Protocol for Managing use of the Emergency and Urgent Care (EUC) system by people from vulnerable groups: a systematic mapping review and intervention review

Louise Preston, Sue Baxter, Andrew Booth, Duncan Chambers, Janette Turner and Ruth Wong – February 2018

Overview

- Inequalities in access to healthcare services persist for a number of vulnerable groups.
- When compared with the general population, these vulnerable groups are likely to have poorer health (attributable to diverse reasons)
- These vulnerable groups use the Emergency and Urgent Care (EUC) system more frequently than the general population
- Often they use the EUC when they have low acuity problems that would be better treated by a different healthcare provider - e.g. they might use an emergency ambulance when a walk in centre would be more clinically appropriate.
- Patterns of frequent use are not restricted to people from these vulnerable groups, but they tend to be more common amongst vulnerable populations (for a variety of complex reasons such as difficulties in accessing primary care, poor health and a preference for using EUC over routine care)
- A wider issue relates to preventative health interventions to ensure that these groups are better able to keep well or manage their health. These tend to be delivered in primary care and are outside the scope of this review.
- The EUC system faces severe pressure from increasing demand and therefore a greater understanding of interventions, delivered within the EUC, and with the potential to reduce or divert people who do not need to use the UEC would benefit the health service and patients.
- We aim to map interventions used within the EUC system to
    - manage demand for EUC from these groups
    - enable appropriate usage by these groups.
- Using a specific set of population groups, identified as vulnerable (having poorer health than the general population) and unequal access to healthcare we will map interventions delivered to these groups.
- In addition, we will characterise these interventions using TIDieR - the Template for Intervention Description and Replication (Hoffmann et al., 2014)

- Whilst this review focuses on interventions, rather than outcomes, we will provide a narrative summary of the outcomes of the interventions.
- Our review targets commissioners of services, to determine what interventions have been used for these population groups and research commissioners to identify gaps that persist in the evidence base and to focus primary research on areas where research is limited.

Background

Health inequalities mean that some groups in the population cannot access healthcare services as they need them and have poorer physical and mental health than other groups. Such populations may use EUC more frequently than other groups and may also use these services when their health problem may have been more appropriately dealt with by other health (or social) care services. This creates demand on an already pressured emergency and urgent care system with an impact on care delivered to both these groups and to other people who are seeking emergency care. Therefore, interventions that can be delivered within the EUC system in order to reduce the risk that patients use the UEC system inappropriately and ensure that they receive the most appropriate care offer potential benefit to patients and the health service more generally.

In order to explore this, we are planning to undertake a mapping review, examining interventions targeted either at specific population groups, or targeted at all EUC users, (with outcomes that differentially affect specific population groups), in order to map the range of interventions, across the EUC system, designed to reduce use of EUC

The health system is complex and interventions to reduce demand for EUC (e.g. case management interventions) take place within the entire healthcare system, not just within EUC. Other interventions or initiatives, both within and outside the healthcare system offer the potential to improve health and outcomes for people from these specific groups. However, this review focuses on interventions that are delivered by EUC or within the EUC system.

Definitions

Vulnerability

Vulnerability, in a healthcare context can be conceptualised in a variety of ways. We have chosen to use the definition from the EU VulnerABLE project (Balfour R et al., 2017) "*Vulnerability is a social phenomenon, affected by multiple processes of exclusion that can lead to or result from health problems*"

Vulnerability is a complex phenomenon – for the purpose of the project we are conceptualising this population as being more likely to have poor health and are more likely to face problems accessing healthcare appropriately.

The HS&DR team, in conjunction with ScHARR have identified seven priority vulnerable groups as a focus for this review, although there is necessarily overlap between these groups:

- Socioeconomically deprived individuals and families (socioeconomically deprived)
- People living in rural/isolated areas (including coastal communities) (geographically isolated)
- Migrants (new migrants)
- Ethnic minority groups (minorities)
- The long term unemployed/inactive (unemployed)
- People with unstable housing situations who are homeless or at risk of homelessness (homeless)
- People with substance misuse problems (substance misuse)

People with substance abuse problems represent a different population from the groups above and have much in common in terms of clinical need with the excluded groups outlined below. However, as a priority group for HS&DR they will be included in the review).

We are aware that the groups mentioned above may overlap in terms of the characteristics of individuals (e.g. homeless people who are substance users). In addition, we acknowledge that the groups identified above do not cover all groups that can be considered to be vulnerable. However, we believe that the needs and behaviours of these groups are sufficiently diverse to engage with diverse interventions, allowing wider transferability. The EU VulnerABLE report also includes other population groups not covered directly in our review, not being a priority by HS&DR (due to inclusion in other review and service initiatives). We do not plan to include "those with physical, mental and learning disabilities or poor mental health…older people…victims of domestic violence or intimate partner violence…prisoners".

Two further groups may receive interventions to manage their demand and use of Emergency and Urgent Care. 'Low acuity' users of the ED tend to use the ED when their clinical problem could be more appropriately dealt with elsewhere. Diverse reasons may explain why they seek EUC rather than routine care (Coster et al., 2017, Scherer et al., 2017). Such reasons may be linked closely to population characteristics shared by our vulnerable groups.

Those people who are referred to as 'frequent attenders' at the ED and 'frequent users' of the EUC visit the ED 'often' – defined as five or more visits a year. This population are seen as vulnerable because they "are more at risk of having poor social, physical and psychological health" for a variety of reasons, which cause and result from their use of the ED (Iglesias et al., 2017).

Where 'low acuity/preventable users/avoidable users/frequent users' are considered as a homogenous group, we will examine them as an overall group, otherwise they will be considered as a group in themselves. Whilst this low acuity group is not a priority for

this review, their inclusion in the review will aid commissioners and decision makers to identify potential possible interventions and areas for further research.

Emergency and urgent care

Emergency and urgent care can be defined by the services that are available for people with an acute health problem. In the UK this includes GP (same day routine appointment or out of hours), community services (e.g. district nursing), walk in centres, telephone helplines (NHS 111) or emergency ambulances and emergency departments Specific features of UEC make it a system – that "services can be viewed as an emergency and urgent care system because patients living within a geographical area seeking emergency or urgent care will make decisions about which service to contact first and will often have pathways of care involving a number of services" (O'Cathain et al., 2014).

Research questions and aims

Research questions

- What interventions exist to manage use of the emergency and urgent care by people from vulnerable groups?
- What are the characteristics of these interventions?
- Is there evidence of service delivery outcomes (for patients and the health service) resulting from these interventions?

Aims

- Identify and map, using predefined population groups, interventions that have been developed and delivered to individuals or groups to manage their use of EUC services. These interventions may either reduce demand or ensure that populations use the appropriate EUC as needed.
- To classify these interventions, where the evidence permits, in terms of intervention characteristics.
- To report headline messages of the outcomes of these interventions, where the evidence permits.
- Where interventions include outcomes data (evaluative), to assess the reporting of these interventions using the TidIER framework.
- Where interventions do not report outcomes data (descriptive), to report intervention features using an abbreviated version of TiDIER.
- To understand what can be learnt about delivering interventions to vulnerable service users?
- To identify potential gaps within the research and practice agendas with a view to stimulating future research and evaluation.

Overview of systematic mapping review methods

A prior rapid review undertaken by the Sheffield Evidence Synthesis Centre (Turner et al., 2015) on different models of delivering urgent care found a large evidence base – a total of five rapid reviews included 45 systematic reviews and 102 primary research studies from 1995-2014. Therefore, the evidence base in this area is extensive and we need to ensure that the methods that we are using enables the review to meet its aims of generating useful and usable evidence for the NHS, commissioners and policy makers as well as the wider academic community. Therefore, we are proposing the following approach:

The review will be a systematic mapping review, conducted according to published methods (James et al., 2016), followed by an intervention analysis using the TIDIER framework (Hoffmann et al., 2014). The aim will be to cover a broad area in order to facilitate further knowledge synthesis or primary research whilst summarising the current state of the evidence base through analysing the interventions reported.

Key elements of the mapping review will be 1) systematic database search 2) data extraction of population, setting, intervention, outcomes measured and any results in the form of headline messages 3) No formal quality assessment of included studies.

Identifying evidence

- We will search a key set of core databases (Medline, Embase, Web of Science, CINAHL)
- We will search from 2008 onwards
- Searches will be restricted to English Language and Human studies, where these limits are available within database functionality.
- Following the database searches, searching of Google, specific grey literature databases and key websites will be undertaken to identify evidence of relevant UK initiatives to manage use of UEC by our population groups. These will include the Vanguard sites. Where appropriate contact will be made with individuals leading initiatives to identify key information and evaluation data relating to them.
- Database searches will be structured around the setting or perspective (EUC) and the population (see Appendix 3).
- We will scrutinise reference lists of included papers and undertake cited reference searching using Google Scholar of included papers.

Screening identified evidence

- Identified evidence will be uploaded to Eppi Reviewer
- An initial set of 100 references will be screened by the three reviewers in order to test the screening tool.
- Evidence will be screened at title and abstract by three reviewers with a random sample of 10% from each reviewer being double screened.
- Evidence will be screened according to the study inclusion criteria in Appendix 1.

- Evidence included in the mapping review will be further screened to identify which studies will be included in the full intervention analysis (evaluative) and which will be included in the brief intervention analysis (descriptive).
- Where systematic reviews (or other review types) are identified, they will be scrutinised for the primary studies that they include. Any post 2008 studies included in these reviews that meet our inclusion criteria will be included in our review.
- Evidence will be coded into 'bundles' for each of the population groups of interest. We acknowledge potential overlap between groups e.g. homeless substance users and will reflect this heterogeneity.
- Evidence may also characterise population groups of interest not in terms of their vulnerability but rather according to their use of the EUC (i.e. low acuity users or frequent attenders). As these groups are considered to be vulnerable, we will include evidence relating to these groups that satisfies the other study inclusion requirements.

Extracting data

- Data will be extracted for the **mapping** review using a template in WORD (see Appendix) from primary research studies. This extraction template will include bibliographic information, setting in the UEC system, geographical setting, details of the participant group, BRIEF details of the intervention and headline messages about the outcome of the study (where outcomes have been measured)
- Where an intervention has been evaluated, data will be extracted for an intervention analysis using the TidiER framework in WORD. Where there is no evidence of evaluation, an abbreviated version of TidiER will be utilised in order to capture information about the intervention delivered.

Assessing study quality and relevance

- This review is a systematic mapping review. This methodology does not include any assessment of study quality using formal checklists.
- To ensure that the review meets the needs of its target audience, we will make an overall assessment of the evidence base, considering issues such as study types, study size, reporting etc.

Synthesising data

- We will provide a numerical and narrative overview of the evidence identified for each population group.
- In addition, we will narratively summarise evidence from the interventions according to the elements of the TIDieR framework.
- The final report will bring together themes from across the population groups to reflect any commonalities within the narrative synthesis.

Outputs from the review

- We will produce three reports for this review
    - The first interim report will present a mapping review of the interventions identified
    - The second interim report will present an intervention review of three groups (socioeconomically deprived/minorities/new migrants)
    - The third and final report will comprise the two reports detailed above, plus analyses for the remaining groups (geographically isolated/ unemployed/ homeless/ substance misusers and other vulnerable users (low acuity and frequent users)
- The first and second reports will be for interim use (HS&DR and ScHARR) use only. The third report will constitute the definitive report, for peer review and publication in the HS&DR Journals Library
- Once the final report has been published, we will produce an evidence brief and an open access peer reviewed publication. It is also hoped that this report will be used to support future HS&DR research commissioning.

Patient and public involvement (PPI)

We will involve patients and members of the public through a newly formed Sheffield Evidence Synthesis Centre PPI group. Involvement will be determined in conjunction with the group members. The group will review the protocol and participate in structured exercises on definitions of vulnerability. We will also ask the members to comment on plain language summaries and other relevant outputs and to give their perspective on relevant contextual factors and key messages for the NHS.

Review Planning

Timelines

Dates	J	F	M	A	M	J	J	A	S
Project months	1	2	3	4	5	6	7	8	9
Core activities									
Database search									
Additional searching if required									
Screening and mapping for report 1									
Report 1 delivered									
Intervention analysis report 2									
Report 2 delivered									
Intervention analysis report 3/final report									
Final report writing									
Final report delivered									
Other activities									
Protocol submitted									
PPI workshops									
Teleconferences - Louise Wallace/ScHARR									

ScHARR team and allocation of workload

Louise Preston - Review Lead (0.2 fte)
Ruth Wong - Information Specialist and Reviewer (0.2 fte)
Sue Baxter - Reviewer (0.4 fte) (until 1st April 2018)
Duncan Chambers – Reviewer (0.4 fte)
Janette Turner – Topic expert and reviewer
Andrew Booth – Senior Lead and reviewer

RW will undertake the searches.

LP, SB, DC and RW will sift the results from the searches and categorise the evidence by population group.

LP and SB will lead on the mapping review (report one).

For report two, LP will lead on socioeconomically deprived and DC will lead on minorities and new migrants.

For report three, DC will lead on the homeless and substance misusers, RW will lead on the geographically isolated and the long term unemployed. LP will lead on the evidence relating to 'frequent and low acuity' users.

LP will collate and author the final report.

Internal/external topic experts

Janette Turner – Topic expert

Appendices

Appendix 1 Study inclusion criteria

Population	Socioeconomically deprived people and families Migrants Ethnic minority groups The long term unemployed/inactive People with unstable housing situations People living in rural/isolated areas People with substance abuse disorders Where articles relate to more than one population group, these should be included. Where an intervention relates to a group who are using the EUC frequently and/or for low acuity reasons, these are included.
Setting	Delivered within the UEC system Evidence from any of the following settings: USA, UK, Canada, Australia, New Zealand or Europe.
Outcomes	Patient outcomes (exclude if reference solely reports clinical outcomes) Health service outcomes (for patients and the health service)
Study design	All types of study design, where an intervention is reported (descriptive or evaluative) We will not include surveys of patient experience of interventions. We will use reviews as a source of primary evidence
Type of data	We will include evidence from conference abstracts for interventions/ populations where there is not already a published evaluation study. Given the evidence generally available in conference abstracts, these are more likely to be included at the mapping stage rather than for intervention analysis. Grey literature in the form of reports of interventions delivered in the UK only.
Other limitations	English language only Evidence published since 2008.

Appendix 2 TIDIER

Item 1. Brief name: Provide the name or a phrase that describes the intervention	Explanation—Precision in the name, or brief description, of an intervention enables easy identification of the type of intervention and facilitates linkage to other reports on the same intervention. Give the intervention name, explaining any abbreviations or acronyms in full or a short (one or two line) statement of the intervention without elaboration.
Item 2. Why: Describe any rationale, theory, or goal of the elements essential to the intervention	Explanation—Inclusion of the rationale, theory, or goals that underpin an intervention, or the components of a complex intervention, can help others to know which elements are essential, rather than optional or incidental
Item 3. What (materials): Describe any physical or informational materials used in the intervention, including those provided to participants or used in intervention delivery or in training of intervention providers. Provide information on where the materials can be accessed (for example, online appendix, URL)	Explanation—A full description of an intervention should describe what different physical and information materials were used as part of the intervention (this typically will not extend to study consent forms unless they provide written instructions about the intervention that are not provided elsewhere). Intervention materials are the most commonly missing element of intervention descriptions. This list of materials can be regarded as comparable with the "ingredients" required for a recipe. It can include materials provided to participants … training materials used with the intervention providers … or the surgical device or pharmaceutical drug used and its manufacturer …. For some interventions, it might be possible to describe the materials and the procedures…together. If the information is too long or complex to describe in the primary paper, alternative options and formats for providing the materials should be used and details of where they can be obtained should be provided in the primary paper.
Item 4. What (procedures): Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities	Explanation—Describe what processes, activities, or procedures the intervention provider/s carried out. Continuing the recipe metaphor used above, this item refers to the "methods" section of a recipe and where intervention materials ("ingredients") are involved, describes what is to be done with them. "Procedure" can refer to the sequence of steps to be followed and is a term used by some disciplines, particularly surgery, and includes, for example, preoperative assessment, optimisation, type of anaesthesia, and perioperative and postoperative care, along with details of the actual surgical procedure used. Examples of processes or activities include referral, screening, case finding, assessment, education, treatment sessions, telephone contacts, etc. Some interventions, particularly complex ones, might require additional activities to enable or support the intervention to occur (in some disciplines these are known as implementation activities), and these should also be described. Elaboration about how to report interventions where the procedure is not the same for all participants is provided at item 9.
Item 5. Who provided: For each category of	Explanation—The term "intervention provider" refers to who was involved in providing the

intervention provider (for example, psychologist, nursing assistant), describe their expertise, background and any specific training given	intervention (for example, by delivering it to recipients or undertaking specific tasks). This is important in circumstances where the providers' expertise and other characteristics could affect the outcomes of the intervention. Important issues to address in the description might include the number of providers involved in delivering or undertaking the intervention; their disciplinary background (for example, nurse, occupational therapist, colorectal surgeon, expert patient); what pre-existing specific skills, expertise, and experience providers required and if and how these were verified; details of any additional training specific to the intervention that needed to be given to providers before and/or during the study; and if competence in delivering the intervention was assessed before or monitored throughout the study and whether those deemed lacking in competence were excluded or retrained. Other information about providers could include whether the providers were doing the intervention as part of their normal role or were specially recruited as providers for purposes of the study; whether providers were reimbursed for their time or provided with other incentives (if so, what) to deliver the intervention as part of the study, and whether such time or incentives might be needed to replicate the intervention.
Item 6. How: Describe the modes of delivery (such as face to face or by some other mechanism, such as internet or telephone) of the intervention and whether it was provided individually or in a group	Explanation—Specify whether the intervention was provided to one participant at a time (such as a surgical intervention) or to a group of participants and, if so, the group size. Also describe whether it was delivered face to face, by distance (such as by telephone, surface mail, email, internet, DVD, mass media campaign, etc.) or a combination of modes. When relevant, describe who initiated the contact , and whether the session was interactive or not and any other delivery features considered essential or likely to influence outcome.
Item 7. Where: Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or relevant features	Explanation—In some studies the intervention can be delivered in the same location where participants were recruited and/or data were collected and details might therefore already be included in the primary paper. If, however, the intervention occurred in different locations, this should be specified. At its simplest level, the location might be, for example, in the participants' home, residential aged care facility, school, outpatient clinic, inpatient hospital room, or a combination of locations. Features or circumstances about the location can be relevant to the delivery of the intervention and should be described. For example, they might include the country, type of hospital or primary care, publicly or privately funded care, volume of activity, details of the healthcare system, or the availability of certain facilities or equipment. These features can impact on various aspects of the intervention such as its feasibility or provider or participant adherence and are important for those considering replicating the intervention
Item 8. When and how much: Describe the number of times the intervention was delivered and over what period of time including the	Explanation—The type of information needed about the "when and how much" of the intervention will differ according to the type of intervention. For some interventions some aspects will be more important than others. For example, for pharmacological interventions, the dose and scheduling is

number of sessions, their schedule, and their duration, intensity or dose	often important; for many non-pharmacological interventions, the "how much" of the intervention is instead described by the duration and number of sessions. For multiple session interventions, the schedule of the sessions is also needed and if the number of sessions, their schedule, and/or intensity was fixed or if it could be varied according to rules and if so, what they were. Tailoring of the intervention to individuals or groups of individuals is elaborated on in item 9. For some interventions, as part of the "when" information, detail about the timing of the intervention in relation to relevant events might also be important (for example, how long after diagnosis, first symptoms, or a crucial event did the intervention start) As described below in item 12, the "amount" or dose of intervention that participants actually received might differ from the amount intended. This detail should be described, usually in the results section.
Item 9. Tailoring: If the intervention was planned to be personalised, titrated or adapted, then describe what, why, when, and how	Explanation—In tailored interventions, not all participants receive an identical intervention. Interventions can be tailored for several reasons, such as titration to obtain an appropriate "dose"; participant's preference, skills, or situation; or it may be an intrinsic element of the intervention as with increasing intensity of an exercise. Hence, a brief rationale and guide for tailoring should be provided, including any variables/constructs used for participant assessment and subsequent tailoring. Tailoring can occur at several stages and authors should describe any decision points and rules used at each point. If any decisional or instructional materials are used, such as flowcharts, algorithms or dosing nomograms, these should be included, referenced or their location provided .
Item 10. Modifications: If the intervention was modified during the course of the study, describe the changes (what, why, when, and how)	Explanation— This item refers to modifications that occur at the study level, not individual tailoring as described in item 9. Unforeseen modifications to the intervention can occur during the course of the study, particularly in early studies. If this happens, it is important to explain what was modified, why and when modifications occurred, and how the modified intervention differed from the original. Modifications sometimes reflect changing circumstances. In other studies, they can show learning about the intervention, which is important to transmit to the reader and others to prevent unnecessary repetition of errors during attempts to replicate the intervention. If changes to the intervention occurred between the published protocol or published pilot study and the primary paper, these changes should also be described.
Item 11. How well (planned): If intervention adherence or fidelity was assessed, describe how and by whom, and if any strategies were used to maintain or improve fidelity, describe them	Explanation—Fidelity refers to the degree to which an intervention happened in the way the investigators intended it to and can affect the success of an intervention. The terms used to describe this concept vary among disciplines and include treatment integrity, provider or participant adherence, and implementation fidelity. This item—and item 12—extends beyond simple receipt of the intervention (such as how many participants were issued with the intervention drug or exercises) and refers to "how well" the intervention was received or delivered (such as how many participants took the drug/did the exercises, how much they took/did, and for how long).

	Depending on the intervention, fidelity can apply to one or more parts of the intervention, such as training of providers, delivery of the intervention, and receipt of the intervention. The types of measures used to determine intervention fidelity will also vary according to the type of intervention. For example, in simple pharmacological interventions, assessing fidelity often focuses on recipients' adherence to taking the drug. In complex interventions, such as rehabilitation, psychological, or behaviour change interventions, however, assessment of fidelity is also more complex. There are various pre-planned strategies and tools that can be used to maintain fidelity before delivery of the intervention or during the study. If any strategies or tools were used to maintain fidelity, they should be clearly described. Any materials used as part of assessing or maintaining fidelity should be included, referenced, or their location provided
Item 12: How well (actual): If intervention adherence or fidelity was assessed, describe the extent to which the intervention was delivered as planned	Explanation— For various reasons, an intervention, or parts of it, might not be delivered as intended, thus affecting the fidelity of the intervention. If this is assessed, authors should describe the extent to which the delivered intervention varied from the intended intervention. This information can help to explain study findings, minimise errors in interpreting study outcomes, inform future modifications to the intervention, and, when fidelity is poor, can point to the need for further studies or strategies to improve fidelity or adherence. For example, there might be some aspects of the intervention that participants do not like and this could influence their adherence. The way in which the intervention fidelity is reported will reflect the measures used to assess it as described in item 11.

Appendix 3 Search Strategy

- Terms taken/adapted from existing review search strategies and search filters
- Multiple limits applied: document type, humans, English language and date limits
- Suggested databases to search
    - MEDLINE
    - Web of Science
        - Science Citation Index Expanded
        - Social Sciences Citation Index
        - Conference Proceedings Citation Index – Science
        - Conference Proceedings Citation Index - Social Science & Humanities (1990-)
        - CINAHL

Revised MEDLINE search strategy (January 2018)

1 *Emergency Service, Hospital/

2 *Emergency Medical Services/

3 *Emergency Medicine/

4 (emergenc* adj2 service*).ti,ab.

5 emergenc* care.ti,ab.

6 ((urgent or unscheduled) adj care).ti,ab.

7 emergenc* department*.ti,ab.

8 *Ambulances/

9 ambulance*.ti,ab.

10 or/1-9

11 *Vulnerable populations/

12 *Poverty/

13 *Socioeconomic Factors/

14 (vulnerable or socioeconomic* or disadvantaged or depriv* or poverty or poor or low-income* or low income* or low pay or low* paid).ti.

15 ((vulnerable or socioeconomic* or disadvantaged or depriv* or poverty or poor or low-income* or low income* or low pay or low* paid) adj3 (individual* or people or person* or famil* or population* or communit* or neighbourhood* or group*)).ab.

16 ((financ* or economic* or money) adj2 (hardship* or difficult* or problem* or worries or worry)).ti,ab.

17 *Social Isolation/

18 (social* adj1 (exclu* or inequalit* or isolat*)).ti,ab.

19 or/11-18

20 Rural Population/

21 (rural or remote or coast* or geographical* isolat*).ti.

22 ((rural or remote or coast* or geographical* isolat*) adj3 (people or patient* or population* or communit* or neighbourhood* or group* or area*)).ab.

23 ((hard* or difficult) adj2 (reach or locate or find)).ti,ab.

24 or/20-23

25 refugee*.ti,ab.

26 asylum seeker*.ti,ab.

27 (migrant* or immigrant* or emigrant*).ti,ab.

28 Refugees/

29 "Emigrants and Immigrants"/

30 "transients and migrants"/

31 ((human or child or people or person) adj traffick*).ti,ab.

32 ("first generation" or "second generation" or "third generation").ti,ab.

33 ("new arrival*" or settler* or newcomer*).ti,ab.

34 ((multi or trans or cross) adj cultural*).ti,ab.

35 (multi adj (ethnic or racial or lingual)).ti,ab.

36 diaspora.ti,ab.

37 ethnic groups/

38 (traveller* or gypsies or gypsy or gipsy or gipsies or romany or romanies or romani or romanis or rromani or rromanis or roma).ti,ab.

39 (african american or african americans or asian or asians or black or blacks or hispanic or hispanics or indian or indians or latino or latina or latinos or latinas or native american or native americans).ti.

40 (bme or black ethnic minorit* or black minorit* ethnic* or south asian* or bangladeshi* or pakistani* or indian* or sri lankan* or asian* or east asian* or chinese or taiwanese or vietnamese or korean* or japanese or afro-caribbean* or african-caribbean* or caribbean or african* or black* or afro* or islam* or hindu* or sikh* or buddhis* or muslim* or moslem* or christian* or catholic* or jew*).ti.

41 or/25-40

42 *Unemployment/

43 (unemploy* or jobless or workless).mp.

44 ((job* or work or employment) adj3 (redundan* or insecur* or loss* or lose or lost or search* or seek* or find*)).ti,ab.

45 (economic* adj3 inactive).ti,ab.

46 or/42-45

47 exp *Homeless Persons/

48 (homeless* or rough sleep*).mp.

49 ((unstabl* or emergency or temporary or inadequate or poor or overcrowd* or over crowd*) adj3 (hous* or accommodation or shelter* or hostel* or dwelling*)).ti,ab.

50 runaway*.mp.

51 (street adj3 (individual* or person* or people or group* or population*)).ti,ab.

52 or/47-51

53 (addict* or ((substance* or alcohol* or drug* or cocaine or heroin or amphetamine* or marijuana or cannabis) adj2 (misus* or abus* or depend* or use* or using))).ti,ab.

54 (legal high* or (psychoactive adj (substance* or product*))).ti,ab.

55 *Substance-Related Disorders/

56 *Drug Users/

57 *Alcoholics/

58 or/53-57

59 10 and (19 or 24 or 41 or 46 or 52 or 58)

60 Case report.tw.

61 Letter/

62 Historical article/

63 60 or 61 or 62

64 exp Animals/

65 Humans/

66 64 not (64 and 65)

67 63 or 66

68 59 not 67

69 limit 68 to (english language and yr="2008 -Current")

Appendix 4 Data Extraction form

Paper ID Author Date	Setting		Study Type	Population		Intervention		Outcomes (headline message)
	Country	UEC setting		Description of population	Intervention group size (control group size)	Description or evaluation?	Describe intervention	

References

BALFOUR R, ARORA L, FARRAR P, HUGHES P & MOROSI, M. 2017. EU VulnerABLE: Pilot project related to the development of evidence based strategies to improve the health of isolated and vulnerable persons.

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