

FEBRUARY 2021



A comparison of outcomes between homeless patients and the wider population

ANALYSIS OF HOMELESS PATIENT INEQUALITIES

Turning data into decisions

Our aim at Dr Foster is to equip healthcare organisations to make better and faster decisions on the quality and value of connected healthcare.

We do this by working with our clients to deliver easy to use and role-relevant solutions that deliver actionable insights – insights that play a significant role in driving decisions.

Executive summary

Dr Foster has extensive experience in population health management, using our analytical expertise to identify segments of the population, and to measure inequalities and outcomes for these segments compared with wider population groups. After consultation with University College London Hospitals, which recently established a multidisciplinary collaboration in response to homelessness, Dr Foster set out to produce a suite of analysis using the Hospital Episode Statistics (HES) Admitted Patient Care data to identify and understand comparative characteristics of homeless patients nationally.

Homeless people represent a small cohort of the population, but the health needs of these patients are multiple and complex. This project sought to produce a suite of analysis identifying the shared characteristics of homeless patients, what their needs are, and to highlight some of the differences they have in experiences and outcomes to the rest of the population.

To look at patient outcomes we have considered several different factors, including mortality, length of stay, comorbidity, and readmissions.

Throughout the last decade, there has been an upward trend in the count and proportion of non-elective inpatient spells with homeless diagnosis coding present in England, which could be attributed to an increase in the number of homeless people and/or because

coding for these patients has improved.

The majority of these spells are for middle-aged males. Interestingly, the more common diagnoses were related to behavioural and lifestyle factors. The most common reasons for admission in 2018/19 were alcohol-related mental disorders and poisoning (by psychotropic agents and other medications/drugs). Unclassified residual codes also scored highly, which includes admissions for unidentified, undiagnosed, or ambiguous reasons.

For spells of a diagnosis group with at least 200 admissions, homeless patients on average spend slightly longer in hospital than non-homeless people. The median length of stay for homeless patients was two days, compared with one day for the general population.

The analysis found that 97.5 per cent of patients made up to three

admissions over a 12-month period. The highest number of total admissions over a 12-month period was 16. Homeless patients have a higher 28-day readmission rate than the general population, but lower-than-average comorbidity scores. This indicates that homeless patients may not have their needs fully addressed during their admission. Overall crude mortality was 0.79 per cent, which was lower than all patients at 2.48 per cent.

The analysis identifies that addressing the health needs of homeless patients is a challenge within the current structure of health governance and demands a more integrated approach. It is indicative of a potential gap in the depth of coding available to understand and analyse homeless patients accessing the system.

Summary findings

<p>397</p> <p>The highest count of homeless inpatient spells was recorded in Birmingham with 397 spells</p>	<p>11.4%</p> <p>Increase in homeless inpatient spells annually</p>	<p>8.1%</p> <p>Alcohol-related mental disorders are the most frequent reason for admission</p>
<p>49</p> <p>The highest rate of homeless inpatient spells per 100,000 was Westminster with 48.96</p>	<p>94%</p> <p>Of homeless patients made up to two admissions within a 12-month period</p>	<p>1 in 4</p> <p>Homeless patients are readmitted within 28 days</p>

Defining homelessness

Whilst the more generic definition of homelessness is “a person without a home”, within healthcare this must be expanded to include patients under the umbrella category of “rough-sleeping”, due to the ways in which they access services.

Traditionally, a service-user will make initial contact within primary care to address their health concerns, but a patient who is rough-sleeping is likely to lack a permanent residential location and this creates a barrier for accessing primary care health services. The knock-on effect of this is rough-sleeping patients will also lack follow-up clinical documentation to support and manage their medical needs out of hospital, which could potentially reduce the risk of readmission.

Consequently, when reviewing characteristics of homeless patients within the admitted-care dataset, it is appropriate to incorporate all those identifiable as rough-sleepers as this group instantly has a shared characteristic impacting their health outcomes. All analysis is based on non-elective inpatient spells only. Homeless spells were identified using the above definition and looking across all episodes and diagnosis positions in the spell.

Utilising ICD-10 coding, there were four ‘groups’ of patients identified as relevant for inclusion in the analysis:

- Z59.0 “Homelessness”
- Z59.1 “Inadequate Housing”
- Z59.8 “Other problems related to housing and economic circumstances”
- Z59.9 “Problem related to housing and economic circumstances, unspecified”

Characteristics of homeless patients

REGIONAL

To investigate homeless inpatient spells regionally, the analysis was divided at upper tier local authority (UTLA) level which splits England into 150 distinct regions. As the size of each UTLA in England differs, it was important to consider both the count of admissions and rate per 100,000 of UTLA population.

The UTLA with the highest count of homeless inpatient spells was Birmingham with 397, whereas the UTLA with the highest rate of homeless inpatient spells per 100,000 was Westminster with 49. Comparatively, Birmingham had a rate of 17, and Westminster had a count of 250.

397

Highest count of homeless inpatient spells was in Birmingham with 397

49

The highest rate of homeless inpatient spells per 100,000 was Westminster with 49

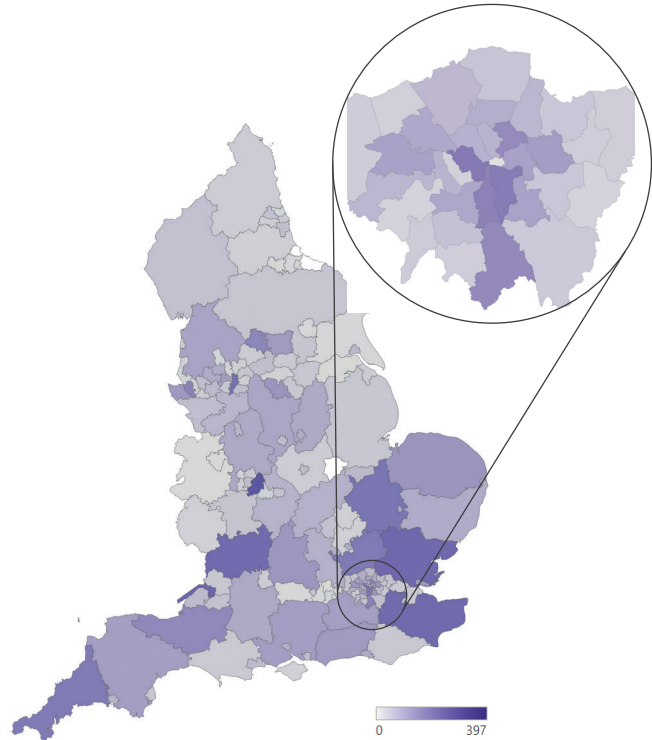


Figure 1 - Count of the number of homeless inpatient spells in 2018/19 split by UTLA

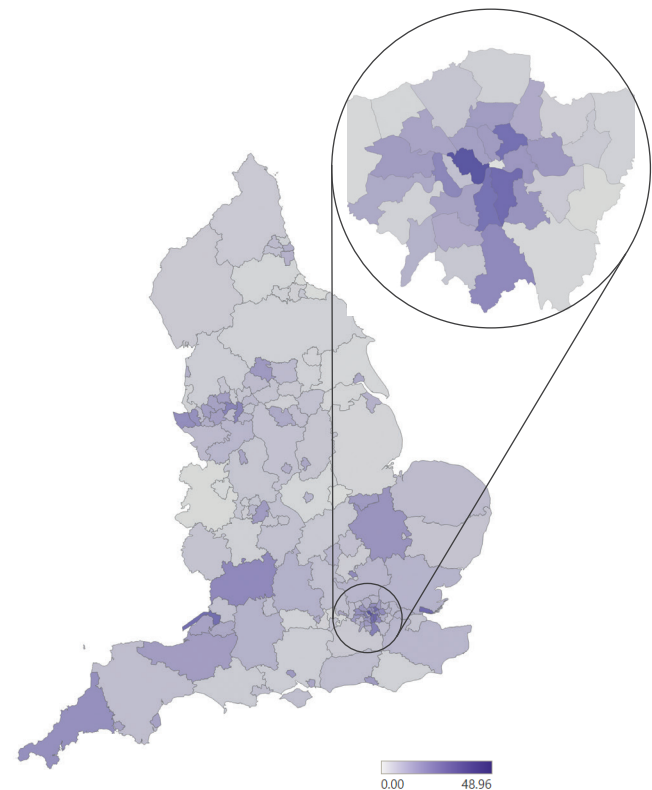


Figure 2 - Rate of homeless inpatient spells 2018/19 as a proportion of the population of UTLA and provided as a rate per 100,000

ACTIVITY

Overall, the number of inpatient spells has increased every year since 2010/11. In 2010/11 there were 5,397 homeless inpatient spells. By 2018/19, there were 12,638 homeless inpatient spells, representing an increase of 134 per cent. On average, there is an 11.4 per cent increase in homeless inpatient spells annually (about an additional 900 admissions on average each year).

To identify whether the increase in spells is specific to homeless patients, the rate of homeless spells per 100,000 of all spells was considered. This showed a similar increase. In 2010/11, homeless inpatient admissions reflected a rate of 84. By 2018/19, this was 167.

With increases in both the count and proportion of spells throughout the last decade, it can be stated that there has been an evident upward trend in non-elective inpatient admissions for homeless people. This could be due to there being more homeless patients, or better coding of homelessness throughout the last decade.

We also sought to evaluate how zero-day length of stay (LOS) admissions has changed in the last decade. While the numbers have increased, the proportion of zero LOS stays has remained fairly consistent year on year. A change in these numbers may indicate differing experiences in-hospital which could lead to different outcomes.

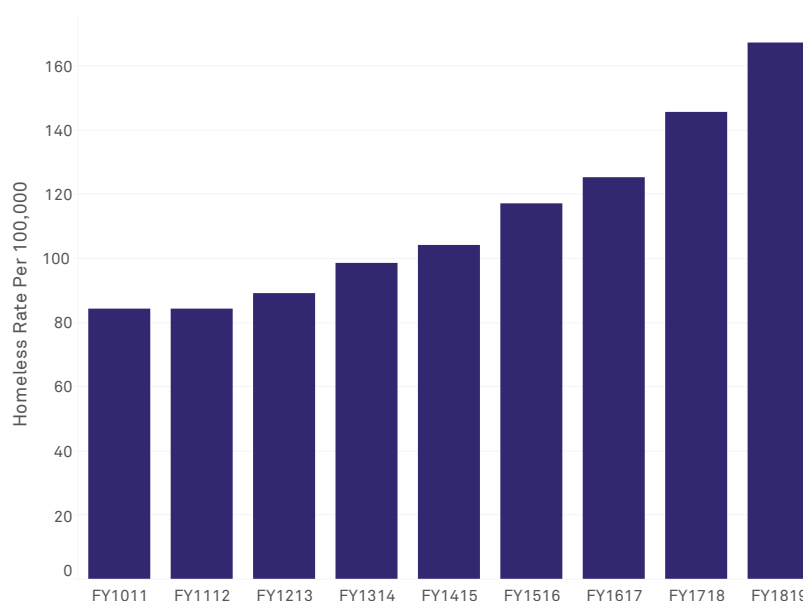


Figure 3 - Rate of homeless inpatient spells per 100,000 from 2010/11 to 2018/19

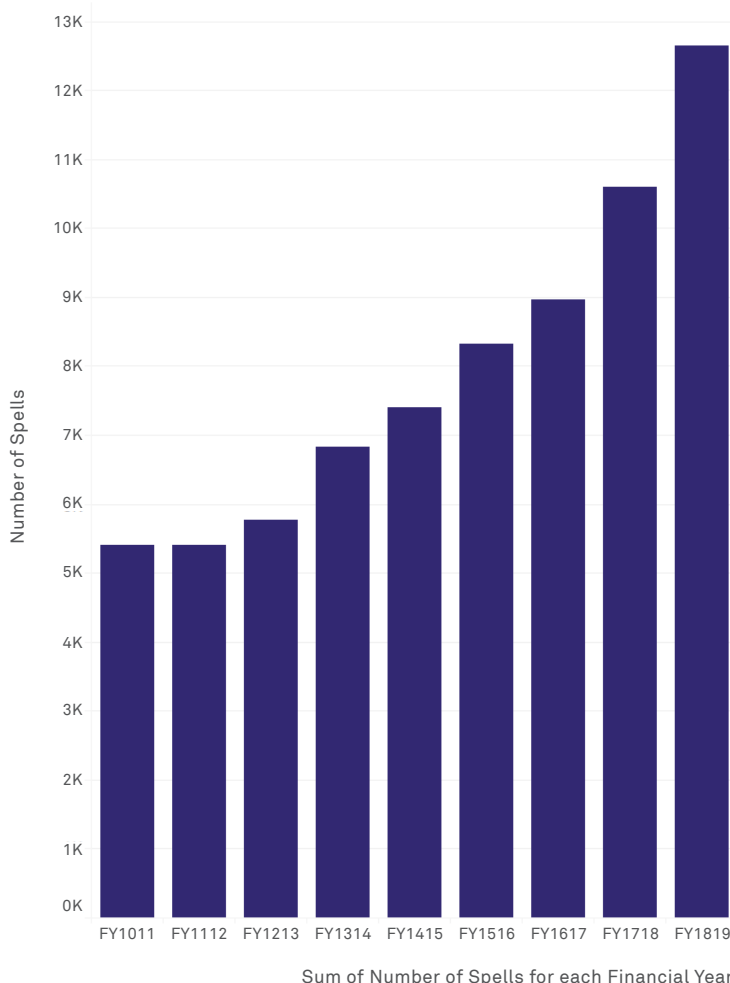


Figure 4 - Count of the number of homeless inpatient spells from 2010/11 to 2018/19

11.4%

Increase in homeless inpatient spells annually

DEMOGRAPHY

Homeless patients were divided nationally into five-year age groups, ranging from 0-99, and then split by males and females, to produce a population pyramid.

The structure of this identifies that the majority of non-elective homeless inpatient spells are utilised by middle-aged males, as over three in 10 homeless spells are males aged 30-49.

30%

Of homeless spells are made by males aged 30-49

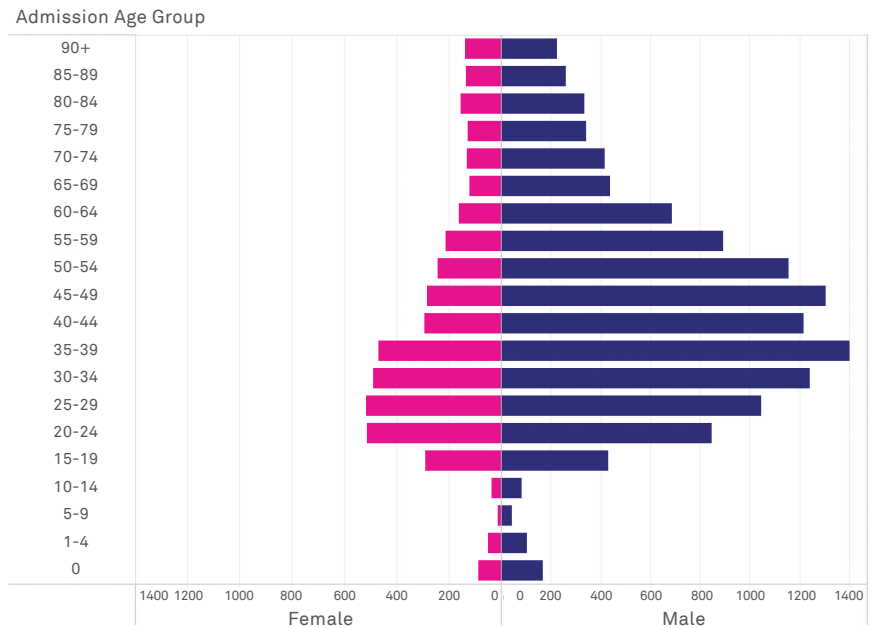


Figure 5 - Age and sex distribution of homeless inpatient spell

DIAGNOSIS

To analyse the diagnoses of homeless inpatient spells, spells were split into the Agency for Healthcare Research and Quality’s CCS (Clinical Classifications Software) diagnosis groups based on the primary diagnosis of the diagnosis-dominant episode of the spell. Subsequent analyses on length of stay, comorbidities, and readmissions were then carried out at diagnosis group level. These identified that the most frequent reason for admission in 2018/19 were:

- Alcohol-related mental disorders, n=1,020
- Poisoning by psychotropic agents, n=811
- Poisoning by other medications and drugs, n=656
- Residual codes, unclassified, n=589
- Skin and subcutaneous tissue infections, n=554

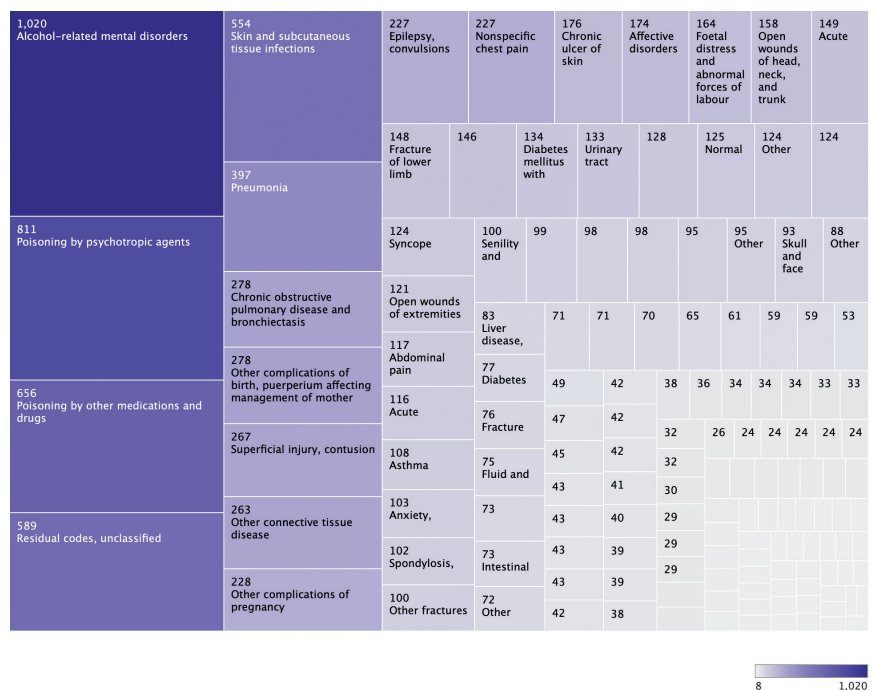


Figure 6 - Number of homeless inpatient spells by primary diagnosis in the admitted spell

DIAGNOSIS

- Pneumonia, n=397
- Chronic obstructive pulmonary disease and bronchiectasis, n=278
- Other complications of birth, puerperium affecting management of mother, n=278
- Superficial injury, contusion, n=267
- Other connective tissue disease, n=263

It is interesting to note that the more common diagnoses were related to behavioural and lifestyle factors, but that also 'residual codes, unclassified' appeared high in the list. Unclassified residual codes includes, but is not limited to, some of the following diagnoses, based on ICD-10 3-character codes:

- Abnormalities of gait and mobility
- Pain, not elsewhere classified
- Procedures for purposes other than remedying health state
- Symptoms and signs involving appearance and behaviour
- Symptoms and signs involving emotional state
- Unknown and unspecified causes of morbidity

This group of unclassified residual codes appears to suggest non-elective inpatient admissions for more ambiguous, unidentified, or undiagnosed pains. There can be several interpretations of this, and further investigation would be required to understand more about how unclassified residual codes are being used for homeless patients.

One possible reason is that patients are seeking a bed for the night, but the frequent use of this as a primary diagnosis suggests that homeless patients have multiple, complex needs that are not addressed during their stay in hospital because secondary care services are not set up in order to meet these needs. It is worth noting that spells with a primary diagnosis of unclassified residual codes have a slightly higher average comorbidity score and higher 28-day readmission rate than all other patients.

However, 95 per cent of homeless patients with this primary diagnosis had just one admission in the previous 12 months, suggesting that homeless people who present with ambiguous diagnoses tend not to re-present within the year. We would usually expect them to re-present given this is unresolved (implied by the absence of a definitive diagnosis).

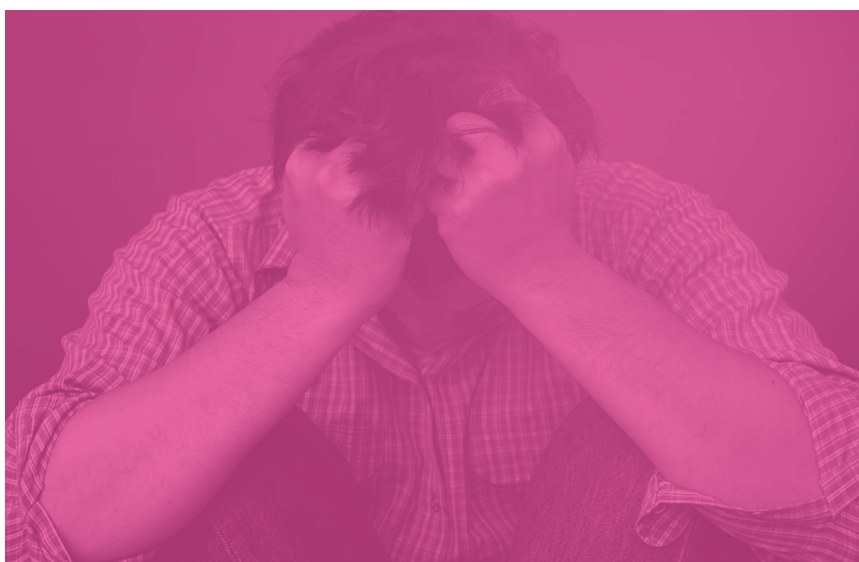
In addition, there were a number of maternal diagnoses. These diagnoses demonstrate that the healthcare demand from this cohort is diverse and not limited to alcohol and drug related issues, respiratory issues, or skin and tissue infections.

1,020

Most frequent reason for admission was alcohol-related mental disorders

95%

Of patients with an unclassified primary diagnosis made only one admission in the last 12 months



LENGTH OF STAY (LOS)

The median LOS of homeless spells was analysed across different diagnosis groups in comparison with all spells.

For diagnosis groups with at least 200 homeless inpatient spells:

- The median LOS for homeless patients is two days, whereas it is one day for the general population.
- The longest median LOS was seven days for 'Pneumonia' (n=397)
- The shortest median LOS was zero days for 'Non-specific chest pain' (n=227)
- The biggest difference in median LOS between homeless patients versus all patients was 'Other connective tissue disease'. Homeless patients spent on average five days in hospital, whereas the general population spent zero days in hospital.
- Homeless patients either had the same median LOS or spent longer in hospital than the general population when broken down by diagnosis group.

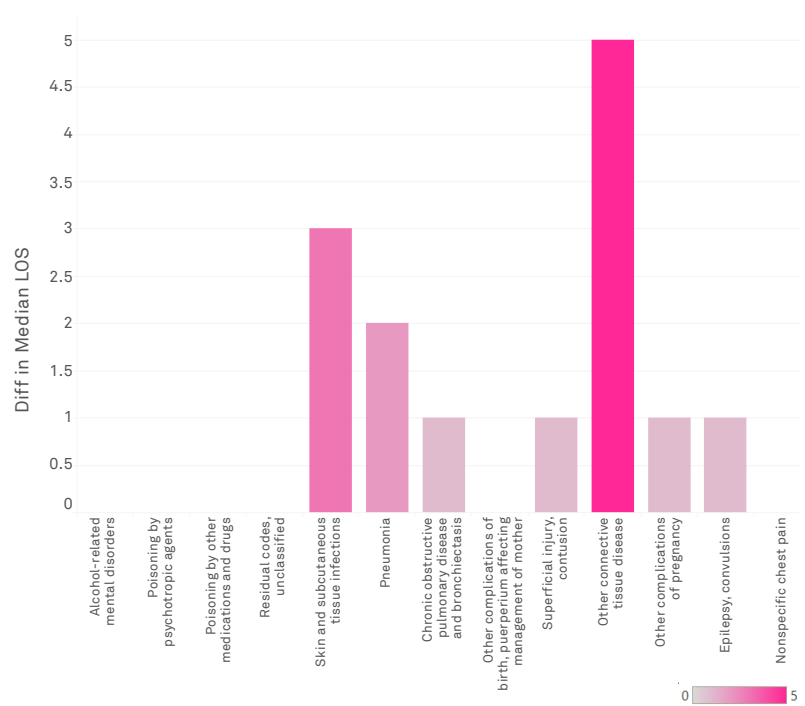


Figure 7 - Median LOS chart for diagnoses with at least 200 homeless inpatient spells

2 days

Median LOS for homeless patients, difference of +1 for the general population

7 days

The longest median LOS was 7 days for pneumonia (n=397)

COMORBIDITIES

The chosen metric for investigating comorbidities was the Charlson score. The Charlson Comorbidity Index gives an indication of the impact chronic long-term conditions are having on an individual's health. The Charlson scores for homeless patients are averaged for each diagnosis group and then compared to all patients.

There are a number of factors that influence the average Charlson score. For instance, one chronic condition included within the score is dementia, which tends to affect the elderly population. The score can only ever be as robust as the coding for the patient, e.g. if a patient has dementia and this is not known, then that patient's Charlson score will be lower than it should be.

With the homeless patient cohort, these are significant points to consider when assessing the Charlson score, as the cohort is likely to have less coding than the general population, and the make-up of the cohort is skewed towards middle-aged men, which does not reflect the national demographic of patients.

Homeless patients have a slightly higher average comorbidity score for those aged 20-49, and a lower on average comorbidity score for all age groups over 50. With the vast majority of homeless patients in the age groups from 30-49, these findings fit the narrative because there aren't many elderly homeless patients where on average, there tends to be higher comorbidity scores.

The life expectancy for homeless males is 45 and for females it is 43. This is significantly lower than the general population (around 30 years lower). As a result, the age at which frailty is a factor for this cohort is vastly different. Age is, therefore, a key consideration for how this cohort is treated and represents another barrier in terms of accessing required services. It is much harder to access frailty support services at 45 rather than 75.

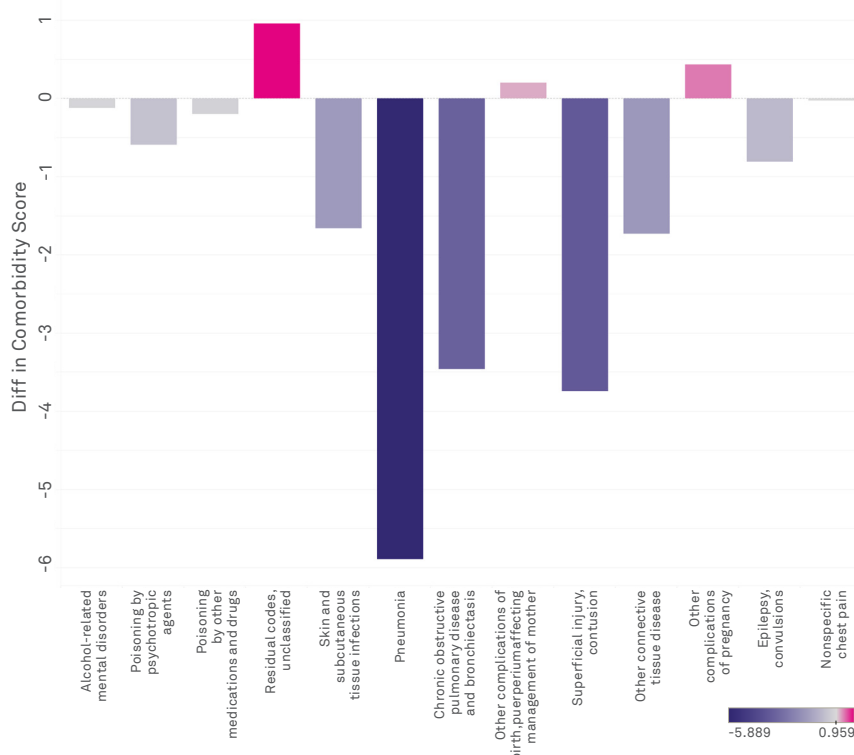


Figure 8 - Average Charlson score of homeless patients compared with all patients for diagnoses with at least 200 homeless inpatient spells

For diagnosis groups with at least 200 homeless inpatient spells:

- The average Charlson comorbidity score for homeless patients is 2.96. For all patients it is 4.45, a difference of 1.49 points less
- The highest average Charlson score was 5.20 for 'Pneumonia' (n=397)
- The lowest average Charlson score was 0.55 for 'Other complications of birth, puerperium affecting management of mother' (n=278)
- The biggest difference in average Charlson score between homeless patients compared with all patients was 'Pneumonia'. All patients had +5.89 higher average Charlson comorbidity score than homeless patients (11.09 vs. 5.20).
- On the whole, homeless patients had a far lower average Charlson comorbidity score than all patients for most diagnoses.

READMISSIONS

Readmissions were analysed by calculating whether a patient made a subsequent readmission in the 28 days following discharge.

For diagnoses with at least 200 homeless inpatient spells:

- The 28-day readmission rate was 24.1 per cent for homeless patients, and 23.4 per cent for all patients. A difference of +0.7 per cent.
- The highest 28-day readmission rate was 39.9 per cent for ‘Chronic obstructive pulmonary disease and bronchiectasis’ (n=278)
- The lowest 28-day readmission rate was 2.5 per cent for ‘Other complications of birth, puerperium affecting management of mother’ (n=278)
- In fact, apart from ‘Other complications of pregnancy’ and ‘Other complications of birth, puerperium affecting management of mother’, homeless patients had higher 28-day readmission rates for all diagnoses.

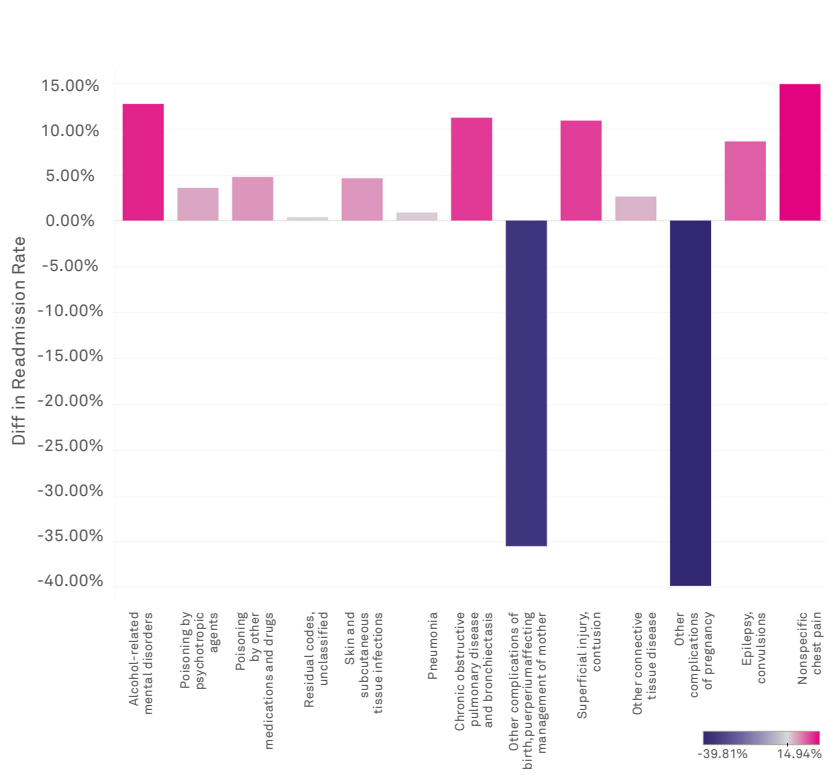


Figure 9 - 28 Day readmission rate of homeless patients compared to all patients for diagnoses with at least 200 homeless inpatient spells

PREVIOUS ADMISSIONS

Previous admission analysis counts the number of admissions a homeless patient made over a 12-month period. It counts the number of admissions from their latest admission, with the latest admission taking place within the financial year 2018/19.

- 83.0 per cent of patients made just one admission over a 12-month period
- 94.3 per cent of patients made up to two admissions over a 12-month period
- 97.5 per cent of patients made up to three admissions over a 12-month period
- The maximum number of admissions made over a 12-month period is 16.

This was also broken down by major diagnosis groups. However, no significant trends were found.

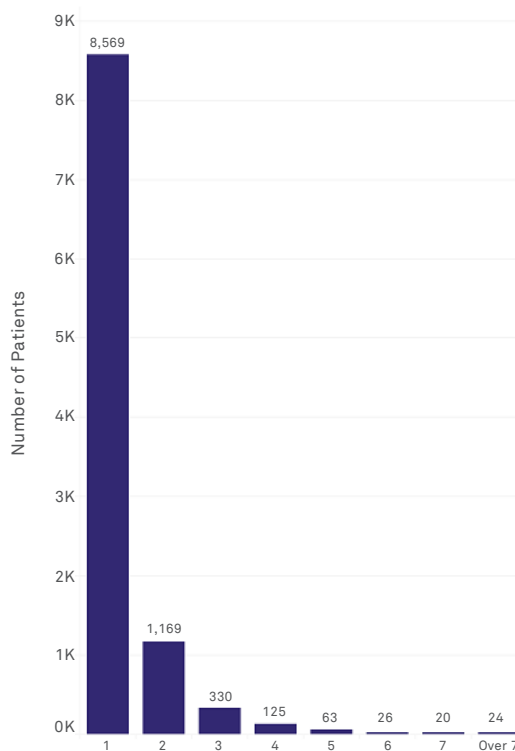


Figure 10 - Distribution of admissions made per homeless patient over 12 months

1. If a patient made an admission on 1st April 2018 but did not make any more admissions for the remainder of the year, then the number they made from 1st April 2017 to 1st April 2018 are counted

“It is important to deliver integrated and accessible care which reduces the barriers experienced by homeless people to access care and provide accessible support which responds to behavioural needs of homeless and rough sleepers in the right way, at the right time and in the right place.”

Claire McGinley, Integrated Care Clinical Operational Manager at
UCLH

Conclusions

The highest rates of rough sleeping non-elective inpatient admissions happen in UTLAs with urban populations, with Westminster having the highest rate. Demographically, the majority of such patients are males in their 30s and 40s. There was an increase in the number of patients coded with 'rough-sleeping' throughout the last decade, suggesting either that there are simply more rough-sleepers, they have more admissions each on average than before, or that the coding for rough sleepers has improved.

Homeless patients spend longer in hospital and have slightly higher 28-day readmission rates, but have lower comorbidity scores. When coupled with evidence of top primary diagnoses, including issues related to mental health and lifestyle, maternal health, and non-specific problems, the data indicates admissions where homeless patients do not have their health needs appropriately addressed during their stay. Despite this, only 1 in 20 patients had more than 2 admissions in a 12 month period.

Overall, this indicates a potential issue with the depth of coding and capturing documentation associated with homeless patients during their stay. The frequency of non-specific codes used, along with relatively lower comorbidity scores, demonstrates that the reality or complexity of the health needs presented by homeless patients is not met on admission. This could be associated with them not being fully known, as they are not clearly recorded or captured.

The differences in coding between homeless patients and the general population indicate that there needs to be a more joined-up, integrated approach from the NHS, local authorities, and voluntary sector organisations to house, protect, and support the health of homeless patients more collaboratively. It is important to deliver integrated and accessible care that reduces the barriers experienced by

homeless people when accessing care and responds to the behavioural needs of homeless people and rough sleepers in the right way, at the right time, and in the right place. This can only be achieved by having multiple specialist services working collaboratively across sectors. The value of this approach cannot be underestimated.

If the depth of coding and data capture do not give us sufficient insight into the issues facing homeless people then it is difficult to measure the impact of our efforts to improve their lives.

Analysis for this investigation has taken place on HES Admitted Patient Care dataset, with further investigation recommended on the emergency care dataset. This would help to capture the point of entry into treatment for homeless patients. To identify homeless patients within the emergency care data set, the full postcode would be required, however there are limitations to this approach. These include required access to sensitive data, ethical considerations, and the effectiveness of using postcodes to capture homelessness.



Ideas for change

1

There are likely to be differences in coding between homeless patients and the general population, indicating that we need a joined-up approach to care.

2

There are administrative and coding pressures when it comes to recording the most important code in the diagnosis. Homeless coding is more likely to be the secondary diagnosis, and there is often a lack of focus and emphasis on coding it.

3

More accurate diagnosis coding for pregnant women presenting with conditions unrelated to their maternal health.

4

This analysis has identified significant gaps in capturing and identifying homeless data.

5

Homeless patients will more likely present with advanced conditions such as substance poisoning or high grade wounds, requiring ICU treatment and in some cases irreversible damage, e.g. emergency amputations. Identifying diseases at an earlier stage in their progression would improve the prognosis and outcomes for homeless patients.

6

Patients with unclassified residual codes are so complex that they cannot be properly coded, especially if the documentation is poor. Many homeless patients will present with more than one issue, and they will require a lot of direct input from multiple professionals across services and sectors at one time, collaborating in a way that effectively addresses their needs.

