APPLICATIONS OF GEODEMOGRAPHIC METHODS IN THE ANALYSIS OF HEALTH CONDITION INCIDENCE DATA

Peter J. B. Brown
Alexander Hirschfield
Peter W. J. Batey
The Urban Research and Policy Evaluation Regional Research Laboratory
Department of Civic Design
University of Liverpool
Post Office Box 147, Liverpool L69 3BX
UK

ABSTRACT This paper describes how a geodemographic discriminator can be used in a variety of research contexts as a means of revealing the extent of variation in the incidence of phenomena among a population. The paper draws upon a number of applications of an approach to the use of area typologies in the investigation of a wide range of health conditions in North West England. For illustrative purposes, examples are presented which are based upon the analysis of data relating to the incidence of food poisoning in the Blackpool, Wyre, and Fylde District Health Authority area and the attendance of a drug abuse clinic in Liverpool. The first part of the paper sets the context for the application of these geodemographic methods by describing, briefly, some of the background to their development and use. The empirical section concludes with a brief discussion of refinements to the basic form of geodemographic analysis reported here.

1. INTRODUCTION

The main aim of this paper is to illustrate how exploratory analytical methods, which have been widely employed in the commercial field, can provide useful insights into the nature and extent of variation in the rate of incidence or penetration of a phenomenon of interest among a population. These insights are provided by geodemographic discriminators, or by national classifications of small areas based on census-derived indicators, that serve as complex segmentations of the population.

The health-related applications of the geodemographic methods described in this paper have been developed in the course of a series of projects carried out by the Urban Research and Policy Evaluation Regional Research Laboratory (URPERRL) on behalf of health authorities in the North West of England (Bowman, Brown, and Batey 1990; Hirschfield, et al. 1990; Fazey, Brown, and Batey 1990). An underlying aim of these projects has been to examine and comment on the extent of spatial and aspatial variation in the incidence of a range of health conditions. The projects have formed part of the work program of URPERRL in its role as one of eight Regional Research Laboratories (RRLs) that were established as part of the main phase of the Economic and Social Research Council’s £2 million RRL Initiative. URPERRL differs from other RRLs in that it has a specific remit to undertake urban research, the components of
which include monitoring social and economic conditions and evaluating the impacts of urban policy.

The spatial and temporal dimensions of variation have been explored primarily with the aid of various features of geographical information system (GIS) technology. The outcome has typically taken the form of relatively straightforward maps depicting either incidence rates or the location of individual cases. Earlier papers have focused on the problems encountered in the choropleth mapping of incidence rates for relatively rare conditions (see, for example, Brown et al. 1990, and Brown et al. forthcoming). An aim of the current paper is to describe, in more detail, one form of aspatial analysis which has complemented these mapping operations, and has drawn upon the same Poisson chi-square based approach that has been employed in seeking to overcome the small number problems that are encountered in the map-based investigation of the distribution of relatively rare phenomena.

2. GEODEMOGRAPHIC ANALYSIS

The term "geodemographics" has come to be adopted in recent years to refer to the development and application of small-area typologies that can be used to gain a better understanding of the degree of variation in patterns of consumer behavior and the incidence of medical conditions, social problems, and other lifestyle characteristics observed among different socioeconomic groups. These typologies have emerged from the more effective manipulation of census data, together with significant improvements in classification methodology, which have led to the production of multidimensional classifications of people according to the types of areas in which they live, rather than according to the more conventional, unidimensional criteria of social class or income.

Later in this section we outline how this form of geodemographic discriminator can be used in an exploratory analysis of incidence rate variation by attaching a typology cluster code to each address-based record in a health-related database. First, however, a discussion is presented of how the broad approach came to be developed, and how the typologies or classifications are applied and should be interpreted. Also noted are some of the limitations and qualifications that must be borne in mind when undertaking this form of exploratory data analysis.

In the mid-1980s, interest in area typologies in the private sector in the United Kingdom was stimulated by recognition of the opportunity to link a census enumeration district (ED)-based classification to postal geography. The link is achieved via a correspondence table that relates the full postcode (typically 150 households) to the ED (typically 150 households) within which it falls. In this way, address-based information can be readily processed to provide an indication of the area types in which relatively high and low levels of response, or some other aspect of consumer behavior, is observed. This has led to a wide range of applications of area typologies (see, for example, Webber 1985, and Beaumont and Inglis 1989).

Two members of the URPERRL staff were directly involved in the development of an innovative form of geodemographic discriminator, known as Super Profiles, as part of a collaborative project involving researchers at the