

Has the acuity and/or dependency of patients on general wards increased over time?

Health services need to respond to changing clinical demands, but it is unclear whether hospitalised medical and surgical patients have more complex needs than in previous years. This Evidence Brief summarises the key findings from a rapid review of available empirical evidence assessing whether there have been changes in patient acuity and dependency over recent decades, both within the UK and internationally.

What is the problem?

Workforce plans should be driven by patient needs, including consideration of patient numbers, characteristics, case complexity and the type of care they require. A wealth of research has demonstrated that if staffing numbers and demand are not accurately matched, there is a greater chance of necessary care being missed and negative consequences to patients' health and well-being [1]. A key question is whether the care needs of people in hospital have increased over time, particularly in terms of having more underlying conditions, higher acuity or complex care needs. Therefore, we conducted a rapid review to explore the available evidence on trends in acuity and dependency amongst patients admitted to acute general hospitals.

How did we search for relevant studies?

This was a rapid review. We searched MEDLINE (Jan 2010 to Jun 2024) using the following keywords: acuity OR acute OR dependency OR severity or case*mix OR complex* OR comorbidity OR multimorbidity profile OR characteristics OR polypharmacy, combined with keywords indicating study type (i.e., longitudinal, trend, temporal, cohort). We additionally used targeted searches to obtain reports released by organisations that regularly analyse trends from routine data sources in the UK (e.g., the Health Foundation, briefings to UK parliament).

How were the studies selected?

To assess changes over time, we included studies providing empirical data on markers of acuity or dependency at multiple time points. Given the varied patient populations, settings and indicators returned, our approach to selection first prioritised evidence with data collected in the UK, supplemented by evidence from high-income countries such as those in Europe and North America. Other criteria included: sample sizes with >10,000 patients covering large geographical areas, as well as substantial data collected within the last 10 years. Based on theoretical links with increased nursing workload, indicators of acuity/dependency such as age, comorbidity measured via validated tools (e.g., Charlson Comorbidity Index), polypharmacy and prevalence of certain conditions (obesity, type 2 diabetes, frailty, mental health diagnoses, dementia) were also prioritised.

We undertook a full-text review of 37 pieces of evidence, the majority of which were primary studies. After applying our priority criteria, we selected 10 sources for final inclusion. Study populations included medical and surgical patients, and some studies focused specifically on emergency admissions.

Results

Trends of patient acuity and admissions in English hospitals

Of these selected studies, five reported data from English NHS Trusts (collected locally and/or sourced from NHS Digital, such as the Hospital Episode Statistics dataset) [2-6]. Studies found increases in patient comorbidity over time. For example, McLean et al found an increase in average Charlson comorbidity score from 8.6 in 2000-4 to 11.8 in 2010-14 [2]. Steventon et al found that 1 in 10 patients had ≥ 5 health conditions in 2006-7, compared with 1 in 3 in 2015-6 [3]. Similarly, Friebel et al found a 5.5-fold increase in admissions of patients with > 5 comorbidities from 2008 to 2018 [6].

Hospitalised patients are also older than before, with mean age increasing (79.5 years in 2010-4 versus 79.0 years in 2000-4) and proportions of patients aged > 85 years increasing (relatively by 59% when comparing 2015-6 with 2006-7) [2, 3].

The number of emergency admissions has also increased [4, 6]. For example, Cowling et al report an increase to 8988 per 100,000 population in 2011-12 compared to 7675 in 2002-3 [5]. These increased numbers in admissions have been partly attributed to a change in age profile, the availability of primary care services, and changes in admission thresholds [5]. Furthermore, large year-on-year increases in proportions of patients with dementia have been observed in emergency admissions (0.23 in 2001-2 vs. 0.53 in 2010-11, $p < 0.001$) [5]. Length of stay has reduced, particularly among elderly surgical patients (11.5 days in 2000-4 to 9.4 days in 2010-14) [2] and those with ≥ 5 conditions (15.8 days in 2006-7 vs. 10.8 days in 2015-16) [3]. This suggests that hospitalised patients receive more intense care during their admission than before.

International trends of patient acuity and admissions

Outside of England, five international studies provide additional data and context for this review [7-11]. The most recent comprehensive study was conducted in Canada [7] and also reports increased patient complexity between 2002 and 2017 when measured by age, comorbidity, polypharmacy (i.e. regular use of 5 or more medicines), emergency admissions and unplanned readmissions. A study of 8.7 million surgical patients in the USA found significant increases in obesity and type 2 diabetes, and additionally forecast that by 2030, eight out of ten surgical patients will have a BMI above the healthy threshold[9]. A Swedish study from a single large hospital confirmed increases in age and comorbidity, and also increased risk according to the American Society of Anaesthesiologists (ASA) classification among patients: severe systemic disease (ASA >=3) increased from 22.5% in 2006 to 47.6% 2021[10].

Strengths and limitations

This is a rapid and selective review of relevant studies, and our strategies for evidence searching and selection are explicit and reproducible. Further studies not presented in this publication were reviewed at the full-text screening stage, and their results are consistent with the findings presented here.

We did not apply a formal quality assessment tool in this rapid review. However, the evidence included is relatively robust, with large sample sizes and covering diverse geographical populations. Furthermore, the direction of results is largely consistent across studies, despite the heterogeneity of measures (e.g., mean age versus proportion of older adults; Charlson comorbidity index versus the number of co-occurring conditions). Other than a single study exploring dementia, we did not find evidence on the impact of caring for patients with comorbid mental health conditions. Given our approach for study selection (i.e., prioritising general acute wards and excluding high-dependency specialty areas), a more focused review around psychiatric comorbidity is recommended.

Lastly, given that the most recent studies in England were published in 2022[6], there is a gap in understanding current national trends. However, more recent international sources (including one study with forecasting into 2030) provide a useful guide as to how trends are likely to evolve. To understand current trends, up-to-date data from UK national sources, such as those available via NHS Digital (e.g., hospital episode statistics, hospital admitted patient care activity, emergency admissions with secondary diagnosis of dementia) can be examined.

Implications for nursing workforce planning

It should be noted that there were no studies that explicitly analysed nursing workload as a result of rising comorbidity, population age or acuity. It is also not clear to what extent the factors identified are reflected in current

acuity/dependency measures. However, each of these factors has been shown to influence functional status, which in turn leads to increased nursing workload[12]. Specifically, the increased workload of caring for patients with dementia and obesity has been demonstrated via other reviews [13, 14]. Therefore, while there may be a lack of studies directly measuring nursing workload, there is a surplus of data and evidence showing that the patient characteristics and conditions that are known to impact nursing workload have increased over time.

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