

## **Abstract**

The national picture of the comparative costs and diagnoses of hospitalised homeless patients are examined using the 'No Fixed Abode' flag in English hospital statistics. Comparable studies sample patients in single cities – New York and Toronto. The most common diagnosis is substance misuse; the share of homeless NHS patients with this diagnosis is rising, and now equals that found in North American cities. About half of the cost of homeless patients concerns diagnoses of mental illness, although these comprise a much smaller share of homeless patients than in North America. Hospital costs for homeless patients – both total and per admission – have fallen significantly in recent years, primarily due to fewer admissions and shorter lengths of stay for mentally ill patients. Concern to reduce NHS costs at the level of individual institutions has often shaped policy. Broader policy to prevent and reduce homelessness offers substantial long term reductions in the cost of chronic care.

# Hospital care and costs for homeless people

## Introduction

Research has improved awareness of the extremely poor health of the homeless<sup>1-5</sup> and given a better understanding of the effectiveness of community-based healthcare interventions.<sup>3,6-8</sup> A more recent focus of reform, driven by the distinct morbidities and pre- and post-treatment circumstances of homeless patients, is the redesign of hospital services to offer cost-effective patient pathways that better address the needs of the homeless. Pioneering initiatives such as the Boston Health Care for the Homeless Program<sup>9</sup> and Pathway<sup>10,11</sup> signal international recognition of the patient value and cost savings that might result from more informed hospital service planning, including specialist staff and partnership with a range of external health and non-health services. However, with the exception of one city- and one hospital-level study regarding New York<sup>12</sup> and Toronto<sup>13</sup> respectively, little is known about the comparative use and cost of hospital services by the homeless. Other North American studies focus on the impact of particular interventions.<sup>14-18</sup> Our purpose in this article is to outline the use and cost of hospital services for the homeless in England in order to increase strategic understanding of how best to deliver healthcare for the homeless and those vulnerable to homelessness.

## Methods

How do we identify homeless patients? The approach discussed here is to use England's NHS Hospital Episode Statistics, combining four years to give national coverage between April 2007 and March 2011, in order to identify the use of hospital services by the homeless and to contrast this use with that of a comparative sample of the housed. The homeless are identified by the patient being recorded on admission as having 'No Fixed Abode' (NFA), and the relatively large number of admissions – 35,518 – suggests that this group consists of more than rough sleepers (for example, it likely includes some of those living in hostels for the homeless). To help ensure that the data is focused on the comparative experience of homeless patients, rather than, for example, non-homeless patients seeking anonymity, some cases are excluded: those outside of the age range 16-64 inclusive, those with poor data quality, and those relating to pregnancy terminations, obstetrics, or neonatal care. This method of identifying homeless patients is inexact; for example, some homeless patients may provide the address of a hostel, and so will be placed in the comparison group. Nonetheless, various sample evidence is consistent with other evidence on the homeless population.<sup>19</sup> The same exclusions are used to extract a comparison group of Fixed Abode episodes. NFA admissions over the period are 80% male, and have a modal age near the mean of 38.7 years. By contrast, the 23.7 million comparison admissions are 47% male, have a mean age of 44.6, and modal age of 63. (The homeless percentage male is almost identical, 80-82%, in New York, Toronto and England.)

## The comparative diagnoses

Unsurprisingly and in common with existing evidence<sup>3,5</sup>, the NFA and comparison case mixes differ markedly. Table 1 presents groups of Healthcare Resource Groups (HRGs) that are common amongst the homeless. Thus, in 2010/11, a group of four HRGs relating to alcohol, drugs and ‘poisoning, toxic, environmental and unspecified effects’ are more than 10 times more common in the homeless data, and mental health HRGs are over 6 times more common. Considerable change is also apparent: the share of the substance misuse HRGs rises from 20.9% to 27.7% of NFA episodes between 2007/8 and 2010/11, with no such rise in the comparison group. Although HRG data does not distinguish between alcohol and drugs, this rise is consistent with data showing considerably increased rates of alcohol dependence between 2003 and 2009 in patients of a specialist primary care centre in Leicester.<sup>20</sup> Other evidence from the Pathway initiative at University College London Hospital suggests common ‘tri morbidity’ of physical ill-health, mental ill-health and substance misuse<sup>10</sup>. Other specific issues highlighted in a 2006 review<sup>3</sup> include blood-borne virus infections (resulting from drug abuse), foot trauma, inflammatory skin conditions, skin infestations, and respiratory illnesses including pneumonia and (often latent) tuberculosis.

The diagnoses of English NFAs resemble those reported for US and Canadian urban homeless hospital admissions.<sup>12,13</sup> Comparisons with homeless patients in 1992-3 in New York<sup>12</sup> suggest an almost identical fraction – about a quarter – of homeless patients are diagnosed with substance abuse. However, the percentage of the English homeless with mental health diagnoses is just under half that found in both the New York and Toronto patient samples. This may reflect professional differences in mental health diagnosis, or health insurance coverage and social policy in England that diminishes the risk of mentally ill becoming homeless. The recent US health reforms, which extend coverage, may lead to fewer mentally ill patients becoming homeless.

### **Fluctuations in activity, 2007-11**

Admissions and bed-days in the NFA and comparison patient groups covering the four year period are summarised in Table 2, and are of particular interest because the data covers the 2008-2009 recession, its aftermath, and the April 2009 removal of ring-fencing for the ‘Supporting People’ budget used by Local Authorities to fund hostel and other homelessness services.

The number of NFA bed days and admissions first rise with the onset of the ‘Great Recession’ in 2008/9, but fall by 24% between 2008/9 and 2009/10, which coincides with the removal of the ring-fence of homeless hostel funding. It also coincides with available evidence on rough sleepers: there is a fall, 2008/9 to 2009/10, of about 15% in the number of London rough sleepers that are not migrants from Eastern Europe.<sup>19</sup> (Those homeless following international migration are likely to have differentiated health, inpatient needs and eligibility.) Statutory homeless acceptances also declined from 135,590 in 2003 to 41,780 in 2010, and then increased to 53,410 by 2014.<sup>21</sup>

### **In-hospital mortality amongst homeless patients**

As well as being a key outcome, in-hospital mortality indicates whether homelessness is primarily a problem of early death or of chronic sickness. Across all four years combined, there are 214 deaths

recorded in the NFA sample, or 0.578% of all NFA discharge episodes. The comparison group shows 125,455 deaths (0.52% of discharge episodes). The overall NFA in-hospital mortality rate is therefore about 10% higher. However, when the mortality rates are broken down by age (as in Figure a), the NFA group has a 37% higher rate in the 45-54 and 55-64 age groups, rising to 80% higher in the 35-44 group, 205% in the 25-34 group and 145% in the 16-24 group (although these youngest groups represent a smaller share of deaths). The NFA group therefore have a markedly higher age-corrected in-hospital death rate. GPs in England, surveyed by the Department of Health<sup>22</sup>, suggest admission rates that are at least twice as high for homeless patients, which in turn suggests that the homeless are more than three times as likely to die in hospital than comparators. This is not inconsistent with the findings from a 2009 study in Glasgow.<sup>2</sup> This *relative* hospital mortality, although very high, nevertheless suggests that only a small fraction of NFA cases end in death during the homeless phase, and indicates for many more cases, the likelihood of years of chronic illness before premature death.

### **High rates of self-discharge, and an increasing share of emergency cases**

There also appears to be significant scope for improving the discharge process to reduce the rate of emergency readmission: 12-15% of the NFA episodes end in self-discharge, notably higher than the 1.5-1.75% in the comparison group. A 2011 retrospective study<sup>23</sup> showed that the establishment of a discharge coordinator (aimed at ensuring that patients are not discharged back onto the street) reduced a hospital's emergency NFA readmissions by one third relative to no previous provision. Better discharge planning was also a key element of a recent RCT at the Royal London Hospital.

To identify the extent to which the higher rate of self-discharge for NFA episodes is driven by their HRG mix, a calculation is made of the number of NFA self-discharges that would occur if the NFA group had the same HRG-specific self-discharge rates as the comparison group. The resulting self-discharge rate is 5.4% (i.e. notably less than the actual NFA self-discharge rate of 12-15%, but more than the comparison group figure of 1.5-1.75%), implying that while the NFA case mix partly explains their higher rate, it is by no means the whole explanation.

No less than 87% of NFA episodes are recorded as emergencies, versus 42% in the comparison population (Figure b). Furthermore, the NFA percentage emergency has increased from 88.9% in 2007/8 to 91.9% in 2010/11, a trend that is indicative of little progress in engagement with primary care, and highlights the value of revisiting the potential role of specialist GP practices for the homeless.

### **How much more does a homeless hospital admission cost?**

The potential to reduce the cost of homeless admissions while improving patient care has been a key argument for new pathway approaches. There are several reasons why homeless patients may experience longer (and more expensive) hospital stays. Many will rely upon hostel or other forms of public accommodation that may not always be available at the time of discharge; the multiple morbidities of homeless patients may also take added time to resolve. In addition, their substantially

different case mix is likely to have an impact. Table 2 includes a broad costing for both the NFA and comparison groups to highlight their differences in resource use. A unit cost per bed day is applied to mental health episodes (i.e. those in Chapter T of HRG version 3.5), with other HRGs costed using the National Tariff (without adjusting for short or long stays, using underlying Tariff data where Tariff estimates are not available). Table 2 and Figure c show that over this period, the cost per NFA admission is 60-80% higher than for the comparison group, partly due to a length of stay of about three times longer.

### **Why do the homeless cost more? The impact of mental health**

A large share of the hospital cost of the homeless – about half – relates to mental health (excluding substance misuse), which may be contrasted to 8-9% in the comparison group. This high share of cost is due in both groups to a high average length of stay for the mental health category of around 30 days. Mental health only represents around 10% of all NFA episodes and 1-2% of comparison group episodes, but amounts to 50-60% of NFA, and 20% of comparison group, bed days. It is nonetheless important to note that the total cost and number of NFA mental health bed days has fallen by around one third between 2007/8 and 2010/11. During this period, following the financial crisis, the health service sought to make economies in anticipation of (at best) flat real health spending, post 2010. Strikingly, the comparison group does not show a similar fall, and raises the question of whether economies have been found amongst this especially dependent population.

Looking at the overall costing (including non-mental-health HRGs), the cost per NFA admission has fallen by 11% whilst that for the comparison group is higher by 3%, between 2007/8 and 2010/11. This relative change largely reflects the larger fall in the number and cost of NFA mental health episodes.

To identify the extent to which case mix explains the higher NFA length of stay (and by extension, cost), we standardise by HRG, calculating the NFA average length of stay per episode assuming this length of stay were the same as the comparison group for each HRG. Before adjustment, average NFA lengths of stay are 178% longer. After correcting for HRG, the NFA lengths of stay are only about 7.3% longer than would be expected for the homed, so the higher length of stay per episode of NFA patients is therefore largely explained by case mix. (Notably however, spell lengths and estimated costs per admission, 2010/11, were about 18% higher for homeless mental health patients.)

Homeless patients therefore appear to have a longer average length of stay (and by extension, higher cost), than the comparator group, but this largely reflects the mental-health diagnoses rather than homelessness per se. By contrast, the New York study<sup>12</sup> found a 36% longer length of stay for homeless patients after adjusting for diagnosis, as well as coexisting illnesses and demographic characteristics. While an English length of stay for the homeless only 7.3% higher after controlling for diagnosis leaves little acute resource to be saved by pathway initiatives, this may nonetheless be possible, as found by the Pathway initiative at University College London Hospital (UCLH).<sup>10</sup> The UCLH Pathway responds to 300-500 admissions each year and coordinates care with a range of external organisations inside and outside of healthcare to resolve the problems in each patient's life. The service consists of two specialist nurses, 4 GP sessions, as well as a care navigator supervisor and

several care navigators<sup>11</sup>. The care navigators are formerly homeless people trained to help those being treated by the service. The evidence that the NHS provides a less generous incremental length of stay for the homeless than the North American acute services that have been studied, is disconcerting, if not perhaps surprising given that universal coverage has been recently accompanied by a focus on hospital cost reductions.

### **The overall picture**

Health policy influences the health of the homeless, the incidence of homelessness, and the long run demand of the former homeless for services such as social care, housing, and police, as well as health. It is important therefore to be mindful that the acute services offered to the homeless will carry long term consequences for both patient health and public expenditure, which are likely to amount to a far greater sum than the cost of a typical brief hospital spell. It is worth emphasising that although the homeless incur a 10-20 years loss of expected life,<sup>4</sup> this implies that an immediate death during or shortly after becoming homeless is not typical, with most continuing to live with chronic illnesses for many years. The long term cost-benefit implications of many acute services for the homeless contrasts with a policy environment in which it has been commonplace for policy initiatives for acute services to demonstrate how reform would reduce near-term hospital costs. Further analysis is needed of the various long run costs that result from alternative approaches to treating homeless patients in the acute phase.

Reform here may draw from studies of the development of acute and post-acute accommodation for patients who are too frail to recover on the streets but are not ill enough to be in a hospital, as suggested by US 'respite care'.<sup>24</sup> Better management of healthcare for the homeless (through interventions such as improved discharge or better management in the community), and better policy to address the causes of homelessness, therefore offer potential long- as well as short-term cost savings, together with health benefits. At this time of financial 'austerity' short term expenditure on hospital care has been contained by reducing mental health in-patient treatment, but with only modest attention to the consequence for longer term costs, or to policies which, by addressing homelessness before and at its inception, could mitigate the long term cost of community and NHS chronic care.

Further refinement of Hospital Episode Statistics to broaden the address options that healthcare providers can enter, together with guidance on the definition of homelessness, could increase coverage and consistency of the data, giving a greater insight into overall levels of activity and how they are changing.

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