

# Socio-economic deprivation is associated with increased proximity to general practices in England: an ecological analysis

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## Abstract

**Background** As health status is consistently negatively correlated with socio-economic deprivation, the need for health services is generally assumed to be greater in more deprived communities. The Inverse Care Law predicts that access to good quality primary care services in more deprived wards will be less than that in affluent wards. However, the relationship between deprivation and geographical proximity to health services has received little attention.

**Methods** We investigated the relationship between geographical proximity to general practices and a number of markers of socio-economic deprivation at the electoral ward level in the North East of England using various domains of the Index of Multiple Deprivation 2000 (IMD2000).

**Results** More deprived wards, as measured by the employment, education and income domains of the IMD2000, had greater proximity to general practices, as measured by the access domain of the IMD2000, than affluent wards. This results held in both urban and rural wards.

**Conclusions** Contrary to our expectations and the predictions of the Inverse Care Law, geographical proximity to general practices was greater in more deprived, compared to more affluent wards. However, geographical proximity to services does not necessarily ensure that services will be accessed or that they are of good quality.

**Keywords:** inverse care, inequalities, deprivation, access to services

## Introduction

As health status is consistently negatively correlated with socio-economic deprivation,<sup>1</sup> the need for health services is generally assumed to be greater in more deprived communities. However, the relationship between deprivation and geographical proximity to health services has received little attention. We assessed the relationship between geographical proximity to general practices – the main source of primary health care in the United Kingdom – and a number of markers of socio-economic deprivation at the electoral ward level in the North East of England using freely available data.

## Methods

Proximity to general practices was measured using the access domain of the Index of Multiple Deprivation 2000 (IMD).<sup>2</sup> This is a combined measure of average straight line distance to the nearest post office, food shop, general practice and primary school. Scores for all wards in the North East were ranked for analysis, with a rank of 1 representing greatest proximity to services. Strong correlations between this measure and both straight line distance and road travel time to the nearest general practice surgery and hospital have been previously reported.<sup>3</sup>

Socio-economic deprivation was quantified using ranks of the employment, education and income domains of the IMD with ranks nearer to 1 representing less socio-economic deprivation: higher average income, educational attainment or employment. The variables used to construct these domains of the IMD are listed in the Table 1.

As both socio-economic deprivation and geographical proximity to services might be expected to vary according to rurality, we considered rurality to be a potential confounder in our analysis. We, therefore, used the Countryside Agency's Ward Level Definition of Rural Areas to distinguish between rural and urban wards.<sup>4</sup> This definition uses data on a number of variables which are known to vary strongly according to rurality (including population density; the percentage of the population that is economically active, uses public transport to get to work and is employed in agriculture, forestry, fishing, mining or primary production of energy or water) to classify all wards in England and Wales as either rural or urban.

The associations between geographical proximity to services and the measures of socio-economic deprivation were assessed using the Spearman rank correlation test in Stata version 8.0. Correlations were investigated in all wards combined and in rural and urban wards separately.

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**Table 1** Indicators used in the socio-economic domains of the IMD<sup>2</sup>

<b>Education</b>
Working age adults with no qualifications
Children aged 16 and over who are not in full-time education
17–19-year-olds who have not successfully applied for higher education
Primary school performance at 'key stage 2'
Primary school children with English as an additional language
Absenteeism at primary schools
<b>Employment</b>
Unemployment claimant counts
People out of work but in government supported training
People aged 18–24 on 'New Deal' options
Incapacity Benefit recipients aged 16–59
Severe Disablement Allowance claimants aged 16–59
<b>Income</b>
Adults in households receiving Income Support, Income Based Job Seekers Allowance, Family Credit or Disability Working Allowance
Children in households receiving Income Support, Income Based Job Seekers Allowance, Family Credit or Disability Working Allowance
Non-earning, non-IS pensioner and disabled Council Tax Benefit recipients

## Results

Full data was available for all 505 wards in the North East of England in 1998. These wards had an average population of 5139. Table 2 shows the associations between the rank of the access domain and the rank of the socio-economic domains of the IMD, both in all wards and when urban and rural wards were analysed separately. In all cases there was a highly statistically significant inverse relationship between the rank of the access domain and the rank of the other domains suggesting that those areas with greater socio-economic deprivation, in terms of income, education and employment, tended to have greater geographical proximity to general practices. Although this association was seen both in urban and rural wards, there was a consistent trend for the strength of association to be greater in rural wards.

**Table 2** Associations between rank of access domain and ranks of employment, education and income domains according to rurality

	Association with rank of access domain – Spearman's rho		
	All wards (n = 505)	Urban wards (n = 347)	Rural wards (n = 158)
Rank of employment domain	–0.51**	–0.27**	–0.56**
Rank of education domain	–0.38**	–0.19**	–0.25*
Rank of income domain	–0.52**	–0.27**	–0.58**

\*Statistically significant at the 1 per cent level.

\*\*Statistically significant at the 0.1 per cent level.

## Discussion

We have found a consistent relationship between markers of socio-economic deprivation and a measure of geographical proximity to general practices at the ward level in the North East of England with more deprived wards tending to have greater proximity to general practices.

Our analysis is based on aggregate data and may not be applicable to individuals. We have also relied on a measure of geographical proximity to health services that is a combined measure of proximity to a number of key services including, but not restricted to, general practices. This measure is likely to contribute error, although not systematic bias, to our results. Our analysis is also restricted to one geographical region of the United Kingdom and our results may be specific to that area – although there is no obvious reason why the North East of England might be expected to be unusual in terms of location of general practices.

Contrary to what might be expected, we have found that more deprived areas tend to be better served by health services in terms of geographical proximity to general practices. This suggests that general practices are generally located nearer to those people who need them most, e.g. socio-economically deprived communities. The relationship seen may also reflect the tendency for deprivation to concentrate in city centres – where services are also often concentrated.

Our findings may provide some comfort to those seeking to overcome the inverse care law – the tendency for 'the provision of good quality health care... to vary inversely with the need for it in the population served'.<sup>5</sup> However, geographical proximity to general practices is only one aspect of the provision of good quality health care and does not necessarily ensure that the standard of care delivered is of a high standard or that utilisation of health services is appropriate.

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