

Evaluating mental health decision units in acute care pathways (DECISION): a quasi-experimental, qualitative and health economic evaluation

Steve Gillard,^{1*} Katie Anderson,¹ Geraldine Clarke,² Chloe Crowe,³ Lucy Goldsmith,⁴ Heather Jarman,⁵ Sonia Johnson,⁶ Jo Lomani,¹ David McDaid,⁷ Paris Pariza,² A-La Park,⁷ Jared Smith,⁴ Kati Turner⁴ and Heather Yoeli¹

¹School of Health and Psychological Sciences, City, University of London, London, UK

²Improvement Analytics Unit, Health Foundation, London, UK

³Adult Acute Mental Health Services, North East London NHS Foundation Trust, London, UK

⁴Population Health Research Institute, St George's, University of London, London, UK

⁵Emergency Department Clinical Research Unit, St George's University Hospitals NHS Foundation Trust, London, UK

⁶Division of Psychiatry, University College London, London, UK

⁷Care Policy and Evaluation Centre, London School of Economics and Political Science, London, UK

*Corresponding author steven.gillard@city.ac.uk

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Disclaimer: This report contains transcripts of interviews conducted in the course of the research, or similar, and contains language that may offend some readers.

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Scientific summary

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Background

Mental health crisis care is under intense pressure in the UK and in equivalent systems internationally. Mental health attendances at emergency departments (EDs) are increasing while the number of available psychiatric inpatient beds is decreasing, resulting in challenges to the ED system and lengthy waits for people in mental health crisis. Poor experiences and low levels of satisfaction with mental health care all point to the ED as being a far from ideal environment for support and treatment for mental health crisis.

People experiencing mental health crises are often admitted to an acute psychiatric ward. Psychiatric inpatient stays can be costly, in some cases detrimental to mental health, disproportionately harmful to people from some minority ethnic groups and reportedly unnecessary for as many as 17% of referred individuals. To address these growing challenges, policy in England has called for the development and evaluation of new, more effective, models of crisis care. Alongside street triage, crisis houses and crisis cafes, psychiatric decision units (PDUs) have emerged as one of a number of responses.

There is no single service specification for PDUs in England but rather a shared set of characteristics. PDUs are short-stay facilities, based either at psychiatric or general hospital sites, offering time-limited care (typically up to 24–72 hours) including overnight stay. The focus of PDUs is on providing a comprehensive assessment in a calm, safe environment, offering therapeutic input as appropriate, and onward signposting and referral to a range of community-based care, both within and outside the NHS. Staff-to-patient ratio – at around one to two – can be higher than an inpatient ward (typically around one to four). PDUs are often nurse led, supported by healthcare assistants, with consulting input from psychiatry. Overnight accommodation generally comprises reclining seating rather than beds. Units tend to be small, with a capacity of around six to eight.

Objectives

The aim of the study was to ascertain the structure and activities of operational PDUs in England and to provide an evidence base for their effectiveness, costs and benefits, and optimal configuration. The study addressed the following research questions:

1. What is the range of hospital-based, short-stay interventions internationally designed to reduce admissions to acute psychiatric inpatient care and what is their effectiveness?
2. What is the scope and prevalence of PDUs nationally and how are they configured?
3. How has the introduction of PDUs impacted on psychiatric inpatient admissions and ED psychiatric episodes/breaches?
4. What are the care pathways before and following an admission to the PDU?
5. What is the impact of the introduction of PDUs on inequalities of access to acute mental health services?
6. How do service users experience PDUs and crisis care pathways before and after admission to PDU?
7. How are decisions made about referral and admission to PDU, and assessment and onward signposting and referral?
8. How do the economic costs and impacts of PDUs compare with areas without PDUs?
9. How do the costs for individual service users following PDU implementation compare with their costs prior to the introduction of PDUs to crisis care pathways?

Methods

This was a mixed-methods study in six work packages (WP): WP1 – systematic review and service mapping; WP2 – interrupted time series (ITS); WP3 – synthetic control study; WP4 – cohort study; WP5 – qualitative interview study; WP6 – health economic analysis. With the exception of WP1, the study took place in four sites; sites were mental health NHS trusts that had an operational PDU, and the EDs at NHS hospitals in the same locality as the mental health trust (MHT) that referred to the PDU.

WP1: service mapping

We conducted a survey of PDUs in England, establishing their prevalence and structure, and how they complement other NHS crisis care services locally. Participants were freedom of information officers and mental health service managers at all mental health NHS trusts in England ($n = 53$). A 29-item questionnaire was developed to determine whether mental health NHS trusts had a PDU, the operational structure of PDUs and the existence of alternative assessment and crisis care provision. Descriptive statistics were used to present survey findings.

Systematic review

We searched EMBASE, MEDLINE, CINAHL, PsycINFO® (American Psychological Association, Washington, DC, USA) and the Cochrane Central Register of Controlled Trials for controlled or comparison group studies of hospital-based mental health assessments permitting overnight stays of a maximum of 1 week that measured adult acute psychiatric admissions and/or mental health presentations at an ED. Selection, data extraction and quality rating of studies were double assessed. Quality was assessed using the Cochrane Collaboration's revised risk of bias tool RoB-2 and the Risk of Bias in Non-randomised Studies of Interventions (ROBINS-I) tool, as appropriate. Narrative synthesis of included studies was undertaken and meta-analyses performed where sufficient studies reported outcomes.

WP2: interrupted time series

Changes in acute and psychiatric hospital activity following the introduction of PDUs in four sites were assessed via a retrospective, secular trend analysis using an interrupted time series (ITS) design, considering routinely collected healthcare data in the 24 months before and 24 months after the opening of PDUs, extracted from electronic patient records at each site. Primary mental health outcome was informal psychiatric admission, primary ED outcome was mental health presentation at the ED. A small number of semistructured interviews were conducted with strategic managers in each site to identify other changes to the crisis care pathway (e.g. introduction or withdrawal of relevant services).

Outcome data were collated as time series over a (maximum) 48-month period for each site, aggregated to a single observation at weekly or monthly units depending on the variable under study. Segmented generalised linear model (GLM) regression analyses were employed to evaluate whether there was a change in healthcare utilisation outcomes following PDU implementation. To estimate overall effects, parameter estimates of PDU effect were pooled across sites in a meta-analytical model. Secondary analyses of primary outcome measures in ITS were also performed to attempt to account for the impact of other service reconfigurations.

WP3: synthetic control study

Patient-level service use data were obtained from Hospital Episode Statistics admitted patient care (HES-APC) and emergency care (HES-ED) data sets. Treated trusts comprised the four MHTs with PDUs and their six referring acute trusts. A total of 38 MHTs and 136 acute trusts in areas without PDUs were included as potential controls. Primary mental health outcome was rate of admissions to any psychiatric acute admission per 10,000 patients in the MHT catchment area; primary ED outcome was rate of mental health attendances at the department per 10,000 patients in the acute trust catchment area.

The closest 10 peers for MHT outcomes and 20 peers for acute trust outcomes according to annual data available for 2018/19 were used as the control pool for each trust. We used the generalised synthetic control method to estimate the impact of the PDU on each outcome separately at each treated trust, risk-adjusted to control for relevant variation over time in the population and assessed for significance by a parametric bootstrap procedure.

WP4: cohort study

Participants were individuals experiencing their first visit to a PDU over a 5-month period ($n = 1176$), with routine service use data collected for periods of 9 months both preceding and following first visit to PDU, extracted from electronic patient records by business intelligence teams at each site. Because the follow-up period coincided with 'lockdown' measures at the start of the COVID-19 pandemic, a similar dataset was collected from a retrospective cohort for periods one prior to our primary cohort ($n = 972$). We compared inpatient and community mental health service use in the pre- and post- first-visit periods using paired t -tests bootstrapped with 2000 replications for continuous data or McNemar's χ^2 tests for binary paired data. We used z -tests to compare the demographics of those individuals in the primary cohort accessing the PDU to the general population of service users at each site.

WP5: qualitative interview study

Lived-experience researchers conducted in-depth interviews with first-time visitors to PDUs ($n = 39$) within 1 month of discharge and again 9 months later, exploring their experiences of the PDU and of the crisis care pathway. We interviewed PDU clinical staff ($n = 15$) about their experiences of working on the unit and clinicians referring to PDUs ($n = 19$) about their expectations of PDUs and experiences of referring to units. Data were analysed thematically using a co-production approach to ensure that service users and lived-experience researcher priorities and concerns were integrated alongside those of clinicians and other academic researchers.

WP6: health economic analysis

The health economic analysis used data from all other WPs. Data from the ITS and synthetic control studies were used to compare site-level resource use and healthcare costs of psychiatric admissions and ED mental health attendances (and associated activity) in pre and post PDU implementation periods, and between areas with PDUs and those without, respectively. We considered the cost of operating PDUs at each site and estimated, at site level, return on investment from an NHS perspective. We used cohort study data to estimate individual patient-level changes in resource use and costs to the NHS in the 9 months following the PDU visit for each site. To inform scenario modelling, regression analyses were used to identify potential explanatory factors for differences in levels of cost for different sociodemographic groups. Scenario modelling was also informed by quality-of-life data for a small number of participants ($n = 148$). For all analyses costs were reported in 2019/20 prices, taken from national reference costs and annual unit costs of health and social care.

Synthesis

Syntheses of data from across WPs and sites was conducted using a critical interpretive synthesis approach to develop a number of 'synthesising arguments' that offered explanatory insight into findings and informed applied learning. An interpretive workshop involving the research team and a lived-experience advisory panel was held to ensure that service user views and experiences informed this process alongside clinical and academic perspectives.

Results

Our mapping exercise revealed PDUs in just six MHTs in England, of various configurations, with a small number of other units recently decommissioned and more about to open. The ITS study demonstrated a reduction in informal psychiatric admissions post PDU opening in some sites and overall, but with no clear continuing trend in admissions. Formal admissions increased overall and there was no change in

overall levels of inpatient psychiatric activity following the opening of a PDU. There was reduction in ED-based liaison psychiatric episodes in one site but an upward trend continued overall. Mental health presentations at ED dropped in the same site but with, again, no overall change. There was no change in breaches of 4-hour waits in EDs and overall length of wait increased. The implementation of other crisis services (e.g. street triage) in the study period were shown to consolidate the effect of PDUs. In the synthetic control study, there was no overall change in rate of total psychiatric admissions in study sites compared with controls post PDUs opening, but length of psychiatric inpatient stays was shorter in some sites and overall. Rate of mental health presentations at the ED was lower than controls at one site but not overall, while length of ED waits and proportion of waits breaching 4-hour targets were again lower at one site compared with control but unchanged overall.

The cohort study indicated that use of both inpatient and community mental health care was significantly higher post visit to PDU than pre first visit at all sites (while numbers of ED-based liaison psychiatry episodes dropped at some sites). There were few differences in service use between pre-pandemic and primary cohorts, although community mental health service contacts were more likely to be remote and less likely to be face to face, and contacts with crisis resolution and home treatment teams reduced in some sites during the pandemic. First-time visitors to PDU were more likely to be younger than trust-wide populations, and at some sites more likely to be male and less likely to be White British. In the qualitative interview study, many people staying on PDUs found them safe, calming and supportive and appreciated the opportunity to talk in depth to staff members. However, in some cases they reported being discharged too quickly while still feeling suicidal, and they indicated that PDUs were only as effective as the support in the community that they were signposted to. PDU staff found work on the units rewarding, including the additional responsibility that came with working on nurse-led units, and felt supported in the team, but work was emotionally demanding and could result in high staff turnover. Staff referring to PDUs felt units were valuable but sometimes had different expectations of the function of PDUs and tension could arise between PDU and referring teams where communication was not as clear as it might be.

The economic analysis estimated that there were marginal savings (and some increases in cost) relating to within-site changes in psychiatric inpatient and ED attendance activity, and larger savings compared with controls resulting from overall shorter psychiatric admissions (mostly driven by findings at one site) and lower rates of ED attendances at some sites. The costs of operating PDUs varied in relation to staff-patient ratios, as did per visit costs, which were also impacted by average length of stay on units. These costs substantially outweighed any savings from PDUs (except at our outlier site where length of psychiatric stay was reduced compared with control in one analysis). There were additional individual-level costs associated with increased inpatient and community mental health service use following the first visit to a PDU. However, this was a short-term view that did not take into account potential gains to quality of life indicated by our data (neither did we assess possible non-NHS cost savings). Modelling indicated the PDUs may be cost-effective in certain scenarios and that this warrants further research.

Conclusions

Our synthesis indicated that, where staff-patient ratio was higher and length of stay longer, PDUs have the potential to reduce informal psychiatric admissions and improve quality of care for a group of people who have high levels of acute needs but who might not benefit from inpatient admission (these units cost more to operate). PDUs with higher capacity and shorter length of stay might impact mental health attendances in the ED (this distinction reflects findings internationally in our systematic review). In either case, PDUs should not be commissioned with the expectation of a simple financial return on investment. However, where PDUs are configured with a clear aim in mind and integrated alongside a range of crisis and community mental health support, they improve quality of care and facilitate access to appropriate care, potentially reducing level and cost of acute and emergency mental health service use.

Study registration

The systematic review was registered on the International Prospective Register of Systematic Reviews as CRD42019151043.

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