



Cardiff Institute of Society and Health
Athrofa y Gymdeithas ac Iechyd Caerdydd

Public Health Career Scientist Award - A programme of applied research on the evaluation of complex public health interventions

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Government health strategy in England and Wales has prioritised action to tackle the major preventable diseases, coronary heart disease and cancer, and to reduce health inequalities. As highlighted in the Acheson Report on Health Inequalities and in *Saving Lives: Our Healthier Nation*, nutrition, tobacco and alcohol use, and teenage sexual behaviour are important contributors to these priority areas that need to be the focus of public health policy (Reducing health inequalities: an action report Department of Health 1999). However, it has been noted, for example by the NHS R&D Strategic Review Topic Working Groups on Cancer (p.35) and CHD & Stroke (p.37), that there is a lack of evidence of the effectiveness of interventions in these areas, and thus policy priorities cannot be implemented by investment in services of known effectiveness.

A major problem in the evaluation of public health interventions is that the strongest research design, the randomised controlled trial, is most easily applied to the evaluation of simple, well-defined interventions, whereas public health interventions are most likely to be successful if they are complex interventions acting at multiple levels and through multiple channels (Speller et al. *BMJ* 1997;315:361-363). The result of this mis-match is that good quality studies are undertaken of weak interventions, with inevitably disappointing results, while good quality, complex interventions are not rigorously evaluated, and their effectiveness is not unequivocally demonstrated (Mant D. *Health promotion & disease prevention*. In Peckham & Smith *Scientific Basis of Health Services*. 1996:170-8). This methodological tension is an important contributor to the perceived dearth of evidence on the effectiveness or otherwise of public health interventions.

Developments in research design for the development and evaluation of complex interventions (Campbell et al. *BMJ* 2000;321:694-6), including the use of cluster randomised trials, have the potential to allow well-conducted studies to provide an unbiased estimate of the effectiveness of the interventions when applied in normal practice, and also to illuminate the impact of factors that are variable in complex public health interventions, such as intervention delivery, context and support. More work is required on the design, conduct and analysis of such trials, and an assessment of their (potential) value in evaluating complex public health interventions is required.

The Career Scientist award funds a five year programme of research which will further exploit data collected by Professor Moore in the course of five research projects in which he has been involved. The broad agenda of the research programme is to demonstrate the feasibility of evaluating complex public health interventions using experimental research designs, most particularly cluster randomised effectiveness trials with a significant component of process evaluation involving qualitative data collection. To do this by fully exploiting existing research studies in which Professor

Moore is involved, and to disseminate good practice in the design, conduct and analysis of trials of complex interventions across multiple disciplines.

The research programme will have three specific focus areas:

Identifying factors that affect the effectiveness of the intervention – to develop and test the use of multi-level modelling to identify individual and pupil level factors that are associated with intervention impact, and to identify how qualitative and quantitative data can most usefully be combined.

Individual versus group level analysis in cluster randomised trials – to examine the trade-off between precision and bias when choosing between units of analysis.

The process of peer education – to use social network data collected in two trials of peer-led interventions to identify the process by which peer education works, limits to its likely effectiveness, and its impact on existing social networks.

Publications:

Moore L, Graham A, Diamond I - On the feasibility of conducting randomised trials in education: case study of a sex education intervention. *British Education Research Journal* 2003;29:673-689

Presentations:

'Research design for the rigorous evaluation of complex educational interventions: lessons from health services research'. Paper presented at Royal Statistical Society Annual Conference, Plymouth, September 2002.