Patients Discharged with Non-specific Diagnoses Following an Emergency Hospital Admission

Technical Annex: Scoping Review Method

Requirements

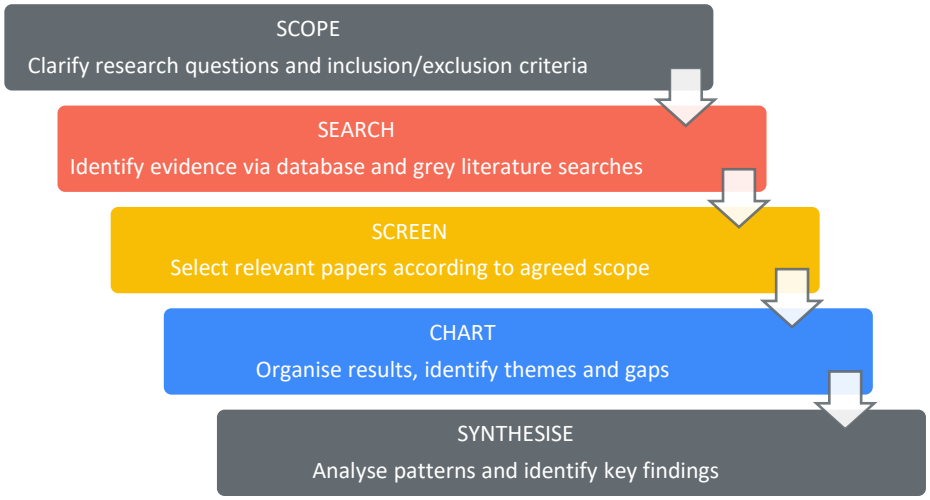
In 2021, the Strategy Unit explored differences in emergency admission rates between ethnic and socioeconomic groups in Birmingham and the Black Country ICBs. The analysis found that patients from ethnic minority and deprived communities were more likely to be discharged with a primary diagnosis code from ICD10-chapter R. In contrast to other chapters in the ICD10 classification system, chapter R describes signs and symptoms, such as headache, abdominal pain, syncope, and confusion, rather than specific diseases, disorders, or injuries.

This may indicate that the lead clinician did not reach a view about the patient's disease or condition before discharge. Diagnosis is a central part of the medical process. It guides the selection of treatments, informs discussions about prognosis, and provides clarity to patients and their families. If opportunities to diagnose conditions are missed, then this can lead to suboptimal outcomes for patients and health systems. Bias in diagnosis rates might therefore exacerbate health inequalities.

There are a range of potential explanations for this finding; clinical, epidemiological, operational, and artefactual. The Strategy Unit was commissioned by the Health Foundation to conduct more in-depth analysis, including this scoping review, to confirm the earlier finding, better understand the factors that give rise to it, and identify implications for health service equity.

Our approach

We conducted a scoping review, following the Arksey and O'Malley's framework, which comprises five stages:



We set out some potential *a priori* causal mechanisms that might explain the finding that patients from ethnic minority and deprived communities are more likely to be discharged from hospital following an emergency admission without a specific diagnosis. One of the key objectives of this project was to seek evidence to support or counter these and other potential mechanisms. The review was therefore iterative, informing and informed by analytical and qualitative work running in parallel.

Analysis and reporting was guided by the PAGER approach (Bradbury Jones et al, 2021) which provides a structure for reflection and triangulation across the project team:

Research questions

The review was based on the following questions:

- Why patients might be discharged without a formal diagnosis, including literature on medically unexplained symptoms, healthcare seeking behaviour, and use of health services for non-health reasons (stress, debt, safeguarding etc)?
- What evidence is there on discharge without diagnosis and differences between deprived/affluent groups and white/minority ethnic groups and what explanations have been offered?

Framing the review

Population/s	• Ethnic minority groups • Socioeconomic groups As the quantitative findings emerged, we broadened the review to include the working age population and children/adolescents aged 11 and over. Papers which had been excluded were screened again.

Phenomenon	Discharge with no formal diagnosis following emergency hospital admission	
Theories or explanations	Suggested explanations: 1. Differences in admission thresholds 2. Differences in casemix 3. Reduced access to diagnostic testing after admission 4. Differences in the level/quality of interactions with clinicians after admission 5. Differences in clinical coding practices 6. Differences in discharge thresholds There may be other explanations or theories which emerge from the literature.	
Scope		
	Included	**Excluded**
Geographical scope	We prioritised UK papers as we were interested in contextual factors particular to the NHS. However, we have included papers from other countries as an indication of the broader evidence base on the research questions.	
Settings	Emergency hospital admissions	Other health care settings were considered where there was minimal or no evidence relating to emergency admissions.
Evidence types	• Research studies and reviews • Reports and commentaries	Editorials and correspondence Conference abstracts and posters
Date restrictions	We limited searches to the last 10 years (2015-2025) to focus on contemporary literature, with the option to identify earlier seminal papers through backwards citation searching.	
Search sources and locations		
Bibliographic databases	• MEDLINE • HMIC • CINAHL • Google Scholar (citation searching)	
Grey literature (searches of organisation web sites)	Research and evaluation sources: • National Institute for Health Research (NIHR) • NIHR Applied Research Collaborations (ARCs) • Health Innovation Networks • Academic Health Science Centres • Commissioning Support Units	

	• Thinktanks: Health Foundation; Nuffield Trust; King's Fund; The Health Policy Partnership NHS and professional sources: • NHS bodies including NHS England, NHS Race and Health Observatory • National Grey Literature Collection • Future NHS platform including GIRFT • NHS Confederation & NHS Providers • Professional bodies e.g. Royal College of Emergency Medicine, Royal College of Physicians • Office for Health Improvement and Disparities • Healthwatch • Institute of Health Records and Information Management Third sector: • Joseph Rowntree Foundation • National Voices • Institute of Health Equity • Runnymede Trust • BHA for Equality • Race Equality Foundation
Search terms	
See Appendix 1 for the initial search strategy. When the review was expanded to include a broader cohort, we retrieved a results set which removed the inequalities terms. We also expanded the search strategy to include additional terms identified from the first results set. We conducted backwards (checking reference lists) and forwards (Google Scholar searches) citation searching for key papers. We also conducted searches via Connected Papers on a selection of core papers.	
Screening	
Papers were screened according to the agreed inclusion/exclusion criteria.	
Data extraction and coding	
Data on setting, evidence type, country of publication, sample and outcomes were extracted. Papers were mapped to populations of interest/potential explanations.	
Use of AI tools	

In conducting this literature review, we used Connected Papers, an AI-powered visualization tool, to support comprehensive citation searching and literature discovery. This tool helped us identify relevant academic papers through visual exploration of citation networks and assisted in ensuring that key publications were not overlooked. Connected Papers served as a supplementary resource to traditional database searches, enhancing the thoroughness and completeness of our search process.

References

Arksey, H. and O'Malley, L. (2005) Scoping studies: towards a methodological framework. International Journal of Social Research Methodology, 8, 19-32.

Bradbury-Jones, C., Aveyard, H., Herber, O.R., et al. (2021) Scoping reviews: the PAGER framework for improving the quality of reporting. International Journal of Social Research Methodology, 25, 457-470.

Potential mechanisms

1. **Differences in admission thresholds**

   Are patients from ethnic minority and deprived communities admitted in an emergency at lower thresholds? If this is the case then more patients may be discharged shortly after admission, having been assessed by hospital staff as low risk and not in need of hospital care.

2. **Differences in casemix**

   Do patients from ethnic minority and deprived communities exhibit casemix characteristics (e.g. age, sex, comorbidities) that are strongly and independently associated with being discharged following an emergency admission without a specific diagnosis? If this is the case, then the finding may be explained via the differential distribution of casemix variables.

3. **Reduced access to diagnostic testing after admission**

   Do patients from ethnic minority and deprived communities experience poorer access to diagnostic testing services after admission? If this is the case, then these patients may be less likely to receive a specific diagnosis.

4. **Differences in the level or quality of interactions with clinicians after admission**

   Do patients from ethnic minority and deprived communities experience poorer access to clinicians after admission, or is the quality of the interactions between these patients and clinicians inferior? If this is the case, then these patients may be less likely to receive a specific diagnosis.

5. **Differences in clinical coding practices**

   Are clinicians and/or clinical coders less likely or more reluctant to attribute a specific diagnosis to a patient from an ethnic minority and deprived community, for a given level of diagnostic certainty?

6. **Differences in discharge thresholds**

   Are patients from ethnic minority and deprived communities discharged at lower thresholds after an emergency admission? If this is the case, then these patients may be less likely to receive a specific diagnosis before discharge.

Draft search strategy (MEDLINE)

	Search terms	Results	Clusters	Notes
1	sociodemographic factors/	1512	Ethnic minority groups	
2	exp "Health Disparate Minority and Vulnerable Populations"/	187052		
3	"Ethnic and Racial Minorities"/	1268		
4	exp Ethnicity/	114011		
5	exp Racial Groups/	116711		
6	Cultural Characteristics/	16995		
7	cross-cultural comparison/	28721		
8	(ethnic* or race or racial or racis* or POC or "BME" or "BAME").ti,ab.	349389		
9	(socio-demographic or sociodemographic).ti,ab.	126203		
10	(Arab or Africa* or Afro* or Asian or Bangladesh* or Black or Caribbean or Chinese or India* or Irish or (Mixed adj other) or Multi*rac* or Pakistan* or Roma or traveller* or Gyps* or Gips*).ab,ti.	1268037		These lines are from a recent RHO review on ethnic inequalities in healthcare
11	(Sikh* or Hindu* or Muslim* or Islam* or jew*).ab,ti.	31479		
12	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11	1753131		
13	exp Socioeconomic Factors/	534071	Socioeconomic factors & deprivation	Includes narrower terms: INCOME/ POVERTY/ SOCIAL CLASS/
14	exp social deprivation/	3334		
15	exp Poverty/	51974		Exp SOCIOECONOMIC FACTORS/ seems to pick up POVERTY/ but not nested terms
16	Working Poor/	21		
17	exp Social Welfare/	62330		
18	(socio-economic or socioeconomic or SES).ti,ab.	187995		

19	(depriv* or disadvantage* or impoverished).ti,ab.	223118		
20	(social adj2 (status or position or background or circumstance*)).ti,ab.	20367		
21	13 or 14 or 15 or 16 or 17 or 18 or 19 or 20	903672		
22	exp Diagnosis/	9781437	Diagnosis	Exploding includes narrower term: MISSED DIAGNOSIS/
23	Undiagnosed Diseases/	247		
24	exp Diagnostic Errors/	124666		
25	Delayed Diagnosis/	9092		
26	di.fs.	3100717		Looks for "diagnosis" as a floating subheading
27	"International Classification of Diseases"/	9975	ICD code R	
28	"ICD-10".ti,ab.	18425		
29	(R* adj3 (chapter or code*)).ti,ab.	73956		
30	(27 or 28) and 29	3213		
31	(12 or 21) and 30	520		
32	(Underdiagnos* or under-diagnos* or (under adj diagnos*)).ti,ab.	20064	Diagnosis	
33	"diagnostic uncertainty".ti,ab.	2095		
34	((non-specific or non specific or unspecific) adj diagnos*).ti,ab.	224		
35	(failure* adj3 diagno*).ti,ab.	9807		
36	((No or without) adj2 diagnos*).ti,ab.	28728		
37	"route to diagnosis".ti,ab.	131		
38	22 or 23 or 24 or 25 or 26 or 32 or 33 or 34 or 35 or 36 or 37	10965414		
39	exp Emergency Service, Hospital/	107355	Emergency admissions	
40	patient admission/ or patient readmission/	51152		
41	(emergenc* adj2 admission*).ti,ab.	7006		
42	(emergenc* adj2 department*).ti,ab.	144721		

43	("A&E" or "accident and emergency").ti,ab.	39800	
44	39 or 40 or 41 or 42 or 43	272373	
45	Health Equity/	5071	Inequalities
46	exp health inequities/	45867	
47	exp Social Discrimination/	15585	
48	Social Marginalization/	662	
49	exp Prejudice/	39774	
50	Health Services Accessibility/	92478	
51	Medically Underserved Area/	7718	
52	Minority Groups/	19144	
53	Minority Health/	909	
54	(inequal* or inequit* or disparit* or equit* or equalit* or variation* or bias*).ti,ab.	1479906	
55	45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54	1610422	
56	(12 or 21) and 38 and 44 and 55	1035	Results
57	31 or 56	1552	
58	(threshold* or criteria or (risk adj2 assess*)).ti,ab.	1313349	Mechanism 1
59	Time Factors/	1248695	
60	40 and (58 or 59)	10939	
61	(casemix or case-mix or "case mix").ti,ab.	7568	Mechanism 2
62	exp "Diagnostic Techniques and Procedures"/	8181671	Mechanism 3
63	50 and 62	7054	
64	"Quality of Health Care"/	79291	Mechanism 4
65	Culturally Competent Care/	2457	
66	Patient Participation/	30944	
67	Physician-Patient Relations/	78080	
68	Health Literacy/	11311	

Exploding includes narrower term BIAS,

69	help-seeking behavior/	1472	
70	exp Attitude to Health/	545913	
71	exp communication barriers/	8120	
72	medically unexplained symptoms/	1200	
73	Somatoform Disorders/	9748	
74	"functional disorder*".ti,ab.	6175	
75	((patient* or physician* or clinician* or professional*) adj3 expectation*).ti,ab.	13199	
76	((health or healthcare or "health care") adj2 seek*).ti,ab.	14191	
77	(("cultur* competen* care" or "cultur* care" or (transculturalism or "cultural awareness" or "cultural sensitivity" or "cultural knowledge" or "cultural sensitivity")) adj2 (care or healthcare or medicine)).ab,ti.	1415	
78	64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75 or 76 or 77	719590	
79	Clinical Coding/	2445	Mechanism 5
80	(clinical adj2 (coding or coder*)).ti,ab.	625	
81	79 or 80	2917	
82	Patient Discharge/	43034	Mechanism 6
83	82 and (58 or 59)	7814	
84	((time or timing) adj2 discharge).ti,ab.	8858	
85	(12 or 21 or 55) and 38 and 44 and (60 or 61 or 63 or 78 or 81 or 84)	2176	Results
86	31 or 56 or 85	3448	
87	limit 86 to english language	3347	
88	limit 87 to yr="2015 -Current"	1965	

Iterative search (MEDLINE):

89	undifferentiated diagnosis.mp.	3	Additional terms related to non-specific diagnosis sourced from included papers
90	(bias adj3 diagnos*).ti,ab.	1069	
91	Heuristics/	1235	
92	"cognitive bias*".ti,ab.	3469	
93	misdiagnosis.mp.	23945	
94	diagnostically unresolved.mp.	5	
95	ill-defined diagnoses.mp.	5	
96	pathological diagnos*s.mp.	13134	
97	symptomatic diagnos*s.mp.	309	
98	Or/89-97	42835	
99	38 or 98	11094957	Combined with diagnosis terms from initial search
100	44 and 99	99285	Combined with terms relating to setting
101	100 not 86	96259	Excluding previous results
102	limit 101 to yr="2015 -Current"	51061	
103	limit 102 to english language	48903	
104	91 or 92	4671	Results too high so combined bias and heuristics terms with "DIAGNOSIS/"
105	38 and 104	1165	
106	89 or 90 or 93 or 94 or 95 or 96 or 97 or 105	39358	
107	44 and 106	870	
108	32 or 33 or 34 or 35 or 36	62165	
109	44 and 108	2067	
110	107 or 109	2888	
111	limit 110 to yr="2015 -Current"	1870	
112	limit 111 to english language	1810	

113	112 not 86	1743	To exclude records already screened
114	("admission threshold*" or "discharge threshold*").ti,ab.	172	Previous search combined "threshold" with MeSH terms
115	99 and 114	70	
116	persistent physical symptom*.mp.	144	Symptoms which have arisen from quantitative analysis
117	99 and 116	37	
118	44 and 98	894	
119	Headache/	33022	Symptoms which have arisen from quantitative analysis
120	Syncope/	12508	
121	exp Seizures/	78532	
122	exp Fever/	49132	
123	Dizziness/	7027	
124	Nausea/	18196	
125	Vomiting/	26220	
126	exp Abdominal Pain/	34995	
127	exp Pelvic Pain/	12284	
128	Cough/	19697	
129	Dyspnea/	26392	
130	palpitations.mp.	7073	
131	precordial pain.mp.	341	
132	Chest Pain/	15761	
133	Or/119-132	307857	
134	99 and 133	183415	
135	44 and 134	10624	Combined with setting
136	135 not 86	10462	Excluding previously screened results
137	limit 136 to yr="2015 -Current"	5330	
138	limit 137 to english language	5031	
139	39 or 40 or 41	159451	Setting (not including

			Emergency departments)
140	134 and 139	6542	New terms relating to symptoms combined with setting
141	140 not 86	6413	Excluding previously screened results
142	limit 141 to yr="2015 -Current"	3315	
143	limit 142 to english language	3167	
144	23 or 24 or 25 or 30 or 32 or 33 or 34 or 35 or 36 or 37 or 98	234763	Using fewer diagnosis terms to manage volume
145	143 and 144	240	
146	115 or 117 or 118 or 145	1195	
147	limit 146 to yr="2015 -Current"	876	
148	limit 147 to english language	861	
149	148 not 86	853	Excluding previously screened results
150	30 and 44	424	R code terms plus setting
151	150 not 86	356	
152	limit 151 to yr="2015 -Current"	265	

Sets 113, 149 and 152 were screened