Effectiveness and Cost-effectiveness of ‘Usual Care’ versus ‘Specialist Integrated Care’: A Comparative Study of Hospital Discharge Arrangements for Homeless People in England

SUMMARY OF RESEARCH

The overall aim of this two year study is to establish firstly the ways in which specialist integrated homeless health and care (SIHHC) services are being developed and implemented to facilitate hospital discharge in England and, secondly, the impact this is having on quality of care and organisational outcomes such as the prevention of readmission to hospital.

The study will evaluate the principal models of SIHHC developed as part of the Department of Health’s Section 64 (voluntary sector led) *‘ten million pound cash boost’* (DH, 2013*)* to improve hospital discharge for homeless people, alongside some of the more longer established approaches such as the Pathway model. The main purpose of the study is not to make recommendations as regard one particular model being more effective than the other, but to understand the different components of each model in terms of what works to secure safe, timely and compassionate discharge from hospital.

In terms of what is already known about SIHHC, it is recognised that there is a fine balance between promoting access by providing specialist services and creating the conditions for further marginalisation and reinforcement of stereotypes. In some areas it is possible that a well developed hospital discharge protocol is able to secure timely discharge for homeless people without the need for SIHHC. To enable exploration of this, hospitals with access to SIHHC will also be compared to those without access to such schemes.

This is an important consideration as a key implication of the Francis (2013) inquiry into the abuse and neglect at Mid Staffordshire NHS Foundation Trust is that commissioners and managers will need to pay close attention to the scope for challenge and innovation in routine ‘standard care’. By educating hospital staff about the needs of homeless people, SIHHC may be a means of achieving this but little is know about its effectiveness in this area.

Following a literature review, in-depth fieldwork employing realistic evaluation will be carried out in six case study sites across England. For the purposes of this study, sites are understood as ‘whole systems’ of care in which the hospital is the focal point. Reflecting the principal typological approaches, sites will be purposively selected to include hospitals that have access to clinically led models of SIHHC (n=2), those that have access to housing link worker schemes with no clinical in-put (n=2) and those which rely on standard provision (n=2). In selecting case studies, particular attention will be paid to different aspirations for integration encompassed in service specifications and discharge protocols, showing in the final analysis if and how this impacts on a wide range of outcomes.

In each site, fieldwork will comprise: interviews with commissioners and service managers from SIHHC and a range of other agencies ([minimum] n=5 per site); interviews with discharge coordinators, case managers and key workers from SIHHC and a range of other agencies ([minimum] n=5 per site); and interviews with service users (n=10 per site) shortly after discharge from hospital and at three months follow-up. In addition to capturing information on service use, the interviews with service users will ascertain experiences of the hospital discharge process, if ‘joined-up’ care was delivered and overall reflections on the health and well-being outcomes that have been achieved. This qualitative data will then be complimented with more quantitative evidence on the costs and outcomes of specialist integrated care.

Key outcomes of the research will include in-depth understanding of the how different mechanisms are working to address poor discharge, with a particular focus on integration. From this, the study will provide new insights that policymakers and commissioners will be able to utilise to make recommendations and effect changes in practice. Finally, we will produce a toolkit for commissioners about developing SIHHC if the findings support this.

AIMS AND OBJECTIVES

The overall aim of the study is to explore how SIHHC is working to secure safe, timely and compassionate discharge from hospital. The objectives of the study are:

1. To situate what is already known about delayed discharge among homeless people in terms of the broader literature on hospital discharge, intermediate care and reablement.
2. To explore how different models of SIHHC are being developed and implemented across England to facilitate effective hospital discharge
3. To explore how SIHHC impacts on outcomes and different patterns of service use across the whole system (e.g. the use of unplanned care) and the associated cost implications of this.
4. To explore homeless people's views and experiences of whether, and if so how, SIHHC works to improve experiences of hospital discharge and to deliver improved health and well-being outcomes
5. To produce a 'toolkit' for commissioners on developing SIHHC (if the findings support this)

BACKGROUND AND RATIONALE

What is already known about hospital discharge and homelessness?

The research literature on hospital discharge goes back at least 40 years and there is remarkable consistency in its findings, which continue to report the frequent breakdown of routine discharge arrangements (DH, 2003). Older people and people with multiple and complex needs (long-term conditions) including homeless people are particularly affected by poor discharge arrangements, often leading to poor health and well-being outcomes and high readmission rates (Tansley and Gray, 2009).

For older people, policy initiatives around hospital discharge have focused mainly on the problem of delayed discharge, whereby people are deemed 'medically fit' but unable to leave hospital because they are waiting for a community care assessment or placement. In England, this problem was addressed through two key strategies. First, the development of intermediate care, which provides integrated support to facilitate timely discharge and a period of rehabilitation to prevent readmission. Second, a reimbursement policy, which allows the NHS to impose a financial penalty on local authorities for inappropriate occupation of NHS beds. The number of delayed discharges (across all patient groups) reduced dramatically from 2001 onwards. However, evaluations found it difficult to untangle the impact of these different initiatives. Key learning from the extant literature on delayed discharge suggests that there is a need to extend the policy, resource and service lens from a primary focus on acute hospital entry and exit points to the wider health and social care economy in order to develop a broader repertoire of rehabilitation, intermediate and transitional care provision as well as long-term community infrastructure. According to Godfrey et al. (2008 p10), this requires 'whole system working and joint investments, encompassing not only marginal additional growth money but also shared decision-making around mainstream budgets'.

For homeless people, length of stay in hospital is reported to be three times longer than for other patients (Hewett, Halligan and Boyce, 2012). However, this is often attributed to the complexity of homeless people's presenting health needs (multimorbidity) rather than to delayed discharge. In other words, 'homeless patients stay three times as long as they are [three] times as sick' (Hewett and Halligan, 2010, p306). Despite this, there is strong evidence that a key problem facing homeless people in hospital is 'poor care' which often leads to difficulties accessing appropriate treatment, early 'self-discharge' and being discharged prior to being 'medically fit'. A review of hospital admission and discharge arrangements by Homeless Link (2012) identified 'countless examples' of the mention of homelessness on admission triggering prejudice among hospital staff. According to one homeless interviewee, 'As soon as [the nursing staff] find out you're homeless they want you out of the door' (p7). The review reported that more than 70% of homeless people were 'discharged straight back onto the streets, further damaging their health and all but guaranteeing their readmission' (p6). The main recommendation of the Homeless Link report is for cultural change in the way homeless people are viewed and treated in the NHS.

Other themes highlighted in the Homeless Link review and the literature more broadly include: hospital staff not asking people about their housing situation on admission and not addressing needs relating to drug and alcohol use (e.g. ensuring access to methadone); hospital staff not alerting accommodation providers to the fact that a person is in hospital leading to tenancies being terminated; hospital staff having a poor understanding of the services available to homeless people, including overestimating the level of care that can be provided in hostel settings leading to unsafe discharges; a lack of practical support, such as no replacement of soiled clothing; uncertainty regarding where the involvement of one sector should start and end, including little agreement about how far hospital staff should be expected to proactively seek accommodation; a lack of appropriate accommodation options raising the question of whether 'signposting' is an adequate response if this potentially leads to discharge back onto the streets

The case for specialist health and care services for homeless people is often justified on the grounds that their needs are so complex as to be beyond the scope of routine services (Gould, 2009). Long-term homelessness is characterised by 'tri-morbidity' (the combination of mental ill health, physical ill-health, and drug and alcohol misuse) (Hewett, Halligan and Boyce, 2012) and compounded through multiple exclusion (McDonagh, 2011). In terms of tackling health inequalities, the Marmot review proposes a system of 'proportionate universalism'; that is, helping all sections of society but with a scale and intensity that is proportionate to the level of disadvantage. For homeless people, this provides an opportunity to improve outcomes by targeted investment, with the very real prospect of reducing unscheduled expenditure in secondary care (Hewett and Halligan, 2010).

Specialist schemes are not, however, without limitations. Daly (2007) argues that there is a fine balance to be drawn between promoting access by providing specialist services and creating the conditions for further marginalisation and reinforcement of stereotypes. Recently, the Francis (2013) report into abuse and neglect at Mid Staffordshire NHS Foundation Trust leads us to question the value of 'specialist care' where it works to compensate for poor (discharge) practices in routine 'standard' care. Indeed, one of the key recommendations of the Francis inquiry is that managers and staff should challenge poor practice at the time they see it. Responding to Francis, Dixon-Woods et al. (2013) emphasize the importance of innovation in routine 'standard care' as the key to safe compassionate care and of providing staff with the means to achieve this. They see the need for a shift from 'rules and regulations' to cultures of reflection and constant learning.

> 'If the NHS can work well for homeless people, then it will certainly work well for the rest of us' (Hewett, 2013, p3).

Current picture of 'standard' versus 'specialist' provision in hospital discharge arrangements for homeless people

DH guidance stipulates that lead managers for hospital discharge in acute hospitals and local authority adult services should ensure that their hospital discharge policy includes guidance for staff dealing with individuals who are homeless and aged both under and over 65 years. Moreover, the protocol should ensure that homeless people are identified on admission and their pending discharge notified to relevant primary health care and homeless service providers (DH, 2003 p74-75). Evidence suggests that this is far from being implemented across England with only 39% of local authorities reporting that they have formal protocols in place for the admission and discharge of people who are homeless (Homeless Link, 2010).

In terms of conceptualising 'standard' versus 'specialist' discharge arrangements, the following typology - developed by Homeless Link as part of their aforementioned review - is a helpful starting point (2012, p5):

- *Specialist* - formal protocol involving a specialist post or service, funded either by the local authority or co-funded with the NHS
- *Standard* - formal protocol, without specialist provision, but a clear process in place with the hospital, often using agreed referral forms
- *Standard (sub-optimal)* - no formal policy in place and no specialist provision

Where protocols for homeless people's admission and discharge are in place Homeless Link (2012) report that these vary from area to area. In some areas, local authority staff visit patients on the ward to make an assessment, start the referral process to an accommodation provider and offer advice. Nonetheless, the extent to which hospital staff stay engaged in this process varies. Some alert housing agencies and then deem that to be the end of their role. Others stay involved to organise a case conference with the potential of delivering a more integrated or coordinated response. Importantly, 'good practice' or 'bright spots' were not seen as being restricted to hospitals with 'specialist provision' (p20). Even in areas with no discharge protocol, some good practice was recorded whereby community based staff were advocating successfully on the part of homeless people to support them through the hospital 'journey'.

Where formal protocols (without specialist provision) seemed to have driven improvements, a number of factors appear relevant. These include effective joint working at both operational and strategic levels, good communication between agencies, the provision of training (especially induction) and considerable efforts to keep protocols 'live' (e.g. regular meetings, phone calls and personal contacts between partners) (Homeless Link 2012 p10). In a number of areas visited by Homeless Link, 'specialist provision' appeared to have evolved from protocols that had started out as cross-agency referral agreements. In York, for example, hospital staff would refer homeless patients to the Salvation Army who would then provide support and advocacy, such as organising the housing support related side of the discharge including ensuring that hostel staff were briefed on the person's health needs. This bridging role led the Salvation Army to develop a visible presence in the hospital ('in-reach') and to provide training to hospital staff on the needs of homeless people (reported in Homeless Link, 2012 p8).

In London and inner city areas with higher populations of homeless people a number of specialist schemes have been developed which are GP or nurse (clinically) led. A number of different models fall within this typology. For example, in the Royal Liverpool University Hospital (RLUH) a nurse-led team is responsible for the discharge of patients who are homeless. The team comprises a 'link nurse', a substance misuse nurse, an adult safeguarding lead, and three hospital outreach workers providing 27/4 housing and welfare benefits support to homeless people. The RLUH team then link homeless people into the vulnerable persons' team at a specialist primary care centre (Brownlow) which includes access to a GP, two homelessness nurses, an alcohol outreach nurse and a Hepatitis C nurse.

Another high profile (award winning) 'clinically led' model is the Pathway approach. This approach was pioneered at University College Hospitals London (UCH) and has since been adopted across a further three London hospital sites as well as in Bradford, Leeds, Manchester and Brighton. The Pathway approach comprises a hospital based team which is GP and nurse led. For example, the newly established Pathway Team, which works across the King's Health Partnership (KHP) hospitals (Guys and St Thomas, King's College Hospital and [to soon include] South London and the Maudsley) involves: six Homeless Health Practitioners (two general nurses and four Mental Health Practitioners); ten GP sessions per week, provided by two GP's contracted for 52 weeks per year from a local practice or urgent care centre provider; a full time social worker (employed by the hospital not the local authority); a full time housing specialist contracted from a third sector provider; a half time, band 4 secretary for administrative support; and specialist legal support from the KHP in-house legal team as necessary.

Peer support from Care Navigators is also a key component of the Pathway approach. The hospital based teams co-ordinate care for patients from hospital admission through to 'independence' (defined as 'putting patients in touch with follow-on services'). Key steps include nurse-led assessments, weekly homeless 'paper based' ward rounds and case conferences leading to multi-agency care plans. The Pathway service is structured to provide support to Accident and Emergency department staff in managing homelessness and 'frequent attenders'. Specialist intermediate care or 'medical respite' ('step down') facilities are also being developed to provide opportunities for convalescence and recuperative care.

The total annual cost of the King's Health Partners Pathway service is estimated to be £675,480. This is financed through both NHS and charitable sources. It is acknowledged that the Pathway approach is expensive and unlikely to be cost effective where there are less than 200 homeless or 'tri-morbid' admissions per annum (Pathway Annual Review, 2013, p4). As noted above, a number of areas have begun to implement the model (what has been termed 'Pathway Lite') adapting it to fit with local circumstances and available resources.

In 2013, the Department of Health announced a £10 million grant fund as part of a 'Homeless Health Discharge' initiative targeted at further developing partnerships between the voluntary sector, the NHS and local government. Fifty-two voluntary sector led schemes[1] have since been funded. An initial evaluation of the start-up phase by Homeless Link (2015) suggests the majority of the schemes developed with this funding are 'Housing Link Worker' projects which do not include any direct clinical in-put.

> Link workers with a housing background aim to bridge the gap between hospitals and homelessness accommodation, and may have referral rights into local hostels or temporary accommodation. Where possible, they assess a client while in hospital and then refer the client to appropriate accommodation and other support services. Building up relationships with relevant organisations, accessing housing and signposting clients are key aspects of this role…
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> (Homeless Link, 2015, p12)

A much smaller number of the schemes are 'clinically led' employing Nurse Link Workers who can provide some direct health in-put or are 'mixed' employing both housing and nursing link workers. The principal typologies identified by Homeless Link (reflecting how the DH funding was spent) are:

- Housing Link Workers (22 Schemes)
- Accommodation with Housing Link Workers (8 Schemes)
- Pathway Model (funding for navigators) (6 Schemes)
- Accommodation (including intermediate care and respite) (7 schemes)
- Housing and Nursing Link Workers (4 projects)
- Nursing Link Workers (2 projects)

An important feature to have emerged in some of the inner city areas is the use of this Section 64 funding to add extra capacity to already established schemes. Some areas thus have a ***nest*** of different schemes and typologies ideally working closely and seamlessly together:

> *'Following a Needs Assessment delivered in 2012, Lambeth and Southwark CCGs kindly commissioned an initial pilot of the 'Kings Health Partners Pathway Homeless Team'. The Pathway Homeless Team is affiliated to, and forms part of the Pathway network of 'Homeless Ward Rounds' in acute care settings nationally…. The pilot team was multi-professional, and multi-agency, and involved 14 core staff. In addition to the team members directly funded by the CCGs, the team also benefited from working in close partnership with two hospital discharge projects funded by short-term Department of Health money. Therefore, 4 out of 5 of the involved Housing Support Workers were actually employed by St Mungo's Broadway and the Passage. The team also benefited from the input of a Groundswell Peer Advocate and Groundswell volunteers. This input was also made possible by short-term Department of Heath funding'.*
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> Extract from the King's Health Partners
> Pathway Homeless Team Pilot Project Report, March 2014

What is already known about the effectiveness and cost effectiveness of standard versus specialist hospital discharge provision?

Notably, few of the sites visited as part of Homeless Link's (2012) review were recording any formal data on the impact of the various approaches that had been introduced to improve hospital admission and discharge for homeless people. To address this oversight, Homeless Link funded an economic evaluation of a hospital discharge project in Wirral which employed a 'link worker' to train staff and undertake some direct case work to support homeless patients' discharge (White, 2011). The evaluation included a comparative analysis of the data for homeless patients, using Hospital

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[1] Section 64 grants can only be made to non-statutory organisations.

Episode Statistics, in the year prior to and during the introduction of the link worker. This showed very positive indicative results in terms of cost savings (a reduction of around £26,500 in the total cost of episodes linked to patients with 'No Fixed Abode'). There was also a fall of one third in the number of episodes resulting in emergency readmissions within less than 28 days.

A randomized controlled clinical trial of the costs and benefits of the UCH and Brighton Pathway services has recently been completed by members of this research team [Hewett & Foster] (Hewett et al., submitted). In the trial, homeless patients admitted to hospital were randomly allocated 'standard' care or 'enhanced' care with input from the Pathway team (as described above). Patients assigned 'standard care' were visited once by the Pathway homeless health nurse. They and their named ward nurse were provided with an information leaflet describing local services for people who were homelessness, but the Pathway team played no further role in their management. Health care usage was determined using hospital system data whilst quality of life and accommodation were assessed by questionnaires at admission and six weeks after discharge.

Results indicated that the Pathway approach does not alter length of stay but improves the quality of life of homeless people (with fewer patients returning to the streets) at a cost deemed cost effective under current guidelines.[2] In part, this was an unexpected finding since an earlier review had suggested the UCH Pathway was able to achieve a reduction of 1,000 bed days (30% reduction) in the first full year of service delivery (Hewett, Haligan and Boyce, 2012). The trial findings were, however, able to allay concerns that the introduction of the Pathway approach might increase overall length of stay by delaying discharges. An additional important finding was that improvement in housing status occurring during the trial did not manifest as a reduction in the use of health care services; although longer durations of follow up may change this picture. It was further noted that quality of life benefits are hard to demonstrate in an intervention where the short duration of follow up limits the accrual of benefits.

Integration

A consistent theme in the Coalition government's policy on homelessness is a belief that support services could be improved if agencies worked together more effectively (DCLG, 2011). This is also implicit in the DH's (2013) 'Homeless Health Discharge' initiative which aims to develop partnership working between the voluntary sector, the NHS and local government. A particular concern of the Commissioning Brief (NIHR 13/156) is to understand how these Section 64 schemes are working, with a particular focus on integration.

The evidence base for partnership working and integration across all sectors is weak and it has been argued that government exhortations to reduce public funding because joint working/integration can improve the effectiveness of services while also delivering cost savings may not be justified (Petch, 2012). In a recent systematic review, Cameron and Lart (2013) have argued that the evidence base for integrated care is underdeveloped because few studies have adopted a comparative design, so differences between 'standard' care and 'integrated' care are not assessed.

Drawing comparisons between 'integrated' and 'standard' care is methodologically fraught not least because there is a lack of conceptual clarity regarding what constitutes integrated care (Leathard, 2003). Additionally, there are many reports of integrated services (e.g. a co-located multi-disciplinary team) failing to deliver integrated care (e.g. where the patient continues to have multiple assessments and support plans in spite of co-location and multi-disciplinary team working) (Cornes et al., 2001).

Petch (2012) suggested that one strategy for overcoming this is to consider partnership working as the process and integration as a potential outcome. Partnership working might also be considered in terms of a continuum incorporating relative autonomy, co-ordination, joint appointments, enhanced partnership and structural integration. In considering partnership process, it is also important to consider the number and reach of partners, resources and depth of activity, from sharing information at one end to formal merger on the other. For example, co-ordination is evident in the St Petroc's scheme and more structural approaches exist in the Pathway model where there is both vertical integration (of primary and secondary care) and horizontal integration (across

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[2] £26,000 per Quality Adjusted Life Year (QALY).

health, housing and social care).

Finding ‘pure’ comparator sites (i.e. hospital sites with no integration) may, in fact, be practically impossible given the raft of initiatives targeted at ‘standard’ discharge practices, most notably the mainstreaming of intermediate care and later reablement. In consequence, it seems more helpful to construct the comparative focus of this study around the differences between ‘specialist integrated care’ versus ‘standard integrated care’, recognising that different degrees of partnership working and integration may be ‘designed for’ and achieved across each of these typologies with associated differences in outcomes. Outcomes linked to continuity of care are perhaps the most important marker of effective integration. Thus, it will be important to assess the full range of possible ‘transitions’ in any given locality and how homeless patients move across sectors (health, housing and social care) and between ‘specialist’ and ‘standard’ care, and indeed, between different forms of ‘specialist’ care.

As noted above, voluntary sector projects in the vicinity of both Liverpool and King’s hospitals have received some of the aforementioned DH Section 64 funding to develop ‘specialist discharge schemes’. These are envisaged as working in partnership with the schemes that are already established. Unless these relationships and transitions are carefully managed, there is a danger that homeless people could experience a thicket of un-coordinated short term support (multiple ‘sequential handovers’) in which everybody has snippets of the individual but no one agency co-ordinates the overall picture. In their study of integrated working around multiple exclusion homelessness, Cornes et al., (2010) concluded that while short term specialist support does have a role to play, it should not detract attention from the need to develop higher level strategic measures which deliver personalised and integrated case management over the longer term for all adults (e.g. a ‘Common Assessment Framework’).

Summary

Our review of current UK provision (based on a preliminary literature search and desk top review) suggests that SIHHC discharge schemes comprise approaches which are either clinically led (such as the Pathway approach) or those that rely on housing link workers with no direct clinical in-put. Specialist schemes have access to many different types of resources and disciplinary expertise and are underpinned by different protocols for partnership and integrated working. Nearly all of the schemes encompass some form of housing ‘in-reach’ (statutory or voluntary sector support to secure accommodation on discharge). There is also a growing trend towards the development of intermediate/reablement care which provides access to either ‘temporary accommodation’ or ‘medical respite’.

In line with the HS&DR call we wish to generate new evidence about how these schemes are working on the ground. While there is some evidence about the scope and effectiveness of particular schemes, this brief review highlights that there are also many unknowns for commissioners. It has been suggested, for example, that ‘GPs are the only health professionals trained to deal with physical ill-health, mental ill health and drug and alcohol issues in a social and psychological context’ (Hewett, 2010, p6). This raises the question of how specialist discharge schemes which are clinically led compare to those that are not.

We would further argue that the comparison between ‘specialist’ integrated care and ‘standard’ integrated care is critical because both ‘*projects’* and ‘*protocols’* are potentially key components and mechanisms for improving care (discharge arrangements). As noted above, Homeless Link (2012) did not see ‘good practice’ as being restricted to areas with specialist provision. Post Francis, understanding what might best support innovation and integration in routine mainstream care is seen as an urgent priority for the NHS and its partners. It is important to know if SIHHC supports or detracts from this.

RESEARCH PLAN & METHODOLOGY

Overview of Research Plan

This research comprises two inter-linked work packages. The first is a realistic evaluation to be carried out across six case study sites across England. It is designed to explore: (Objective 2) how different models of SIHHC are being developed and implemented to facilitate effective hospital discharge and; (Objective 4) homeless people's views and experiences of whether, and if so how, SIHHC works to improve experiences of hospital discharge and to deliver improved health and well-being outcomes. The second is a data linkage and health economic analysis work package targeting twenty sites across England with specialist hospital discharge schemes. This is designed to explore (Objective 3) how SIHHC impacts on outcomes and different patterns of service use across the whole system (e.g. the use of unplanned care) and the associated cost implications of this. Both work packages will be underpinned by a literature review (Objective 1) and will inform the development of a commissioning 'tool kit' (Objective 5).

Research Design (Theoretical and Conceptual Framework)

The design of this study has been informed by guidance on developing and evaluating complex interventions in both health and social care (Evans et al, 2013). The guidance takes the researcher through a staged process of developing, evaluating and implementing a complex intervention in which multiple structures, people and processes are involved, notably the delivery of a service. Best practice is to develop interventions systematically, using the best available evidence and appropriate theory, then to test them using a carefully phased approach, starting with a series of pilot studies targeted at each of the key uncertainties in the design, and moving on to an exploratory and then definitive evaluation. As outlined above, the Pathway model has been developed in a carefully planned and staged way leading to definitive evaluation (RCT). In terms of the 'Continuum of Evidence' (p8) framework developed as part of the complex intervention guidance the next stage is to determine if others can replicate the intervention and results in uncontrolled settings. That is, 'To roll out and monitor results of wide implementation' (p14)

However, this linear view of service development does not always capture the complexities of local commissioning where an evidence based approach may be lacking (Huxley et al., 2010). Acknowledging the consistent failure to apply effective interventions in practice, the complex intervention guidance notes the way in which evaluation may need 'to move back and forth between the development and feasibility phases' (p16). In terms of the design of this study, the roll out of 'Pathway Lite', the proliferation of new voluntary sector led predominantly housing link support schemes along with seeming inaction in many areas (where protocols for the discharge of homeless people have yet to be developed) points to the need to 'move back' and to provide a more nuanced understanding of each of these developments.

In making sense of the proliferation and diversity of provision which now surrounds hospital discharge arrangements for homeless people in England, a key concern in designing this study, is that we should not position 'models' comparatively so that they are in competition with one another. An important lesson to emerge from the national evaluations of intermediate care was that it proved impossible to arrive at recommendations as regards any particular model or service configuration being more or less effective and cost effective than the other (Barton et al., 2006).

Rather we see more practicable value for commissioning, in shifting the evaluative 'gaze' away from potentially replicable *whole* 'models' or 'interventions' towards a greater understanding of underpinning processes and practices. As in the case of Pathway Lite, commissioners will often 'mix and match' components of different interventions to ensure fit with local circumstances and resources. Indeed, while the findings of the Pathway evaluation provide what is often considered to be definitive ('gold standard') evidence, it is not clear from the trial which components and mechanisms delivered which results. For example, did the approach work because of 'integration' or because it was 'GP led'? Or were there other mechanisms at play that were not specifically 'designed for', such as workers having the opportunity to 'step out' of the mainstream services and to work in an unusually well-resourced team with good levels of management and charismatic leadership? Arguably, the RCT is also limited by the fact that comparisons were made against what might be assessed as ‘sub-optimal’ or ‘poor care’ (i.e. just giving the patient a leaflet) rather than against ‘standard care’ where there are fully developed discharge protocols in line with DH guidance.

In research design terms, ‘realistic evaluation’ (Work Package 1) has proved effective in generating evidence about how different components and underlying mechanisms can generate impact in different circumstances (Byng, Norman and Refern, 2005; Wilson and McCormack, 2006; Manzano-Santaella, 2011; and Pearson et al., 2015). The fundamental question that researchers working with a critical realist perspective ask, is how do certain causal mechanisms (e.g. GP led advocacy), operating in particular circumstances (e.g. a SIHHC scheme), create certain changes or outcomes (e.g. improved experiences of hospital discharge)? The overall aim is to generate a ‘road map’ or ‘tool kit’ for local commissioners and providers on how to translate these mechanisms effectively into their own contexts and systems of care.

The data linkage and economic evaluation (Work Package 2) is then designed to compliment this emergent and nuanced picture of ground level practice developments with more quantitative generalizable evidence on the costs and outcomes linked to the provision of ‘specialist’ arrangements for hospital discharge. Here, a cohort of homeless people who have used a specialist hospital discharge scheme will be compared to a cohort of homeless people who have not used such provision.

Plan of Investigation and Methodology for Delivering Case Studies

The study will comprise the following stages: [1] Preparation (research team building; devising project delivery plan; establishing advisory groups; training peer researchers; hosting an expert seminar and securing ethical permissions); [2] Literature Review; [3a] Delivery of Work Package One [3b] Delivery of Work Package Two; [4] Dissemination (preparing conference papers/articles) and developing a ‘tool kit’ for commissioners).

Stage 1: Preparation (including PPI)

Ethical approval and research governance will be sought from the National Research Ethics Service, and R&D from local NHS Foundations Trusts/Clinical Commissioning Groups and local authorities (where appropriate). Please see below and in main application form for further discussion of ethical considerations.

The preparation phase will also involve an establishing an Advisory Group. The research has already secured support from a wide range of key stakeholders who are listed as collaborators. This includes representatives from research, practice, and stakeholder bodies such as Homeless Link and Revolving Doors.

‘Experts by Experience’ (people with direct personal experience of homelessness) have already been involved in all stages of developing the study proposal and will be central to the successful delivery of the research if funded. The idea for the project was first discussed at a meeting involving Revolving Doors’ Peer Research Network. Two ‘experts by experience’ have since joined the team as collaborators. Both Alan and Natalie have peer research experience, have contributed extensively to electronic and face-to-face discussions during the preparation of the full application for this study and will be members of the main Advisory Group if the project is funded. Further details of PPI (the ‘peer research’ component) are outlined later in this document.

As part of the preliminary stage, we also plan to host an ‘expert seminar’ to ascertain a picture of the latest developments and ideas surrounding SIHHC, and as noted above, as a way of securing expressions of interest in becoming our research partners.

Stage 2: Literature Review

A narrative literature review will be undertaken to assess what is already known about hospital discharge and homelessness (Objective 1). This will be contextualised in terms of findings from key systematic reviews of (generic) delayed discharge, intermediate care and reablement literature. We will conduct an electronic literature search for peer-reviewed articles published in English from 2000 - 2014 in the CINAHL, NHR CRN Portfolio, PsycINFO and MEDLINE databases. We will use keywords such as: homeless, hospital discharge, integrated care (full range of relevant terminology multidisciplinary, interprofessional etc.). Potentially relevant articles will be analyzed by two experienced narrative reviewers. Further to this, we will also undertake a grey literature search through relevant websites (e.g. Department of Health; Homeless Link), as well as through the internet using the Google search engine.

The literature review will generate a more complete typology of the 'resource components' which have been used or could be used within SIHHC, along with any evidence for effectiveness. Qualitative studies will be used to generate preliminary theories about how underlying mechanisms within the resource components generate benefit.

Stage 3a: Delivery of Work Package One - Realistic Evaluation

Overview

For the purposes of the realistic evaluation we are proposing to generate six case studies. Four of the host sites will have access to a 'specialist' hospital discharge scheme and two of the sites will have 'standard' provision only (i.e. no access to specialist support around the discharge of homeless people from hospital).

Site Selection

Sites with 'specialist provision' will be targeted purposively to reflect the principle typologies described above and the potentially important distinctions that are to be made between those schemes (1) which have direct access to clinical input and leadership those which do not; and (2) those schemes which have direct access to accommodation and those which do not. As shown in Figure One below sites will be selected to reflect:

(Specialist Discharge Schemes with Direct Clinical Leadership and In-put)
Site One – Pathway (GP led with clinical in-put)
Site Two – Nursing Link Worker (nurse led with clinical in-put)
(Specialist Discharge Schemes with no Direct Clinical In-put)
Site Three – Housing Link Worker (no clinical in-put)
Site Four – Accommodation and Housing Link Worker (no clinical in-put)
(Standard Provision)
Site Five – No specialist hospital discharge scheme – discharge protocol only
Site Six – No specialist hospital discharge scheme – no discharge protocol

Figure 1: Definition of Specialist/Standard/Sub-optimal Hospital Discharge Arrangements for Homeless People (Homeless Link, 2012)	Site 1 Inner London	Site 2 Inner City	Site 3 Metro/ Rural	Site 4 Metro/ Rural	Site5	Site 6
Specialist (Enhanced DH Policy Guidance): Formal protocol around discharge arrangements for homeless people involving specialist post or service – funded either by the DH (Section 64) local authority or co-funded with the NHS	**GP Led**	**Nurse Led**	**Housing Link Worker**	**Accommodation with Housing Link Worker**		
Standard (DH Policy Guidance Implemented): Formal protocol around discharge arrangements for homeless people, without specialist provision					standard	
Standard (Sub-optimal) (DH Policy Guidance Not Implemented): No formal protocol in place as regards discharge arrangements for homeless people						standard

Typologies linked to ***'mixed'*** (combined housing and nursing link worker) and intermediate and respite care will be considered in Sites 1 and 2 which will purposively targeted to additionally reflect the ***'nesting'*** of multiple discharge schemes. These will most likely be located in the inner London and inner city areas to reflect the potentially higher level of resource allocation needed to meet the needs of larger populations of homeless people. Sites Three and Four will target areas with a single discharge scheme located in metropolitan/rural areas. It is perhaps worth stressing here, that the qualitative phase of this (realist) evaluation does not aim to compare these different typologies 'like for like' but to generate multiple *'context, mechanism and outcome'* (CMOs) configurations to inform discussion around what works best for whom and in what circumstances. So for example, exploration of different CMOs may help to answer key commissioning questions such as in a rural area with limited resources and a small number of homeless people is it more advisable to have a 'housing link worker' or a 'nursing link worker' and what is the value of direct access to accommodation? For illustrative purposes (based on the preliminary typological review outlined above) Figure 2 charts some of the different resources and impact generating mechanisms we might expect to find attached to each purposively selected category of scheme.

Figure 2: Resources and Potential Impact Generating Mechanisms Attached to SIHHC Schemes	Site 1 e.g. London Pathway	Site 2 e.g. Liverpool Royal Nurse led	Site 3	Site 4	Site5	Site 6
Provision of specialist training for hospital staff on the needs of homeless people		specialist			N/A	N/A
Specialist case management with professionally qualified case manager (e.g. GP/nurse/social worker)	specialist	specialist			N/A	N/A
Specialist key working (navigation and brokerage) led by non-professionally qualified staff (or peer mentors)	specialist	specialist	Specialist Housing link worker	Specialist Housing link worker	N/A	N/A
Arrangements for single shared assessment/information sharing/integrated support planning.	specialist				N/A	N/A
Weekly multi-disciplinary team meetings/case conferences	specialist				N/A	N/A
Arrangements for review/follow-up post discharge (e.g. support to make sure care continues after discharge)	specialist	specialist			N/A	N/A
Availability of intermediate care/medical respite beds (dedicated homeless service, beds)	planned				N/A	N/A
Access to emergency/temporary accommodation on discharge	specialist - the passage	specialist		specialist	N/A	N/A

The final consideration in selecting the case studies is that we wish to be able to study different aspirations for integration within SIHHC, showing in the final analysis if and how this impacts on a wide range of outcomes. This will be guided by Figure 3. Again, for illustrative purposes, Site 1 is shown as the inner London Pathway model where a high degree of integration is known to have been achieved, with lesser but substantial integration being achieved in the Liverpool model. In Sites 3 and 4 we anticipate 'Housing Link Work' to involve primarily enhanced partnership working between the hospital and local homeless services and agencies.

Figure 3: Protocols for Partnership and Integration as Envisaged in Commissioning/Service Delivery Specifications (Anticipated Degree of Integration)	Site 1 e.g. London Pathway	Site 2 e.g Liverpool Royal Nurse led	Site 3	Site 4	Site5	Site 6
(Structural) Vertical Integration (e.g. integration of primary/secondary Care)	specialist					
(Structural) Horizontal Integration (e.g. integration across health, housing, social care)(co-location/multi-disciplinary team based in hospital)	specialist	specialist				
Enhanced Partnership (e.g. arrangements for in-reach/outreach)	specialist	specialist	specialist	specialist		
Joint Appointments (e.g. social worker seconded to GP led scheme)	specialist					
Co-ordination (e.g. shared 'referral forms')					standard	
Autonomy						standard
Extent of horizontal integration – partnership arrangements between three or more disciplines are in operation (e.g. GPs, nurses, social workers, housing support workers)	specialist	specialist				

Site Recruitment

In order to recruit the case study sites, we will identify and write to all schemes fitting the criteria outlined above informing them about the study and seeking expressions of interest to become our research partners. To boost potential interest and to prevent against research fatigue we will also host an expert seminar in the first month of the research. We will host this in partnership with Homeless Link and we will invite representatives from the longer established and newer Section 64 Hospital Discharge Schemes. We will use the event to feedback some of the early findings from other studies and Homeless Link's evaluations and then to invite interest in the new study. Once we have ascertained which schemes would be interested in becoming a research partners for the in-depth qualitative phase of this study, we will then carry out some preliminary information gathering to fully describe these projects (e.g. costs, staffing, difference in practice approaches and the different resource and component parts). Figures 2 and 3 will act as a guide to inform final site selection so that the case studies present the opportunity to study many different context, mechanism, outcome (CMO) configurations. As regards Sites 5 and 6 research will needed to establish which areas have no protocol and no specialist provision (these sites are known to Homeless Link regional officers).

To date we have held preliminary discussions with a number of schemes who have already expressed a keen interest to take part. We have also met with the National Housing Federation as regards the Housing Link Worker schemes.

Fieldwork[3] in Six Case Study Sites Across England

Each case study might be usefully thought of as a 'mini-ethnography'. Sites are understood as 'whole systems' of care in which the hospital is the focal point. The aims are to situate each of the SIHHC projects (or protocols or practices in standard care) in their wider historical and geographical **contexts**; understanding how they fit as a 'jigsaw piece' in a wider whole system of care; exploring their theoretical underpinnings and 'programme logic' (in particular, unearthing what projects define as their 'Key Practice Principles [KPPs]) and testing out these *'uncertainties'* or hypotheses by way of locally tailored evaluations which investigate the **outcomes** that are being achieved.

In the language of realistic evaluation, KPPs are '**mechanisms'**, but we chose to use these terms as we find they are more user friendly when carrying out fieldwork. Already, KPPs can be discerned from our background review of SIHHC, for example, the idea that training provided through specialist homeless workers can deliver more compassion in mainstream care. Another example, taken from the Pathway model, suggested that 'advocates' need to be of sufficiently 'high professional standing' (GP led) because of the enormity of the barriers facing homeless people in accessing social care and housing related resources. In terms of KPPs a particular focus of this study will be on integration and how the projects are designed around this. For example, Pathway multi-disciplinary meetings are in keeping with a 'community of practice' ethos where, for example, even if a practitioner does not have direct involvement in a case he or she will still be asked for their opinion. The 'hypothesis' is that this will engender better patient care through more collegiate and interdisciplinary team working.

So as not to lose sight of what is the overarching research question (that is, what is the value of 'specialist integrated care' as compared to 'standard care') we have framed the proposed research conceptually as shown in Figure 5 (overleaf). This is to illustrate how the different Context-Mechanism-Outcomes (CMO) are linked to each site and to facilitate comparisons and contrasts. In this context, comparative analysis works principally in the anthropological sense to generate critical insight and reflexivity by enabling participants to know something of what is happening 'over the hill' (i.e. how other schemes are operating, their challenges and if and how they have been overcome). In terms of understanding scope for innovation, we are especially interested to know if KPPs 'cluster' significantly more in specialist projects rather than in standard care.

While a 'specialist hospital discharge scheme' might be conceptualised as mechanism for change

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[3] The fieldwork will be carried out by Martin Whiteford (100% FTE) who will be responsible for four sites and Michelle Cornes (50% FTE) who will be responsible for two sites.

in its own right, we situate it as ‘context’ within this particular interpretative framework to maintain the integrity of our underpinning philosophy. This is about the need to move beyond **‘evidence based’** guidelines about single interventions or models towards a more **‘evidence informed’** approach which is concerned more with encouraging reflection on and in practice and supporting staff and commissioners to challenge themselves and each other (Wilson and McCormack, 2006). As detailed below, we also include methods for engaging ‘experts by experience’ in this iterative process drawing on the work of Beresford (2007) who sees participatory research as having particular benefits in developing new knowledge about health inequalities.

Figure 5: Overarching Research Framework for Understanding CMOs Across Specialist and Standard Care

Context - Including an understanding of the wider whole system in which a specialist scheme or hospital protocol is situated	**Specialist Integrated Care (X4)** *(Note that a separate column would be generated for each site)*	**Standard Care (X2)** *(Note that a separate column would be generated for each site)*
Mechanism (s) including resources for facilitating safe discharge of homeless people from hospital including identification of any Key Practice Principles (KPP) encompassed within the broader programme logic. Underlying or hidden mechanisms are also important (e.g. practitioners “going the extra mile”	KPPs: E.g. GP led advocacy overcomes the barriers facing homeless people in accessing community services. KPPs (Integration) E.g. Regular multi-disciplinary meetings using community of practice methodology	KPPs: E.g. To keep protocols live there is a need for robust induction processes for new staff . This obviates the need for specialist schemes and leads to more seamless services KPPs (Integration) E.g. Integration – special arrangements are in place with local supporting housing providers so that people in hospital are ‘fast tracked’ in the referral process
Outcomes – Understanding what it is that the ‘projects’ or ‘protocol’ is trying to achieve and if and how it has been achieved	Examples… • Improved experiences of hospital discharge • Improved health & well-being • Compassionate Care • Social inclusion benefits • Cost of care – increased decreased • Cost of integrated care – opportunity costs • Other (e.g. reducing hosp readmission rates)	Examples… • Improved experiences of hospital discharge • Improved health and well-being • Compassionate Care • Social inclusion benefits • Cost of care – increased or decreased • Cost of integrated care – opportunity costs • Other (e.g. reducing hospita readmission rates)

Because of the need for locally tailored evaluation in each case study site, some flexibility in the data collection strategy will be required. For example, focusing on mechanisms linked to GP led advocacy may require a different interview mix as compared to exploring mechanisms linked to specialist workers providing training to hospital staff. However, as a minimum the following data collection and analysis will be carried out in/for each site:

[3:1] Documentary Analysis: This stage involves collecting a wide range of background information about the sites (population, local homelessness provision, etc,). Service specifications (for specialist schemes) or ‘protocols’ for standard care will be collected and reviewed, as will any previous local evaluations/inspections.

[3:2] Interviews with commissioners and service managers from SIHHC and a range of agencies (minimum 5 per site). The focus of these interviews will be on the history and current conceptualisation of the ‘problem’ of homeless people’s discharge from hospital in that particular site; understanding what solutions have been developed locally (identifying any KPP), how they have been implemented, the costs associated with them and perceptions of how they are working. A standard typology pro-forma will be used to gather information on the different resource components that are available across the six sites.

[3:3] Observations of Practice and Interviews with discharge coordinators, case managers and key workers from SIHHC and other agencies (minimum 5 per site). Time will be spent observing the practices of the SIHHC schemes and standard hospital discharge practices working with homeless people. Focussing more on a practice rather than strategic perspective, these interviews will also cover the history and current conceptualisation of the ‘problem’ of homeless people’s discharge from hospital in that particular site; understanding what solutions have been developed locally (identifying any KPPs), how they have been implemented and perceptions of how they are working.

[3:4] Interviews with service users (homeless people) (n=10 per site). These interviews will be carried out shortly after discharge from hospital and then again in three months time. Where there is a period of ‘step down’ care a further interview will be carried out at the point of discharge. The purpose of these interviews is to find out about people’s experiences of being admitted to (i.e. the events leading up to the admission) and discharged from hospital and whether SIHHC (and the mechanisms therein) or the protocols of standard hospital care had the intended impact. The interview guide will be tailored to ascertain feedback on any local KPPs but will be informed more broadly by Pearson’s et al.’s (2006) realist systematic review of intermediate care. This provides a conceptualisation of what might be termed good practice or compassionate care in hospital discharge practice and provides an organising structure for a depth conversation. In this view, intermediate care is conceptualised as a short-term service arrangement which responds to a person’s ‘health crises’ or acute hospital admission with[4]: (1) the objectives of care and place of care being negotiated between the service user and health and social care professionals; (2) health and social care professionals fostering the self-care skills of service users and shaping the social and physical environment to ‘re-enable’ (promote recovery); and (3) service users, carers, health and social care professionals and voluntary services contributing actively to decision making and the delivery of that care is meaningfully integrated.

The main focus of the second follow-up interview will be on: (i) Patterns of service use in the intervening three months period, including any readmission to hospital (What support was received? Did the support materialize as planned? Did the support meet self-perceived needs?); (ii) What was liked and disliked about the support? (iii) How was the support perceived to have helped? What goals were achieved? What goals were still aspired to and what additional support might help to achieve those goals?

The timing of the second interview at three months is intended to give sufficient time to reveal potential for continuity (i.e. support beyond the 6-8 weeks cut off point often associated with intermediate care support) but not so far into the future as the connections with the initial hospital and discharge planning episode will likely be lost to memory.

We will also seek homeless people’s written consent to access support plans and personal information which may be held by a range of providers.

The inclusion criterion for service users will be that they are experiencing ‘multiple exclusion homelessness’ (MEH). This criterion is chosen as it encompasses multimorbidity (a range of health issues) and compounding factors potentially impacting on well-being which are linked to experiences of ‘deep social exclusion’. People experience MEH if they are ‘homeless’ (broadly defined, to include temporary/unsuitable accommodation as well as sleeping rough), and have also experienced one or more of the following domains of deep social exclusion –‘institutional care’ (prison, local authority care, stays in mental health hospitals or wards); ‘substance misuse’ (drug problems. alcohol problems, abuse of solvents, glue or gas); participation in street culture activities (begging, street drinking, ‘survival’ shop lifting or sex work) (Fitzpatrick et al. 2011 p.502).

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[4] Note that the definition of intermediate care used in the review is broad in scope and would encompass SIHHC not just medical respite/step-down accommodation

Service users will be recruited on the basis that they are ‘key informants’ with regard to different experiences of MEH which might highlight different patterns of service user (including barriers). In each site, we will purposively recruit service users referred either to specialist schemes or in (standard care) to discharge coordinators/ward managers. Recruitment will aim to target the following groups/demographics and whenever possible we will approach people in the order to which they referred to the service:

- Young Homeless People (1 male/ 1 female) (Age 18-24)
- Men in the middle age range (4 male) (Age 25-49) [Known to have the most complex needs (McDonagh, 2011)]
- Women in the middle age range (25-49)(2 Female)
- Older Homelessness (50+) (1 male/1 female)

If a service user (key informant) decides to drop out of the research or becomes unavailable we will recruit another participant to take their place. Participants will receive a £10 voucher (per interview) for sharing their expertise and giving-up their time. We will also employ ‘peer researchers’ (see below) to ensure engagement and support for the research locally among homeless people.

Peer Research

The Commissioning Brief suggests that this population poses particular problems for research in terms of participation and consent. This team has extensive experience of undertaking participatory longitudinal research with people experiencing MEH. Our experience is that the involvement of ‘peer researchers’ helps address some of these challenges. The gains of involving service users in this way include: research that is better informed by the concerns and needs of homeless people; methods which are more sensitive to and better enable effective engagement of research participants; and likely to elicit fuller and more open responses from them because people with similar experience have been involved in formulating them (see Beresford, 2007).

A team of six ‘peer researchers’ will be recruited and trained with a view to one ‘peer researcher’ being attached to each site (ideally they will be local to the research site in which they will work so as to have good knowledge of services and local community). Many of the SIIHC projects already include ‘peer mentors’ (it maybe that the peer mentors would be wiling to take on the additional role of peer researcher). A two day training course will be provided to allow the peer researchers to meet as a team and latterly as part of a specialist service user advisory group. In the fieldwork sites, the peer researchers and university researchers will work closely together (sharing expertise and offering mutual support and supervision).

The ‘peer researchers’ will be involved in all duties commensurate with being a full member of the research team (i.e. treated equally and inclusively). The ‘peer researchers’ main role will be to accompany and/or carry out joint interviews with the university researchers (where appropriate[5]) and to stay ‘in touch’ with key informants during the three month intervening period (mainly though telephone contact and informal contacts, for example, at day centres and other venues).

Two experienced ‘peer researchers’ are collaborating at the design stage and have made the following recommendations: “*I remember from my time in the Hostel the Buddy system we had in place, I became a buddy and the idea was that any other client who needed to talk to someone about any issues they had could talk to their designated buddy at any time of day. Buddies would have a smiley face on their room door with their name underneath. My idea is that peer researchers could be used to Buddy homeless people due for discharge at an early stage, as early intervention would be needed, and peer researchers could build a rapport with the patient and gain the trust needed to be able to follow them over a 3 month period as intended*”.

There is the potential here, that the peer research process could (while engendering the rapport and trust needed to prevent ‘attrition’) begin to cross over into the actual discharge process. This will need to be carefully managed and, if it occurs, made explicit in the analysis. Beresford (2007) would not however, see this as inherently problematic or risky but as part of the inherent nature of

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[5] If for example, the peer researcher is personally known to the interview participant then it may not be appropriate for them to be part of the interview as it may prevent full and open discussion.

service user research with its commitment to change and challenging traditional research practices which have often been exclusionary. Perhaps the most important consideration is that if the research does build relationships and in interest in peer research among the homeless people taking part in the study, then there are opportunities in place for that to continue beyond the life of the programme. This is where our links with Homeless Link, the faculty of Inclusion Health and Revolving Doors are important because they already have these facilities in place.

Data Analysis

In relation to each individual site, data will be brought together in a matrix showing the different domains of interest. The domains will generate a series of codes which will be used to analyse documentary, interview and observational data. Key qualitative and quantitative (cost related) findings will then be summarised, ensuring the data from each system can be considered together (O'Cathain et al, 2010). Theory will then be developed for each site: initial KPPs (the provider view of the CMOs) will be further tested and challenged and added to within the qualitative interviews and initial analysis. This final stage of analysis for each case will provide the opportunity for further hypotheses to be developed as CMO configurations articulating how the research team believe each system, made up of its own particular combination of 'resource components' is generating outcomes.

Comparative (cross case) analysis will then be performed using further matrices in the predictor-outcome form (Miles & Huberman 1994) to examine patterns and predictors for a series of key outcomes. This combination will allow us through a process of modified analytic induction (Byng, Norman, & Redfern 2005) to develop hypotheses about the key influences on good quality discharge practices an a range of other outcomes. This process should also provide some initial findings about the likely cost differences between the different overarching models and specific 'resource components' for managing admissions, including insight into which hypothetical mechanisms of action or conducive contexts have the most significant resource implications (whether implying costs or savings).

These initial hypotheses will be tentative and will be tested by relooking across the cases for confirmation, rebuttal and 'silence'. The results will not include definitive causal mechanisms and context dependencies, but will provide weightier evidence as to which mechanisms are likely to be effective in which contexts. This will allow us to develop guidance for commissioners, as well as develop provisional theories which can be tested further in more quantitative studies.

Preliminary findings will be fed back to sites for scrutiny and further analysis by means of a local feedback event (n=6). This is intended to guard against ascertainment bias where evaluators focus on outcomes which they have knowledge of an will investigate these outcomes more thoroughly.

Stage 3b: Delivery of Work Package Two – Data Linkage and Health Economic Analysis

Overview

The most comprehensive assessment to date of the health care usage of homeless populations in England was prepared and published by the Department of Health in March 2010. The report 'Healthcare for Single Homeless People' (Office of the Chief Analyst and Department if Health, 2010) analysed Hospital Episode Statistics data for people who gave their address as "No fixed abode" and also summarised data from six specialist GP practices who provided healthcare to homeless people. Extrapolating from these data they estimated that health care costs of homeless people are approximately eight times greater than those of similarly aged adults and this client group have almost three times the average length of stay when hospitalised with a cost of at least £85 million per year. However, there were several key problems with this analysis: the use of the "No fixed abode" category will miss many homeless people, for example those living in shelters, hostels or other temporary accommodation; the size of denominator populations to allow comparison of hospitalisation rates was highly uncertain and, those using specialist practices may be highly unrepresentative of the homeless population. We therefore propose to use established probabilistic data linkage methodologies, which we have extensive experience in using and evaluating for this population, in order to determine the long term outcomes required to investigate the effectiveness and cost-effectiveness of different hospital discharge arrangements for homeless people in England.

Data sets used for evaluation
A total of three types of data will be used within this linkage study. Firstly, data on individuals using the four SIHHC services taking part in the wider study will be asked for consent to collect identifying and demographic data (name, date of birth, gender, current or previous postcodes, nationality, ethnicity), information on contact with homeless services, contact with health services, other support needs (including drugs and alcohol). Where available, NHS number will be collected, where it is not available we will work with services to encourage use of the Personal Demographics Service (PDS) which is the national electronic database of NHS patient demographic details such as name, address, date of birth and NHS Number. The PDS enables a patient to be readily identified by healthcare staff quickly and accurately. Information on the PDS is held nationally and accessed by authorised healthcare professionals through their organisation's local system. In addition to collecting data at these four sites, we will attempt to increase the study power by collecting data from up to sixteen other SIHHC services (therefore twenty in total).

Secondly, to examine the health outcomes of individuals using SIHHC, we propose linking these data to Hospital Episode Statistics (HES) as this contains data on emergency and planned hospital admissions. The national HES dataset will be used as this allows for the fact that homeless populations are mobile and may present at health services in multiple geographical locations.

Thirdly, in order to compare the outcomes of those individuals accessing SIHHC services to a wider homeless population, we will also use the CHAIN database of rough sleepers in London. http://www.broadwaylondon.org/CHAIN (n > 20,000). The work will be undertaken in collaboration with St Mungo's Broadway's Research Programme. The CHAIN database is set up to enable research that can inform the provision of better services for rough sleepers and those whose data is included have consented to allow these data to be shared for this purpose. Data are available for clients registered from 2004 but includes dates of first verified rough sleeping prior to this date. The data includes identifying and demographic data (name, date of birth, gender, nationality, ethnicity), information on contact with homeless services, contact with health services, other support needs (including drugs and alcohol), resettlement and death.

Data linkage
The Enhanced Matching System (EMS) is a probabilistic record linkage program developed to match data for individuals across datasets, or within a single dataset for the purposes of de-duplication. EMS was developed over several years and can be configured with ease for different matching projects. EMS uses a probabilistic linkage framework which builds upon work at Public Health England (Formerly the Health Protection Agency) (Potz and Powell, 2007) and the methods described by Newcombe (1988). EMS is used operationally by Public Health England for many types of analysis including to accurately measure the levels of drug resistance in tuberculosis cases notified in the UK and establish the amount of transmission among these cases. Historically, probabilistic linkage has been necessary for this work due to the low recording rates of a unique identifier (such as NHS number) between the two datasets. We have experience of using EMS in homeless populations, and have also conducted a validation study examining the accuracy of the probabilistic matching process and sensitivity was calculated as 99.3% (95%CI: 98.7, 99.7), specificity 99.6% (95%CI: 99.4, 99.8), positive predictive value 98.1% (95%CI: 97.1, 98.8), and negative predictive value 99.9% (95%CI: 99.7, 99.9). These results represent accuracy when performing linkages without the use of NHS number, and provide confidence of the matching process to correctly identify these individuals without the use of NHS number which, despite encouraging use of the PDS may not be held by many the services taking part in this evaluation.

Comparative Effectiveness Analysis

Study design: The three datasets combined above using the probabilistic linkage will be treated as a virtual cohort for the purposes of analysis.

Outcomes: The primary outcome will be hospitalisation (Morbidity). We will refine analyses to measure different types of hospital admission rates (overall admission rates, unscheduled admission rates and 28 day emergency readmission rates). These will be classified by speciality and major disease groupings using relevant groupings of ICD codes including Healthcare Resource Groups (HRGs – groupings of treatment episodes which are similar in resource use and clinical response) and will include data from Hospital inpatient visits and those to Accident and

Emergency Departments. We will assess the extent and pattern of multiple morbidities within these populations to inform interventions to improve service integration and collaboration. These data will also be used to measure duration of admission in order to estimate costs of these admissions for the economics analysis described in a later section.

Secondary outcomes will look at mortality, with the emphasis on avoidable mortality. A variety of mortality groupings have been developed to identify causes of death that could be considered avoidable through better medical care depending on age at which they occur. These are summarised in a recent ONS consultation document (Office for National Statistics, 2008). The proposals for the Public Health Outcome Monitoring framework (Department of Health, 2010) take a similar approach and focus on key areas of avoidable mortality namely: mortality from suicide, communicable diseases, excess seasonal mortality and, in persons aged less than 75 years, cardiovascular disease, cancer, chronic liver disease and chronic respiratory diseases. All of these are useful indicators within homeless populations.

Comparators: It is methodologically challenging to determine appropriate comparator populations for this study due to the health seeking and demographic characteristics of service uses - issues which we will explore further in the sensitivity analysis described below. The comparator groups chosen attempt to investigate these service user differences, and therefore the following four groups will be compared: 1) users of SIHHC hospital schemes which involve a range of in-put including direct clinical in-put; 2) users of SIHHC discharge schemes which are led by Housing Link Workers and do not involve any clinical in-put; 3) Homeless individuals in the CHAIN dataset – de-duplicated using probabilistic linkage to ensure they are not included in comparator groups one and two; 4) A sample of lowest quintile of deprivation population in HES (based upon the index of multiple deprivation).

Statistical analysis: We will initially focus on the use of survival analysis and Poisson regression models to estimate overall hospitalisation and death rates in homeless users compared to population controls. The model will appropriately account for multiple admissions during the follow up period.

Follow up: Individuals will enter the cohort upon using a SIHHC service and will be censored at 12 months after entering the study.

Confounding variables: As this is a virtual cohort, we will not be able to collect confounding variable data on individuals at entry to the study. However, we will use a methodology described previously in a homeless population, and examine baseline clinical risk factors on the basis of data provided in HES prior to enter the cohort, populated by probabilistic linkage for a period before the start of the virtual cohort.

Sensitivity analyses: There are several challenges when examining differences in the outcomes of users of the two types of SIHHC service. Firstly, there is likely to be differences in the underlying health risks of the groups and accessibility to services. Secondly, clinically led services may be more likely to collect data on service user NHS number, potentially improving (and biasing) the accuracy of linkage for this group compared to others. Thirdly, there may be biases between the groups for health service utilisation in the immediate period before and after the study by service users – those using clinically led services may be more likely to return to these services again and be captured more often within HES data than the Housing Link Worker services. Rather than providing a definitive point estimate of effectiveness, we aim to provide a plausible range for which outcomes for the carefully chosen comparator groups. We will examine these plausible ranges further by conducting the following sensitivity analyses: 1) repeat analysis only for those individuals where it has been possible to generate confounding variables that can be used for adjustment within the statistical models; 2) re-linking the datasets probabilistically, without inclusion of NHS number in order to remove any potential for bias associated with differential NHS number availability by service type; 3) creating a wash out period of 3 months after entry into the cohort where outcome data for this period are excluded in order to reduce bias of health care usage by initial SIHHC service.

Measuring the long term effectiveness of these and other interventions: These analytic processes will be developed to allow routine generation of nationally recognised health outcome indicators within homeless populations allowing assessment of the long term impact of policy and service development. We will explore opportunities to expand data linkage to include datasets from other organisations providing services to homeless groups around the country during the course of the project. Use of consistent matching algorithms over time and sequential annual updates of the data will enable robust trends analysis over a longer period. In addition to this, we will directly feedback to services about their own data in a standardised report at the end of the study in order for them to gain insight into their outcomes.

Health Economics Analysis
This analysis will cover two economic models. The primary analysis will be a cost effectiveness model (linked to effectiveness data described in the comparative effectiveness section). This model will take an NHS perspective, with costs based on the linked HES data analysis and outcomes based on morbidity and mortality data. Outcomes of homeless users of the two main types of SIHHC service (clinical/non-clinical) will be compared to each other and homeless controls. Outcomes used for this analysis will include: 1) overall hospital admission rates; 2) unscheduled admission rates; 3) 28-day emergency readmission rates. Cost estimates will be calculated using national NHS tariff data, and will include length of hospital stay, emergency admissions, and fixed and variable costs estimates for each of the SIHHC services.

A second cost utility analysis will also be performed. This model will also take an NHS perspective and use costs based on HES data as for the cost effectiveness model, but additionally will use outcomes based on QALY data (primary EQ5D data collected through the field work in a subgroup of SIHHC users at baseline and three month follow up). Data from the two types of service will also be compared to each other and homeless controls from a wider London based survey of 455 homeless individuals (Story et al., 2014). QALY loss due to morbidity and mortality averted will be examined. Cost estimates will be based on HES data and calculated at two time points: baseline, including retrospective data up to 3 month prior enrolment in the study, and follow up, including prospective data up to 3 month service follow up. Outcome data (QALY) will be calculated from EQ5D data collected at baseline and 3month follow up.

An important improvement (or worsening) in the EQ5D visual analogue scale (0 to 100) as result of the provision of specialist services to this group is five. Data from our 455 controls provides a mean EQ5D visual analogue scale score of 65 and standard deviation of 25. Using a power of 80% at the 0.05 level of significance (two sided) it is estimated that a sample size of 100 is required to detect such a change. Based on our previous work it is assumed that of all eligible patients identified, 80% of these will consent to take part in the study, and therefore 125 individuals will need to be approached to achieve this sample size. Therefore, 125 individuals will be approached at each of the different types of specialist sites covered by the study. Based on historical service usage data at each of these specialist sites, we believe that it will be possible to achieve this sample size during the months of data capture (months 7-18) from the specialist sites included in the main analysis. However, if at the start of data collection this appears unfeasible (given more recent trends in service usage) we will expand EQ5D data collection to include the wider 16 sites (as described in the data sets used for evaluation) to again increase and achieve the required sample size.

Cost and effectiveness estimates to be calculated for one year follow up period after entering the study with simulations to 20 years and costs will be discounted at 3.5% per annum. A sensitivity analysis will be carried out in order to examine uncertainties within the cost effectiveness and utility model to examine the uncertainty within the parameters used.

Additional ethical issues
The approach to this analysis takes into account the current political and public climate for approvals and linkage of personal identifiable data. We have therefore developed a two stage approach to our work: Firstly, to ensure a minimal dataset for this analysis we will seek individual consent from individuals using SIHHC services, to link their personal data to HES with appropriate NHS ethics approval; secondly, and to improve the power of the study by including a greater number of individuals, we will apply for approval under Section 251 of the NHS Act 2006 to obtain identifiable patient information from services to achieve linkage from an additional sixteen SIHHC services nationally. Our Section 251 request will comply with the Act by being "in the interests of

improving patient care" and because there is no reasonable practicable alternative. The linked dataset will be stored in the Farr Safe Haven, a robust infrastructure certified according to international and national information security standards (ISO/IEC 270001 and NHS IG Toolkit). Data providers will securely upload encrypted identifiable data to a highly secure system. The UCL Identifiable Data Handling Solution (IDHS) has recent experience of gaining such approvals within 1 month of application.

The key principles are that:- Data security will be ensured through the a "Trusted Third Party"/"Safe Haven" model where UCL will provide a secure environment for processing identifiable personal data, where only approved researchers' can gain access to the data and where there are penalties for anyone who abuses personal data Research is needed to improve the health of vulnerable populations.

The main ethical issues are those that relate to the use of personal information without the explicit consent of those from whom the information is derived i.e. the second stage of data linkage proposed within this work. The recent Academy of Medical Sciences Report "A new pathway for the regulation and governance of health research" January 2011 highlights the importance of research use of health and social care data to improve understanding of disease and provision of services but state that "access to patient data for research is currently hampered by a fragmented legal framework, inconsistency in interpretation of the regulations, variable guidance and a lack of clarity among investigators, regulators, patients and the public". Despite these complexities we are confident of both the ethical and legal basis of our proposed research. The robust methodology described uses previously approved principles used by ourselves and other groups to link health and non-health data. We have allocated time within the grant to navigate these complexities and ensure relevant approvals. We also plan to host a number of Patient and Public Involvement (PPI) events to engage the full range of stakeholders in addressing these issues.

Patient and Public Involvement (PPI)

In addition to the plans for PPI described in the main proposal, this work package will also include three one day engagement events in each of the Public Health Regions of England (North, Central and South). The events will be designed to look at all aspects of data linkage, the ethical issues that may arise, what would be required of services willing to take part in this study and the potential benefits, for example, improved outcomes data. The events will target PPI stakeholders involved in all SIHHC hospital discharge schemes across England (including service providers and service users). On completion of the study, three further events will be hosted to feedback the findings of study. These events will be in addition to the initial expert seminar and the local feedback events planned for each fieldwork site in order to give sufficient time to look in depth at 'data linkage' (rather than findings around 'hospital discharge per se').

Stage 4: Dissemination and Outputs

In addition to a full project report for the NIHR's journal series and academic papers in learned journals, we will target key professional journals (e.g. Connect, Nursing Times, Community Care, etc,) and organisational/network newsletters and social media with articles and briefings to promote the project throughout and once findings are completed. The combination of these will bring a comprehensive description of the research and academic credibility to the evidence (i.e. the project report and academic articles) with accessible insights and recommendations targeted at specific audiences. Finally, if the findings support this, we will also produce a commissioner's guide (checklist for practice) in the form of toolkit.

In designing for impact we are aware that passive forms of dissemination do not always promote evidence informed practice. We have secured the expert support of Homeless Link who will provide consultancy and support throughout the life of the project to help us develop work in this area.

Gantt Chart

(24 months)	1-3 Q1	4-6 Q2	7-9 Q3	10-12 Q4	13-15 Q5	16-18 Q6	19-21 Q7	22-24 Q8
Preparation & Ethics	▨	▨						
Literature Review	▨	▨						
WP1 Fieldwork Site 1/2			🟦	🟦				
WP1 Fieldwork Site 3/4				🟦	🟦			
WP1 Fieldwork Site 5/6					🟦	🟦		
WP2 PPI Regional Engagement Events (n=3)	🟩	🟩						
WP2 Data linkage permissions and collection	🟩	🟩						
WP2 Set up, cleaning of data, and performing linkage	🟩	🟩	🟩	🟩				
WP2 Preparing cost data, EQ5D data entering and cleaning			🟩	🟩				
WP2 Statistical analysis for effectiveness study					🟩	🟩	🟩	
WP2 Cost effectiveness analysis					🟩	🟩	🟩	
Overarching Analysis & Report Writing					🟪	🟪	🟪	🟪
Local Feedback (n=6), Regional PPI (n=3) and National Dissemination.							🟨	🟨
Advisory Group Meetings	*	*	*	*	*	*	*	*

WP =Work Package

PROJECT TEAM

Dr Michelle Cornes (King's College London): CI overall management responsibility for delivery of contract and lead for Work Package 1. [50% FTE]

(Working Mainly Work Package 1)
Dr Martin Whiteford (Liverpool University: Main field researcher for Work Package 1 [100% FTE]

(Working Mainly on Work Package 2)
Professor Andrew Hayward, (UCL) will be the overall lead for Work Package 2 [5% FTE]

Dr Robert Aldridge (UCL) will oversee the data linkage, statistical analysis and health economics aspects of this project. [5% FTE]

Dr Spiros Denaxas (UCL) Research Fellow in Health Informatics based in the Farr Institute for Health Informatics Research at UCL Partners: Will oversee and advise on the storage and processing of data in the Farr Safe Haven using national information security standards (ISO/IEC 270001 and NHS IG Toolkit) based on his extensive experience in this area. [5% FTE]

Dr Michela Tinelli (LSE) is a Fellow at LSE Health and Social Care: Lead for economic evaluation [20% FTE] Her role will be to prepare cost data and EQ5D datasets (months 1-12) and undertake economic analysis and reporting (months 12-24).

Wurie Fatima (UCL) responsible for liaising with the services, training staff on how to consent service users and collect EQ5D questionnaires, and assist the preparation and collection of data required for the linkage. Fatima will also administer the necessary ethical section 251 applications relevant to the project. At the end of the project the researcher will develop individual reports for the services to feedback to them about the outcomes of their clients, and the results of the wider project. [5% FTE]

David Scott (UCL): database administrator responsible for setting up the probabilistic linkage process, cleaning the data from the 20 SIHHC schemes, and administer and clean the national HES data that will be used in the linkage and finally to perform the probabilistic linkage. [5% FTE]

Statistics post-doctoral researcher (UCL) After the data has been cleaned and linked, statistical analysis for effectiveness study will be performed by a statistics post-doctoral role. This individual will perform the statistical modelling for the comparative effectiveness analysis, conduct the sensitivity analyses, and produce data for the study and individual feedback reports for services [100% FTE in Y2]

(Role of other co-applicants)

Professor Richard Byng (Plymouth University); Will add SDR credibility and role in synthesis theory building [5% FTE]

Dr Mike Clark (LSE): To work with commissioners to develop the findings for practice [3% FTE]

Professor Graham Foster (QMUL): To advise on clinical issues, methodological and quantitative aspects of the study [5% FTE]

Dr Nigel Hewett (Pathway) is medical director of Pathway and will advise on clinical issues/site access. [5% FTE]

Professor Jill Manthorpe (King's College London): Responsible for literature review, support for the PI, and overall financial management [5% FTE]

Dr Jo Neale (Institute of Psychiatry): To offer methodological support, particularly in relation to the qualitative components of the case studies and to advise on analyses and dissemination [5% FTE]

Collaborators: Raphael Wittenberg (LSE and Oxford University) Natalie Atkinson (Expert by Experience) and Alan Kilminster (Expert by Experience), Helen Mathie (Homeless Link), Sarah Anderson (Revolving Doors), Mike Seale (Newman University Birmingham) , William Lee and Lynne Callaghan (Plymouth University) Professor Mark Gabbay, Dr Stuart Oultram, Dr. Paula Byrne (Liverpool University), Dr Diane Exley, Brownlow Health (Liverpool) Andrew Hayward and Rachel Hunter (UCL).

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