Short report
The relationship between use of NHS Direct and deprivation in southeast London: an ecological analysis

Jenni Burt, Richard Hooper and Lynda Jessopp

Summary
Background Little is known about the utilization of NHS Direct by disadvantaged groups, in spite of the service aiming to be ‘accessible to all’. This study investigates the relationship between use of NHS Direct and deprivation in one predominantly disadvantaged area.

Methods Ward-level call rates to NHS Direct South East London over a 6 month period were calculated using postcode data. Jarman and Townsend scores were used as a proxy of deprivation in each ward. We performed negative binomial regression to investigate the relationship between deprivation score and rate of calls to NHS Direct.

Results There was a significant, non-linear (quadratic) effect of deprivation score on call rates; call rates were lower in both the most affluent and most deprived wards.

Conclusion Calls to NHS Direct rise with increasing deprivation until, at extreme levels of deprivation, they subsequently decline. This challenges assumptions that NHS Direct is not utilized in deprived areas.

Keywords: NHS Direct, deprivation, utilization, access to services

Background
NHS Direct, the nurse-led telephone health advice and information service, aims to be accessible to all regardless of social positioning or income. As such, it has a key role to play in the Government’s aim of reducing inequalities in access to NHS services. The success of this ‘open access’ role and its impact on uptake of NHS services will be tested when, in 2004, NHS Direct becomes the gatekeeper of out-of-hours primary care services.

However, concerns that NHS Direct may in fact be serving the needs of the ‘worried and well middle classes’ rather than disadvantaged groups are strong. A recent survey indicated that those in social classes D and E do have lower awareness of the service. These potential inequities are highlighted in a recent report from the House of Commons Public Accounts Committee, which recommends that NHS Direct acts to encourage use by disadvantaged groups. Contrary to the debate surrounding NHS Direct, deprivation is frequently associated with higher use of other services, including in- and out-of-hours general practice and accident and emergency (A&E) departments. Thus far, there is no published evidence on the effect of deprivation on uptake of the NHS Direct service. This study aims to address this gap by investigating the relationship between use of NHS Direct and deprivation in one predominantly disadvantaged area.

NHS Direct South East London (SEL) serves a mainly inner-city area with a population of 1.5 million. The service was established in Lambeth, Southwark and Lewisham (LSL) in May 1999, and Bexley, Bromley and Greenwich (BBG) in September 2000. The area includes pockets of both extreme deprivation and relative affluence. Call rates to NHS Direct SEL have increased since its inception, and in 2001 were running at around 325 a day.

Methods
Postcode data on all calls from 1 September 2001 to 28 February 2002 were downloaded from NHS Direct’s Clinical Assessment System (CAS) (n = 75,928). Calls with incomplete or missing postcode data (n = 8,837) or from outside the study area were excluded. Six-monthly call rates per 1000 people were calculated for each ward using 2001 ward-based population predictions. Jarman and Townsend scores were calculated for each ward.

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using England and Wales as the mean (zero). Positive scores indicate greater levels of relative deprivation.

We performed negative binomial regression to investigate the relationship between deprivation score and rate of calls to NHS Direct. Analyses were adjusted for the proportion of under-5s and over-65s in each ward, as well as a possible difference between LSL and BBG. Non-linear effects of deprivation were examined using quadratic terms and division by quintiles. Analyses were performed using Stata 7.0 (Stata Corporation, College Station, TX).

Results

Ward-level Jarman scores ranged from –25.11 to 64.31, and Townsend scores from –2.30 to 15.67. Using the ward-based general practice deprivation payment scheme definitions (currently being phased out in favour of enumeration districts), it is apparent that this area is one of high deprivation relative to England and Wales. A total of 32.9 per cent (52/158) wards are deprived, compared with 5 per cent nationwide. Of these wards, 16.5 per cent (26/158) have low levels of deprivation (Jarman score of 30 to <40), 14.6 per cent (23/158) medium deprivation (40 to <50), and 1.9 per cent (3/158) high deprivation (>50).

Call rates to NHS Direct also vary across wards. Six-monthly ward call rates per 1000 population ranged from 0.1 to 40 to <50), and 1.9 per cent (3/158) high deprivation (>50).

There was a significant, non-linear (quadratic) effect of Jarman score ($\chi^2 = 30.8, df = 2, p < 0.001$) and Townsend score ($\chi^2 = 19.1, df = 2, p < 0.01$) respectively on call rates. After adjusting for an overall difference between LSL and BBG there was no evidence that the shape of the relationship was different in the two areas, although the range of deprivation scores in LSL was narrower than in BBG. In each area analysed alone, a quadratic effect of deprivation fitted the data significantly better than a linear one. The Table shows the effect of deprivation categorized by quintiles: this approach is less powerful, and less useful for looking specifically at LSL with its limited range of deprivation, but allows effects to be quantified more easily. Call rates were lower at each end of the deprivation range; both in the most affluent and most deprived wards.

**Table**: Effect of deprivation on call rates: incidence rate ratios (IRRs) by quintiles of Jarman score and Townsend score respectively, adjusted for region (LSL versus BBG) and proportions of under-5s and over-65s

<table>
<thead>
<tr>
<th>Quintile</th>
<th>Townsend score</th>
<th>Jarman score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range of score</td>
<td>IRR (95% CI)</td>
</tr>
<tr>
<td>1</td>
<td>–2.30 to 1.37</td>
<td>1.00</td>
</tr>
<tr>
<td>2</td>
<td>1.81–6.01</td>
<td>1.30 (0.99–1.71)</td>
</tr>
<tr>
<td>3</td>
<td>6.06–8.51</td>
<td>1.29 (0.92–1.92)</td>
</tr>
<tr>
<td>4</td>
<td>8.59–10.91</td>
<td>1.32 (0.93–1.87)</td>
</tr>
<tr>
<td>5</td>
<td>10.92–15.67</td>
<td>1.01 (0.68–1.52)</td>
</tr>
</tbody>
</table>

Discussion

This study provides strong evidence for an association between deprivation and usage of NHS Direct in one inner-city area. This relationship is not, however, linear. Initially, as deprivation increases, so do call rates to NHS Direct. However, at extreme levels of deprivation this pattern is reversed, with call rates decreasing as levels of deprivation continue to rise.

There is continuing debate about the utility of the Jarman score as an indicator of deprivation. However, although its origins are as a predictor of workload to determine general practitioner (GP) deprivation payments, it can be used as a proxy for deprivation. Our results were similar for both Jarman and Townsend scores.

We used routine data recorded by NHS Direct South East London, which is likely to be an accurate representation of call volume. However, technical issues of call routing may lead to slightly lower call rates in wards on the borders of the area, with some potentially directed to alternative sites. Nearly 12 per cent of calls had incomplete, inaccurate or missing postcodes, and we were thus unable to assign a ward to them. Thus, potential bias could arise if callers from more disadvantaged areas are more likely to remain anonymous, or less likely to give an accurate postcode. The later introduction of NHS Direct into BBG is of concern, although our analysis controlled for possible differences between BBG and LSL. The inner-city setting, with high levels of deprivation and distinct patterns of service provision and utilization, limits the generalizability of our findings. With higher use of A&E departments, the ambulance service, and in-hours general practice when compared with the rest of England, utilization of healthcare services in London may be distinct. However, understanding of NHS Direct utilization in disadvantaged wards is essential if NHS Direct is to achieve equity of access.

It is well established that higher levels of deprivation, at both ward and individual level, are associated with greater use of a range of immediate care services. Even after adjustment for need, GP consultation rates are related to both area-level deprivation and lower socio-economic group. Comparisons with utilization of GP and A&E services may be limited as NHS Direct does not provide diagnosis or treatment, and contact is by telephone only. A previous study on GP consultation rates...
and deprivation, including telephone consultations, did not analyse these separately.\textsuperscript{7} However, the results presented here suggest that NHS Direct utilization rates do initially follow a similar pattern to that reported for other immediate access services, with increasing deprivation associated with increasing use. Few ward-level studies of other services have been conducted in areas with comparably high levels of deprivation. This may partly explain the differences between our results and those of other studies, which tend to report a linear relationship. The decline in utilization of NHS Direct at extreme levels of deprivation reported here may reflect difficulties in accessing the service. In particular, differential access to a telephone might explain some of the reduction in utilization rates in the most deprived wards.

Additionally, reported patterns of utilization of immediate care services do not remain constant regardless of the nature of the contact. In particular, the use of GP services for preventive care declines in lower social classes – the so-called ‘inverse prevention law’.\textsuperscript{18–20} NHS Direct may also be used for information and support on the prevention of ill health – indeed, a key aim is to empower users to make decisions about their health and care.\textsuperscript{1} Although this analysis provides evidence for the use of NHS Direct in disadvantaged areas, systematic differences in the reasons for and outcomes of calls were not examined. However, it is possible that lower use of the service for information on preventive activities may also contribute to the lower use in areas of extreme deprivation.

The House of Commons Public Accounts Committee emphasized the need for NHS Direct sites to both understand and act to improve usage by disadvantaged groups.\textsuperscript{5} As well as less advantaged social groups, action should also be targeted at older people and ethnic minority groups.\textsuperscript{4} However, this analysis shows that action may need to be focused on areas of extreme deprivation, rather than all areas with some level of disadvantage.

Larger ecological studies using standardized NHS Direct data\textsuperscript{5} would increase understanding of usage patterns at national level. However, this would not address how use of NHS Direct varies in relation to deprivation at an individual level, after adjusting for need.\textsuperscript{21} Although complex to conduct, this individual-level research may also provide some insight into whether socioeconomic differences exist in the use of this resource for preventive care.

It is encouraging that this preliminary research challenges assumptions that NHS Direct does not reach deprived areas. Yet whether NHS Direct can have any impact on reducing inequalities in health remains to be seen. As its role expands into out-of-hours primary care, and perhaps beyond, so must our understanding of the complexities of its utilization and impact.

Acknowledgements

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References


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