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Door locking and exit security measures on acute psychiatric admission wards

Short title: **Door locking on admissions wards**

Abstract

Background: Locking the exit doors of psychiatric wards is believed to reduce the risk of patients absconding. **Aims:** To both investigate the prevalence of door locking and other exit security measures on UK admission wards, as well as studying whether door locking appears to be effective in keeping inpatients in. **Methods:** A cross sectional survey on 136 acute psychiatric wards in the UK was conducted, in which a range of data on patients, staff, and conflict and containment events, including door locking and absconding was collected from shift-to-shift during a period of six months. **Results:** About a third of the participating wards (30%) operated with their ward exit door permanently locked, whereas another third (34%) never locked the ward door. Univariate analyses suggested little association between exit security measures and absconding. A more robust multilevel statistical analysis, however, did indicate a reduction of about 30% of absconding rates when the ward door was locked the entire shift. **Conclusion:** Although locking the ward door does seem to reduce absconding to a certain extent, it far from completely can prevent it. As it may be unrealistic to strive for a 100% absconding proof ward, alternative measures for door locking to prevent absconding are discussed.

Key index terms: Absconding, Aggression, Coercion, Locked wards;

Accessible summary:

- A study on the practices of door locking was conducted on 136 acute psychiatric wards.
- About a third of the participating wards (30%) operated with their ward exit door permanently locked, whereas another third (34%) never locked the ward door.
- Although locking the ward door does seem to reduce absconding to a certain extent, it far from completely can prevent it.
- Alternative measures for door locking to prevent absconding are discussed.

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Introduction

Common reasons for locking the exits door of psychiatric wards, as provided by ward managers are to "prevent patients from escaping", "legislation", "to provide patients and others with safety and security", "to prevent import and unwelcome visits", and "staff's need of control" (Haglund et al., 2007, p. 52). Mental health professionals also see many very serious disadvantages of locking ward doors, for instance that it makes patients feel confined and isolated, that it creates a non-caring environment, makes staff's power obvious and forces patients to adapt to other patients' needs, as well as that it causes extra work for staff (Haglund et al., 2006).

Today, the policies and practices of locking psychiatric wards vary considerably between countries. Door locking practices have also been subject to changes within countries as time has progressed (e.g., see Neuenschwander et al., 2003). Psychiatric inpatient wards in the UK, for instance, have been through several phases where ward doors were open or locked. Since the 1950s, acute inpatient care increasingly has taken place on open wards in the UK (Ashmore, 2008). By the 1970s, almost all non-forensic psychiatric ward doors in the UK were open, and the first locked psychiatric intensive care units (PICU's) were being created for patients unmanageable on open wards (Crowhurst & Bowers, 2002). By 2001, locking of psychiatric wards appeared to have made a return; a quarter of psychiatric wards in London were then permanently locked (Bowers et al., 2002).

A telephone survey conducted in 2003 confirmed that the rate of locked psychiatric wards in the UK in the beginning of the new century seemed to have gone up, but also that it was still rather low compared to many other European countries. From the British wards surveyed, 36% by then had their doors permanently locked. The Scandinavian countries Finland (92%), Norway (88%), and Sweden (83%), as well as Italy (80%) and the Netherlands (70%), appeared to have considerably higher rates of locked wards. Although the number of wards surveyed was limited for some countries in this study (i.e., 6 to 40 psychiatric wards were surveyed per country) conducted by members of the European Violence In Psychiatry Research Group (EVIPRG), this finding of 36% of wards being locked in the UK accords well with another study (Garcia et al., 2005) that reported 'frequent' use of door locking on 37% of UK psychiatric wards. A Swiss study (Neuenschwander et al., 2003) also indicated that door locking is more frequent in many other European countries. In that study it was found that the exit doors of five Swiss psychiatric emergency wards were open only on 14% of the days in the period 1995 - 1997. Recent findings of Haglund et al. (2007)

indicated that 73% of the Swedish psychiatric wards were locked on the day they conducted their survey study, and 66% of the surveyed wards were locked always or most of the time. A one-day census investigation in countries located in more Central and Eastern Europe (i.e., Austria, Hungary, Romania, Slovakia, Slovenia), however, suggested lower frequencies of door locking in that region (Rittmannsberger et al., 2004). Out of 4191 psychiatric inpatients included in that study, 21.4% were treated in a ward with locked doors on a certain day. This study, however, will also have included patients that were treated on other wards than admission wards; as all patients who were admitted for a period of one year or less were included in the study.

Alongside the trend that the number of locked wards in the UK gradually seems to be increasing, psychiatric care in the UK during the last two decades also has been marked by a decrease in inpatient population and care, the opening of PICUs, and the continued development of community care (Boardman, 2005). Possibly, changes in patients' characteristics, with only the more severely disturbed being admitted, has instigated greater use of door locking. It seems that the change in door locking policies in the UK is most likely driven by concerns about patient safety, particularly the risk of patients absconding and then seriously harming themselves or someone else. Indeed, in the recent study of Ashmore (2008), psychiatric nurses reported that ward doors were locked to (among others) prevent patients from absconding, particularly those who were considered a risk of harming themselves or others. The question, however, arises what is known about the effectiveness of door locking in terms of preventing patients from absconding and enhancing safety for all parties involved? Possibly, locking ward exit doors may have paradoxical negative effects on the safety of patients and staff. To illustrate this, a Dutch study on a permanently locked ward, found that 15% of aggressive occurrences took place directly in front of the locked exit door (Nijman et al., 1997), indicating that locking inpatients triggers violence. An earlier British study indeed suggested that opening the ward exit door might lead to a reduction of aggression on the ward (Folkard, 1960). Could it also be the case that permanently locked wards might trigger rather than reduce the desire to attempt to abscond in some patients? In the Dutch study mentioned above, the ward was sealed off with two consecutively placed locked doors, but some patients still managed to abscond. Ashmore (2008) indeed suggested that locking the ward doors may intensify certain negative feelings such as feeling confined, trapped, and more isolated from family and friends, resulting in "increased rather than decreased attempts to leave the ward" (p. 182).

On the basis of experiences and reflections like this, the current study sought to investigate how effective exit security measures are in practice in keeping inpatients in. Ashmore (2008) recently noted that "although the increasing trend in the locking of acute wards has attracted some attention in the literature (..), there is a paucity of material examining its actual practice, particularly in the UK" (p.176) In line with this comment, the current study aimed at investigating the current prevalence of door locking and the use of other (additional) exit security measures on psychiatric admissions wards in the UK, as well as on empirically studying the associations between locking ward exit doors and absconding rates.

Method

Sample

In 2004 and 2005, a cross sectional survey on 136 acute psychiatric wards was undertaken, known as the City-128 study (Bowers et al., 2007). In that study, a comprehensive range of data on patients, staff, services, and conflict and containment events, including door locking, absconding, and drug/alcohol use, was collected during six months on each of the participating wards. Acute psychiatric wards were defined as serving acutely mentally disordered adults, taking admissions in the main directly from the community, and not offering long-term care or accommodation. The 136 participating psychiatric wards were located in three geographical areas (London, Central England, Northern England).

For the current study, these same wards that participated in the earlier City-128 study were re-approached early 2006 for a follow-up interview to collect supplementary data on door locking and additional exit security measures at the time of the previous data collection. Of the 136 wards, 133 were able to participate in this additional study. This sample size represents approximately one out of every four acute psychiatric admission wards in England. The mean number of beds on the participating wards was 21. Most wards provided mixed sex accommodation (73%), with the reminder serving females (14%) or males (13%) only. Most wards (48%) had been built in the 1980s and 1990s, with 17% in 2000 or later, 19% in the 1960s and 1970s, and the rest prior to this date.

Underneath, the instruments used in the current study are addressed in detail. It concerns the "follow-up telephone interview of City-128 wards on exit security" which was completed in 2006, and the *Patient-staff Conflict Checklist* (PCC; Bowers et al., 2003a),

which was used as one of the main routine outcome measure earlier during the earlier City-128 study conducted in 2004 and 2005 (see Bowers et al., 2007).

Instruments

The follow-up telephone interview of City-128 wards on exit security was specifically designed for the current study on door locking policies and ward exit security by the research team at City University (Bowers et al., 2008). This structured interview was, among others, designed on the basis of advice from Mr Jim Halliwell, then Senior Architect at the Centre for Healthcare Architecture and design. The interview consists of 21 items, which were completed by telephone with a qualified nurse who had been working on the participating ward for at least three months. It was made clear to the interviewee that the questions should be answered as the ward was during the earlier extensive City-128 data collection, that had been performed in 2004 and 2005 (see Bowers et al., 2007), and that any subsequent changes should be ignored. Apart from questions about the ward exit door, questions were posed during the interview about other systems and mechanism aiming at preventing patients from leaving the ward without permission. These included, among others, whether the ward had a so-called air lock system (two doors, in stead of one), whether the ward exit door was visible from the staff office, whether a nurse was stationed near the exit door, whether there were CCTV monitors on which patients leaving the ward were visible, as well as questions about alternative escape routes in stead of through the front exit door. For a full description of the items of the follow-up telephone interview of City-128 wards on exit security, the reader is referred to the appendix 1 of the report of Bowers et al. (2008, p. 112). As three of the 136 wards had been closed down by the time this additional information on exit security was gathered, the information was available for 133 of the initial 136 City-128 study wards.

As part of the City-128 study, detailed assessments were made of various staff, ward and patient variables on each of the participating wards. In the current paper, the key instrument is the *Patient-staff Conflict Checklist* (PCC; Bowers et al., 2003a). The PCC was used to log the frequency of patient conflict behaviours (e.g., absconding, self-harm, violence, medication refusal), as well as the staff containment measures used to maintain safety (e.g. intermittent special observation, constant special observation, seclusion, physical restraint etc., and locking of the ward exit door). The PCC provides strict definitions of conflict behaviours and containment measures and had to be completed on each ward at the end of every nursing shift. On entry to the City-128 study conducted in 2004 -2005, ward nursing

staff of the 136 wards had received training in the use of the PCC, and each ward was provided with a handbook giving definitions of items. The items for aggression were drawn from the Overt Aggression Scale (Yudofsky et al., 1986, Silver and Yudofsky 1987, 1991), a widely used and validated instrument, with a reported inter rater reliability of 0.7 – 0.87. For all incidents of selfharm or attempted suicide, a Bongar Lethality Scale (Bongar, 1991) was completed as part of the PCC, to assess the severity of the incident. The PCC was supplemented with additional items to include age, gender, diagnosis, ethnicity, and postcode of patient's place of residence, for those patients admitted during the shift. In tests based on use with case note material, the PCC has demonstrated an acceptable interrater reliability of 0.69 (Bowers et al., 2005), and has shown a significant association with rates of officially reported incidents (Bowers et al., 2006).

Statistics

On the basis of the PCC data, the prevalence of both door locking and absconding rates of the 136 wards from shift to shift were studied. The absconding rates addressed in this paper were derived from the PCC on which the number of patients who were missing from the ward was reported from shift-to-shift. For additional information concerning the number of attempts to abscond, whether successful or unsuccessful, and the rates of officially reported absconds the reader is referred to the full report of the City 128 locked doors study (Bowers et al., 2008).

By means of ANOVAs and spearman's r correlations the associations between door locking practices and additional exit security measures on the one hand, and absconding rates on the other, were investigated. General descriptive statistics were used to gain insight in the current practices of exit security measures on the participating wards, and the internal consistency between the use of the various exit security measures was explored by means of Cronbach's α.

In addition, multilevel random effects modelling was carried out using MLwiN 2.02 on the absconding scores per shift. Poisson regression was used as this fitted the distribution of scores, and the scores represented counts of incidents. The number of beds on the ward was used as the exposure or offset variable, therefore differences in ward size were accounted for in the model. Random effects modelling allows for the fact that the wards were only a sample of all possible wards and similarly, Trusts were only a sample from all possible Trusts. A three level model was explored with shifts at the lowest level, wards at level 2 and Trusts at level 3. That is shifts were nested within wards, which were nested within Trusts. Shifts were

chosen as a level because of clustering effects within AM, PM and Night shifts; wards for similar reasons, and Trusts because they represent organisational units with single local policies and operational procedures. The penalised quasilikelihood method of estimation (PQL) was used with second order linearisation, since this method does not tend to underestimate variance estimates (Ukoumunne et al., 1999).

The model was produced through a staged process of backward selection, deselecting the least significant at each stage. Each group of variables (e.g., patient variables, staff characteristics etc.) was used to build a separate initial model, then the significant variables were used to construct a final comprehensive model using the same process of backward selection. While there were significant associations between some of the independent variables in our study, there was no logical reason why any particular variables should be considered to be intervening, rather than potentially causal in their own right; nor is there any evidence in the existing research literature that this is the case (Kiely, 1991). However it is possible that some variables might play that role, perhaps particularly conflict behaviours other than absconding. We therefore present the results of the separate domain analyses, as well as the final complete model. When door locking was entered in the model as a categorical variable, 'door not locked' was used as the reference category.

Results

Below, the number of permanently locked wards and additional exit security measures will be addressed. Following this, the associations the various exit security measures have among themselves will be explored, as well as their relations with absconding rates. Finally, the results from the multilevel analysis are presented.

Door locking practices and absconding rates

Whether the ward door was locked, and for what duration, was collected for each shift via the PCC. Door locking had to be scored by the ward team for each shift on a scale of 1 – 5, with 1 representing open for the whole of the shift, and 5 representing locked for the whole of the shift. When aggregated to the level of wards, it was found that 41 of the 136 wards (30%) had been permanently locked during the entire City-128 study performed in 2004 – 2005 (i.e., the mean door locking score for these wards was 5), whereas 46 wards (34%) had been permanently open (i.e., the mean door locking score on the PCC for those wards was 1). The remaining 49 wards with mean scores between 1 and 5 can be classified as ‘partially open wards’.

The average daily absconding rate, expressed as the number of patients reported missing from the ward on the PCC, was 0.31 per day (s.d. = 0.17). One way analysis of variance between the permanently locked wards (n = 41), partially open wards (n = 49), and permanently open wards (n = 46) did not show significant differences in absconding rates between the three ward types [$F(2, 133) = 2.8$, $p = 0.067$]. To be precise, the daily absconding rate on permanently open wards was 0.27, versus 0.33 on permanently locked wards, and 0.34 on partially open wards.

At the shift level, however, associations between door locking and absconding became apparent. For this an ANOVA was performed on the following five door locking categories for each shift: 1) ward door having been open during the entire shift; 2) the door having been locked for less than one hour during the shift; 3) the door being locked between one and three hours during the shift; 4) the door having been locked more than 3 hours during the shift; and 5) the door having been locked for the whole shift. The mean absconding rates during these five door locking conditions were, 0.100, 0.138, 0.134, 0.197, and 0.102, respectively, indicating absconding to be more frequent on shifts where the door was unlocked part of the time [$F(4, 42400) = 19.06$, $p < 0.001$].

Additional exit security practices and absconding

Table 1 summarises the information from the interviews about (additional) exit security measures for the acute psychiatric wards that were surveyed about these issues in 2006.

Insert Table 1 here

Table 1 shows that there is a significant amount of security features related to the main exit from the ward, with a third of wards having a double exit doors creating an 'air lock'. Not all of these, however, are fitted with an interlock system that only allows one to be unlocked at a time. There is also a significant use of technology, including intercoms, CCTV, swipe cards and keys pads. The majority of wards have exits that automatically unlock in the case of the fire alarm being set off (68%), or fire exits that can be released at will by patients (73%).

The internal consistency in terms of Cronbach's α between the exit security measures presented in Table 1, however, was remarkably low (i.e., 0.19). This means that there hardly seems to be any relationship between the different forms of exit security. Wards that have high levels of one form of exit security do not have to have other forms put in place, which may leave one or another alternative escape route to patients who really want to abscond.

In order to further assess the inter-relationships between exit security measures, door locking, and absconding, a 'security score' was created for each ward by summing the items indicated by an asterisk in Table 1. These items were selected as they seem to be most likely to create hurdles or barriers for patients who want to abscond. The distribution of these security scores ranged from 0 – 10, with the mean score being 5.1 (s.d. = 2.1). Interestingly, the practice of door locking per ward (i.e., 'permanently locked', 'permanently open', and 'partially open') failed to show an association with this combined exit security score [$F(2, 130) = 0.422$, $p = 0.657$]. In other words, as was the case with the separate exit security measures among themselves, door locking was not clearly associated with increased numbers of other security measures aiming at keeping inpatients in. The overall summed security score also did not turn out to be significantly associated with absconding rates (Spearman's $r = -0.025$, $p = 0.776$).

A multilevel model of factors associated with absconding

It was investigated which patient, staff and ward variables, in combination with door locking, were associated with absconding. In Table 2, summarised results of this multilevel analysis are presented.

Insert Table 2 here

The table indicates that increased absconding from the ward is (among others) associated with a higher number of patients with schizophrenia on the ward, a poor ward environment quality, more bank /agency unqualified staff being on duty, and a high

prevalence all kinds of other conflict behaviors such as alcohol and drug use on the ward, verbal aggression and self-harm. Absconding was also associated with more use of enforced medication and discussion about PRN medication. Most importantly, in the final model, the door being locked the entire shift was found associated with lower absconding rates.

4. Discussion

In the current study it was found that, when measured on a shift-to shift basis, about a third (30%) of the 136 participating wards operated with their ward exit door permanently locked. Univariate analyses suggested little associations between door locking practices and other exit security measures on the one hand, and absconding on the other. The more robust multilevel statistical analysis, however, did indicate a significant reduction in absconding when the ward door was locked the whole shift.

The current study, however, has a number of limitations that need to be taken into account when interpreting the results. To begin with, the data on exit security measures were collected in 2006 and matched to data collected during the large-scale City 128 study performed in 2004 and 2005. The recollection of the staff members that were interviewed in 2006 about ward exit security measures as they had been in 2004 – 2005 may not have been totally accurate. Policies and practices can change fast in acute psychiatry, especially in relation to door locking and exit security. The second important limitation of the current study is the cross sectional nature of the dataset. The significant associations that were found can not establish the direction of causality. Therefore it is important to note that, although the evidence of the multilevel analysis suggests that permanently locking the ward may reduce the absconding rate, firm conclusions about the directions of the associations cannot be drawn from the current findings.

The current results, however, indicate that if the found association would be causal, the reduction of absconding rates could be somewhere near 30% in case the ward exit door is locked continuously. Possibly, the enormous amount of inconsistency between door locking and additional exit security features at the ward level, leaves (alternative) ways to abscond for patients who really want to get out of the hospital, including running off during escort to other parts of the hospital, smashing windows etc. In other words, although it may be concluded that locking the door does reduce absconding rates to a certain extent, it far from completely prevents absconding. Even the locked door by itself can be circumvented in a number of

ways, like rushing the door when it is opened, kicking it open, or setting of the fire alarm to open it on some wards. In line with this, Ashmore (2008) recently noted about door locking that "(…) it may be too simplistic to suggest that, by itself, it is an effective strategy for preventing people from leaving the ward" (p. 182). On the other hand, it should be noted that locking the ward exit door may also serve other functions than preventing patients to abscond (e.g., "to prevent import and unwelcome visits"" from outside the ward; see Haglund et al., 2007, p. 52).

However, as it may be dangerous (e.g., in case of a fire), but also highly unrealistic to strive for a 100% absconding proof ward environment, we want to recommend also considering alternative measures that may prevent absconding. The multilevel analysis provided some interesting clues about how absconding may be counteracted with measures other than locking the ward door. The findings, for instance, suggested an increase in absconding when the number of unqualified bank/agency was higher. This seems to suggest that hiring temporary staff without the right qualifications should be avoided as far as possible on wards where absconding risks are high. Furthermore, absconding was linked to various conflict behaviours and containment measures. Although the causal nature of these associations is not known with the current design, it is known that an increased amount of conflict on wards can trigger a desire to leave the ward (Bowers et al., 1999). In addition it is known that the patients involved in disruptive and conflict behaviour, are the same ones that have a higher likelihood to abscond (Bowers et al., 2003b).

A nursing intervention to reduce absconding has shown to be effective without the use of door locking (Bowers et al., 2003b). This so-called "anti-absconding package" contained the following measures, among others: 1) Identification of patients at high risk of absconding, using an algorithm based on previous research; 2) Facilitating social contact for those at high risk of absconding, via phone contact, encouraging visits, or using all available resources to enable supervised temporary leave; 3) Targeted nursing time daily for high absconding risk patients; 4) Careful and supportive breaking of bad news to patients, and; 5) Post ward incident debriefing of patients (for more information on the anti-absconding package see Bowers et al., 2003b). Adding the current finding to this that poor environmental quality of the ward seems to increase the likelihood of patients absconding, suggests that investing in improved living conditions, whether physical or social, rather than investing in additional (high tech) security measures, might be important in keeping inpatients in.

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Table 1. Distribution of various exit security measures on psychiatric admissions wards in the UK

	%
Unit entrance	
Swipe card system at unit entrance	26
Key pad system at unit entrance	8
Intercom system at unit entrance	45
Outside ward front door, patient has to pass further locked doors*	29
Staffed unit reception desk that person leaving has to pass*	56
Is there a gatehouse etc at the exit to the hospital grounds*	19
Ward entrance	
Swipe card system at ward entrance	35
Key pad system at ward entrance	18
Intercom system at ward entrance	43
Two separate lockable doors*	32
Interlock system*	19
Thickness of front door*	
About as thick and solid as an ordinary house front door	14
Slightly thicker, like an ordinary hospital door	52
Solid in construction, made with strong wood and strong hinges	33
Does the door automatically make an audible noise when opened*	25
Nursing office situated next to the door*	49
Nurse by the door to filter patients leaving*	42
CCTV for viewing who is leaving the ward*	20
Front door automatically unlocks if fire alarm goes off*	68
Fire door that patients can release to get out*	73
Potential exits other than front/fire door	36
1 potential alternative exit*	16
2 potential alternative exits*	8
3 potential alternative exits*	5
4 or more potential alternative exits*	1

* items used to calculate an overall ward exit security score

Table 2. Multilevel model of absconding (number of patients reported missing from the ward on the PCC), with incident rate ratios and confidence intervals

	Domain models				Final combined model			
	IRR	Lower 95% C.I.	Upper 95% C.I.	sig.	IRR	Lower 95% C.I.	Upper 95% C.I.	sig.
Patient								
Proportion schizophrenia*	1,160	1,039	1,294	<0.01	1,140	1,052	1,235	<0.05
Proportion white*	0,856	0,752	0,974	<0.01				
Service environment								
Admissions during shift	1,053	1,025	1,083	<0.001				
Physical environment								
Environment quality*	0,827	0,744	0,919	<0.001	0,876	0,802	0,957	<0.01
Proportion beds in single rooms*	1,137	1,022	1,263	<0.05	1,122	1,025	1,228	<0.01
Index of ward observability*	0,863	0,786	0,948	<0.01	0,881	0,818	0,949	<0.05
Patient routines								
None significant								
Conflict								
Verbal abuse	1,064	1,037	1,091	<0.001	1,063	1,034	1,092	<0.001
Refusing to get up	1,043	1,017	1,070	<0.001				
Refusing to see workers	1,031	1,009	1,054	<0.01	1,035	1,013	1,057	<0.01
Alcohol use	1,122	1,102	1,142	<0.001	1,151	1,129	1,174	<0.001
Drug use	1,043	1,021	1,066	<0.001	1,024	1,002	1,047	<0.05
Attempting to abscond	1,131	1,111	1,151	<0.001	1,133	1,113	1,153	<0.001
Absconding official report	1,330	1,317	1,343	<0.001	1,332	1,319	1,346	<0.001
Refused prn medication	1,041	1,021	1,061	<0.001	1,033	1,010	1,055	<0.01
Demanding prn medication	1,078	1,053	1,104	<0.001	1,080	1,053	1,108	<0.001
Self-harm	1,031	1,009	1,054	<0.01	1,031	1,009	1,054	<0.01
Containment								
Door locked < 1 hr	1,247	1,015	1,532	<0.001	1,219	0,994	1,495	ns
Door locked 1-3 hrs	1,197	1,019	1,406	<0.001	1,027	0,878	1,202	ns
Door locked > 3 hrs	1,283	1,063	1,548	<0.001	1,141	0,945	1,377	ns
Door locked full shift	0,679	0,617	0,748	ns	0,694	0,632	0,763	<0.001
PRN medication	1,102	1,070	1,135	<0.001				
Enforced IM medication	1,031	1,006	1,058	<0.05	1,036	1,010	1,062	<0.01
Sent to PICU	1,031	1,011	1,052	<0.01	1,023	1,001	1,046	<0.05
Intermittent special observation	1,070	1,027	1,115	<0.001				
Special observation	1,074	1,042	1,106	<0.001	1,043	1,013	1,074	<0.01
Show of force	1,064	1,043	1,085	<0.001				
Physically restrained	1,025	1,003	1,048	<0.001				
Staff demographics								
Qualified staff on duty	1,101	1,065	1,138	<0.001				
Unqaulified staff on duty	1,107	1,075	1,140	<0.001				
Bank/agency unqualified staff	1,070	1,037	1,104	<0.01	1,038	1,004	1,073	<0.05
Number of consultant psychiatrists who are locums*	1,116	1,006	1,238	<0.001				
Proportion staff male*	1,115	1,013	1,228	<0.05				

Staff Group					
WAS staff control*	1,162	1,047	1,289	<0.01	

*Variables entered at ward level