Hospital activity and cost incurred because of unregistered patients in England: considerations for current and new commissioners

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ABSTRACT

Background Commissioners are responsible for providing health care for defined geographical areas. A lack of comprehensive national and local information on health needs of unregistered populations makes health service planning difficult.

Methods A cross-sectional study using Hospital Episode Statistics to quantify the level of inpatient and outpatient activity, and associated cost by patients not registered in primary care in English NHS hospitals. Unregistered patients were defined as those without a valid GP registration, prisoners, military personnel, asylum seekers/immigrants and the homeless.

Results Unregistered patients accounted for 99,615 inpatient admissions and 370,504 outpatient attendances in 2009/10, at a total cost of £242 m. Mental health accounted for 30% of all inpatient costs. The majority of unregistered patients were male and aged 20–39 years. There were high levels of activity and cost in urban local authorities (LAs) (Birmingham and London) and LAs with links to military services (Salisbury, Richmondshire, Southampton). A high total inpatient cost was attributed to trauma, general medicine and mental health specialties. A high total outpatient cost was attributed to genitourinary medicine and trauma specialties.

Conclusions Health care use by unregistered populations is an important consideration for resource allocation and planning health care services at national and local levels.

Keywords epidemiology, health services, public health

Introduction

At present Primary Care Trusts (PCTs) in England are responsible for commissioning health care services for populations within a defined geographical area, including individuals who are not registered with a general practitioner (GP). Provision of care for some unregistered populations (asylum seekers, prisoners and military personnel) but not others (persons of no fixed abode) is taken into account in the PCT resource allocation.

Following recent reforms to the English NHS, the responsibility for the health needs of both registered and unregistered populations falls to new commissioners at national and local levels. At national level, the NHS Commissioning Board (NHSCB) will be responsible for commissioning prison health care and will need to consider unregistered populations when commissioning specialized services. At local level, Clinical Commissioning Groups (CCGs) will be responsible for all persons who ‘usually reside in the consortia’s area’ and not solely those registered with GPs who are members of the consortia. Local authorities will also be required to commission some services (access to sexual health services) and deliver others (immunization programmes) in their areas.

The majority of the unregistered population are eligible for NHS funded care. Asylum seekers are entitled to free
NHS treatment in primary and secondary care for as long as their application (including appeal) is under consideration. People who entered the country as asylum seekers but who have not been judged entitled to remain are not eligible for free hospital care, but NHS Trusts have the discretionary power to provide treatment where there is no prospect of reimbursement for it, or to withhold treatment pending payment. Prisoners should receive the same health service as they would receive if they were still living in the community. In 2003, PCTs became responsible for commissioning NHS services for prisoners held within prisons in their local areas. Military personnel de-register from NHS primary care upon enlistment, but they remain entitled to emergency NHS care and full NHS treatment (where appropriate military health care is not available) and the cost is borne by the PCT. Persons of no fixed abode can access primary and secondary care and the commissioning PCT is the area in which the service providing treatment is located.

Policy makers and commissioners require comprehensive information on the use and cost of health services for unregistered populations at national and local levels. There are also concerns that the health needs of unregistered populations are not addressed and that the distribution of these cases is variable around the country. A number of studies have investigated the health care needs of, and health service use by, asylum seekers, prisoners and persons of no fixed abode, but the majority have been completed in London and the cost of health service provision has been considered only for homeless patients.

As part of refining the NHS resource allocation, we investigated the level of inpatient and outpatient activity in NHS hospitals by unregistered patients. We present findings at national and local authority (LA) levels.

**Method**

We used Hospital Episode Statistics (HES) data for 2009/10, which contain information on all admissions and outpatient appointments in NHS hospitals in England.

**Defining unregistered patients**

Inpatient and outpatient care for unregistered patients were identified in HES using two methods:

(i) All patient records with no registered GPs recorded, or where the GP code was not applicable, unknown or invalid.

(ii) All activity from an organization or purchaser that indicated a possible source of unregistered patients. Organizations and purchasers of interest were identified searching the name and address details of the current ‘GP practice and prescribing cost centre’ and the ‘Prisons in England and Wales’ lists for the terms: unreg*, armed, military, army, asylum, migr*, HMP, prison, homeless and travel. All prison and Ministry of Defence purchasers were also identified. Organizations were then checked manually to determine whether they were likely to provide a service for unregistered populations e.g. Salvation Army, Travelling Families Project and Homeless Team. A total of 149 organizations were identified and classified as prison, military, asylum seeker, homeless or other.

**Exclusions**

In HES, the GP registration details may be missing for some patients who are, in fact, registered with a GP. In order to exclude these patients all records in HES were cross-referenced against the NHS Personal Demographics Service (PDS) database (as of 1 April 2009), which holds GP registration details for all NHS patients. This process excluded 401,160 outpatient attendances and 109,085 inpatient admissions.

All outpatient attendances and inpatient admissions attributed to the following groups of patients were also excluded: privately funded patients (excluding 97,992 outpatient attendances and 18,058 inpatient admissions), patients resident overseas (7945 and 7673, respectively) or in Wales, Scotland or Northern Ireland (10,283 and 6631, respectively) and well-baby admissions at a £0 cost (35,762 inpatient admissions). ‘Did not attend’ or cancelled outpatient appointments were also excluded.

**Treatment specialty**

Different treatment specialties were defined by the treatment function codes assigned to each activity in HES. We were also interested specifically in activity associated with mental health and specialized services, both low-volume/high-cost services, which may have high levels of usage in unregistered populations. Activity related to mental health was identified using the specialty codes 700–724. There is no national standard definition for specialized services that can identify activity from HES and therefore, we used a combination of Healthcare Resource Groupings, Specialized Services National Definitions Set and specialized services commissioned at national level to identify all activity related to specialized services.
The cost of inpatient and outpatient activity was estimated using the national tariff (2010/11) or reference costs (2007/08, uplifted for inflation to 2010/11 levels) where a tariff was not available. The estimated cost is not the actual price paid, as local differences in pricing and Market Forces Factors could not be taken into account.

**Results**

In 2009/10, a total of 261,180 unregistered patients (defined as prisoners, asylum seekers, military personnel, homeless and other unregistered) accessed secondary care, including 220,741 patients who had one or more outpatient attendances and 84,318 patients who had one or more inpatient admissions. A total of 370,504 outpatient attendances and 99,615 inpatient admissions were attributed to unregistered patients, accounting for 0.5% of all outpatient attendances and 0.7% of all inpatient admissions in HES in 2009/10 (Table 1). The total cost to the NHS for hospital care among unregistered patients was £241.59 million.

Over 90% of all outpatient and inpatient activity was among patients in the generic unregistered category, military personnel contributing a further 10% (Table 2).

### Gender and age group

Overall, the majority of outpatient attendances and inpatient admissions were made by male unregistered patients (61.4% [95% CI 61.0%, 61.7%] and 57.6% [95% CI 57.5%, 57.8%), respectively). However, this varied when stratified by the type of unregistered patient, from 80% among prisoners (83.3% [95% CI 66.1%, 100.6%]), military personnel (99.7% [95% CI 99.7%, 99.8%]), and asylum seekers (89.9% [95% CI 89.8%, 90.0%]), to 99.2% among homeless people (99.1% [95% CI 99.0%, 99.2%]) and 90.7% among other unregistered patients (90.5% [95% CI 90.4%, 90.7%]).

### Table 1

<table>
<thead>
<tr>
<th>Category</th>
<th>Inpatient admissions</th>
<th>Outpatient attendances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>220,741 (100%)</td>
<td>99,615 (100%)</td>
</tr>
<tr>
<td>Mental health specialty only</td>
<td>210,140 (95%)</td>
<td>98,477 (99%)</td>
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<tr>
<td>Specialized services only</td>
<td>10,597 (95%)</td>
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<tr>
<td>Total number</td>
<td>£43.3 m (100%)</td>
<td>£198.3 m (100%)</td>
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<tr>
<td>Cost per admission</td>
<td>£199.1 (£163.3, £234.8)</td>
<td>£198.6 (£162.7, £234.8)</td>
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### Table 2

<table>
<thead>
<tr>
<th>Category</th>
<th>Inpatient admissions</th>
<th>Outpatient attendances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
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<td>370,504 (100%)</td>
</tr>
<tr>
<td>Total number</td>
<td>£198.2 m (100%)</td>
<td>£43.3 m (100%)</td>
</tr>
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*Other includes prison and travellers—combined because of small numbers.*
personnel (85.4% (95% CI 84.7%, 86.2%)) and the homeless (83.7% (95% CI 80.1%, 87.3%)) to 40.8% (95% CI 34.4%, 47.3%) among asylum seekers (figures provided for inpatient admissions only).

High levels of outpatient and inpatient activity were found in the 20–29 and 30–39 year age groups, accounting for £54.1 and £44.7 million of all costs, respectively. Those aged <1 year accounted for <20,000 outpatient attendances and inpatient admissions but the total cost exceeded £33 million.

Local authority
LA was not recorded for 23.5% inpatient admissions and 11.8% outpatient attendances attributed to the unregistered population. This meant that 15.6% (£37.8 million) of the total costs to the NHS for unregistered patients could not be assigned to any LA.

The pattern of activity by LA was similar for outpatient attendances (Fig. 1) and inpatient admissions (Fig. 2), with high volume in urban centres, in particular London and Birmingham, and areas with links to military services e.g. Richmondshire, Salisbury and Southampton.

For outpatient attendances the geographical pattern of total cost reflected the distribution of activity. However, for inpatient admissions additional urban centres, including Leeds and Sheffield, and areas in the North West of England were found to have high total cost despite low activity. The high total cost in areas in the north west of England was largely due to activity in the mental health specialty.

High levels of activity among military personnel were located in LAs where military hospitals or bases are found (e.g. Plymouth and Richmondshire). High levels of activity among asylum seekers were mostly found in LAs in the West Midlands (e.g. Birmingham, Sandwell) and the North (e.g. Liverpool).

Treatment specialty
The highest number of outpatient attendances and highest total costs were within genitourinary medicine (GUM) (105,498 (28.5% of attendances); £13,397,145 (30.9% of total outpatient cost)) and trauma and orthopaedics (45,696 (12.3%); £5,129,659 (11.8%)) specialties. There were <20,000 attendances in all other treatment specialties.

The highest numbers of inpatient admissions were within the general medicine (12,689, 12.7% of total inpatient activity), accident and emergency (A&E) (12,655, 12.7%) and paediatrics (12,251, 12.3%) specialties. Yet the greatest proportions of the costs due to inpatient admissions were within the trauma and orthopaedics (£22,341,882, 11.3% of total inpatient cost), forensic psychiatry (£20,936,801, 10.6%), general medicine (£15,650,949, 7.9%) and mental health (£15,620,994, 7.9%) specialties.

Among unregistered patients, the mental health specialty accounted for 1.5% of all inpatient admissions (n = 1539) and 30.0% of the total costs (£59,578,967). Specialized services accounted for 11.6% of all inpatient admissions (n = 11,533) and 17.3% of the total costs (£34,363,163). Unregistered patients aged <1 year accounted for 23.4% of activity in specialized services.
Discussion

Main finding of this study

This paper provides an overview of the secondary care use and associated cost to the English NHS by unregistered patients. In 2009/10, over 99,000 inpatient admissions and 370,000 outpatient attendances were attributed to unregistered patients, representing a total cost to the NHS of £242 m (compared with £32,547 m for activity in the registered population). These results demonstrate that the health service needs of and associated costs by unregistered populations are important issues for health care commissioners at national and local levels in England.

What is already known on this topic

Information on health service use by both registered and unregistered populations is needed to inform service delivery within a defined geographical area. Yet, data on the health care needs of and health service used by unregistered populations (including asylum seekers, homeless, prisoners or military personnel) are not routinely collected. Some information is available from studies carried out within specific sub-groups, but differences in the definitions used to select populations of interest, time periods and geographical areas limits the generalizability of the findings.

Evidence suggests that the needs of unregistered populations are different from those of the general registered population. Primary investigations and systematic reviews report high rates of physical trauma, mental illness and substance misuse among the homeless, and high levels of mental illness and infectious disease among asylum seekers. There is also evidence that suggests higher use of primary and secondary health care by unregistered populations compared with the general population. For example, a study from Ireland found that asylum seekers visit general practice five times per year compared with Irish citizens, who visit twice, and a comparison study found that prisoners consult doctors three times more frequently than the general population. Studies carried out in secondary care suggest the same pattern with higher use of A&E among refugee and asylum seeker populations and prisoners compared with the general population.

What this study adds

This is the first study to quantify inpatient and outpatient use and costs incurred due to activity by all unregistered patients in England and examine regional variations. Our unregistered population was a heterogeneous group, including the homeless, asylum seekers and prisoners, which enabled us to report health care use by the unregistered population as a whole and by specific sub-populations.

We found that the majority of the unregistered patients attending secondary care were male and of young age reflecting a similar demographic profile reported among homeless individuals (majority male, aged 30–49 years). We found high levels of inpatient activity in the A&E, general medicine, mental health, GUM and trauma & orthopaedics specialties. Other studies investigating inpatient admissions also support our findings with a similar specialty mix for inpatient admissions among persons of no fixed abode (mental health, A&E and general medicine), and prisoners (mental health, physical health problems and self-harm and substance misuse).

Marked regional variation in health care usage among the unregistered population was found, with highest levels of activity in the London, Birmingham and Southampton LAs, geographical locations known to have higher levels of homeless, asylum seeker and military populations. A similar pattern of health care use among homeless populations in London and Birmingham has been reported, but there are no other published studies investigating geographical variation in service use and cost among other unregistered populations.

We estimated the total cost of inpatient and outpatient use among unregistered patients at £242 m. Information on secondary health care costs by patients of no fixed abode is available from the Department of Health, which has estimated the cost per outpatient attendance at £97 (2007/08 figures), and cost per inpatient admission was £1153. These figures are slightly lower than our estimates of £113 and £1530 for those considered homeless.

Limitations of this study

We used information from the patient, organization and purchasers in HES to ascertain registration status. The specificity of our approach may have been affected by coding errors in HES with regard to GP registration status (entered incorrectly or missing). If included in the unregistered population, this would result in over-estimation of the level of activity by unregistered patients. To address this, we compared the patients identified as possibly unregistered with PDS, the national electronic database of all registered NHS patients, and excluded those found to be registered with a GP. This reduced the activity among unregistered patients by ~50%. The number of those unregistered may also be over-estimated if a registered patient fails to provide GP details and provides incorrect personal information thus preventing linkage with PDS. This is likely to be true of GUM services, where patients might not disclose information to ensure confidentiality.
We grouped activity from different organizations and purchasers into specific unregistered populations (e.g., asylum seeker and military personnel) on the basis of information contained within the name of the organization or purchaser. However, activity may be mis-classified as the category assigned may not truly reflect the individuals’ state. In addition, only 10% of all activity among unregistered patients was identified this way, which means that the information available on these specific groups may not be representative of that population as a whole.

Unfortunately, it was not possible to validate our method to identify activity among unregistered population in HES. Other studies investigating hospital use by homeless populations have defined homeless as those with 'no fixed abode'.14,22–24 We could not replicate this method as we did not have access to patient address information; however, the characteristics of those identified in our homeless category (of young age, male, high activity relating to mental illness and injury) were comparable with those reported by a recent study completed by the Department of Health, which has defined homeless in HES as those aged 16–64 years of ‘no fixed abode’.14

Information on patient age, sex and treatment specialty was well recorded. However, information on LA was missing for a fifth of inpatient admissions and a 1/10 of outpatient attendances attributed to the unregistered population. This meant that £37.8 m (or 15.6%) of the total cost to the NHS attributed to unregistered patients could not be assigned to a geographical area.

Unregistered patients include individuals from a variety of backgrounds, but they share common issues including complex health needs,14,17 high use of secondary care services14,17 and poor access to other health care services.13 The need to reduce inequalities in health for such vulnerable populations was highlighted in the Marmot Review,38 and addressing health inequalities is the key focus of the current health strategy for England.5 Nonetheless, there remain some important considerations for both policy makers and commissioners at national and local levels.

First, resource allocations to PCTs include the number of unregistered (prisoners, armed forces and asylum seekers) in the population but exclude other groups such as the homeless and newly arrived immigrants because of a lack of accurate area-level data.2 Exclusion of these groups may not be appropriate as results from this study and others14 demonstrate, these groups can incur significant hospital costs and are not equally distributed around the country. Furthermore, the resource allocation formula applies the national average need, adjusted for age, to the unregistered population,2 but evidence suggests that the needs of unregistered populations are not equivalent to those of the general population. This may result in underestimating the level of funding for areas where there is high health care use among groups not considered in the formula, e.g., homeless populations and traveller populations, and possibly overestimating the needs of other unregistered populations, such as economic migrants, who have been shown to have lower hospital costs than average.39

Our findings suggest wide geographical variation in hospital activity by unregistered populations. Therefore, careful consideration is needed to ensure that areas with high service use and high total cost can cope with provision, in addition to areas with low service use but a high total cost (largely due to mental health needs).

Commissioners, be it PCTs or CCGs, are responsible for commissioning health services for registered and unregistered populations within their geographical boundaries.1,4 In addition, the NHSCB and LA will have to consider the needs of unregistered populations as they take on the responsibility for commissioning prison health services and specialized services at national level and sexual health services at local level.5,3 This study highlights the need for all commissioners to gain a clear understanding of the health service use and costs incurred by unregistered populations in their area and use this information for service development.

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**Conflict of interest**

M.B. was a member of the Department of Health’s Advisory Committee on Resource Allocation during the period of the analysis.

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