# NHS Fife & Shelter Scotland approach to supporting homeless patients attending hospital

**Evidence and Evaluation for Improvement Team (EEvIT)**

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# Key Learning

Healthcare Improvement Scotland were approached by Shelter Scotland and the Fife Health and Social Care Partnership (HSCP), to carry out a cost-effectiveness analysis of an intervention at Victoria Hospital, Kirkcaldy (NHS Fife). The intervention consisted of two full-time team members (providing a combination of clinical and housing expertise) employed by Shelter Scotland within the hospital. By liaising with clinical staff, shelter staff readily assessed and supported patients who were experience homelessness or that were at the risk of losing their home prior to discharge (and follow up with them post discharge if necessary).

- Having hospital-based staff who can support homeless people at the point of discharge from hospital is potentially cost-effective, on average saving £2,422 (95% CI: £610 to £3,853) per patient supported.
- Results indicate that the intervention has the potential to significantly reduce both the proportion of people experiencing future hospital stays, and inpatient length of stay.
- There is an indication that the intervention increases the number of people in Council/Registered Social Landlord (RSL) accommodation, and temporary accommodation, and reduces the number of people who have no fixed abode and/or are street homeless.

It should be noted that the timing of this project makes it difficult to understand the longer-term benefits of the intervention due to the additional actions taken by local authorities, NHS Fife, and the housing sector in response to COVID-19.

# Introduction

Shelter Scotland and Fife Health and Social Care Partnership (HSCP) requested the ihub's support with the economic evaluation of an intervention, designed to support people who experience homelessness, in Victoria Hospital, Kirkcaldy.

## The intervention

Two full-time staff (with clinical expertise and knowledge of the housing sector) were employed by Shelter Scotland and situated within the hospital. They liaised with clinical staff to identify people who experience homelessness or that were at a risk of losing their home. They then assessed, and provided support to patients prior to discharge (and follow up with them post discharge if necessary), liaising with local authority staff to help facilitate the provision of suitable accommodation. There were two hospital settings for the intervention

1. inpatient discharge via the hospital's "Discharge Hub" ( between January 2018- January 2019), and
2. A&E discharge (between November 2019 – February 2020).

### Patient Population and Data Set

The patient population comprised of those experiencing homelessness (or at the risk of losing their home) whilst accessing acute services at the Victoria Hospital in Kirkcaldy (NHS Fife) between the start of January 2018 and end of February 2020.

# Methods

A pre- and post-intervention comparison of hospital activity, associated costs, and changes in housing status was planned from January 2018 to February 2020 (adjusted timeline due to the onset of COVID-19). Details of the patient data, hospital activity data (and associated cost) and the analysis conducted are provided in the following sections.

## Patients

Demographic data were summarised for participants[1].

**Key data/ information collected:**

- **age**
- **gender**
- **health and wellbeing status (mental health problems, alcohol and/or substance use and physical health issues**
- **prior experience of services within the last year**
- **housing status**
- **self-reported impact of health on housing options and tenancy sustainment**
- **hospital discharge dates at the time around the intervention, and**
- **GP registration status.**

## Self-reported housing status and HL1 data (tenancy applications)

Self-reported housing status was compared pre and post intervention. In addition to self-reported housing status data, HL1 records data for patients was provided by the Local Authority. HL1 is the homeless statutory statistical return to the Scottish Government submitted by each Local Authority containing details regarding homelessness applications submitted locally.

Application and resolution dates for individuals who had submitted HL1 applications to the Local Authority were used to explore how rapidly homelessness cases were resolved, and the duration of tenancy sustainment (upon resolution of an individual's HL1 applications).

**Key data:**

- **self-reported housing status**
- **time to obtain tenancy, and**
- **duration of tenancy sustainment.**

[1] Anonymised individual patient level data were provided by Shelter Scotland. Patient records included community health index (CHI) numbers which made it possible to obtain admission data (such as number of admissions and length of stay) for each patient.

Time since resolution of most recent HL1 application was used as a proxy for tenancy attainment and sustainment.

## Hospital activity variables and cost data

Hospital activity data were retrospectively collected for the first phase of the project. The unit costs for the hospital activities were calculated using routine data from the Scottish Health Service Costs (published annually), also known as the 'Cost Book'[2].

**Key data:**

- **length of stay (days) used to apply bed day costs (per day) via the Cost Book, and**
- **speciality (and/or sub-speciality) services seen.**

## Analysis

In order to calculate the intervention's impact on change in service use, inpatient stays were costed using:

**Net cost per bed day multiplied by length of stay (for the relevant inpatient specialty)[2]**

Where NHS Fife data were not available, national average data were used. For inpatient stays of less than 24 hours this was costed this as a single bed day for inpatient, unless the department was A&E. For an overnight A&E stay the inpatient A&E cost for the Victoria, Kirkcaldy was used and for non-overnight A&E visits, the consultant led outpatient cost was used. For outpatient visits (and procedures where applicable) involving other specialities, it was assumed these were consultant-led unless reported otherwise[2].

To account for skewness in length of hospital stays (cohort sample included some participants who had very lengthy hospital stays) the median per person cost was calculated to explore the saving in terms of hospital activity resource use. Further details of the health economics sensitivity analysis and bootstrapping are available upon request.

## Exploratory analysis

Additional exploratory analysis to explore what changes might have been expected at follow-up had COVID-19 not occurred, was conducted. However, due to the small sample size and changing policy

[2] At the Victoria Hospital or that for the relevant provider elsewhere in Fife (using admission and discharge dates to estimate length of stay), where specialty level data for the Victoria Hospital in Kirkcaldy were not available.

due to the coronavirus pandemic it is not appropriate to draw inferences from this information. Further details are available upon request.

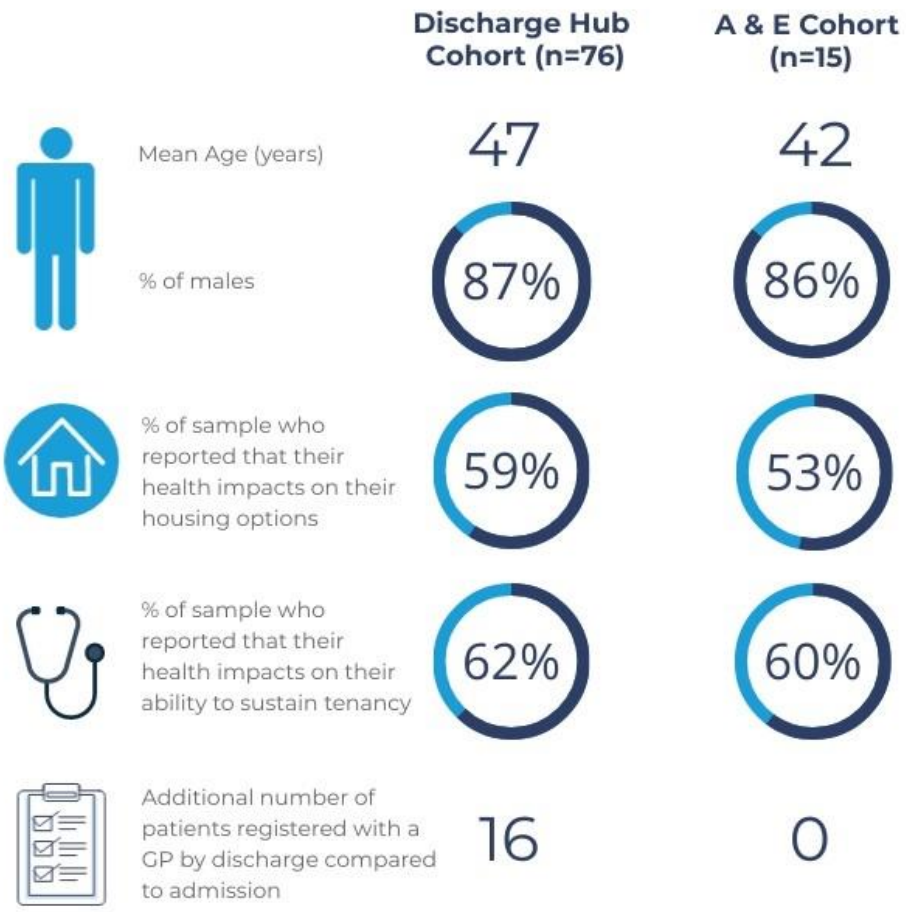
# Results

There was a total of 91 participants (76 participants from the Discharge Hub setting and 15 from A&E setting).

## Key patient demographics

The sample included only adults, ranging in age from 18 years to 83 years old. The sample was predominantly male (accounting for 87% of the sample) and the mean age across the cohorts was 46 years old. An increase in GP registration at time of discharge was only shown in the discharge hub cohort participants. Across both cohorts, over 50% of participants reported that their health and wellbeing status impacted on both their housing options and its sustainment. A more detailed breakdown of the key demographics for participants for both settings can be found in Figure 1. General information about the complexity of the problems faced by participants can be found in Figure 2.

***Figure 1: Participants experiencing the Fife Shelter intervention***



Participants reported experiencing:

- alcohol and/or substance misuse (64 participants)
- mental health problems (51 participants), and
- physical health issues (19 participants).

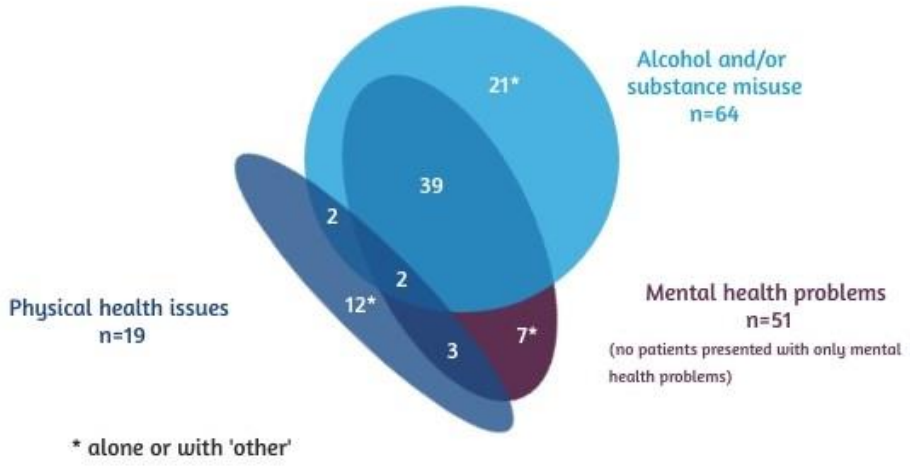
In addition, there were 27 participants who reported a wide range of other complicating conditions[3]. However, none each of these categories had >8 participants, limiting in-depth exploration of the subgroups.

As shown in Figure 2, there was considerable overlap in the number of participants with more than one complicating factor. In descending order, the overlaps were as follows:

- alcohol and/or substance misuse alongside mental health problems (39 participants)
- alcohol and/or substance misuse alongside "other" conditions (21 participants)
- physical health issues alongside "other" conditions (12 participants)
- mental health problems alongside "other" conditions (7 participants)
- mental health problems alongside physical health issues (3 participants)
- alcohol and/or/substance misuse alongside physical health issues (2 participants), and
- alcohol and/or/substance misuse alongside both mental health problems and physical health issues (2 participants).

For all other combinations of > 1 factor, the number of people affected was <5.

***Figure 2: Complicating factors (both cohorts combined): mental health problems, alcohol and/or substance misuse and physical health issues***



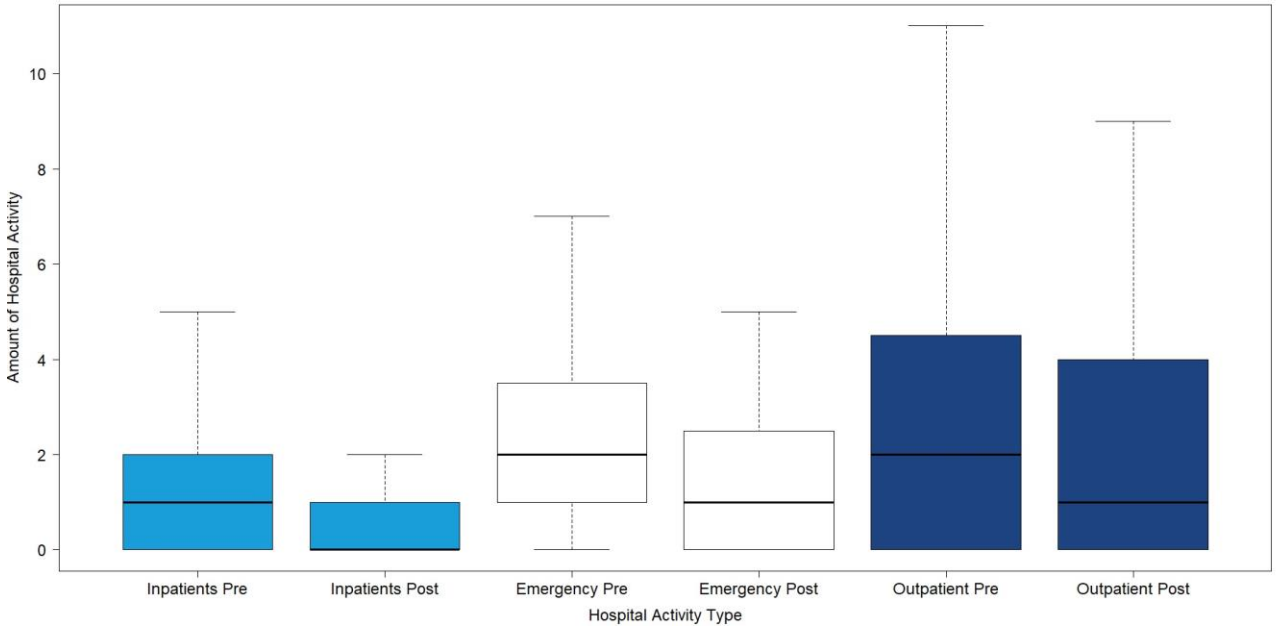

## Impact on hospital activity

Reductions were seen in the average number of visits for the discharge hub cohort (inpatient, emergency (A&E), and outpatient) before and after the intervention. This is shown in the boxplot in

[3] Self-neglect, bereavement, domestic abuse, relationship breakdown, leaving armed services, leaving prison, multiple debts and/or benefit sanctions)Self-neglect, bereavement, domestic abuse, relationship breakdown, leaving armed services, leaving prison, multiple debts and/or benefit sanctions.

Figure 3. It was not possible to conduct the same analysis on A&E participants due to short follow-up data owing to coronavirus being a confounding factor in the possible number of post-intervention visits.

***Figure 3: Number of hospital visits before and after the intervention for the 'discharge hub' cohort (76 participants)***




## Impact on health service costs

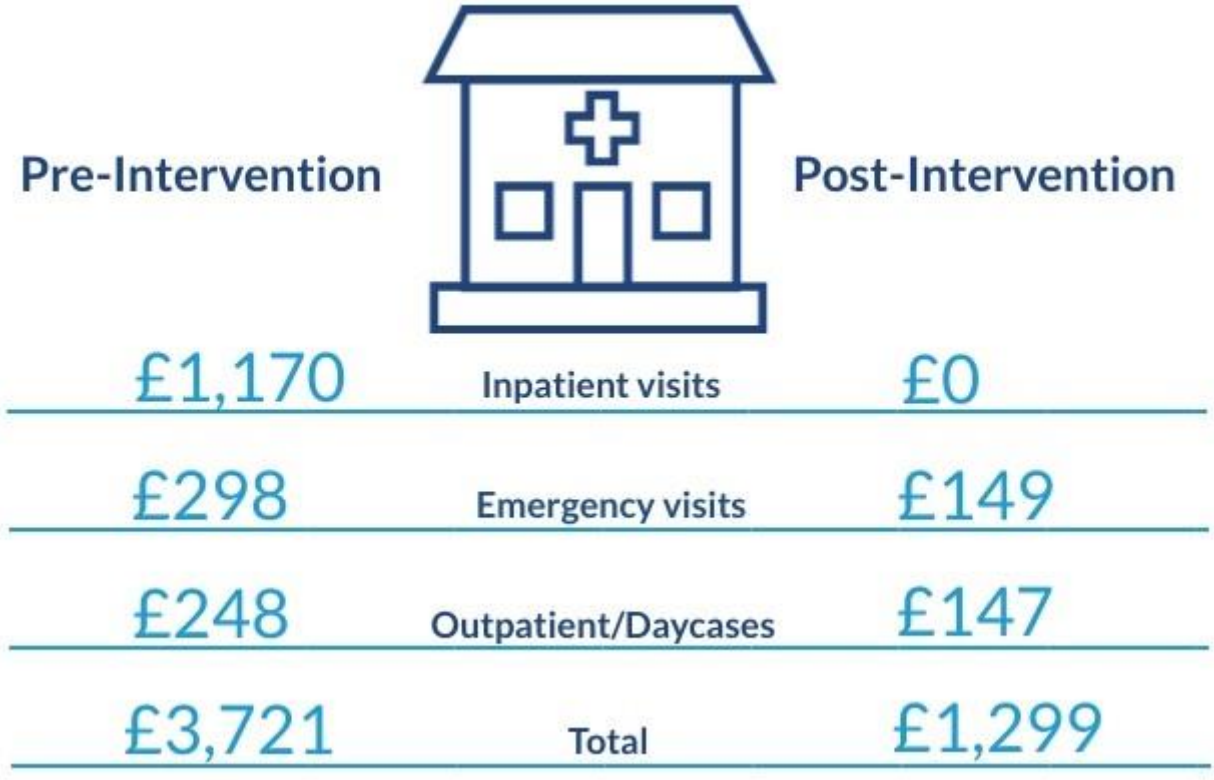
The cost of providing the intervention over the duration of the project was approximately **£84,433**[3] inflated to price year 2019-20 using PSSRU Unit Costs of Health and Social Care.[4]

***Table 1: Total Costs***

| | Pre-intervention | Post-intervention |
|---|---|---|
| **Inpatient** | £570,706 | £189,467 |
| **Emergency** | £74,155 | £75,575 |
| **Outpatients/Daycases** | £42,758 | £44,217 |
| **Total** | £687,619 | £309,259 |

As can be seen the total saving incurred in terms of reduced hospital activity was £378,360. Median costs pre- and post-intervention are provided in Figure 5.

***Figure 5: Median costs***



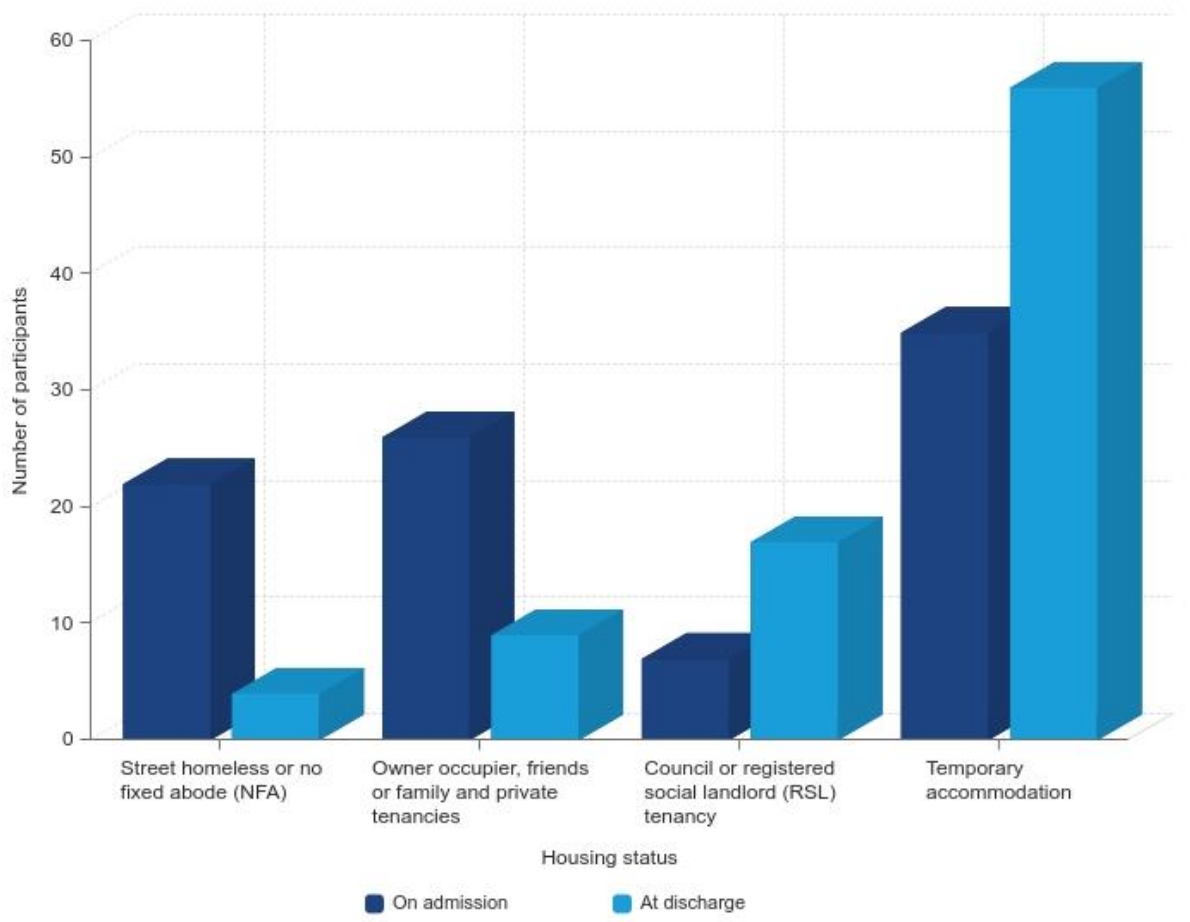

***The Discharge Hub sample comprised 76 participants and the median total costs reduced from £3721 to £1299 (i.e. a maximum saving of £2,422 per person (95% CI: £610 to £3853))[4]. Therefore we expect a more conservative estimate for saving associated with reduced hospital activity to be £184,072 which still indicates that the intervention saves money in terms of acute health service resource use avoided.***

## Impact on Housing

Self-reported housing status as a result of the intervention is provided in Figure 6 (for the total sample). As can be seen, street homelessness and friends/family, owner occupier and private tenancies were reduced whilst council/RSL tenancies and temporary accommodation increased.

[4] The median *observed* saving across the sample is lower at £1557 although the bootstrapped estimate £1716 has a confidence interval (95% CI: £610 to £3853) that includes the saving deduced in this paragraph as the pre-post median total costs. This means we expect in a sample of the same size, the intervention would typically save the NHS between £46,360 and £292,828.In terms of reduced hospital activity. Although the lower limit of this estimate (£46,360) is less than the cost of providing the intervention, it is worth noting that the intervention was cost-saving in 72% of 1000 simulations to estimate variation in the observed saving. Therefore we are confident that the intervention is cost-saving.

***Figure 6: Self-reported housing status when admitted to hospital and at discharge***




*Data on housing status were missing for 1 participant at intervention and 5 participants post-intervention. Figures refer to total cohort including those with missing data.

Housing status did not change over time for 39 of the 91 participants, of whom 26 were already in temporary accommodation and 13 of them had experienced repeat homelessness according to the number of previous HL1 applications.

## HL1 application data

Data on HL1 applications prior to the intervention in the A&E setting were incomplete but at least 7 of the 15 participants (46.7%) were known to HL1 at the time of the intervention. For the discharge hub, 42 participants (55.3%) of the cohort had a previous HL1 application, including 27 (64.3% of the 42 participants) who had more than one previous experience of applying for HL1.

The intervention was not shown to reduce amount of time spent on HL1. A further 22 participants had no HL1 application prior to the intervention but submitted an HL1 application following the intervention. However, the date of application varied as it is up to the individual as to when they submit an application.

***If we assume that HL1 applications occurring within 1 month of the intervention were a direct result of the intervention, 13% of the applications can be regarded as being initiated by the intervention[5].***

## Limitations

Considerable effort was taken to collect, compile, and analyse these data. However, it remains the case that the sample includes a small sample and therefore an in-depth exploration into, for example, subgroups of the sample and/or demographic factors influencing results was not possible owing to the small numbers of patient involved.

Additional limitations to consider:

- The coronavirus pandemic affected the extent to which observational data from the A&E cohort could be analysed, as lockdown from March 2020 will have affected the housing status of patients within this cohort. Conclusions around tenancy sustainment from the discharge hub cohort are likely to be similarly affected by the efforts made to ensure people could self-isolate due to the global pandemic.

- The data are observational and there is no control group. As it is known from the Scottish Government's Health and Homelessness Report[1] that hospital activity is generally elevated among patients who are or have previously been homeless, and that hospital activity peaks at the time of initial HL1 application, it is therefore unclear to what extent hospital activity would likely have been reduced among this cohort regardless of the intervention.

- Although changes were seen in self-reported housing status at the time of hospital discharge, no reduction was seen in time to HL1 case closure following the intervention. This suggests it may be harder to implement sustainable housing solutions for people at such short notice.

## Discussion

In both settings, participants were typically men in their mid-40s. This matches what is already known about the demographics of people experiencing homelessness from previous work in this area[1]. A high proportion of participants had either alcohol and/or drug misuse as a complicating factor, mental health as a complicating factor or both. Pre-intervention hospital activity was significantly higher than post-intervention activity, particularly with regard to inpatient hospital admissions and length of stay.

[5] 11 subsequent HL1 applications had been received following closure of the HL1 case that had either been ongoing or initiated at the time of the intervention (at the time of data cut-off 1st November 2020). This represents 17.2% of those who had an ongoing/initiated HL1 application.

The number of people registered with a GP was shown to increase for patients seen in the Discharge Hub setting, but the same effect was not seen in the A&E setting. This may be due to the small number in the A&E sample, but it is notable that a national campaign to support awareness of GP registration using cards, was announced in September 2019, i.e. after the timing of the work in the Discharge Hub but prior to the study being set in the A&E Department[4].

**The observed saving in terms of NHS (acute health services) resource use (£376,964) potentially exceeds the cost of providing the intervention (£84,433). We estimate a saving between £610 and £3,853 per person in the discharge hub setting, which is likely to result in a saving that exceeds the costs of providing the intervention.**

Associations between the intervention and changes to housing status is less clear. On the one hand, self-reported housing status changes indicate the intervention can, in most cases reduce street homelessness and provide a higher proportion of patients with either temporary accommodation or council/RSL tenancy by the time of hospital discharge. However, in the longer term it is not clear whether or not the intervention can influence time spent on HL1 (ie. Seeking permanent accommodation). People with complex co-morbidities may disproportionately be harder for Local Authorities to find suitable accommodation, and over half the participants in each cohort indicated that their health status affected their housing options.

## Recommended further investigation

The results of the intervention discussed in this report highlight some potential positive associations within the data. However, these will require some further investigation due to the limitations of this small study. We would suggest further investigation regarding the following findings:

- There are some positive indications with regard to tenancy sustainment. However, the coronavirus pandemic and short follow up prior to the data cut off makes it difficult to draw firm conclusions about this currently.

- There is an association between the intervention and reduced costs, however due to the sample size, and broader understanding that hospital activity tends to peak around the time of first HL1 application it is difficult to determine causality[1].

## Conclusion

The intervention was shown to be potentially cost-effective in terms of reduced hospital activity among the discharge hub cohort following the intervention compared to their pre-intervention hospital activity. Changes to inpatient activity drives the cost-effectiveness, but causality is difficult to

prove given our understanding of how patients' hospital activity changes in relation to their HL1 status.

The intervention was shown to be able to improve patients self-reported housing status by the time of hospital discharge, particularly for patients with "no fixed abode", but it was not possible to show longer-term impact on housing status given the small sample size of participants involved, the duration of follow up, onset of the coronavirus pandemic within this follow up timeframe and the inherent difficulties in identifying permanent accommodation for people whose health status may disproportionately affect the housing options available to them. The value of having the intervention team based within the A&E Department at the onset of the coronavirus pandemic may be considerable, but it is not possible to quantify due to the effect of the coronavirus pandemic on hospital attendances and efforts to eradicate homelessness due to the urgency of the pandemic itself.

## Acknowledgements

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Data and support provided by Shelter Scotland, Fife HSCP (including NHS Fife and Fife Council), and Place, Home and Housing (Healthcare Improvement Scotland).

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