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General equilibrium effects of spatial structure: Health outcomes and health behaviours in Scotland [#]

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“Obesity, poor diet and excessive alcohol consumption continue to be a cause of unacceptable levels of ill health which are inequitably distributed across society... Health promotion campaigns usually have a positive effect on some people but often those in most need of changing their behaviour are least likely to take notice of such campaigns.” (Annual Report of the Chief Medical Officer, Scotland, 2010).

“Tobacco smoking remains the biggest single preventable cause of ill health, disability and early death in Lanarkshire and Scotland as a whole. ... Three out of every 10 adults in Lanarkshire smoke however prevalence is significantly higher in areas of deprivation. ... Smoking behaviour is primarily driven by addiction to nicotine however a wide range of personal, social and environmental factors interplay with the addiction to influence who starts smoking, who continues to smoke and who gives up. Tackling smoking within Lanarkshire will therefore require a comprehensive approach which incorporates a range of public health interventions at different levels to tackle the individual, social and cultural influences on smoking behaviour. ... The Scottish Government has recognised tobacco control as a key public health priority and has invested nationally and locally” (Lanarkshire Tobacco Control Strategy 2012-2015, April 2012).

Abstract

Socioeconomic characteristics, health behaviours, and the utilisation and quality of healthcare are prime examples of socioeconomic, cultural and demographic phenomena that are inherently spatial in nature. Understanding the spatial structure of these factors is particularly relevant in order to efficiently allocate resources. This paper explores the general equilibrium spatial structure of health outcomes and health behaviours across Scottish health boards using a variant of the spatial Durbin model which allows for an *a priori* unknown spatial weights matrix. The results suggest that there is substantial spatial dynamics in behaviours across Health Boards and that these spillovers are, as expected, asymmetric. We then demonstrate how the model can be used to estimate the behavioural and health impact of a targeted education policy within each health board taking into account both the direct effect on the particular health board itself and the indirect effect in terms of spillovers. The results illustrate how the dynamic effects should play a large role in designing place based policies that maximise the overall effectiveness of health interventions. Taking into account the spatial dynamics allows policy makers to better target resources and interventions on particular clusters where the direct and indirect spillover benefits are likely to be the greatest in terms of improving health.

Keywords: spatial econometrics, spatial weights matrix, spatial Durbin model, health outcomes, health behaviours, health care utilisation.

JEL: I12, I18, C33.

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