Institution: University of Portsmouth

Unit of Assessment: 17 Geography, Environmental Studies and Archaeology

Title of case study: The Smoking Epidemic in England and Scotland: Shaping Public Health Policy and Planning

1. Summary of the impact

We have achieved significant and far reaching impact in the field of public health outcomes, policy and practice. For the first time, age/sex disaggregated estimates of smoking and ex-smoking prevalence were made available for approximately 7700 electoral wards in England and around 1000 postcode sectors for Scotland. The information has influenced national tobacco control policies (e.g. the ban of smoking in enclosed public spaces in England) and has impacted on national smoking-related health inequalities by targeting delivery of cessation services where they are most needed. Findings have also informed anti-smoking campaigns led by health authorities, charities and pressure groups.

2. Underpinning research

The underpinning research summarised here was initiated by Professor G Moon (University of Portsmouth until 2006), Professor K Jones (University of Portsmouth until 2000) and has been led since 2006 by Dr Liz Twigg (appointed in 2003, promoted to Reader in 2011).

In the UK in 2005, it was estimated that smoking was implicated in around 109,000 deaths annually, costing the NHS around £5.2 billion. It was clear that reducing the health and financial costs of smoking would require further reductions in smoking prevalence. However, achieving such a reduction was hampered by the lack of good quality local information needed to inform public health policy and target cessation campaigns effectively.

Our research addressed this information void by establishing, evaluating and applying an innovative technique for generating predictions of health behaviour for small areas called multilevel small area synthetic estimation (MLSASE). The underpinning research was undertaken across 1996/8 via an ESRC- funded project (a). The method involved creating multilevel statistical models of health behaviour using large-scale surveys (e.g. the Health Survey for England) linked to external datasets (e.g. the UK Census) to understand the drivers of such behaviour. Traditional approaches to health behaviour predictions focus solely on individual dimensions of risk or solely on geographical explanations. The innovation in MLSASE is the explicit recognition that behaviour can be explained in terms of both people and place factors simultaneously and an acknowledgement that individual behaviour may interact with local 'cultures' of behaviour. Resultant models are then used in a predictive framework to estimate local prevalence of (say) smoking or drinking. The key methodology paper (1) was submitted as part of RAE2001 where the Geography of Health group received a 'flag' rating. Evaluative research stages illustrated that the MLSASE methodology was fit-for-purpose, cost effective with much potential for use across other indicators (2). The technique was independently evaluated from a user perspective, that of the UK NHS/Department of Health (3), which confirmed the effectiveness of the 'Twigg Method' in addressing small area data needs. This review also noted positive comparisons with other approaches to synthetic estimation, finding it to be one of the best available.

A second phase of research followed on from this initial research. A significant expansion was commissioned by the (then) Health Development Agency (HDA) in 2005 (4, b) to link MLSASE estimates of electoral ward level smoking with cause-specific mortality to provide small area data on smoking attributable mortality. These data were then aggregated to a number of bespoke, policy relevant geographies including Strategic Health Authorities and Primary Care Trusts and published in the resulting 'Smoking Epidemic Report' which has been cited over 60 times. Smoking estimates were also commissioned by NHS Health Scotland in 2007 (5, c) and the Care Quality Commission in 2009 (d). Parallel research also funded by the HDA (e) focused on

extending the reach of this technique by applying MLSASE to develop indicators of social capital such as volunteering, civic participation and club membership. One of the key academic outputs from this project, published in 2005 was submitted in the RAE2008 and has received over 100 citations to date (6).

3. References to the research (1,2,4,5,6) and a supporting reference for quality (3)

1. Twigg, L., Moon, G. & Jones, K. (2000) Predicting small-area health-related behaviour: A comparison of smoking and drinking indicators. *Social Science and Medicine*, 50, 1109-1120. http://dx.doi.org/10.1016/S0277-9536(99)00359-7
Citations: 74, Impact Factor = 3.688

2. Twigg, L. & Moon, G. (2002) Predicting small area health-related behaviour: A comparison of multilevel synthetic estimation and local survey data. *Social Science and Medicine*, 54, 931-937. http://dx.doi.org/10.1016/S0277-9536(01)00065-X
Citations: 35, Impact Factor = 3.688

3. Pickering, K, Scholes, S and Bajekal Madhavi. (2004) *Synthetic estimation of healthy lifestyles indicators: Stage 2 report.* Prepared for Department of Health by NatCen. Available at http://www.publichealth.ie/files/file/Synthetic_Estimation_Stage_2_Report.pdf

4. Twigg, L, Moon, G and Walker S (2004) *The Smoking Epidemic in England*. London: Health Development Agency. Available from http://www.nice.org.uk/niceMedia/documents/smoking_epidemic.pdf
Citations: 69

5. NHS Health Scotland, ISD Scotland and ASH Scotland (2007). *An atlas of tobacco smoking in Scotland: a report presenting estimated smoking prevalence and smoking-attributable deaths within Scotland*. Especially Appendix 3,and 4.
Available at :
http://www.scotpho.org.uk/downloads/scotphoreports/scotpho070705_tobaccoatlas.pdf

Links to Appendices available at: http://www.scotpho.org.uk/publications/reports-and-papers/497-an-atlas-of-tobacco-smoking-in-scotland-a-report-presenting-estimated-smoking-prevalence-and-smoking-attributable-deaths-within-scotland%20Accessed%20October%202013

6. Mohan, J, Twigg, L, Barnard, S and Jones, K. (2005) Social capital, geography and health: a small-area analysis for England. *Social Science & Medicine* 60 (6), 1267-1283. http://dx.doi.org/10.1016/j.socscimed.2004.06.050
Citations: 114, Impact Factor = 3.688

Grants awarded
a) PI G Moon, Co Investigator (CI) Jones and PDRA Twigg. 1996-1998. Multi-level Modelling Approaches to Predicting Small-Area Health-Related Behaviour. ESRC Grant R00221792, £28198
b) PI Twigg and CI Moon. 2003-2004 Smoking Attributable Mortality in England. Health Development Agency £26,000
c) PI Moon, CI Twigg 2001-2002 Smoking in Scotland Health Education Board, Scotland, £24,000
d) PI Moon, CI Twigg Care Quality Commission
e) PI Mohan (UoP until 2005), CIs Twigg, Jones (Bristol) 1999-2002 HDA Social Capital, Place and Health £92,000 1999–2002

4. Details of the impact

Background.
This case study originates from original excellent research in which end-user needs have been considered from the outset. Part of the **impact chain** in shaping public health outcomes and policy begins with the publication of the Twigg et al, 2004 'Smoking Epidemic' report (which featured a

foreword by the (then) Chief Medical Officer, Sir Liam Donaldson). The headline figures were used in February 2006 to open the debate on the Health Bill that eventually led to the ban of smoking in enclosed public places in England. Evidence suggests that this legislation has led to improvements in health in the current REF period and has resulted in a change of attitude towards smoking behaviour (1). Although the rationale for policy change focused on health benefits for non-smokers, according to the Smoking Toolkit Study, adult smoking prevalence has reduced from 24.1% in 2007 to 20.6% in 2011 (2).

Impacts within the REF period (2008-13)

Alongside these indirect contributions, the Smoking Epidemic work and other MLSASE research has had direct, significant and far reaching impact across a number of areas in the current REF period:-

- In 2008, the National Institute for Clinical Excellence (NICE) used headline figures from the Smoking Epidemic as part of the rationale for implementing NICE Public Health Guidance No 10 that focuses on smoking cessation (3). NICE recommends that this guidance is used by cessation service workers in the NHS, local authorities, the wider public, voluntary and community sectors and the private sector when carrying out their professional, managerial or voluntary duties.

- Updated estimates of smoking prevalence were generated for English Primary Care Trusts on behalf of the Care Quality Commission in 2009. These were used to evaluate the performance of NICE smoking cessation guidelines in an overall attempt to tackle inequalities in health relating to cardiovascular disease. Specific attention was given to assessing whether nicotine replacement therapy, smoking cessation advice, recruitment to stop smoking services etc reflected variations in smoking prevalence and how this varied across deprivation groups. The report's evidence of 'inverse-care' (i.e. an imbalance between service provision and service need) has led to a series of policy recommendations including better data collection, improved patterns of prescribing and monitoring of evidence based practice (4).

- The estimates created for the Atlas of Tobacco Smoking in Scotland (see above) have mainly been used at local level (by NHS Boards, Community Health Partnerships etc) to plan and monitor smoking cessation services and tobacco control activity. They have also been used to inform debate and influence opinion by the Scottish Government, ASH Scotland and the Scottish NHS (5).

- The Smoking Epidemic estimated that smoking causes an average of nearly 10 deaths an hour. In 2010 such summary calculations were used by the Medicines and Healthcare Product Regulation Agency in their consultation with over 250 public and private organisations/charities (including Asthma UK, the Advertising Association, the Royal College of GPs and the Welsh Assembly) on the regulation of nicotine containing products (6). In the same year additional headline figures from the Smoking Epidemic report were quoted as part of an 'expert testimony' on 'lessons from tobacco control' in the development of NICE Guidance to prevent obesity using a whole systems approach (7).

- Treatment and care for people with long-term conditions account for seventy per cent of health and care spending, and over 20 million people in England are living with one or more long-term condition. In May 2013, the UK Centre for Tobacco Control Studies (University of Nottingham) used example findings from the Smoking Epidemic in their evidence to the Commons Select Committee on the Management of Long Term Conditions (8).

- The original English estimates of smoking prevalence (and the associated estimates of smoking-related deaths) have continued to inform and influence policy and debate in the public health field. Shortly after the publication of the report, the smoking estimates were placed in the public domain via an interactive mapping tool on the Action on Smoking and Health (ASH) website and were used to demonstrate the 'Iron Chain between Smoking and Deprivation' (see http://www.mapsinternational.co.uk/_subroot1/ash/ash.html for the

mapping tool and http://www.ash.org.uk/files/documents/ASH_491.pdf which explains how the mapping tool has been put together).

- By the end of this REF period, both the Smoking Epidemic and Scottish Atlas are being used by a set of wide-ranging organisations, including health agencies, pressure groups, military groups, schools and local authorities to inform debate, form anti-smoking policies and influence opinion. A simple internet search on the respective reports results in at least 25 different non-academic organisations referring to the reports' findings. A sample of these is provided as links to the associated websites (9).

5. Sources to corroborate the impact

1. Bauld, L (2011) Impact of smokefree legislation: evidence review, Department of Health. Available at:- https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/216319/dh_124959.pdf

2. Smoking toolkit study. Available at:- http://www.smokinginengland.info/latest-statistics/

3. NICE (2008) Smoking cessation services in primary care, pharmacies, local authorities and workplaces, particularly for manual working groups, pregnant women and hard to reach communities. NICE Public Health Guidance 10. Available at:- http://www.nice.org.uk/nicemedia/pdf/ph010guidance.pdf

4. Care Quality Commission (2009) *National Study, Closing the Gap. Tackling cardiovascular disease and health inequalities by providing statins and stop smoking services*. Care Quality Commission, London, Available at:- http://www.erpho.org.uk/ViewResource.aspx?id=20097
   NB Appendix A makes reference to the 2009 research where Twigg was a Co-Investigator

5. Supporting letter from NHS Health Scotland.

6. Medicines and Healthcare products Regulatory Agency (MHRA) consultation letter MLX 364 The Regulation of Nicotine containing products. Available at:- http://www.mhra.gov.uk/home/groups/es-policy/documents/publication/con065618.pdf

7. Expert testimony to NICE's Programme Development Group on a whole system approach to prevent obesity: written reports from Linda Bauld, UK Centre for Tobacco Control Studies. Available at:- http://www.nice.org.uk/nicemedia/live/12109/55094/55094.pdf

8. UK Centre for Tobacco Control Studies (University of Nottingham). Submission to Commons Select Committee on the Management of Long Term Conditions. Available at:- http://www.esrc.ac.uk/_images/Commons%20Select%20Committee%20Long%20Term%20conditions%20UKCTCS%20submission_tcm8-26036.pdf