

Premature Ageing in the Homeless Population

Depaul Health Initiative
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DEPAUL

Homelessness has no place

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“Our research tells us, from the Sundial House sample, that homeless people have more chronic illnesses and a shorter life-expectancy than people who have somewhere secure to live.”

Kerry Anthony, CEO, Depaul.

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introduction

In 2004, as part of its overall response to homelessness in Dublin City and resulting from the development of the National Homelessness Plan, the Homeless Agency decided to proceed with the development of Sundial House in the James Street area of Dublin. Helm Housing, now Tuath Housing, was designated as the housing developer with Depaul as the provider of support and care. Depaul commenced service delivery in September 2008.

The remit for Sundial House is to provide long term supported housing to 30 individuals who have experienced extended periods of street homelessness and have entrenched alcohol use. The service offers a long-term sustainable housing solution for individuals with multiple and complex biopsychosocial needs as a result of long-term homelessness.

Depaul uses low threshold, harm reduction principles and person centred care as its central philosophy. Joint commissioning partnership between the Health Services Executive and Department of the Environment is administered by Dublin City Council to ensure the long-term, intensive health and housing support can be offered onsite to the intendent population.

key outcome of the service

This project has ensured that 30 people who have had histories of entrenched street drinking, with up to 15 years of interaction with homeless services and who have been repeatedly excluded from temporary accommodation, can now be assured that they have long term accommodation. They have access to services to enable them to manage and stabilise their drinking, improve their health and establish relationships within a long-term supported community based project. In order to achieve this central outcome for the service user group, Depaul has adopted the following principles:

- to provide a supportive and healthy shared living environment
- to provide emotional and motivational support
- to take a holistic, harm reduction approach to health and addiction needs
- to meet the medical/health needs of people in their own accommodation
- to work in conjunction with statutory services (primary health) to ensure all social and complex health needs, both mental and physical, are addressed
- to promote positive relationships and provide an accepting environment for these to develop or rebuild
- to ensure service users have a stake in their place of accommodation
- to promote meaningful engagement and motivation to improve quality of life and maximise the potential of the individuals accommodated



physical design & living environment

Sundial House is a 'purpose built' service with integrated building systems that are designed to meet the challenges of the provision of accommodation and services for long-term homeless adults. The building is designed over 5 levels and is fully wheelchair accessible. This layout has played a critical part in the success of the project, ensuring each floor can be accessed by lift, with generous office and communal spaces, kitchen/dining, surgery and residential areas. The accommodation includes:

- 3 enhanced care facility beds (2 single, 1 twin on second floor)
- 18 single ensuite bedrooms
- Four twin/couples rooms on the third, fourth, fifth floor
- Three living rooms with tea and coffee stations
- A nursing station
- Patio and outdoor seating
- A service user accessible laundry space
- Disability access showers and toilets
- Communal kitchen and dining areas
- Quiet room for family visits and Pastoral Care

Systems within the building include fobbed access to both service user and staff areas, warden call facilities to allow individuals to request assistance if required and temperature controls within each personal living space. Service users have their own rooms and have 24 hour access to the building, with their own front gate key fob and can come and go as they please. There are 3 official building checks every day and if there are particular concerns about an individual, checks will be more often. If a service user wants some time alone they have their own private space and will not be disturbed. The courtyard and integrated indoor /outdoor spaces enable and support a managed approach to alcohol use within the building.

staffing & service provision

The service currently has a staff make up of a local management team, project workers, 5.5 full time Health Care Assistants (HCA), 1 full time Registered General Nurse (RGN) and ancillary staff team.

Current service provision includes; daily medication support by HCA team, personal care and environmental hygiene, meals, social activities/volunteer programs, 2 half day General Practitioner in-reach clinics, 2 half day nursing clinics.



background

Homelessness and health

Homelessness is associated with dramatic health inequities, including younger onset of chronic disease, multimorbidity and a reduced life expectancy (Fazel et al., 2014). The mean age at death for rough sleepers in Dublin is 38 for women and 42 for men (Barry et al, 2016). Hospitalisation and death from age-related conditions such as cancer and cardiovascular disease occurs 10-15 years earlier in homeless people in the US (Baggett et al., 2013, Adams et al., 2007).

In addition, studies from the US and Canada have reported earlier onset of frailty and other geriatric syndromes usually seen in older adults (Adams et al., 2007, Gelberg et al., 1990, Brown et al., 2012, Brown et al., 2016b, Brown et al., 2014). Frailty can be generally seen as a decline in multiple physiological systems or a general state of vulnerability. Other geriatric syndromes include dementia, multi-morbidity (more than one chronic disease at the same time) and functional decline.

An assessment of physical and cognitive health of residents in Sundial House was conducted in March 2017 as a Trinity College Dublin (TCD) second year medical student project. Five medical students carried out the project under the supervision of Dr Cliona Ní Cheallaigh, consultant physician in St James's Hospital and senior lecturer in medical

gerontology in TCD and of Jess Sears, CNM, Depaul. Depaul welcomed the opportunity to collaborate with Trinity Medical Students in conducting this study and contributing to this research report. This report has been adapted from the primary research report prepared by the 2nd Year medical students and primary investigators to demonstrate the extent of premature ageing in long-term homeless adults and its impact on both the health and housing sectors. The study was conducted with use of The Irish Longitudinal Study on Aging (TILDA) as a comparative control group.

The aim of the study was to achieve a comprehensive view of the level of multi-morbidity and health care utilisation amongst this population in order to evaluate resources and staffing levels to meet the evolving needs for older homeless people. Additionally, we sought a better understanding of the needs of this population to allow for specifically targeted interventions to prevent, improve or better manage these conditions in this group.

methodology

SETTING: Health assessments were undertaken at Sundial House, Depaul's low-threshold long-term supported accommodation that currently houses thirty-one individuals who have histories of extended periods of street homelessness and have entrenched alcohol use issues. Sundial House offers harm reduction and alcohol management plans developed with service users to address their alcohol, health and social needs. The alcohol management plan is at the core of Depaul's harm reduction ethos, and is supported by data that shows that alcohol related problems are 6-7 times more prevalent among homeless people than in the general population (Hwang, 2001).

Keyworkers are appointed to all residents to support access and engagement around health-related issues.

The study was carried out by five medical students under the supervision of Dr Ní Cheallaigh, and was supported by Depaul's Health Initiative, consisting of the Baxter Community Integration Nurse Clinical Nurse Manager. Depaul's team assisted with both administering and modifying the exams and recruiting participants.

PARTICIPANTS: All thirty-one residents from Sundial House were invited to partake in this study. Informed consent was obtained using a verbal consent process in addition to written materials.

ETHICAL APPROVAL: The study was approved by the Joint Hospital Research Ethics Committee.

MEASUREMENTS: Maximum grip strength was measured from two tests (one on each hand) using a hydraulic hand dynamometer (Baseline, Fabrication Enterprises, Inc., White Plains, NY), provided by TILDA. Both measurements were noted and the largest recording was used. Measurements were recorded in kilograms (kgs).

Functional mobility was recorded via the Time to Up and Go (TUG) test -- participants were instructed to stand from a seated position, walk three meters at a normal pace, turn around, walk back and returned to the same seated position. Time was recorded by stopwatch from the command "Go" to when the participant was sitting with their back resting against the back of the chair. Participants were allowed any walking aids typically used on a daily basis.

A questionnaire adapted from a previous TILDA (Kenny et. al, 2013) study was conducted to compare self-reported physical activity levels, manageable ADL's, exhaustion levels and unintentional weight loss of 10 lbs or more in the past year. This questionnaire along with collateral information provided by the nursing team was used to assign a Fried Frailty Score.

Clinical Frailty Scale (Dalhousie University, 2009), was used to establish a holistic assessment of frailty. This scale is used to predict the mortality associated with a person's frailty with a high correlation to the frailty index ($r = 0.80$) (Rockwood et. al, 2005). Participants were ranked on a 9-point scale, in which each increasing increment represents an increased severity of frailty, dementia and therefore life expectancy.

Montreal Cognitive Assessment Test (MoCA) was used to assess global cognitive performance.

Finally, residents' primary care and St. James's Hospital (SJH) patient records were screened to identify diagnoses and hospital usage.



results

i. Participants

31 individuals were included in the study; 27 males and 4 females. All but one were of Irish origin. The range of ages of the Sundial House residents were 29-84 with an average age of 55.8.

12/31 participants completed all assessments. 20/31 participants completed some of the study assessments.

Participants in wave one of the nationally representative Irish Longitudinal Study on Ageing (TILDA) were used as controls. The first wave of data collection was conducted between October 2009 and July 2011. In total, 8175 individuals aged 50 and over participated in the study. 329 interviews were also conducted with younger spouses or partners of participants, leading to a total sample size of 8504. The median age of the controls was 62 years.

ii. Physical Frailty

Physical frailty can be assessed using the grip strength and timed get up and go tests, 16 participants (40-71 years, 81.25% male) were assessed for maximum grip strength, achieving scores ranging from 18.14-49.9kg. The mean score attained was 30kg of force with a standard deviation of 9.4kg. This score was noticeably lower than that of 65-74 year old controls from the TILDA study and approximately the same as TILDA's 75-85 year olds (*Figure 1*).

16 participants (40-66 years, 87.5% were male) performed the TUG test to assess functional mobility. Recorded times ranging from 6.54-33.63 seconds, with a mean time of 16.61 sec and standard deviation of 8.33 sec. This mean time was twice that of the housed age-matched group of under 65 years, and significantly longer in comparison to the over 65 years housed group (*Figure 2*).

12 participants had completed assessments enabling calculation of the Fried Frailty Score (a composite score based on grip strength, Time to Up and Go (TUG) and self-reported energy exhaustion and weight loss). Of these, 33% of homeless participants were defined as frail (Fried Frailty Score of 4 or 5), compared to <10% of the TILDA controls (*Figure 3*). 20 homeless participants were evaluated with the Clinical Frailty Score (CFS), with 11/20 having scores of 4 or more on the CFS (*Figure 4*). *Clinical Frailty Scale - Appendix A pg.25*.

Figure 1

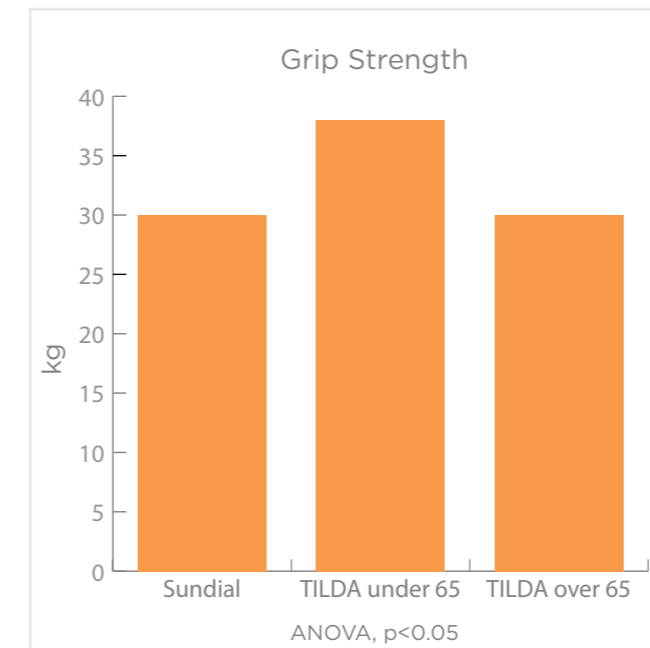


Figure 2

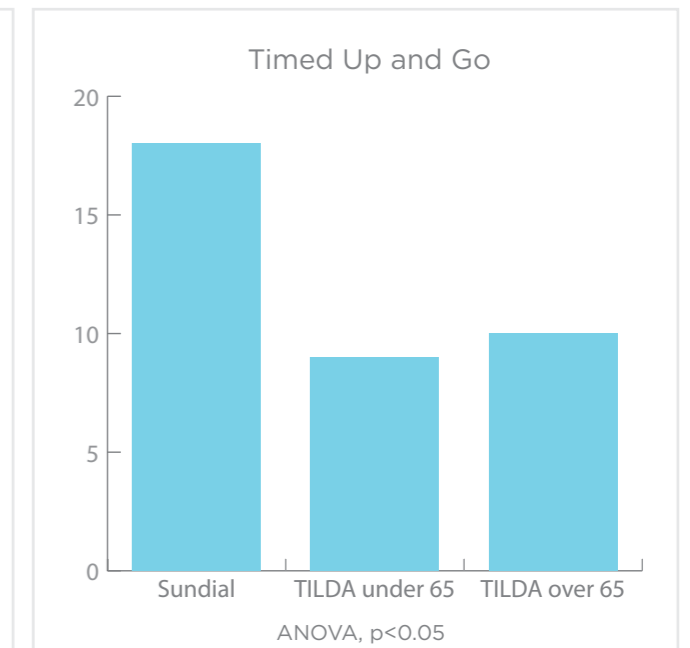


Figure 3

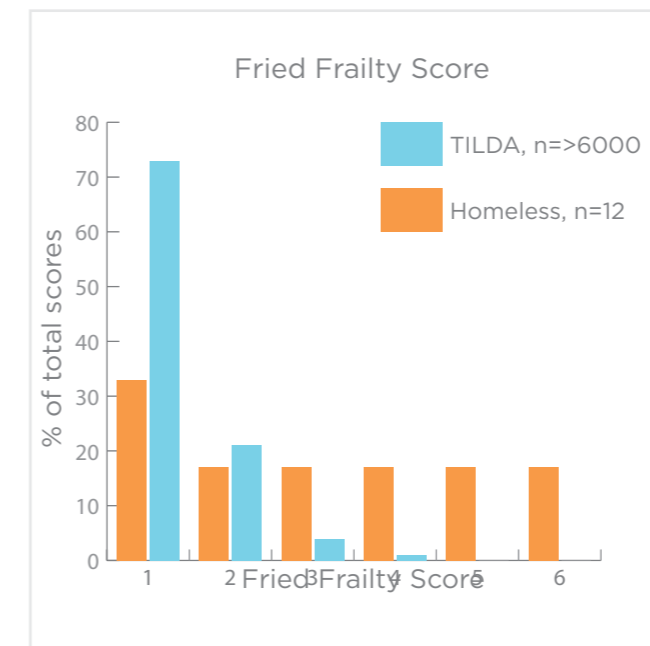
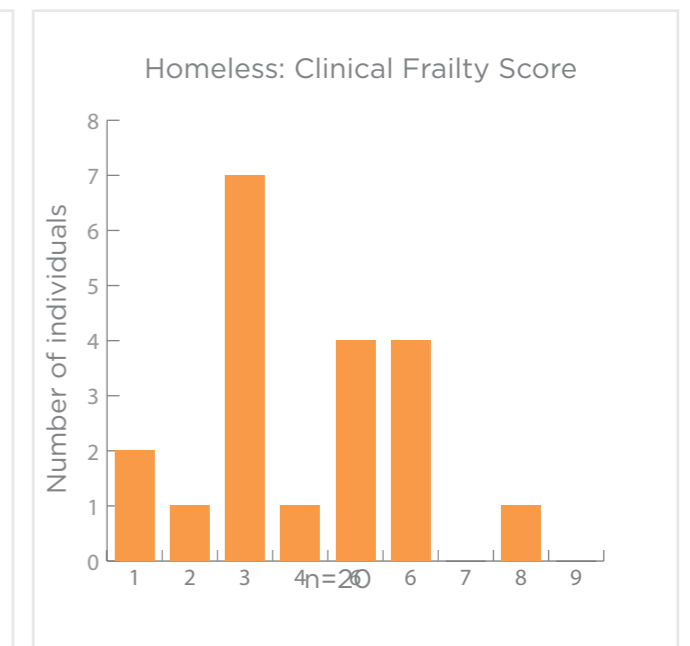


Figure 4



results

iii. Cognitive Frailty

The MoCA is a well-established test used to screen for cognitive impairment – measuring several metrics, which include measures of orientation, registration, attention, calculation, recall, executive function, abstraction, and visuospatial ability. The total possible score is 30 points; a score of 26 or above is considered normal. Twelve homeless individuals completed the MoCA, (mean age 58.25, range 53-66). Median MoCA score was 14 (range 4-21), whereas age-matched TILDA controls had a median score of 25 (Figure 5). Some individuals were not able to complete the MoCA at all due to literacy or general lack of ability to follow verbal instructions.

An important part of this piece was having the nurse on site available to rephrase the question or “translate/interpret” the instructions in a language that gave the service user the best possible chance of participating. It could be argued that the scores produced are indicative of a positive skew in the data and that cognitive functioning is in fact overrepresented here at a significantly lower score of 14/30. The median MOCA score in Sundial residents was 11 points lower than the median scores for >85yr olds in TILDA.

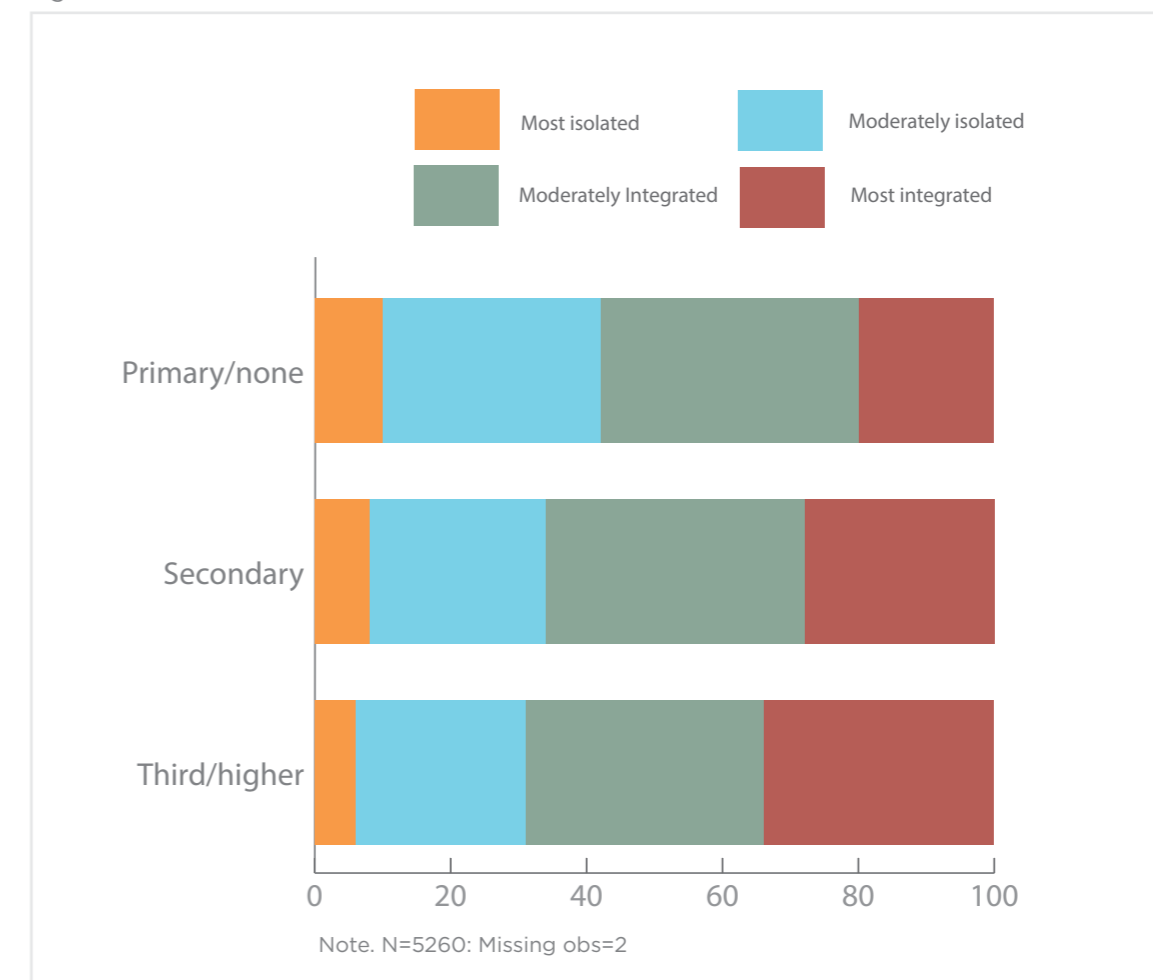
iv. Social Connectedness

Data from TILDA has highlighted the importance of social connectedness in older individuals in Ireland, and has demonstrated that individuals with lower levels of education experience less social connectedness. Service users in Sundial House displayed a significantly lower level of social connectedness than TILDA participants of all educational levels (Figure 6). There was a general sense that service users felt connected to staff and their peers, but many had low levels of family support either due to breakdown of relationship or living outside of the city. Most reported not to have any engagement with family/children, even for those living in the city.

Figure 5



Figure 6

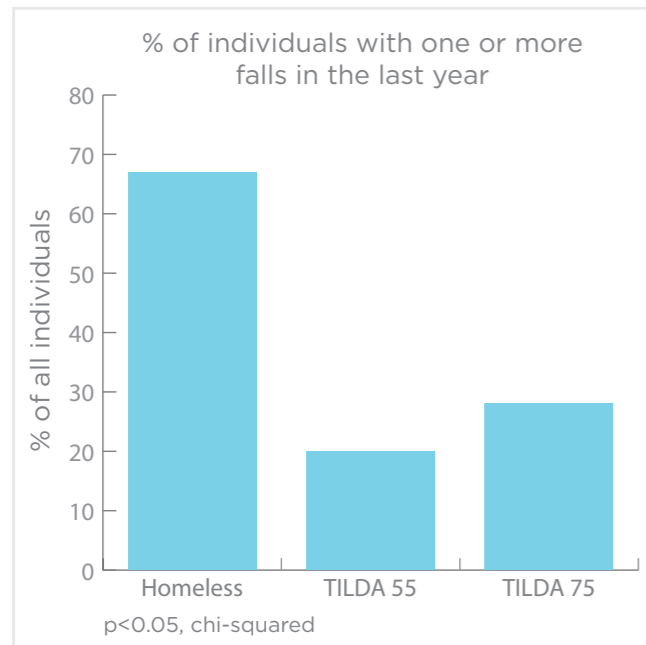


results

v. Falls

The level of self-reported falls in Sundial residents is higher than all age groups in TILDA (Figure 7).

Figure 7



vi. Multi-morbidity

Primary care and hospital records for all current or previous Sundial House residents in 2016/2017 were reviewed. This included 32 adults (3 female), median age 55.8, range 29-84 (only 2 >65). This was mapped against a list of 40 chronic conditions used in a large-scale study in Scotland. The average number of chronic conditions per person was 6.3 (± 3.5) (range 1 - 15). 27/31 residents had ≥ 2 mental and physical conditions. The Sundial House group shows a significantly higher proportion of chronic conditions when compared the over 85 year old group of the general population in Scotland (Figure 8).

The most common physical chronic conditions are: liver related (Alcoholic liver disease, cirrhosis, fatty infiltration of the liver, hepatitis) seizures and epilepsy, brain related¹, cardiac related², bone + joints related³, chronic pain, bruises and rashes, and eye and ear related⁴ (Figure 9).

¹ Cerebral, cerebellar atrophy, TBI, CVA, haemorrhages, Wernicke's encephalopathy
² IHD, CAD, Atrial Fibrillation, cardiomegaly, cardiomyopathy, infective endocarditis
³ Osteoporosis, osteopenia, fractures, amputations, osteoarthritis
⁴ Blindness, trauma, cataracts, chronic mastoiditis, otosclerosis, cerumen build-up

Figure 8

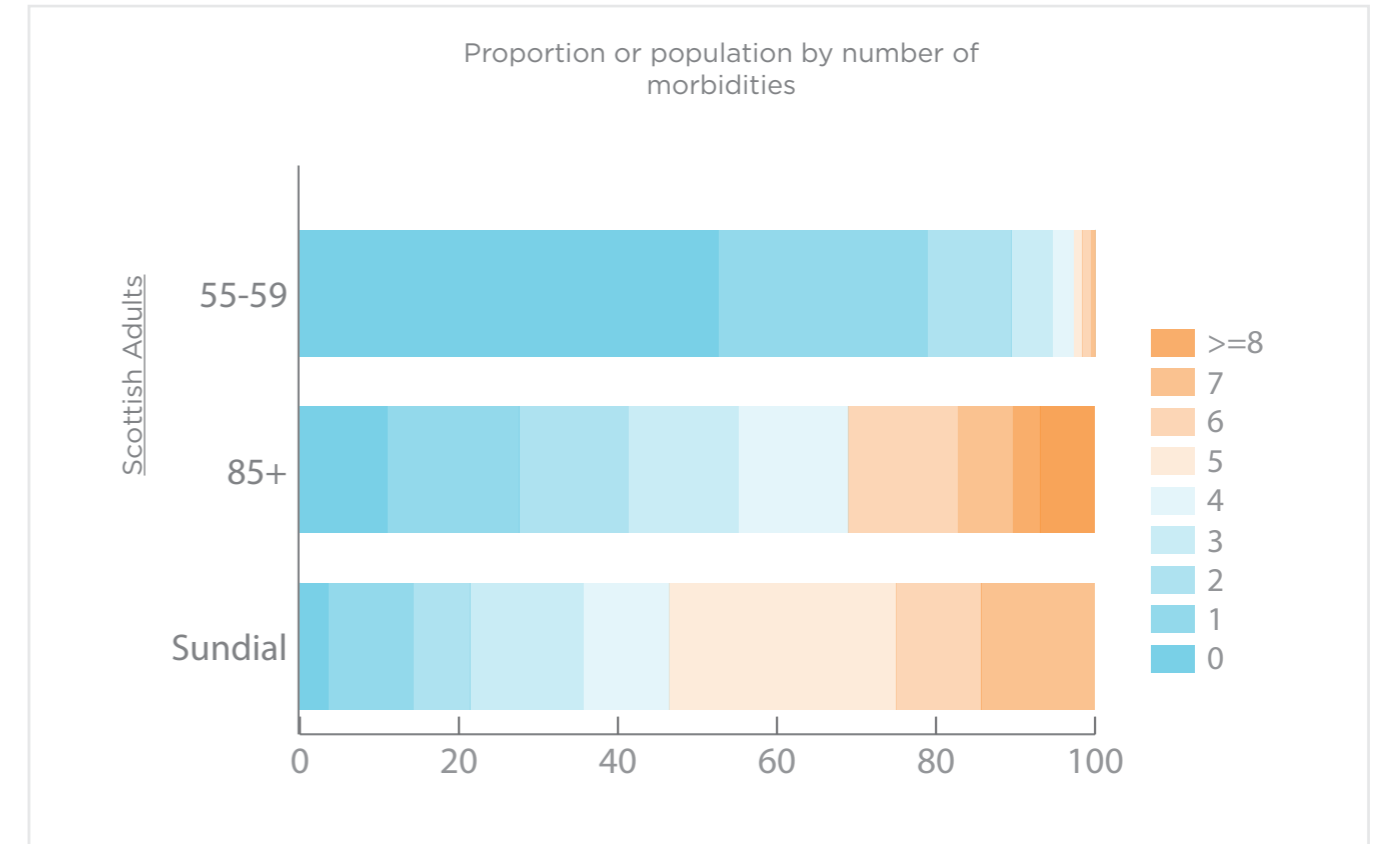
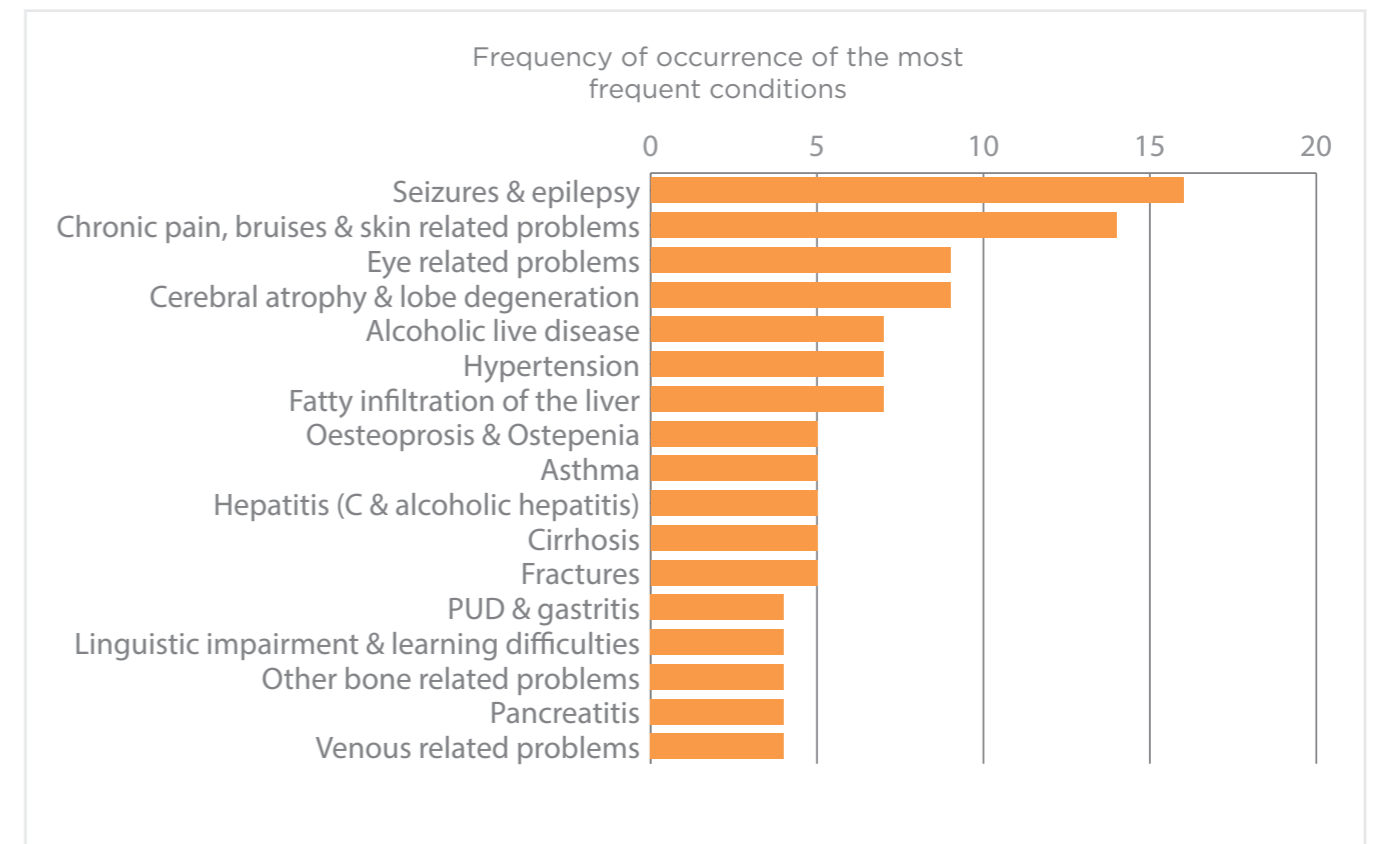


Figure 9



results

vii. Utilisation of Acute Hospital Care

In 2016, the mean number of Emergency Department attendances in St James's Hospital was 5/Sundial resident and the mean number of inpatient bed days was 30/ person. This is a dramatic increase compared to the mean number of ED attendances and inpatient bed days for housed people in the St James's Hospital catchment area (*Figures 10 and 11*).

Figure 10

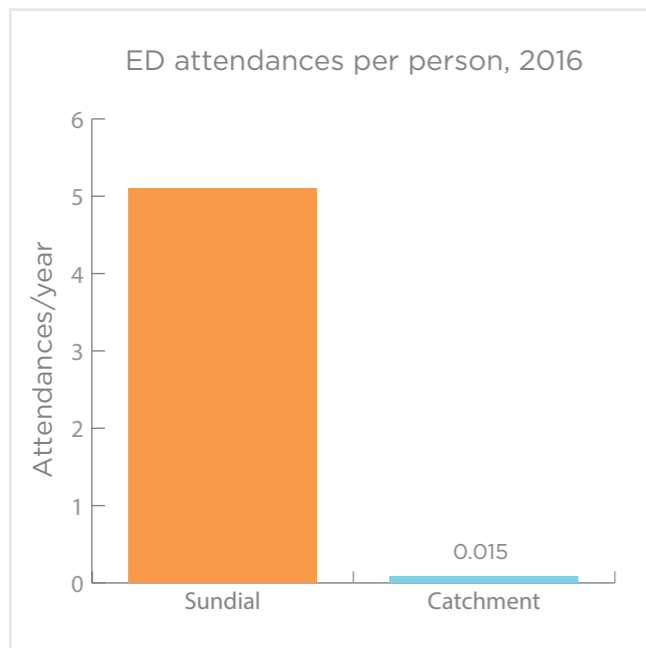
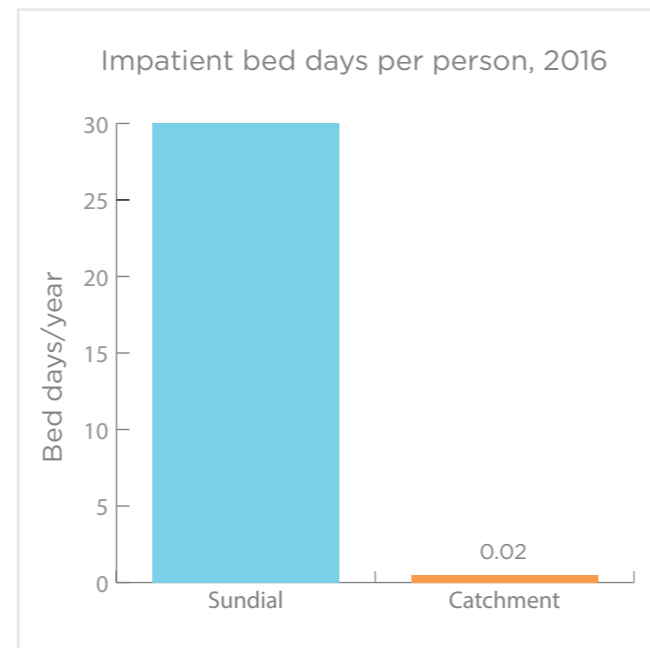


Figure 11



discussion

The implications of this study are to highlight the enhanced vulnerability occurring from homelessness and how the debilitating nature of cognitive impairments and increased fragility can lead to an increased harm rate. Data compiled from the cognitive and frailty assessments show significantly negative comparative scores in all tests amongst the homeless population with their age-matched housed counterparts. These results clearly indicate that Sundial House residents, and the wider homeless population of Dublin are aging at an accelerated rate in contrast to the housed general public.

Despite the lack of similar research centred on homeless participants, the general consensus from similar studies is that there is a significant correlation between homelessness and frailty and cognitive impairment. There is also international evidence to show that there is a higher incidence of chronic conditions recorded in the homeless population when compared to the general population. More than half of the Sundial House residents (58%) were diagnosed with a mental condition along with their alcohol and substance abuse. These results are consistent with those of a study conducted on rough sleepers in 2015, which looked at the associations of homelessness, addiction and health in Dublin and Limerick. The study found that more than half of the homeless population had a mental illness associated with an addiction problem (O'Reilly et al., 2015).

The residents of Sundial House have been observed to have a biological age approximately 10-20 years older than their chronological age, which for Sundial House would assess the average physical age of the population to be between 66-76 years. This ageing population coupled with complex medical issues relates directly to the rates of deaths in service and the care that is required at pre-hospice, pre-long term care and end of life.

As can be seen from the data above, Sundial House residents were reported to have a significantly higher number of chronic conditions/life limiting conditions that require specialist integrated care management. In general, the specialty of medical services for the older person or Geriatric Medicine, have high functional and robust assessment services in place to manage people in the community such as ambulatory care units and integrated discharge planning teams. Unfortunately, these services are provided to the over 65 year old population and Sundial House residents are largely excluded. These structures have been seen to reduce Emergency Department (ED) visits and hospitalisation, therefore reducing inappropriate or unnecessary admission to hospital.

Understanding the impact that chronic conditions have on the healthcare services is crucial for the Republic of Ireland. It is estimated that three quarters of total healthcare expenditure in Ireland is allocated to the management of chronic diseases, 60%

of hospital inpatient bed days are dedicated solely to chronic conditions and their associated complications, which substantially increase costs and put pressure on limited resources. (DoHC, 2008)

The data regarding hospital admittances and total inpatient bed days is of clinical significance because it gives a better understanding of the pressures involved in managing homeless patients in a healthcare setting.

Sundial House residents alone accounted for 0.04% of all ED admittances in SJH for 2016.

A study conducted in Dublin from 2005 - 2014 found that there has been a 406% increase in admittances of patients with 'no fixed abode' since 2005 in Ireland. Each patient spends an average of 6.5 days at the hospital, inevitably incurring huge costs for the health services, as well as heightening the problem of acute shortage of beds. The study further found that majority of the homeless patients admitted had a mental/behavioural disorder (57.3%), 34.3% had an alcohol misuse diagnosis and 21% had a substance abuse diagnosis (O'Farrell et al., 2016).

There are generally much higher hospitalisation rates in the homeless community when compared with the housed population (Fischer et. al., 1986). One of the biggest reasons being compliance with treatment plans for specific chronic conditions - this is actually a difficult problem to deal with, and hence, many homeless people are

referred to inpatient care for closer attentive management and support than the housed population who could be referred to OPD.

Sundial House residents accounted for 0.02% of the total bed occupancies in SJH, with each resident spending an average of 30 days in the hospital, significantly higher than this recorded average. It is also greater than the figure recorded by (Salit et. al., 1998), who claims that homeless patients on average stayed 25% longer than other public hospital patients.

Although the data provided could not allow us to differentiate the reasons for staying in the hospital, generally, homeless patients with psychiatric illnesses tend to stay for longer periods of time, incurring higher costs for the hospital (Hwang et al., 2011)

To conclude, these findings are of immense value because, not only do they bring to light how severely the health of a homeless person deteriorates, especially when associated with an alcohol addiction (as seen by the staggering number of chronic conditions and co-morbidities), but also gives a rough idea of the pressures faced by the healthcare system in terms of providing care for the homeless community (due to lack of beds, and inevitably high costs incurred). This data could be used as a basis to improve and reform the healthcare provided to the homeless community, to make it more economically viable and as holistic as possible.

conclusion

Deterioration & Morbidity: Due to the service user demographic, there will be an ongoing and increased deterioration in the health and morbidity of the service user population in Sundial House. As can be seen in the research above, there is an increased frailty in this cohort of service users. With this in mind, the following should be considered:

Resources: There should be consideration given to the resources that are and will be needed for the service users as their health and frailty needs increase. This includes staff with a specialist skill mix to support service users with complex physical and care needs along with challenging behaviours and alcohol use.

Hospital admittance: Further analysis should be undertaken to look at both the health and social care needs of service users in an effort to reduce the number of hospital admittances and length of stay required for such a service user demographic. In doing this, the following areas should be considered:

- Support needs: What supports would be necessary to ensure that service users have in place a community led approach to their care needs.

- Consideration should be with a view to increasing best practice and increasing timely interventions with service users while not increasing hospital stays.
- Housing supports: What housing supports/ model would best facilitate the service user manage their health needs within the community.
- Intermediary care support: A consultant led step up-step down Intermediate Care Centre is essential for meeting the health needs across the age continuum. Additionally, an Ambulatory Care Team and post discharge support team should accompany the ICC service to ensure appropriate reduction in number of A&E attendances, length of hospital stay, and reduce readmission rates from failed discharges. Evaluation of impacts of these services on positive health outcomes and retention rates in specialist health services for this cohort.



appendix A

Clinical Frailty Scale*



1 Very Fit – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.



2 Well – People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g. seasonally.



3 Managing Well – People whose **medical problems are well controlled**, but are **not regularly active** beyond routine walking.



4 Vulnerable – While **not dependent** on others for daily help, often **symptoms limit activities**. A common complaint is being “slowed up”, and/or being tired during the day.



5 Mildly Frail – These people often have **more evident slowing**, and need help in **high order IADLs** (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.



6 Moderately Frail – People need help with **all outside activities** and with **keeping house**. Inside, they often have problems with stairs and need **help with bathing** and might need minimal assistance (cuing, standby) with dressing.



7 Severely Frail – **Completely dependent for personal care**, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).



8 Very Severely Frail – **Completely dependent**, approaching the end of life. Typically, they could not recover even from a minor illness.



9. Terminally Ill - Approaching the end of life. This category applies to people with a **life expectancy <6 months**, who are **not otherwise evidently frail**.

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

* 1. Canadian Study on Health & Aging, Revised 2008.
2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.

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IADL—instrumental activity of daily living.
Reproduced with permission from Rockwood.⁶

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Homelessness has no place