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A comparison of health inequalities in urban and rural Scotland

Kate A. Levin[a,*], Alastair H. Leyland[b]

[a]*University of Dundee, Dundee, UK*
[b]*University of Glasgow, UK*

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Abstract

Previous research suggests that there are significant differences in health between urban and rural areas. Health inequalities between the deprived and affluent in Scotland have been rising over time. The aim of this study was to examine health inequalities between deprived and affluent areas of Scotland for differing ruralities and look at how these have changed over time. Postcode sectors in Scotland were ranked by deprivation and the 20% most affluent and 20% most deprived areas were found using the Carstairs indicator and male unemployment. Scotland was then split into 4 rurality types. Ratios of health status between the most deprived and most affluent areas were investigated using all cause mortality for the Scottish population, 1979–2001. These were calculated over time for 1979–1983, 1989–1993, 1998–2001. Multilevel Poisson modelling was carried out for all of Scotland excluding Grampian to assess inequalities in the population. There was an increase in inequalities between 1981 and 2001, which was greatest in remote rural Scotland for both males and females; however, male health inequalities remained higher in urban areas throughout this period. In 2001 female health inequalities were higher in remote rural areas than urban areas. Health inequalities amongst the elderly (age 65+) in 2001 were greater in remote rural Scotland than urban areas for both males and females.

Keywords: Health inequalities; Urban/rural; Multilevel modelling; Scotland; UK; Mortality

Introduction

Inequalities in health between the deprived and the affluent have been highlighted in previous studies both in the UK (Eames, Benshlomo, & Marmot, 1993; Marmot et al., 1991; Phillimore, Beattie, & Townsend, 1994) and elsewhere (Bobak, Pikhart, Rose, Hertzman, & Marmot, 2000; Davey Smith, Neaton, Wentworth, Stamler, & Stamler, 1996; Kennedy, Kawachi, Glass, & Prothrow-Stith, 1998). Health inequalities have been rising in Scotland for a quarter of a century (Boyle, Exeter, & Flowerdew, 2004; McLoone & Boddy, 1994). However, it is unlikely that the same level of inequalities exist throughout Scotland. Ferrer and Palmer (2004) found evidence of variability in health inequalities within socioeconomic status (SES) strata in the US population. The relationship between demographic changes and mortality inequalities has also been discussed in previous studies (Boyle, Exeter, & Flowerdew, 2004; Regidor, Calle, Dominguez, & Navarro, 2002) and it has been shown that population change is likely to play a part in the widening of health inequalities. Areas experiencing high migration may therefore experience higher inequalities than those which remain static.

*Corresponding author. Tel.: +44 1382 420140.
E-mail addresses: k.levin@chs.dundee.ac.uk (K.A. Levin), a.leyland@udcf.gla.ac.uk (A.H. Leyland).

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Scotland has a population of approximately 5,000,000, most of which lives in the central region, which includes the two largest cities, Glasgow and Edinburgh. There is an uneven distribution of deprivation across Scotland with higher rates on the west coast. The rural population, making up 29% of the population of Scotland (Williams, Shucksmith, Edmond, & Gemmell, 1996) in 1991, has a larger proportion of residents aged 65 years and above than the rest of Scotland and this population, as a proportion of the overall population, is expanding at a faster rate. Such demographic differences are likely to impact on the distribution of health inequalities across Scotland.

Geographic variations in mortality inequalities are greater in Scotland than any other part of the UK (Leyland, 2004). Previous studies have shown that variation in health exists between urban and rural communities in Scotland, Norway, USA and elsewhere for outcomes such as self-reported health, ischaemic heart disease, cancer and suicide (Campbell et al., 2001; Kruger, Aase, & Westin, 1995; Levin, 2003; Singh & Siahpush, 2002). Measuring health inequalities between SES strata in rural areas, however, requires separating the dimensions of deprivation and rurality, a difficult task due to the way in which the two dimensions intersect one another (Martin, Brigham, Roderick, Barnett, & Diamond, 2000). Furthermore, the heterogeneous nature of rural Scotland requires a definition of rurality with enough categories to overcome large within stratum variation while at the same time allowing for capture of enough cases of both deprived and affluent to make analysis possible. Little work has therefore been carried out comparing socioeconomic inequalities in health between urban and rural areas.

Indicators of health inequality used internationally commonly target those aged under 65 (or 75) years as inequalities are believed to diminish with increasing age (Kunst & Mackenbach, 1994). Potential indicators of inequalities in health in Scotland were listed in Inequalities in Health (Scottish Executive, 2003). The three indicators considered relating to older people showed little difference between rich and poor and subsequently were not included as useful indicators of health inequalities. This study aims to compare health inequalities in urban and rural areas for all cause mortality and look at how these have changed over time.

Data and methods

Scotland is made up of 895 postcode sectors with an average population of ~5500. Postcode sectors are grouped roughly into 56 local government districts, nested within 15 Health Boards. For this analysis postcode sectors whose boundaries cross local government districts were assigned to the district which housed the largest number of residents in 1991. Analysis was conducted at the level of 5-year age-sex group within postcode sector. Grampian Health Board was excluded from this analysis due to changes in postcode sector boundaries, which occurred in 1996. Interpolation and extrapolation of census data for 1981, 1991 and 2001, along with General Register Office for Scotland (GROS) estimates by age, sex and Health Board for the intervening years, gave the disaggregated population data by age, sex and postcode sector for 1979–1980, 1982–1990 and 1992–2000. The health data used in this analysis, also provided by GROS, were all cause mortality data between 1979 and 2001.

Postcode sectors were classified into four categories by rurality: urban, accessible rural, remote towns and remote rural. This classification was derived from one used in the Scottish Household Survey (Hope et al., 2000) and has previously been used to show urban–rural inequalities in health in Scotland (Levin, 2003; Levin & Leyland, 2005). It was assumed that the rurality of a postcode sector remained the same throughout the time period 1979–2002.

The Carstairs Indicator (Carstairs & Morris, 1991) was used as an indicator of deprivation at postcode sector level, calculated from data collected at the 1981, 1991 and 2001 censuses. Its component parts are male unemployment, car ownership, low social class and overcrowding. Quintiles of deprivation for Scotland were calculated using the Carstairs Indicator at these three time points.

Age-standardised mortality rates were calculated separately by sex and split by age (over and under 65 years) for urban and remote rural Scotland over the time period 1979–2001, using direct standardisation methods. Health and population data were then aggregated over the periods 1979–1983, 1989–1993 and 1998–2001 (to overcome the problem of low cell counts) and rates were produced as before. Ratios of all cause mortality rates were calculated for all age and sex groups, of the upper quintile of deprivation to the lower quintile, with