BMJ Open

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Journal:	*BMJ Open*
Manuscript ID	bmjopen-2021-059102.R1
Article Type:	Original research
Date Submitted by the Author:	31-Jan-2022
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Primary Subject Heading:	Health policy
Secondary Subject Heading:	Health services research
Keywords:	MENTAL HEALTH, COVID-19, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, ACCIDENT & EMERGENCY MEDICINE

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Patients presenting to an acute general hospital with acute mental health needs. A retrospective observational cohort study.

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Word count: 2055

ABSTRACT

Objectives

To examine the numbers and patterns of patients presenting to an urban acute general hospital with acute mental health presentations and to further investigate any variation related to the covid pandemic.

Design

Retrospective observational cohort study.

Setting

An urban acute general hospital in London, United Kingdom, comprising of five sites and two emergency departments. The hospital provides tertiary level general acute care but is not an acute mental health services provider. There is an inpatient liaison psychiatry service

Participants

358131 patients attended the emergency departments of our acute general hospital during the study period. Of these, 14871 patients attended with an acute mental health presentation. A further 14947 patients attending with a physical illness were also noted to have a concurrent recorded mental health diagnosis.

Results

Large numbers of patients present to our acute general hospital with mental health illness even though the organisation does not provide mental health services other than inpatient liaison psychiatry. There was some variation in the numbers and patterns of presentations related to the Covid-19 pandemic.

Patient numbers reduced to a mean of 9.13 (SD 3.38) patients presenting per day during the first 'lockdown' compared with 10.75 (SD 1.96) patients per day in an earlier matched time period (t=3.80, p<0.01). Acute mental health presentations following the third lockdown increased to a mean of 13.84 a day.

Conclusions

Large numbers of patients present to our acute general hospital with mental health illness. This suggests a need for appropriate resource, staffing and training to address the needs of these patients in a non-mental health provider organisation and subsequent appropriate transfer for timely treatment. The Covid-19 pandemic and the resulting lockdowns have resulted in variation in the numbers and patterns of patients presenting with acute mental health illness but, these presentations are not new. Considerable work is still needed to provide integrated care which addresses the physical and mental healthcare needs of patients presenting to acute and general hospitals

Strengths and limitations of this study

- This is a retrospective study
- The study examines a large number of patient care episodes.
- Diagnostic coding is open to error in recording and interpretation.
- There is implicit risk in using routinely collected data to evaluate a research question where the data may has not been collected for this specific purpose

KEY WORDS

Mental health, Covid-19, lockdown, emergency department, acute general hospital

DATA SHARING STATEMENT

Data are available upon reasonable request.

INTRODUCTION

There is significant overlap in the mental and physical health needs for patients and for some time it has been an aspiration to offer integrated care. The National Confidential Enquiry into Patient Outcome and Death (NCEPOD) investigated and reported on the mental health needs of patients treated in acute general hospitals for physical illnesses in 2017 and made several recommendations.[1] Key among these were that all hospital staff who have interaction with patients, including clinical, clerical and security staff, should receive training in mental health conditions in general hospitals. Training should be developed and offered across the entire career pathway from undergraduate to workplace based continued professional development. The report also recommended that in order to overcome the divide between mental and physical healthcare, liaison psychiatry services should be fully integrated into general hospitals. The structure and staffing of the liaison psychiatry service should be based on the clinical demand both within working hours and out-of-hours so that they can participate as part of the multidisciplinary team. These recommendations have only been adopted in part in many places and still represent a challenge several years later.

The delivery of truly integrated assessment and care for patients presenting to acute general hospitals where mental health services are not normally provided requires careful planning and an understanding of the numbers and types of patients presenting. This is so that an assessment can be made as to what is required to meet their needs and to provide high-quality care and patient experience.

We undertook this study to examine the numbers and patterns of patients presenting to an urban acute general hospital with acute mental health presentations via the emergency department. This hospital does not provide any routine mental health services other than an inpatient liaison psychiatry service.

We hypothesised that our study would confirm a large number of patients presenting with acute episodes of mental health conditions despite the fact that the hospital does not provide mental health services. We further hypothesised that our study would demonstrate increasing numbers of patients presenting in this way over time and that this might be representative of the situation more generally and beyond our organisation.

The period of our study included the first waves of the global covid-19 pandemic and so we also examined whether there was any effect on the patterns and numbers of patient presentations as a result of the pandemic and the social restrictions associated with the mandated periods of social lockdown where normal mixing and social interaction were severely restricted. We hypothesised that the periods of the social lockdown would result in increasing numbers of patients presenting via the emergency department with acute mental health needs.

METHODS

Data and setting

We conducted a retrospective observational cohort study of all patients presenting to an urban acute general hospital with an acute mental health illness presentation. Our hospital organisation is made up of 5 hospital sites served by 2 acute emergency departments. Presentations to both emergency departments were included. All hospital attendances, admissions and treatments are recorded and coded to form data for Hospital Episode Statistics (HES) and are also recorded in the electronic patient record (EPR).

We used the United Kingdom government website to confirm the dates of mandated social lockdown (L) periods.[2] We included the 3 periods of national lockdown in the United Kingdom which occurred during the study period.

Lockdown 1 (L1) was defined between 23 March 2020 and 15 June 2020. Lockdown 2 (L2) was defined between 5 November 2020 and 2 December 2020. Lockdown 3 (L3) was defined between 6 January 2021 and 12 April 2021. For analysis and comparison, we defined the periods between the statutory periods of lockdown to be 'inter-lockdown' (IL) periods. Inter-lockdown 1 (IL1) was therefore defined between 16 June 2020 and 4 November 2020. Inter-lockdown 2 (IL2) was defined between 3 December 2020 and 5 January 2021. Inter-lockdown 3 (IL3) was defined between 13 April 2021 and 30 June 2021, when the study period ended after the final national lockdown.

Numbers and patterns of presentation were examined longitudinally to identify trends. We also examined and compared data for lockdown (L) and inter-lockdown (IL) periods with matched time

periods (MTP) between March 2018 and June 2019 in order to examine for any effects related to the covid-19 pandemic.

Patients

We included all adult patients aged 18 years and older. We examined the hospital coding records and electronic patient records for all adult patients attending our emergency departments with an acute mental health presentation between 1 January 2018 and 30 June 2021. HES data and patient records were examined to collate demographic information, diagnosis, details of initial referral and treatment, waiting times and admission.

Statistical analysis

We analysed data using SPSS Statistics version 26.0. We present data as means with standard deviations or median values with interquartile ranges. We used the standard t-test, Chi-squared tests, and ANOVA with post-hoc Tukey test to compare categorical and continuous data between matched time periods.

Patient and public involvement

Patients and the public were not involved in framing or designing this research question. As it is a retrospective cohort study there was no patient impact. We did ask strategic lay forum members at our hospital to read and comment on our manuscript.

RESULTS

Numbers of patients

358131 patients attended our emergency departments between 1 January 2018 and 30 June 2021. Of these, 14871 patients (4.2%) presented to our emergency departments with an acute mental health diagnosis (fig 1). In addition, 14947 patients (4.2%) who presented with a physical complaint also had a concurrent recorded mental health diagnosis.

Presentations

The numbers of patients presenting during the covid-19 pandemic varied considerably. The numbers of patients presenting with acute mental health illness was at the lowest level during the first lockdown (L1) period (fig 2). When compared with a matched time period (MTP) in 2018, 761 patients presented acutely in L1 compared with 897 patients in MTP1 (figs 2 and 3). This represents a mean of 9.13 (SD 3.38) patients presenting per day during L1 compared with 10.75 (SD 1.96) patients per day during MTP1 ($t=3.80$, $p<0.01$).

Following the first lockdown there was a significant increase in acute mental health presentations during IL1 compared with a MTP in 2018 ($t=-5.34$, $p<0.01$). There was a similar increase in acute mental health presentations following the third lockdown in IL3, with a mean 13.84 acute mental health presentations per day which was significantly greater than the number of attendances for the MTP in 2019 ($t=-10.79$, $p<0.01$)

Age

The mean age of patients presenting to the department was 38.57 years (n= 14871, SD= 15.041). There was no significant difference in the age of presentation when different time periods were compared. (ANOVA, f=2.0357, p=0.0574).

Diagnoses and patterns of illness

There was variation in the pattern of mental health illness presenting to our emergency departments (figs 4a and 4b). We noted a significant increase (t=-13.62, p<0.01) in patients presenting with psychosis in L1. There were a mean 2.11 (SD 0.85) presentations of psychosis per day during L1 compared with a mean 0.77 (SD 0.30) of such presentations during the respective MTP. In contrast, we saw a significant decrease in presenting rates of self-harm (t=-2.45, p=0.02) and substance misuse (t=6.28, p<0.01) per day in L1 when compared to the MTP.

IL1 saw an increase in patients presenting with acute psychosis (t=-8.56, p<0.01), anxiety (t=-4.41, p<0.01), overdose (t=-11.7, p<0.01), and suicidal presentations (t=-7.34, p<0.01), compared to the respective MTP, whilst substance misuse presentations decreased (t=2.56, p=0.01). In L2 we recorded a continuing increase in patients attending with anxiety (t=-3.50, p<0.01), self-harm (t=-2.25, p=0.03), and suicidal presentations (t=-6.82, p<0.01), whilst presentations of overdoses (t=2.58, p=0.02) and affective disorders decreased (t=5.60, p<0.01). IL2 showed decreased rates of substance misuse, affective disorders, and suicidal presentations.

Overall, the broad patterns and relative distributions of key diagnosis groups did not change when study periods (lockdown and inter-lockdown periods) were compared with MTPs (figs 2 and 3) except for during L1 when psychosis became the most common acute mental health diagnosis.

Emergency Department assessment and outcome

Patients attending with an acute mental health presentation spent a considerable amount of time in the emergency department before transfer was arranged to an appropriate inpatient mental health facility or they were assessed and discharged by the community mental health assessment team. Overall, the mean time spent in the department for these patients was 6 hours 52 minutes (n= 14871, SD= 376.80) with no significant variation when lockdown and inter-lockdown periods were compared (fig 5).

There were no significant differences in the proportions of patients being discharged directly or transferred to an inpatient mental health care facility from the emergency department during the lockdown and inter-lockdown periods.

DISCUSSION

There was considerable concern during the covid-19 pandemic that social isolation resulting from statutory lockdown periods would result in a considerable burden of mental health illness and morbidity.[3,4] There are several reports that patients have been making increased self-reports of symptoms of anxiety, depression and other acute mental health disorders since the beginning of the covid-19 pandemic.[5,6] The associated economic recession may also be an important factor.

There is longstanding evidence that patients with acute mental health illness present to the emergency departments of acute general hospitals;[1] illness is not always specifically identified as physical or mental and the emergency department is identified as a place of safety where assessment and treatment can be started. Our study showed that considerable numbers of patients attend our emergency departments each week with acute mental health presentations. The covid-19 pandemic resulted in some variations in the patterns of mental health illness that were seen; mental health presentations during the first lockdown period fell as did all non-covid-19 related presentations in our emergency departments. The reasons for this are multi-factorial and likely include reduced social movement during lockdown as well as patient concern and fears about attending a hospital during a pandemic. These factors may mean that while the numbers presenting to the emergency department are reduced during the lockdown, this may underrepresent the true level of mental health morbidity in the community that is simply not presenting to hospital during the pandemic. This is possibly one explanation for the rebound increase in acute mental health presentations seen following a lockdown in the inter-lockdown period.

Our study showed that 4% of patients attending our emergency departments had an acute mental health problem and 4% of patients although attending for a physical health complaint, were known to have a concurrent mental health diagnosis. This supports the findings of the 2017 NCEPOD report and specifically the recommendations that there is a need for training and resource to equip staff in acute general hospitals to address the needs of patients presenting with mental health illness. In the years since the publication of the NCEPOD report, Treat as One. Bridging the gap between mental and physical healthcare in general hospitals, our findings suggest that there is still considerable work to do in order to achieve the standards and recommendations that it made.[1]

The fact that patients presenting with acute mental illness still suffer extended waiting times in the emergency department is indicative of this failing. Again, this is likely to be multifactorial and may represent delays in initial assessment or in the ability to exclude and treat physical illness appropriately. Patients attending the emergency department may need to have physical disease and illness excluded or treated before or concurrently with their mental health needs and this can take time. Extended waiting times may also reflect a lack of capacity to transfer patients to an appropriate mental health care facility for timely treatment. Mean waiting times in the emergency department of 6-7 hours do not suggest that mental and physical care are well integrated and may indicate that there are opportunities to improve the quality of care and the experience for these patients.

Our study has several limitations which include the retrospective nature of the study. Diagnoses were identified and confirmed from the electronic patient record and coding for patient episodes of care which are open to a degree of error in recording and interpretation. This potential for error was partly mitigated because acute mental health diagnoses were confirmed by a psychiatrist in the acute setting.

CONCLUSION

Patients present to acute general hospitals with both physical and mental health complaints. Our study shows that while the covid-19 pandemic and the use of lockdowns may have had some impact on the patterns and specific mental health diagnoses that were seen in our emergency departments, the mental health workload and need in acute general hospitals is longstanding. This has not been substantially changed by the covid-19 pandemic.

Our study does show that several years later, considerable work is still needed to provide integrated care which addresses the physical and mental healthcare needs of patients presenting to acute general hospitals. The recommendations of the National Confidential Enquiry into Postoperative Outcome and Death 'Treat as One' remain as valid and important today as they were in 2017.[1]

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Contributorship statement

All authors contributed to the study design. RA and JS conceived the study design. JC, RB and JB collected and analysed the data. JB undertook the statistical analysis. JC, RB, JB and JS contributed to the drafting and critical review of the manuscript. RA revised and edited the manuscript. All authors approved the final draft. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted. RA is the guarantor of this study.

JC, RB and JB contributed equally to this study and are recognised as joint first authors.

Competing interests

The authors have no competing interests to declare

Funding

None

DATA SHARING STATEMENT

Data are available upon reasonable request.

Ethical approval

This study involves human participants but an Ethics Committee(s) or Institutional Board(s) exempted this study. Data were anonymised before being accessed and used and analysed by the authors for this study.

Figures and Legends

Figure 1 Mean number of presentations with acute mental health illness per week 1 January 2018 - 30 June 2021

Figure 2 Patterns of diagnosis and presentation. Mean presentations per day during the covid-19 pandemic

Figure 3 Diagnosis patterns for acute mental health presentations 1 January 2018-30 June 2021

Figure 4a Diagnosis for acute mental health presentations 1 January 2018 – 30 June 2021. Raw number of admissions over each time period.

Figure 4b Diagnosis for acute mental health presentations 1 January 2018 - 30 June 2021. Numbers expressed as a percentage of overall admissions for each time period.

Figure 5 Waiting time in the emergency department for patients attending with acute mental health presentations 1 January 2018 – 30 June 2021.

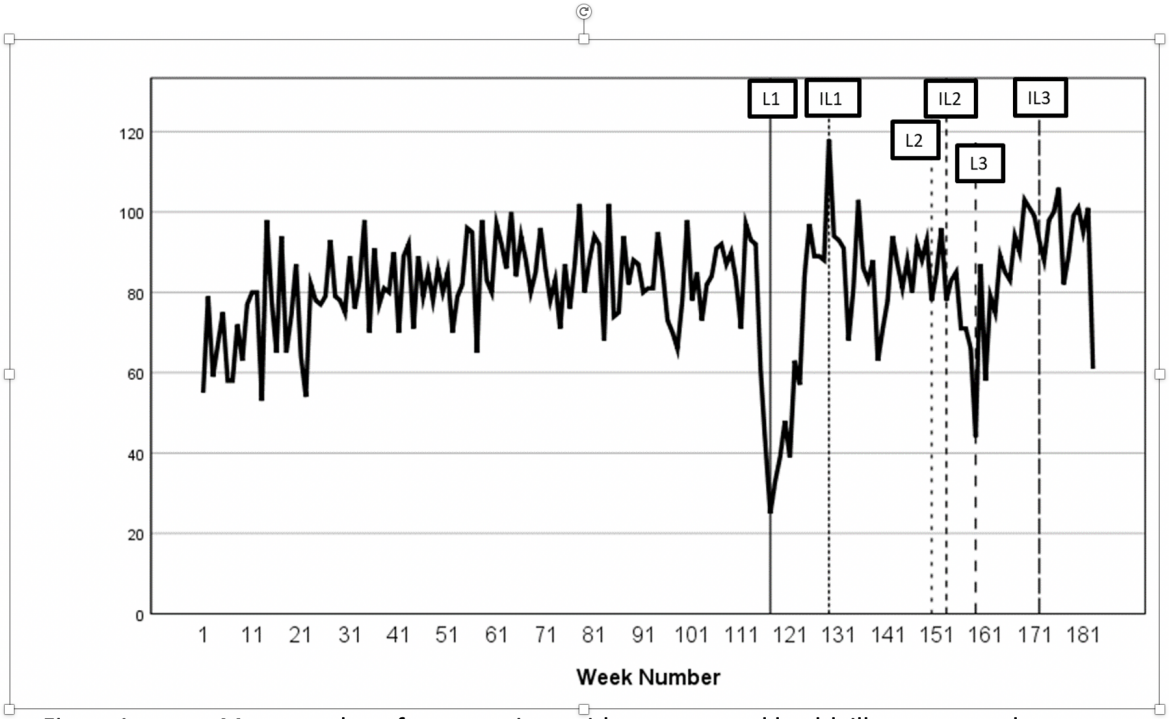
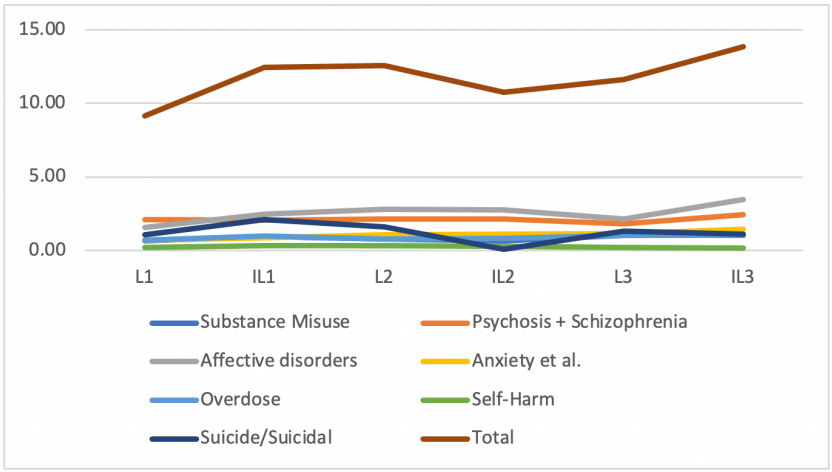


Figure 1 Mean number of presentations with acute mental health illness per week 1 January 2018 - 30 June 2021

Figure 2 Patterns of diagnosis and presentation. Mean presentations per day during the covid-19 pandemic



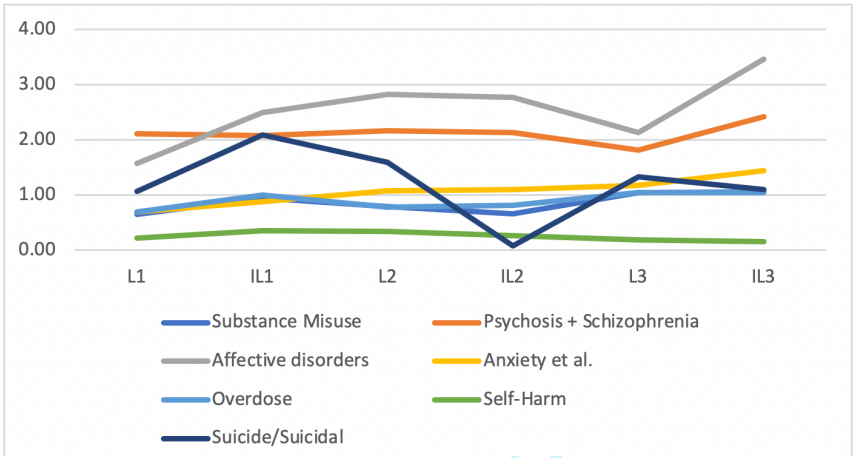
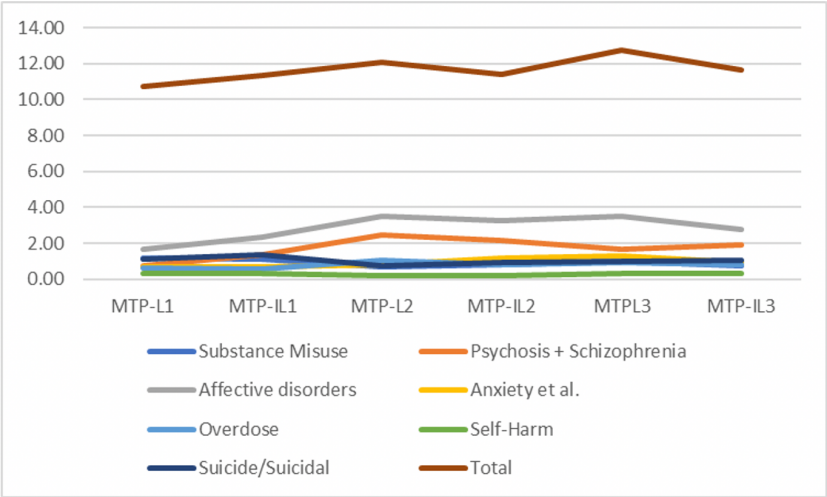
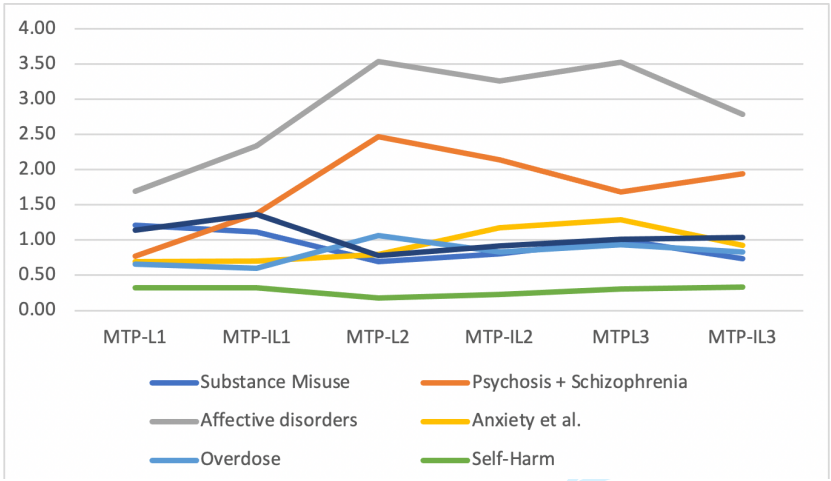


Figure 3 Patterns of diagnosis and presentation. Mean presentations per day during the matched time periods (MTP)





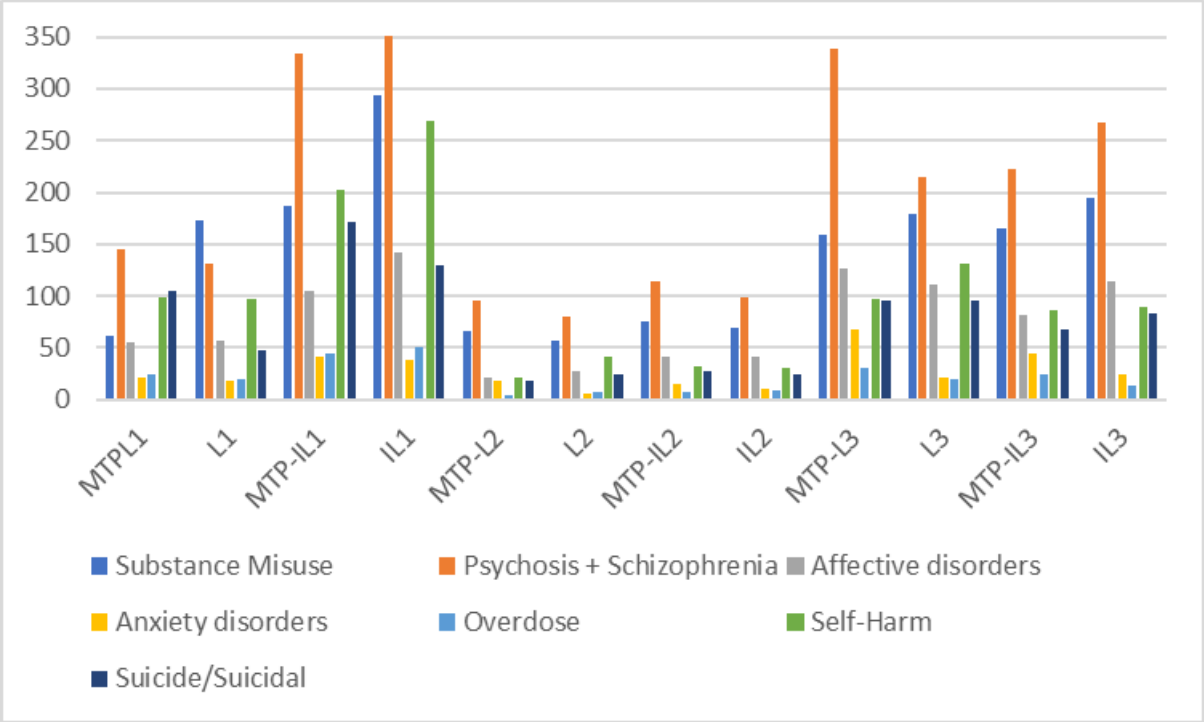


Figure 4a Diagnosis patterns for acute mental health presentations 1 January 2018-30 June 2021.

Raw number of admissions over each time period.

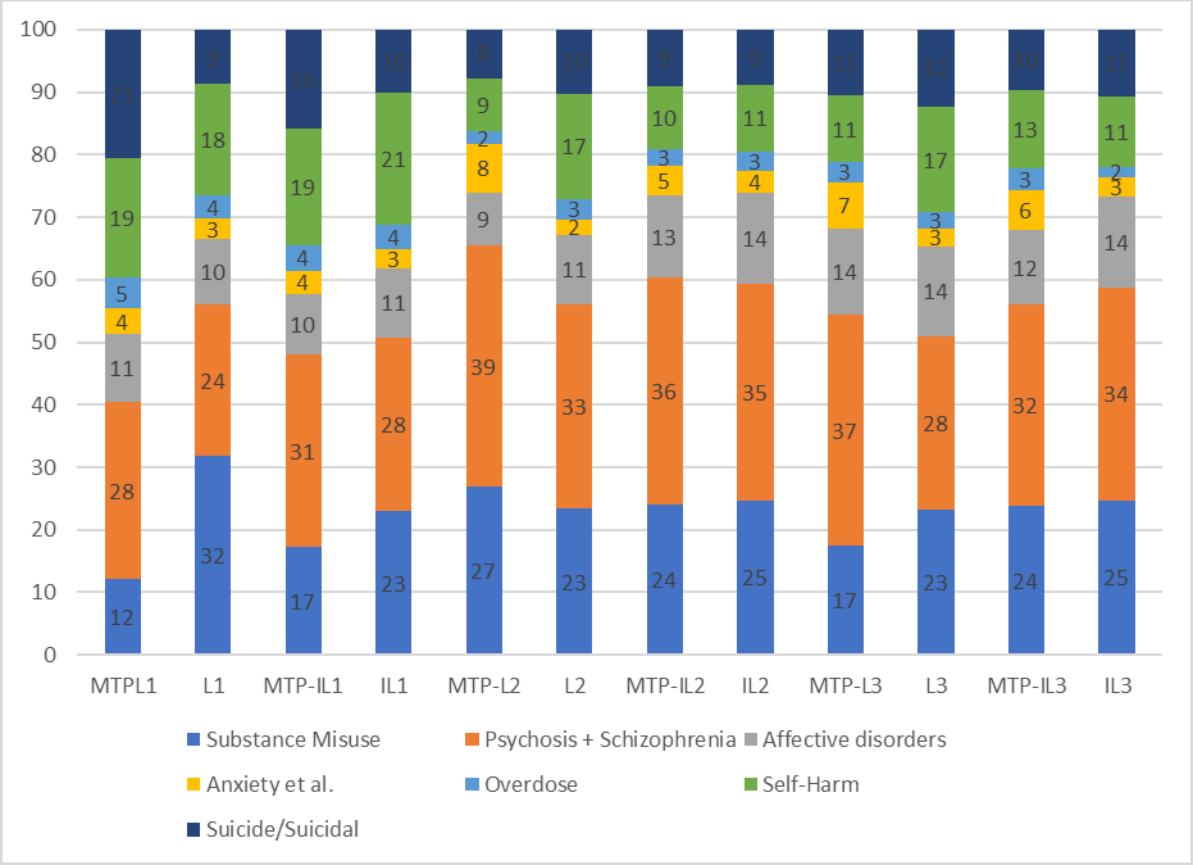


Figure 4b Diagnosis patterns for acute mental health presentations 1 January 2018-30 June 2021.

Each diagnosis as a percentage of overall admissions over each time period.

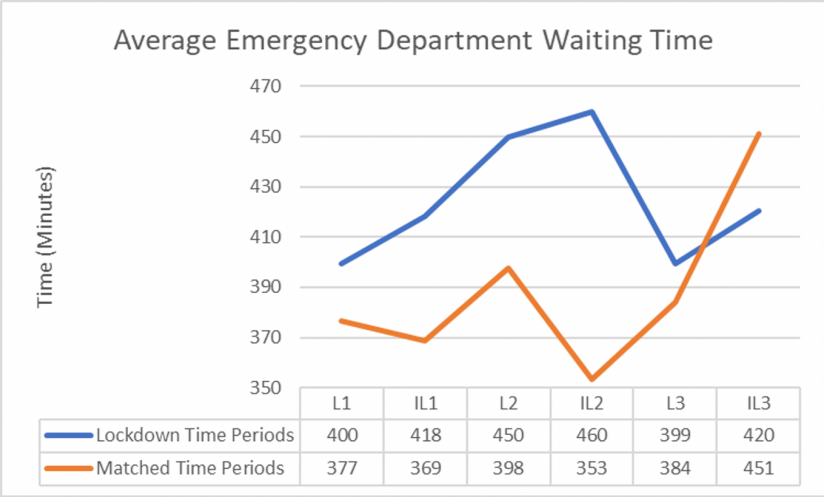


Figure 5 Waiting time in the emergency department for patients attending with acute mental health presentations 1 January 2018 – 30 June 2021

Align to Right

The RECORD statement – checklist of items, extended from the STROBE statement, that should be reported in observational studies using routinely collected health data.

	Item No.	STROBE items	Location in manuscript where items are reported	RECORD items	Location in manuscript where items are reported
	1	(a) Indicate the study's design with a commonly used term in the title or the abstract (b) Provide in the abstract an informative and balanced summary of what was done and what was found	Title Line 1 Abstract Line 49	RECORD 1.1: The type of data used should be specified in the title or abstract. When possible, the name of the databases used should be included. RECORD 1.2: If applicable, the geographic region and timeframe within which the study took place should be reported in the title or abstract. RECORD 1.3: If linkage between databases was conducted for the study, this should be clearly stated in the title or abstract.	Methods Lines 143-145 Abstract Lines 51-54 Not applicable
Introduction					
Background rationale	2	Explain the scientific background and rationale for the investigation being reported	Introduction Lines 92-125		
Objectives	3	State specific objectives, including any prespecified hypotheses	Introduction Lines 92-125		
Methods					
Study Design	4	Present key elements of study design early in the paper	Methods Lines 140-162		
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Abstract Lines 51-54 Methods Lines 140-162		

Participants	6	*(a) Cohort study* - Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study* - Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study* - Give the eligibility criteria, and the sources and methods of selection of participants *(b) Cohort study* - For matched studies, give matching criteria and number of exposed and unexposed *Case-control study* - For matched studies, give matching criteria and the number of controls per case	Methods/Patients Lines 164-169 Methods Matched time periods described lines 159-162	RECORD 6.1: The methods of study population selection (such as codes or algorithms used to identify subjects) should be listed in detail. If this is not possible, an explanation should be provided. RECORD 6.2: Any validation studies of the codes or algorithms used to select the population should be referenced. If validation was conducted for this study and not published elsewhere, detailed methods and results should be provided. RECORD 6.3: If the study involved linkage of databases, consider use of a flow diagram or other graphical display to demonstrate the data linkage process, including the number of individuals with linked data at each stage.	Methods/Patients Lines 164-169 Not applicable Not applicable
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable.	Methods/Patients studied outcomes recorded Lines 165-170	RECORD 7.1: A complete list of codes and algorithms used to classify exposures, outcomes, confounders, and effect modifiers should be provided. If these cannot be reported, an explanation should be provided.	Not applicable
Data sources/ measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Methods/Patients Lines 165-170 Lines 140-145		

Bias	9	Describe any efforts to address potential sources of bias	The use of HES data which is nationally collected and validated lines 140-145 and lines 165-170		
Study size	10	Explain how the study size was arrived at	Methods Lines 140-145		
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen, and why	Methods/Statistical analysis Lines 171-174		
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) *Cohort study* - If applicable, explain how loss to follow-up was addressed *Case-control study* - If applicable, explain how matching of cases and controls was addressed *Cross-sectional study* - If applicable, describe analytical methods taking account of sampling strategy (e) Describe any sensitivity analyses	Methods/Statistical analysis Lines 171-174 Not applicable		
Data access and cleaning methods		..		RECORD 12.1: Authors should describe the extent to which the investigators had access to the database	Not applicable 12.1 and 12.2

				population used to create the study population. RECORD 12.2: Authors should provide information on the data cleaning methods used in the study.	
Linkage		..		RECORD 12.3: State whether the study included person-level, institutional-level, or other data linkage across two or more databases. The methods of linkage and methods of linkage quality evaluation should be provided.	Not applicable
Results					
Participants	13	(a) Report the numbers of individuals at each stage of the study (*e.g.*, numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed) (b) Give reasons for non-participation at each stage. (c) Consider use of a flow diagram	Methods All patients selected Lines 140-169	RECORD 13.1: Describe in detail the selection of the persons included in the study (*i.e.,* study population selection) including filtering based on data quality, data availability and linkage. The selection of included persons can be described in the text and/or by means of the study flow diagram.	Methods Lines 140-169
Descriptive data	14	(a) Give characteristics of study participants (*e.g.*, demographic, clinical, social) and information on exposures and potential confounders (b) Indicate the number of participants with missing data for each variable of interest (c) *Cohort study* - summarise follow-up time (*e.g.*, average and total amount)	Results lines 186-243 Not applicable Study period defined lines Methods/Patients Lines 165-170		

Outcome data	15	*Cohort study* - Report numbers of outcome events or summary measures over time *Case-control study* - Report numbers in each exposure category, or summary measures of exposure *Cross-sectional study* - Report numbers of outcome events or summary measures	Results lines 186-243		
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included (b) Report category boundaries when continuous variables were categorized (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	Results lines 186-243		
Other analyses	17	Report other analyses done—e.g., analyses of subgroups and interactions, and sensitivity analyses	Statistical analysis lines 172-175		
Discussion					
Key results	18	Summarise key results with reference to study objectives			
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	Limitations and strengths of study lines 80-86	RECORD 19.1: Discuss the implications of using data that were not created or collected to answer the specific research question(s). Include discussion of misclassification bias, unmeasured confounding, missing data, and changing eligibility over	Limitations and strengths of study lines 80-86

				time, as they pertain to the study being reported.	
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Discussion lines 251-288		
Generalisability	21	Discuss the generalisability (external validity) of the study results	Limitations and strengths of study lines 80-86 Generalisability and previous studies/NCEPOD report cited lines 275-280		
Other Information					
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	No funding Funding statement Lines 357-358		
Accessibility of protocol, raw data, and programming code		..		RECORD 22.1: Authors should provide information on how to access any supplemental information such as the study protocol, raw data, or programming code.	Not applicable

*Reference: Benchimol EI, Smeeth L, Guttmann A, Harron K, Moher D, Petersen I, Sørensen HT, von Elm E, Langan SM, the RECORD Working Committee. The REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) Statement. *PLoS Medicine* 2015; in press.