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Names-based classification of accident and emergency department users

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ABSTRACT

This paper studies differential healthcare utilisation by ethnic group. Administrative records of nearly 100,000 users of an Inner London accident and emergency (A&E) facility were analysed using an innovative names-based ethnicity classification. Adult repeated 'light' usage (i.e. with no hospitalisation or follow-up) did not differ according to ethnic group. Users from ethnic minorities had lower GP registration rates than the majority reference group. However, lack of GP registration was not associated with repeated light use of A&E, overall. Therefore, these results challenge common perceptions of differential A&E access rates by ethnicity.

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1. Introduction

National Health Service (NHS) accident and emergency departments (A&E) offer free access to healthcare and are open 24 h a day. They are not an inexpensive option: for example, Southwark Primary Care Trust calculated that an average visit to an A&E facility costs the NHS three times as much as a visit to a General Practitioner (GP). This financial expedient provides a strong incentive for analysis of the cost-effectiveness of care provision if this leads to reductions in the numbers of A&E visits that can be deemed as inappropriate, non-urgent, convenience-oriented, preventable or 'light' (Murphy, 1998a, 1998b; Sempere-Selva et al., 2001; Giesen et al., 2006; Leaman et al., 2006).

Our motivation for segmentation of users according to ethnicity is predicated upon the notion that members of some ethnic groups have utilisation patterns that differ from the general population. Such differences might arise because of differences in cultural perceptions, language barriers or (particularly for recent migrants) lack of familiarity with the UK National Health Service (NHS) procedures and functions (Hargreaves et al., 2006). This research hypothesis stands in contrast to some previous research on outpatient activity that identifies greater propensity amongst the established white British population of the area to use outpatient services rather than GPs because of the perceived inadequacy of the latter in inner city areas (see Rajpar et al., 2000). We are aware, however, that analysis of ethnic differences in healthcare utilisation

using routinely collected data is far from straightforward, because of enduring issues of data incompleteness. Such issues frustrate efforts to extend and improve coverage of hard to reach groups (Aspinall, 2000; Kumarapeli et al., 2006; Raleigh, 2008; Sangowawa and Bhopal, 2000).

The contribution of this research is to classify individual health records according to patient cultural, linguistic and ethnic group, using information derived from given and family names, in order to increase our understanding of differential healthcare usage according to ethnicity. We see this as a contribution to the debate on ethnicity and the utilisation of healthcare (Mladovsky, 2009). In the present study we have analysed GP registration rates and the characteristics of light frequent users of King College Hospital's A&E department in Inner London. These data have been coded using Onomap, a names-based ethnicity coding tool developed by two of the authors at University College London and applied in Camden and Southwark Primary Care Trusts as well as other public and private organisations (Lakha et al., forthcoming; Mateos, 2007a, 2007b). There is a vast literature on the health inequalities of migrant populations because *country of birth* information is the most widely collected information related to *ethnicity*. The literature on *ethnic health inequalities* is relatively recent and sparser, largely because monitoring of such inequalities is a recent phenomenon in Britain and is almost non-existent in some other countries (Mateos, 2007a, 2007b). This paper makes a contribution to this sparser literature by proposing an application of a cost-effective method to analyse data sets in which ethnicity information is not available. Moreover, when information on country of birth is available, the names methodology can complement the analyses by distinguishing first from subsequent

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generations. The role of this type of quantitative research is to formulate hypotheses or ‘breaking the ground’ for more specific and resource-intensive qualitative research.

A more broad-based research design might have entailed an interview-based project, in which self-ascribed ethnicity could have been ascertained alongside people’s perceptions of A&E services or the wider healthcare system. We first became interested in seeking to classify ethnicity on the basis of names when alerted to the vagaries of birthplace data in NHS hospital records. The vagaries of assignments, inconsistencies of classification, typographic errors and other issues led us to develop a ‘birthplace geocoder’ to establish a measure of consistency in the records. We rapidly became of the view that clerical staff were not equipped to take reliable records. While some (but not all) of these issues could be resolved by employing trained interviewers to solicit accurate information on ethnicity, this would be costly and raise ethical issues about conducting a survey amongst distraught patients. Southwark NHS was, in any case, seeking a broad brush, generalised overview of A&E usage amongst different ethnic groups in the first instance, and did not have the resources available to commission a specific survey.

The decision was thus taken to conduct an exploratory study using large numbers of records in order to ensure representativeness, a stance that is consistent with prevailing UK government initiatives to achieve greater re-use of government administrative data, subject to safeguards.

2. Methods

2.1. Study area

King’s College Hospital A&E Department is located in the London Borough of Southwark on the south bank of the River Thames. Historically Southwark was centrally located in relation to London’s port and associated industries. Today, it is among the most deprived local authorities in England, ranking 18th out of 325 local authorities on the income deprivation measure and 25th on the employment deprivation measure (Office for National Statistics, 2008). The majority of patients (66%) live in areas ranked amongst the 20% most deprived areas in England. More than 40% of patients live in publicly rented accommodation, typically social housing apartment blocks built in the 1960s. Southwark has a high population turnover, as well as a diverse and multicultural population. The Borough scores badly on a number of official health indicators including high infant mortality, low birth weight, low male life expectancy at birth, low disability-free life expectancy and high teenage conception rates (Petersen et al., 2009). Therefore, the interrelations between these diverse population characteristics and unequal health outcomes make Southwark a unique study area to investigate differential A&E usage.

2.2. Data

Records for each of the A&E attendances (“visits”) to King’s College Hospital A&E unit during a one-year period (1 April 2005–31 March 2006) were obtained from King’s College Hospital NHS Foundation Trust. This facility principally serves the South London Boroughs of Southwark and neighbouring Lambeth, and the analyses were restricted to residents living in these two Boroughs.

Most services in the National Health Service (NHS) record information on episodes of care labelled with unique person identifiers (NHS numbers). NHS numbers are issued when patients first register with a GP. However, NHS numbers are

often missing from A&E records: users can ‘walk in’ from the street without an appointment; some patients are unconscious or distressed on arrival; and some are not registered with a GP. As a consequence, individuals were identified, for this study by using a combination of date of birth, postcode and sex in place of a unique identifier (Gill, 1997). This approach was tested using the local GP patient register, where all users are identified using unique NHS numbers. The combination of the three fields correctly identified unique individuals in 99% of all cases. Using this technique we identified 107,735 users who made the 163,333 A&E attendances collected over that particular year (average 1.52 attendances per user per year).

2.3. Classification of outcome severity

Many studies have been concerned with identifying A&E usage that is deemed *inappropriate, non-urgent, convenience-oriented, preventable or light* (Murphy, 1998a, 1998b; Sempere-Selva et al., 2001; Giesen et al., 2006). In this research we have focussed on A&E outcome categories, because in comparison with other available data (diagnosis, triage, mode of transport) it is recorded at discharge rather than upon arrival (cf. triage) and it was also recorded more comprehensively (86% of attendances) than for any of the other characteristics. We reclassified the outcomes into four major categories of severity by drawing on the expertise of A&E staff.

- (1) *Majors* containing major operations and emergency admission to hospital.
- (2) *Follow-up* containing cases where the attendee is referred to another speciality.
- (3) *Discharged* without follow-up; for those treated and discharged within 4 h.
- (4) *Did-Not-Wait* for those that did not wait to receive attention.

Examples of the *Majors* category are outcomes coded “Admit”, “Gynae scanning”, “Theatre” or “Died”, indicating: hospitalisation, major complications, redirection to an operating theatre or death, respectively. *Follow-up* included categories such as “Eye clinic” or “Fracture clinic”. *Discharged* included for instance, “Discharged” or more cryptic categories such as “Taxi”. *Did-Not-Wait* contained the code for this outcome alone. Many of the codes in use required very specific, local knowledge such as the name of a particular hospital wing or clinic.

Each of the 107,735 users was subsequently identified by the outcome of their first attendance within the study period resulting in a user classification with *Majors* (16%), *Follow-up* (24%), *Discharged* (44%) or *Did-Not-Wait* (2%). Users where the outcome data were missing (14%) were not analysed further, but resembled the *Discharged* category in their demographic profile. The analysis was performed on the 93,096 users with outcome information. To focus on users that potentially could be treated in other healthcare settings we have chosen to assign repeat users, i.e. those that attended two or more times during the one year study period, to the *Discharged* and *Did-Not-Wait* categories and termed these 13,764 ‘light frequent users’ for the purpose of this study. ‘Light’ is thus intended as an umbrella term for attendances that did not lead to hospitalisation or follow-up treatment. Non-registration with a GP was assumed where the GP details were either missing or coded as unknown.

2.4. Statistical analysis

Age- and sex-specific attendance rates were calculated as the number of attendances per user. Multiple logistic regression

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