Civil commitment law, mental health services, and US homicide rates

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Abstract

Purpose—The study considers whether involuntary civil comment (ICC) statute provisions are associated with homicide rates. Do statutes based solely upon dangerousness criteria versus broader ICC-criteria—i.e. "need for treatment," "protection of health and safety," and family protection–have differential associations related to their goal of reducing the frequency of homicide?

Method—State-level data were obtained from online data bases and key-informant surveys. Ordinary-least-squares and Poisson regression were used to evaluate the association between statute characteristics, mental health system characteristics, and 2004 Homicide Rates after controlling for firearm-control-law restrictiveness and social-economic-demographic-geographic-and-political indicators historically related to homicide rate variation.

Results—Poisson and OLS models, respectively, were significant: likelihood ratio $\chi^2 = 108.47$, $df = 10$; $p < 0.000$ and Adj. $R^2 = 0.72$; $df = 10, 25$; $F = 10.21$; $p < 0.000$. Poisson results indicate that social-economic-demographic-geographic-and-political-indicators had the strongest association with state homicide rates ($p < 0.000$). Lower rates were associated with: broader ICC-criteria (p 0.01), fewer inpatient-bed access problems (p 0.03), and better mental health system ratings (p 0.04).

OLS results indicate that social-economic-demographic-geographic-and-political indicators accounted for 25% of homicide rate variation. Broader ICC-criteria were associated with 1.42 less homicides per 100,000. Less access to psychiatric inpatient-beds and more poorly rated mental health systems were associated with increases in the homicide rates of 1.08 and 0.26 per 100,000, respectively.

Conclusions—While social-economic-demographic-geographic-and-political indicators show the strongest association with homicide rate variation, the results show the importance and potentially preventive utility of broader ICC criteria, increased psychiatric inpatient-bed access, and better performing mental health systems as factors contributing to homicide rate variation.

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Keywords

Civil commitment; Dangerousness; Inpatient-bed access; Better mental health systems

Introduction

This study considers civil commitment statutory provisions and their objective of reducing the frequency of dangerous behavior [1, 2]. Commitment statutes require individual participation in mental health care either in a psychiatric inpatient facility, involuntary inpatient commitment (IIC), or under involuntary outpatient commitment (IOC) while remaining in community residence. The requirement is enforced only after an evaluation finding an individual's behavior conforms to specific criteria, is believed to be the result of a mental disorder, and a finding that the individual is refusing to accept mental health treatment. IIC exists in all states and the District of Columbia; IOC is found in 44 states and the District [3–5]. IOC orders are generally described as "a less restrictive alternative to psychiatric hospitalization" for those meeting the IIC behavior criteria of the jurisdiction. There is almost universal statutory agreement that at least one behavioral criterion precipitating an IIC or IOC is "danger to self or others." Despite this consensus, there is considerable statutory variation in IIC and IOC behavioral criteria, the duration of initial commitments, and several other statutory provisions. This paper considers the aforementioned statutory variation and evaluates its relationship, along with accompanying variations in state mental health system characteristics, to the occurrence of one form of dangerous behavior, homicide.

The National Alliance on Mental Illness's (NAMI) platform advocates for increased availability of effective, comprehensive, community-based systems of care for persons with mental illness and for changes in civil commitment law they believe will have an impact on violence-associated outcomes, notably: broader and more flexible behavioral ICC criteria [6]. Finding the behavioral criterion "dangerous to self or others" too narrow—allowing for too much patient deterioration prior to intervention—NAMI advocates the adoption of the broader "need for treatment" criteria (a determination that the patient requires psychiatric services). More inclusive behavioral criteria than those advocated by NAMI exist in several jurisdictions, e.g. criteria added to the danger-to-self-or-others provisions involving "protection of health, safety and property." In Iowa, the provisions are further expanded to allow for issuance of ICC orders if the person "is likely to inflict serious emotional injury on family members or others who lack reasonable opportunity to avoid contact with the person with mental illness" [4]. ICC behavioral criteria may be conceived as an expanding net varying from including only the most restrictive, "danger-to-self-or-others," to being inclusive of all the aforementioned criteria.

The more inclusive provisions of ICC law, given past abuses [7], justifiably raise concerns about civil rights protection and fears that such *parens patriae* approaches may become major impediments to recovery-based programs. The Bazelon Center for Mental Health Law views broader civil commitment criteria as an unjustified expansion of forced treatment opportunities that ignores the inadequacies of the mental health system and inappropriately

blames violent incidents on the perpetrator's unwillingness to seek treatment without evidence that appropriate treatment was offered and rejected [4].

Little research exists on the impact of ICC statutory variation on homicide outcomes. Over time homicide rates associated with mental illness behave like the population-rates [8]. Within time-periods they can vary independently, influenced by mental health policy and other factors. For example, between 1957 and 1969 (pre-community care) in the United Kingdom (UK) the population-homicide rate increased as did the homicide rate attributable to mental illness ($r = 0.81$, $p = 0.001$). Between 1970 and 1995, a period of emphasis on community care and brief revolving-door psychiatric hospitalizations, the mental illness-associated homicide rate decreased relative to the population rate ($r = -0.45$, $p = 0.013$) [9, 10]. In countries with lower homicide rates the mentally ill account for a greater proportion of homicides, potentially making policies related to their care more influential in homicide rate variation [11–13]. Between 1990 and 2000 homicide rates fell sharply in the United States and appear to have leveled off between 2000 and 2006 [14]. Given the lower homicide rate in the US, it may be hypothesized that like other countries with lower rates, homicides associated with mental illness in the US may now constitute a greater proportion of all homicides and the characteristics of the mental health system should therefore be more important in influencing their occurrence.

This study attempts to determine whether ICC statutory variation and variations in state mental health system characteristics are associated with variations in dangerous behavior reflected in state homicide rates.

Method

The study provides a cross-sectional picture of the relationship between variations in IIC and accompanying IOC statutes [4], mental health system characteristics [15], and homicide rates [16]. Since IIC/IOC statutes vary by state, the state is the unit of analysis [4]. A general model including factors believed to be associated with homicide rate variation was constructed. The following variables were included:

2004 Homicide Rates

Though much of the literature considering the relationship between homicide and mental illness relies on perpetrator-conviction rates [9, 11, 17] this study uses a victim-based-rate, the 2004 State Homicide Rate, for its criterion variable. Perpetrator-conviction rates are likely to underestimate the involvement of the mentally ill and thus be less likely to find associations with mental health system characteristics. The numerator of perpetrator-based-rates excludes the mentally ill themselves (who are six-times more likely to be homicide victims than the general public) and bystanders (victims of circumstance precipitated by the actions of the mentally ill) [1, 18–20]. Analyses based solely on mentally ill convicted perpetrators also underestimate the number of such perpetrators. (In 2004, 37.4% of US homicide investigations failed to "clear" police records and were written-off leaving a substantial portion of murder cases unresolved. Most of those arrested on homicide charges never made it to trial, 86% plea bargained, perhaps to a lesser charge, and 30% of those tried were not convicted [21].)

IIC/IOC and mental health system covariates

The breadth/inclusiveness of the state IIC behavioral criterion was chosen as the primary covariate given NAMI's view that broadening such criteria would help prevent dangerous behavior [6]. IIC behavioral criteria were dichotomized (coded 2, for broader standards including protection of 'health and safety', 'family' and 'need for treatment'; coded 1 for more restrictive dangerousness standards: danger to self, others, and grave disability) [4].

When IOC behavioral criteria are less stringent (broader) than IIC, it is easier to place someone on IOC but more difficult to enforce IOC with hospitalization. Since this circumstance might alter the association of the IIC criterion with the homicide rate, stringency of IOC versus IIC criteria was included (coded 1, less stringent, and 0, the same or more stringent). "Civil additions to psychiatric inpatient facilities in 2000" (i.e. new civil cases added to the hospital census) [22] was included as an indicator of IIC utilization. (Given the dearth of psychiatric beds, such hospitalizations are mainly IICs) [22]. The "percent of patients retained in psychiatric inpatient facilities for >90 days" was included as a measure of the extent of use of protective custody [23]. The "frequency of IOC use in 2004" (coded 1, very rarely thru 5, very frequently) [24] and the "duration of the initial IOC order" (in days) [4] were included as indicators of how broadly and with what degree of intensity this intervention was employed.

State's mental health system quality was assessed by NAMI in a 2005 survey. States were letter-graded on 39 criteria organized in four weighted categories totaling 100 points: infrastructure (18 points), information access (16 points), services (44 points), and recovery supports (22 points). Herein, grades, derived from the 39 criteria, were converted to scores: $B = 9$—the highest grade received—to $F = 1$ the lowest, including pluses and minuses [15]. "Problems with psychiatric inpatient-bed accessibility" (graded 0, serious problems exist, to 3, no problems exist) was also included [15].

Context covariates

Firearm availability, elsewhere associated with violence indicators [25, 26] is represented by survey ratings [25, 27] of "the restrictiveness of state firearms-law regulations," (higher scores indicate more regulation).

Research based upon multiple theoretical foci, summarized in Land et al.'s [28] four-decade study of structural covariates of homicide rates, specifies six variables consistently associated with homicide rate variation. These associations are replicated in multiple studies [28], sub-sequent research [29, 30], and are stable across time, area (state, county and census tract), and type of homicide [28–30]. Using Land et al. methods, including Principal Components Analysis, six covariates were reconstructed from 2004 data (unless otherwise specified). An Age–Conservative–Gender Component score, based on assumptions that more conservative social environments might account for findings of reduced homicide rates, added a seventh covariate not covered by Land et al. [28]. These covariates are represented herein by a predicted-score derived from regressing 2004 homicide rates on the seven variables—specifically: three single indicators (% age 15–24 [31]; % divorced males 15? years old [31]; and Southern state) and four principal component scores:

1. Population structure component [28] (based on: the natural log of population size [18] and population density [31]),

2. Resource deprivation component (based on: % black [31], % children not living with both parents [31], the natural log of the state's median family income [31], % families in poverty [31], and the GINI poverty index >99 [31],

3. Social disorganization component (based on the state's number of prisoners, average illicit drug use, [32] and unemployment rate [31]),

4. Age–Conservative–Gender Component (based on the state's American Conservative Union (ACU) Rating (ACU's political conservatism rating of a state's congregational delegation's voting record [33]), the state's sex ratio (no. of males per 100 females [31]), and median age [31]).

The component scores were derived with a regression method based on principal component analysis of the variables listed as associated with each component.

Human subjects

Procedures were approved by the Committee for the Protection of Human Subjects.

Reliability and validity

Consistency of measurement and validity estimates for variables included in the general model are limited in availability and come in various forms given multiple data sources. Though criticized for inaccuracy and underreporting [34], the stability of the measurement of the "2004 State Homicide Rate" variable is very high. Measured by the average correlation between state rates (reported that year) and those reported between 1996 and 2008, it is $r = 0.935$ [35]. This would indicate that while rates have varied nationally overtime they did so very consistently across the states.

Legal provisions for ICC and those related to restrictiveness of gun laws derive from surveys of state statutes. The former dichotomization of ICC statutes into dangerousness and broader statutes was checked multiple times [4] for agreement and against an alternate listing [36]. The three-category "restrictiveness of state firearm laws" variable was validated by a study showing that it significantly and correctly separated the "percent of households with firearms" and the "number of suicides involving a firearm" in each state [25].

Consistency in measurement of variables taken from key informant surveys was primarily guaranteed by training efforts to insure that data gatherers secured the data in a uniform fashion. This was the case for variables taken from the NAMI survey and the frequency of IOC reporting survey [15, 24]. The stability coefficient for NAMI grades in 2005 and 2009, reported in "whole" grades (as opposed to the plus/minus grades reported for 2005 used herein) was $r = 0.587$. Given expected changes in mental health system performance and major changes in NAMI's 2009 survey methods, and weighting categories, this is a fairly stable system assessment [37].

Most of the covariate control variables come from The American Community Survey (ACS) which replaces the US decennial census long form as the nation's primary source of

socioeconomic data for all geographic areas [31]. A study of the reliability of these figures found that median coefficients of variability for demographic, social, economic, and housing variables in the ACS are reduced to a third of their census tract levels by modest aggregation —i.e. from the census tract to the neighborhood level. It would therefore appear that the current study's state level variables would likely produce reasonable levels of reliability. Validity estimates derived from the correlation between ACS and county administrative data vary between $r = 0.87$ and 0.98 [38].

Analysis—Statistical procedures were conducted using SPSS Version 17.

Descriptive statistics are provided. OLS and Poisson Regression (the latter for statistical accuracy with rates and the former for interpretability) are used to test a general model documenting the association between the IIC/IOC statute characteristics, mental health system characteristics, and 2004 homicide rates, after accounting for context-covariates— state firearm-law restrictiveness and the social-economic-demographic-geographic-and-political covariates entered first as a predicted score and then individually. Extensive analyses designed to challenge the model results also used logistic regression and ANOVA.

Results

The average 2004 homicide rate in the 43 jurisdictions with IIC/IOC statutes was 4.51 ± 2.27 per 100,000. The states with the lowest homicide rates were New Hampshire and North Dakota, 1.4 per 100,000; Louisiana had the highest, 12.7 per 100,000.

Among the 43 IIC/IOC jurisdictions, the behavioral criteria used for IIC placement varied considerably: 3(7%) using only "danger to self and others"; 17(39.5%) adding grave disability; 20 (46.5%) adding a "need for treatment"; 2 (4.7%) health safety and property protection; and, 1 (2.3%), adding to the aforementioned the likelihood of inflicting serious emotional burden on families.

NAMI's system grade was 3.92 ± 2.29 ($N = 37$), almost a D?, indicating extensive system failure. The psychiatric inpatient bed access problem score average was 1.14 ± 0.71 ($N = 37$), i.e. most jurisdictions had moderate problems and plans to remedy them.

Model results

Both multivariate models for the 2004 homicide rates reported in Table 1 were significant. The OLS regression results, Model A, were $R^2 = 0.80$; Adj. $R^2 = 0.72$; $df = 10, 25$; $F = 10.21$; $p < 0.000$. The strongest association with homicide rates was the predicted score based on the social-economic-demographic-geographic-and-political-covariate controls: $b = 0.86$ (SE = 0.15), $\beta = 0.65$, $r_{part} = 0.50$, $p < 0.000$. Broader behavioral IIC criteria [$b = -1.42$ (SE = 0.49), $\beta = -0.31$, $r_{part} = -0.26$, $p = 0.008$], fewer problems with inpatient bed access [$b = -1.08$ (SE = 0.37), $\beta = -0.32$, $r_{part} = -0.26$, $p = 0.008$], better global mental health ratings [$b = -0.26$ (SE = 0.12), $\beta = -0.27$, $r_{part} = -0.19$, $p = 0.042$], and more inpatient additions [$-b = 0.00$ (SE = 0.00), $\beta = -0.26$, $r_{part} = -0.19$, $p = 0.026$) were associated with lower homicide rates.

The relation of the structural covariates to homicide rates accounted for an independent contribution of almost four times that of the IIC breadth factor—i.e. 25.0% versus 6.8% of the total variance. Model B results replicate findings [28] demonstrating the primary importance of the area "Resource deprivation component", positively associated with homicide rates for four decades.

Rerunning the homicide rate general model as a Poisson regression improves its significance: likelihood ratio $v^2 = 144.80$, $df = 9$, $p = 0.000$ (see Table 2, Model C). Again the predicted covariate score is significant ($b = 0.18$, $p = 0.000$) and the broader IIC criteria ($b = -0.27$, $p = 0.014$). In addition, NAMI's Global Grade ($b = -0.06$, $p = 0.040$) and Psychiatric Inpatient Bed Access ($b = -0.20$, $p = 0.028$) reach significance in this model.

Since States generally have the same criteria for both IIC and IOC, it is difficult to separate their effects. They are highly correlated ($r = 0.67$). IOC was not included in the model because of this co-linearity and because the greater use of IIC made it the theoretical choice as an explanatory indicator. However, the OLS and Poisson regressions were rerun with the "interaction of IIC and IOC breadth indicators" substituted for the IIC indicator. The OLS model produced little change with the IIC/IOC interaction term significant at $p = 0.008$. The results of the Poisson regression using the interaction term are reported in Table 2, Model D. "Inpatient additions" were significant though not so in Model C (all models were rerun without the inpatient variable since "inpatient additions" for 2004 were not available and 2000 figures were used in the analyses. No differences were found in the other significant associates of Homicide using this process).

Challenges to model-results validity

The relationships between predictors in a model, the absence of a relevant predictor from the model, and failure to adequately consider the unique contributions of covariates within a model, sometimes spuriously account for apparently substantive findings such as that observed herein in between ICC-breadth and homicide rates. High tolerance and low NIF statistics (c.f. Table 1, Model A) indicate, however, that the evaluated relationships do not derive from the presence of co-linearity—i.e. highly correlated explanatory predictor-variables that can lead to high variability in the size of the coefficients. The high Tolerance statistics also indicate that model predictors contribute independently to explaining the variance in homicide rates; they are not significantly related to each other. Alternative hypotheses, accounting for the observed primary findings, based on interrelationships between model-predictors are therefore unlikely to be confirmed. This was tested by running smaller models considering associations between other predictors and the ICC variable—e.g. models inquiring as to whether the breadth of the ICC criterion was associated with "numbers of additions", "access to inpatient beds" and/or ">90-day stays". These Logistic regression models were not significant. Nor were they significant when interactions between predictors were included (e.g. additions and ">90-day stays") or when the "resource deprivation component" was used alone instead of the "predicted score"—the latter model belying an alternative hypothesis indicating that states with less deprivation might be less preoccupied with dangerousness and therefore have mental health laws with a greater emphasis on paternalism than on public protection.

Inclusion of all significant variables in the model is essential and the analyses herein have attempted to include all associates of homicide rates discussed as stable across several decades [28] as well as other relevant alternatives. It has been argued, for example, that restrictive laws were introduced in order to contain costs [39] leading to a possible conclusion that more impecunious states might have more homicides because of poorer policing (or wealthier states have better services), etc. The addition of the state's "per capita community mental health spending" to the models, as well as interaction terms of "per capita community mental health spending" with the "behavioral IIC criterion" and "per capita community mental health spending" with "NAMI grade" were not significant. These variables also did not alter the significant reported relationships between 2004 Homicide Rates and the other covariates in the general model.

Variables making up the social-economic-demographic-geographic-and-political-covariate control score were tested to evaluate their unique effects (vs. common variance effect) on the relationship between the IIC behavioral criteria and the homicide rate. Separate regressions were run in which each covariate comprising the predicted score was substituted individually for the predicted score in the model as opposed to using the predicted covariate-control score summarizing all the Land et al. covariates. This procedure did not indicate a modification of the relationship between the breadth of the behavioral IIC criteria variable and homicide rates. The Resource Deprivation Component score, the primary variable found significant in Model B, was inserted in the general models instead of the full predicted-covariate-control score without change in the ICC criteria significance or that of the mental health indicators. The latter procedure was done using the weighted Resource Deprivation Component score derived from the Principal Components analysis and with a unit-weighted score.

One-way ANOVAs were run to determine whether states with broader IIC and IOC criteria differed on the covariates. No significant differences were found—confirming that there was no relationship between Deprivation or any of the other covariates and state choice of ICC law.

Discussion

As anticipated in this period of comparatively reduced homicides relative to the 1990s, the three mental health system indicators—broader ICC criteria, increased psychiatric inpatient-bed access, and better performing mental health systems—were significant factors associated with homicide rate variation. Cumulatively these mental health system characteristics accounted for 17% of the homicide rate variance; while the proportion of variance explained by traditional and consistently predictive social-economic-demographic-geographic-and-political covariates, 25%, was less than half the explanatory variance, 58% [28], contributed by these indicators in past decades. Consistent with these findings, the circumstances of the homicides following the homicide rate decline in the '90s are more likely to involve those characteristic of the homicides involving the mentally ill—homicides associated with someone known to the victim [40]. In New York City in 2009 only 34% of homicides were by people unknown to the victim [41].

ICC statutory criteria, mental health inpatient involvement, and homicide rates

Homicide has been found to be preventable in as much as 65% of cases [42, 43]. ICC laws are believed to enable prevention of harm to self or others resulting from mental illness. ICC preventive oversight is associated with reduced victimization [44] and reduced patient mortality [45]. ICC criteria define the characteristics of those individuals in given circumstances thought to be at high risk of causing harm and who are in need of inpatient treatment.

In considering the impact of ICC criteria, researchers have primarily focused on the "numbers admitted to inpatient care" and the "duration of hospitalizations" as indicators of "frequency" and "intensity" of utilization. Researchers have generally shown that the broadening of ICC criteria is associated with an immediate increase in admission rates which are sustained for at least 2 years [46]. When ICC criteria are narrowed to a dangerousness standard, 15 of 17 short- and long-term studies based on independent data sets showed increases in admissions followed by initial post-reform decreases [46]. Admissions as well as duration of inpatient mental hospital admissions, however, in this period of deinstitutionalization, have trended downward and have always been constrained by resource/bed availability and system financing mechanisms [47, 48]—a fact that would limit the strength of their relation to substantive policy change such as the explicit ICC definition.

Such resource/bed constraints may have contributed to the herein observed lack of robust associations between higher inpatient additions and homicide rates and the observed non-significant associations between ">90-day stays" and the homicide rate. Further, the more narrowly construed dangerousness criteria allow for confinement of people only after the dangerous behavior has been demonstrated. The expected association between psychiatric hospital utilization and homicide may therefore be attenuated because mentally ill homicide victims are dead, and perpetrators if detained are placed in criminal justice facilities never having been seen in the mental health system [40]. Alternatively stated, if, under a dangerousness criterion, significant numbers of homicide offenders or victims never become mental health facility inpatients (because they are imprisoned or dead) and if inpatient additions are restricted by resource/bed limitations, the range of each variable is restricted such that the relationship between them will be weakened or non-existent.

The patient's status on the ICC criteria, however, has been found to be a major factor in determining *who* enters the hospital [49] and a major factor in determining *when*, in the course of illness a person is brought into the mental hospital [50]. *Selection* for ICC, based on different ICC criteria, recruits different patient groups into psychiatric hospitals [51, 52] at different times in the course of their illness [50]. The associations documented herein between the homicide rate and the ICC criterion would appear to indicate that the broader criteria when used in the determination of *who* and *when* a patient is placed on ICC are more effective in curtailing homicide risk than the more narrow, dangerousness focused criteria.

Broader ICC criteria appear to allow more rapid, timely, and targeted intervention, especially in better mental health systems with access to inpatient hospital beds (statistically significant characteristics sustained in the Poisson regressions). Findings herein seem to substantiate

this observation as ICC behavioral criteria more inclusive than "danger to self, others and grave disability" appear to be associated with lower homicide rates. The unstandardized regression coefficient associated with the ICC behavioral criterion in Model A estimates this association to be more than one homicide fewer per 100,000. A meta-analysis of 60 studies in 16 countries found that the average duration of first-episode-untreated psychosis for jurisdictions with a dangerous criterion was 79.5 weeks, but only 55.6 weeks in jurisdictions with broader IIC criteria ($p < 0.007$) [53]. This earlier intervention associated with broader IIC laws selects a different high-risk group than is selected for ICC in dangerousness-criterion-jurisdictions. Allowing for selection early in initial episodes capitalizes on the circumstances of the mentally ill more likely to be involved in homicides. In 11 of 14 studies from Western countries between 30 and 50% of the lifetime-risk of homicide attributable to psychosis appeared in the first episode [54]. Three North American studies report between 28 and 72% of people with NGRI verdicts had never been hospitalized. Lack of mental health service involvements among probationers and parolees, despite extensive criminal histories, is a prevalent characteristic of people with mental illness in prison for murder [40]. And, one study found that 61% of 88 persons with psychotic illness who had committed homicide were experiencing a first psychotic episode [55].

Broader behavioral IIC criteria allow for consideration of "health and safety," "need for treatment," "likelihood and history of deterioration," and "family disruption" in civil commitment decisions. Patterns of behavior and circumstances, that may not support a judgment of imminent dangerousness, can be considered using these broader criteria. Past violent victimization, violence in the surrounding environment, substance abuse, and rage or anger have shown a cumulative association with the risk of violent behavior [40, 55] increasing the likelihood of homicide among the mentally ill, innocent bystanders, helpers, or family relations. Mental health professionals are among the helpers that are at higher risk of becoming victims of non-fatal violent crime (psychiatrists 68.2 per 1,000, and mental health custodial professionals, 69.0 per 1,000 vs. physicians, 16.2 per 1,000, and nurses, 21.9 per 1,000) and thus of becoming homicide victims [56]. Rage or anger, more easily considered as a factors under a protection of health and safety standard, are the most frequently mentioned motives for murder by convicted mentally ill prisoners and this emotion was overwhelmingly directed toward intimate or familial relations [40].

The association of violent behavior with severe and especially untreated mental illness, most notably with schizophrenia, has been established [40, 57]. Broader criteria may allow better selection based on the complex relationship between violence and mental illness—one associated with multiple risk factors in several domains [56] most notably substance abuse [58, 59]. Such risk factors are not independent of the mental illness; they occur interactively and are exacerbated by dysfunctional coping mechanisms (such as medication non-compliance associated with violence [58, 60]) that are part of the mental illness. The presence of the risk factor in a majority of the involved mentally ill does not discount the role of mental illness in homicide [61, 62]. ICC targets individuals not because they abuse substances but because they have engaged in behavior that is *due to their mental illness* [63].

Future research is needed to empirically document the recognition of patterns of behavior and circumstance used by clinicians to make ICC decisions in jurisdictions functioning

under broader behavioral criteria. Such research related to documenting the recognition and use of the patterns of behavior and circumstance used in the assessment of dangerousness has demonstrated the reliability and utility of such assessments [63]. It would seem, however, that those patterns of behavior and circumstance used by clinicians to make ICC determinations in jurisdictions with broader behavioral criteria may have more preventive utility and greater predictive validity with respect to homicide prevention.

Mental health system characteristics and homicide rates

Though the findings are modest, it is most encouraging to report that the results do offer evidence of an association between homicide rates, inpatient bed access, and the quality of the mental health system. The amelioration of "moderate problems" with inpatient-bed-access (the average state experience) was associated with one fewer homicide per 100,000 and overall quality improvement was associated with the same magnitude of homicide rate reduction when system grades improved from a D+ (the average state experience) to a B−. Both access to timely hospitalization via the acute psychiatric bed and rather modest improvements to the mental health system may help prevent homicide. It would appear that it does not take an A-rated system to impact homicide prevention.

Significant numbers of at-risk-individuals are entering the mental health system. Of 673 new entrants to public mental health services in six Northern California counties over 4 years, 22% (N = 150) faced violent-felony charges, % (N = 39) were convicted; seven individuals were charged with ten homicides and convicted on five [64]. A recent study has indicated that 51,413 psychiatric inpatient beds exist in the US and 147,233 are needed [65]. Bed reductions have not been accompanied by concomitant development of less-restrictive-alternatives that might provide bed-access [66–68]. People with mental illness needing psychiatric inpatient access, or more appropriately crisis facility access as an alternative to hospitalization, are often, in poor quality mental health systems, denied such access and/or prematurely released from general hospitals only to return in a revolving-door pattern [69, 70].

The study has its limitations. It does not offer causal certainty and the findings need to be interpreted with caution. The results are controversial as they offer evidence that may reinforce stereotypes that increase the difficulty of efforts to promote community acceptance of people with mental illness. Yet, by focusing on victim as opposed to perpetrator rates they illustrate the possible helpful potential of mental health system design. Further, the use of the dangerousness criterion as opposed to ICC broader criteria seems to have had the paradoxical consequence of increasing stigma by fostering the public's perception of the mentally ill as dangerous [71]. The study involves ecological correlations and cross-sectional association at the state level between mental health system characteristics, statutory characteristics, and homicide rates. No direct link between the individual experience of the system/statute characteristics and the homicide incident has been established by the ecological analysis herein. The analyses, however, were designed to challenge the association between homicide rates and the ICC criteria. They were designed to insure the absence of co-linearity influence by simultaneously and individually controlling relevant

covariates. The latter effort makes it difficult to argue that the associations reported are spurious.

Conclusion

The study's findings reinforce other study findings indicating a need for increased protective oversight, in better quality mental health systems, increased bed access, and IIC and IOC criteria facilitating early preventive intervention for a very vulnerable population of people with serious mental illness. Excellent progress has been made in recognizing the need to protect the rights of such individuals, and new legislation expanding protective oversight must continue to do so while recognizing the group's vulnerability. There can be no going back to total control of the social lives and opportunities of people with severe mental illness, yet, their vulnerability to victimization and/or that of their families and associates should not go unprotected.

References

1. Torrey EF, Zdanowicz MT (2001) Outpatient commitment: what, why, and for whom. Psychiatr Serv 52(3):337–341 [PubMed: 11239101]

2. Large MM, Nielssen OB, Lackersteen SM (2009) Did the introduction of 'dangerousness' and 'risk of harm' criteria in mental health laws increase the incidence of suicide in the United States of America? Soc Psychiatry Psychiatr Epidemiol 44(8):614–621 [PubMed: 19099169]

3. Torrey EF, Kaplan RJ (1995) A national survey of the use of outpatient commitment. Psychiatr Serv 46:778–784 [PubMed: 7583477]

4. Bazelon Center for Mental Health Law (2004) Involuntary outpatient commitment: summary of state statutes. Bazelon Center for Mental Health Law, Washington DC. http://www.bazelon.org. Accessed December 28, 2009

5. Treatment Advocacy Center. State Standards for Assisted Treatment. 12 17, 2004 http://www.psychlaws.org/LegalResources/StandardsText.pdf. Accessed December 28, 2009

6. Public Policy Committee of the Board of Directors, the NAMI Department of Public Policy, Research (2004) Public Policy Platform of the National Alliance for the Mentally Ill, 7th edn. NAMI Arlington, Virginia

7. Assembly Interim Committee on Ways, Means, Subcommittee on Mental Health (1966) The dilemma of mental health commitments in California: a background document. California State Legislature Sacramento, CA

8. Large M, Smith G, Nielssen O (2009) The relationship between the rate of homicide by those with schizophrenia and the overall homicide rate: a systematic review and meta-analysis. Schizophr Res 112:123–129 [PubMed: 19457644]

9. Taylor PJ, Gunn J (1999) Homicides by people with mental illness: myth and reality. Br J Psychiatry 174:9–14 [PubMed: 10211145]

10. MIND A history of mental health and community care—key dates: http://www.mind.org.uk/help/research_and_policy/the_history_of_mental_health_and_community_care-key_dates downloaded, 4 17 2011

11. Simpson AIF, McKenna B, Moskowitz A, Skipworth J, Barry-Walsh J (2004) Homicide and mental illness in New Zealand, 1970–2000. Br J Psychiatry 185:394–398 [PubMed: 15516547]

12. Hiroeh U, Appleby L, Mortensen PB, Dunn G (2001) Death by homicide, suicide, and other unnatural causes in people with mental illness: a population-based study. Lancet 358:2110–2112 [PubMed: 11784624]

13. Fazel S, Grann M (2006) The population impact of severe mental illness on violent crime. Am J Psychiatry 163:1397–1403 [PubMed: 16877653]

14. Bureau of Justice Statistics, Department of Justice. http://bjs.ojp.usdoj.gov/. Accessed December 30, 2009

15. NAMI (2006) Grading the states—a report on America's health care system for serious mental illness. NAMI Arlington, Virginia

16. FBI Uniform Crime Statistics for 2004. 10, 2005

17. Large MM, Smith G, Swinson N, Shaw J, Nielssen O (2008) Homicide due to mental disorder in England and Wales over 50 years. Br J Psychiatry 193:130–133 [PubMed: 18669997]

18. Fitzgerald PB, de Castella AR, Filia KM, Filia SL, Benitez J, Kulkarni J (2005) Victimization of patients with schizophrenia and related disorders. Aust N Z J Psychiatry 39:169–174 [PubMed: 15701066]

19. Teplin LA, McClelland GM, Abram KM, Weiner DA (2005) Crime victimization in adults with severe mental illness: comparison with the national crime victimization survey. Arch Gen Psychiatry 62:911–921 [PubMed: 16061769]

20. Choe JY, Teplin LA, Abram KM (2008) Perpetration of violence, violent victimization, and severe mental illness: balancing public health concerns. Psychiatr Serv 59:153–164 [PubMed: 18245157]

21. Bureau of Justice Statistics Bulletin. State Court Processing Statistics, 2004 Felony Defendants in Large Urban. April 2008, NCJ 221152 U.S. Department of Justice Office of Justice Programs

22. Manderscheid RW, Henderson MJ (2002) Mental health, United States, 2002. Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services, Rockville

23. 2004 CMHS Uniform Reporting System Output Tables. http://mentalhealth.samhsa.gov/cmhs/MentalHealthStatistics/URS2004.asp. Accessed December 30, 2009

24. Segal SP (2006) Survey of outpatient-commitment utilization. (Unpublished memo)

25. Conner KR, Zhong Y (2003) State firearm laws and rates of suicide in men and women. Am J Prev Med 25(4):320–324 [PubMed: 14580634]

26. Miller M, Hemenway D, Azrael D (2007) State-level homicide victimization rates in the US in relation to survey measures of household firearm ownership, 2001–2003. Soc Sci Med 64:656–664 [PubMed: 17070975]

27. Behavioral Risk Factor Surveillance System. Behavioral Risk Factor Surveillance System. 2001 Survey data. http://www.cdc.gov/brfss/ti-surveydata2001.htm. Accessed December 28, 2009

28. Land KC, McCall PL, Cohen LE (1990) Structural covariates of homicide rates: any invariances across time and social space? Am J Sociol 95(4):922–963

29. Baller RD, Anselin L, Messner SF, Deane G, Hawkins DF (2001) Structural covariates of U.S. county homicide rates: incorporating spatial effects. Criminology 39(3):561–590

30. Kubrin CE (2003) Structural covariates of homicide rates: does type of homicide matter? J Res Crime Delinq 40(2):139–170

31. American Community Survey (2004) http://www.census.gov/acs. Accessed December 28, 2009

32. SAMHSA Office of Applied Studies (2004) State Estimates of Substance Use from the 2003–2004. National Surveys on Drug Use and Health. http://www.oas.samhsa.gov/2k4State/vars.htm. Accessed December 30, 2009

33. American Conservative Union (2004). http://www.acuratings.org/. Accessed December 28, 2009

34. Mosher CJ, Terance D, Miethe TD, Phillips DM (2002) Mis-measure of crime. Sage Publications, California

35. FBI Uniform Crime Report for 2008 (Published SSept. 2009). http://www.deathpenaltyinfo.org/murder-rates-nationally-and-state#MRalpha. Accessed June 14, 2010

36. ICC statutes by state. Go to site and from there to specific state IOC statute. http://www.lexisnexis.com. Accessed December 28, 2009

37. NAMI (2009) Grading the states—a report on America = s Health Care System for Serious Mental Illness. NAMI, Arlington, Virginia http://www.nami.org/gtsTemplate09.cfm?Section=Grading_the_States_2009 Accessed June 14 2009

38. Salvo JJ, Lobo AP, Willett AL, Alvarez JA (2007) An evaluation of the quality and utility of ACS five year estimates for Bronx census tracts and neighborhoods. 2007 Joint Statistical Meetings,

Salt Lake City, Utah http://www.census.gov/acs/www/Downloads/ Salvo_Lobo_Willett_Alvarez_PAPER.pdf. Accessed June 14, 2010

39. Tanay E (2007) Virginia Tech mass murder: a forensic psychiatrist's perspective. J Am Acad Psychiatry Law 35(2):152 [PubMed: 17592159]

40. Matejkowski JC, Cullen SW, Solomon PL (2008) Characteristics of persons with severe mental illness who have been incarcerated for murder. J Am Acad Psychiatry Law 36:74–86 [PubMed: 18354127]

41. Baker A (2009) Homicide near record low rate in New York City. New York Times CLIX (54,904):A1, A3

42. Munroe E, Rumgay J (2000) Role of risk assessment in reducing homicide by people with mental illness. Br J Psychiatry 176:116–120 [PubMed: 10755046]

43. Simpson AI, Allnutt S, Chaplow D (2001) Inquiries into homicides and serious violence perpetrated by psychiatric patients in New Zealand: need for consistency of method and result analysis. Aust N Z J Psychiatry 35(3):364–369 [PubMed: 11437811]

44. Hiday VA, Swartz MS, Swanson JW, Borum R, Wagner HR (2002) Impact of outpatient commitment on victimization of people with severe mental illness. Am J Psychiatry 159:1403–1411 [PubMed: 12153835]

45. Segal SP, Burgess P (2006) Effect of conditional release from hospitalization on mortality risk. Psychiatr Serv 57:1607–1613 [PubMed: 17085609]

46. Bagby RM, Atkinson L (1988) The effects of legislative reform on civil commitment admission rates. Behav Sci Law 6(1):45–61

47. Leiby J (1967) Charity and correction in New Jersey: a history of state welfare institutions. Rutgers University Press, New Brunswick

48. Segal SP (2008) Deinstitutionalization. Encyclopedia of social work, 20th edn, vol 2 Co-published by the NASW Press and Oxford University Press, pp 10–20

49. Segal SP, Lauri T, Segal MJ (2001) Factors in the use of coercive retention in civil commitment evaluations in psychiatric emergency services. Psychiatr Serv 52(4):514–521 [PubMed: 11274499]

50. Large M, Neilssen O, Ryan CJ et al. (2008) Mental health laws that require dangerousness for involuntary admission may delay the initial treatment of schizophrenia. Soc Psychiatry Psychiatr Epidemiol 43:251–256 [PubMed: 18060340]

51. Segal SP (1989) Civil commitment standards and patient mix in England/Wales, Italy, and the United States. Am J Psychiatry 146(2):187–193 [PubMed: 2912261]

52. Luckey JW, Berman JJ (1979) Effects of a new commitment law involuntary admissions and service utilization patterns. Law Hum Behav 3(3):149–161

53. Large M, Nielssen O (2008) Evidence for a relationship between the duration of untreated psychosis and the proportion of psychotic homicides prior to treatment. Soc Psychiatry Psychiatr Epidemiol 43:7–44

54. Nielssen OB, Westmore BD, Large MM et al. (2007) Homicide during psychotic illness in New South Wales between 1993 and 2002. Med J Aust 186:301–304 [PubMed: 17371211]

55. Swanson JW, Swartz MS, Essock SM, Osher FC, Wagner R, Goodman LA, Rosenberg SD, Meador KG (2002) The social–environmental context of violent behavior in persons treated for severe mental illness. Am J Public Health 92:1523–1531 [PubMed: 12197987]

56. Friedman RA (2006) Violence and mental illness: how strong is the link? N Engl J Med 355(20):2064–2066 [PubMed: 17108340]

57. Eronen M, Angermeyer MC, Schulze B (1998) The psychiatric epidemiology of violent behavior. Soc Psychiatry Psychiatr Epidemiol 33:S13–S23 [PubMed: 9857775]

58. Swartz MS, Swanson JW, Hiday VA et al. (1998) Violence and severe mental illness: the effects of substance abuse and nonadherence to medication. Am J Psychiatry 155:226–231 [PubMed: 9464202]

59. Arseneault L, Moffitt TE, Caspi A et al. (2000) Mental disorders and violence in a total birth cohort. Arch Gen Psychiatry 57:979–986 [PubMed: 11015816]

60. Elbogen EB, Van Dorn RA, Swanson JW et al. (2006) Treatment engagement and violence risk in mental disorders. Br J Psychiatry 189:354–360 [PubMed: 17012659]

61. Rachbeisel J, Scott J, Dixon L (1999) Co-occurring severe mental illness and substance use disorders and other risk factors. Psychiatr Serv 50:1427–1434 [PubMed: 10543851]

62. Wallace C, Mullen P, Burgess P (2004) Criminal offending in schizophrenia over a 25-year period marked by deinstitutionalization and increasing prevalence of comorbid substance use disorders. Am J Psychiatry 161:716–727 [PubMed: 15056519]

63. Segal SP, Watson M, Goldfinger S, Averbuck D (1988) Civil commitment in the psychiatric emergency room: III. Disposition as a function of mental disorder and dangerousness indicators. Arch Gen Psychiatry 45:759–763 [PubMed: 3395206]

64. Theriot M, Segal SP (2005) Involvement with the criminal justice system among new clients at outpatient mental health agencies. Psychiatr Serv 56(2):179–185 [PubMed: 15703345]

65. Torrey EF, Entsminger K, Geller J et al. (2008) The shortage of public hospital beds for mentally ill persons. Treatment Advocacy Center, Arlington

66. Torrey F (2006) Violence and schizophrenia. Schizophr Res 88:3–4 [PubMed: 17084596]

67. Segal SP, Watson M, Akutsu P (1996) Quality of care and use of less restrictive alternatives in the psychiatric emergency service. Psychiatr Serv 47(6):623–627 [PubMed: 8726490]

68. Solomon P, Draine J, Marcus SC (2002) Predicting incarceration of clients of a psychiatric probation and parole service. Psychiatr Serv 53(1):50–56 [PubMed: 11773649]

69. Segal SP (2005) Ponencia: La atención de urgencias en Salud Mental en los Estados Unidos; dificultades y soluciones. VII JORNADAS INTERNACIONALES DE ACTUALIZACIÓ N EN SALUD MENTAL;INTERVENCIONES DE URGENCIA EN SALUD MENTAL Las Palmas de Gran Canaria. 17 y 18 de noviembre de 2005

70. Segal SP, Watson M, Akutsu P (1998) Factors associated with involuntary return to a psychiatric emergency service within twelve months. Psychiatr Serv 49(9):1212–1217 [PubMed: 9735965]

71. Phelan JC, Link BG (1998) The growing belief that people with mental illnesses are violent: the role of the dangerousness criterion for civil commitment. Soc Psychiatry Psychiatr Epidemiol 33:S7–S12 [PubMed: 9857774]

Table 1

OLS models evaluating the association of homicide rates, civil commitment statute characteristics, mental health system characteristics, state firearm control provisions, and structural covariates

Model	Model A 2004 Homicide Rate from civil commitment law and mental health system characteristics controlling for structural covariates [a]							Model B 2004 Homicide Rate from structural covariates [b]		
Characteristic:	b	SE	β	Part correlation	Sig.	Tolerance	NIF	b	SE	Sig.
Breadth of behavioral inpatient civil commitment criteria: broader commitment criterion = 2; dangerousness criterion = 1	−1.42	0.49	−0.31	−0.26	0.008	0.69	1.44	–	–	–
Inpatient additions per 100,000	0.00	0.00	0.26	0.21	0.026	0.63	1.59	–	–	–
Percent of state hospital beds occupied at end of 2004 by patients staying >90 days	0.01	0.01	0.13	0.11	0.207	0.81	1.23	–	–	–
Duration of initial outpatient commitment order in days	0.20	0.16	0.12	0.12	0.201	0.90	1.11	–	–	–
IOC frequency of use in 2004	0.00	0.00	0.17	0.14	0.113	0.72	1.38	–	–	–
IOC stringency compared with inpatient criterion	−0.26	0.48	−0.05	−0.05	0.592	0.76	1.32	–	–	–
Global state mental health service grades	−0.26	0.12	−0.27	−0.19	0.042	0.50	1.98	–	–	–
Psychiatric inpatient bed access	−1.08	0.37	−0.32	−0.26	0.008	0.63	1.59	–	–	–
Firearm law restrictiveness	−0.79	0.41	−0.23	−0.17	0.063	0.56	1.78	–	–	–
Predicted homicide rate from structural covariates	0.86	0.15	0.65	0.50	<0.001	0.58	1.71	–	–	–
Population structure component	–	–	–	–	–	–	–	0.56	0.42	0.189
Resource deprivation component	–	–	–	–	–	–	–	1.94	0.45	0.000
% Age 15–24 in 2004	–	–	–	–	–	–	–	−0.01	0.02	0.611
% Divorced males in 2004 (15+ years old)	–	–	–	–	–	–	–	8.05	20.77	0.700
Southern states (civil war)	–	–	–	–	–	–	–	−0.61	0.83	0.466
Social disorganization component	–	–	–	–	–	–	–	0.18	0.39	0.648
Age, conservative, gender component	–	–	–	–	–	–	–	0.43	0.29	0.146

Model statistics:

[a] $R^2 = 0.80$; Adj. $R^2 = 0.72$; $df = 10, 25$; $F = 10.21$; $p < 0.000$;

[b]$R^2 = 0.56$; Adj. $R^2 = 0.49$; $df = 7, 42$; $F = 7.78$; $p < 0.000$

Table 2

Poisson regression models evaluating the association of homicide rates, civil commitment statute characteristics, mental health system characteristics, state firearm control provisions, and structural covariates

Model criterion: 2004 Homicide Rate Parameters:	Model C					Model D				
	b	Standard error	Hypothesis test			b	Standard error	Hypothesis test		
			Wald χ^2	df	Sig.			Wald χ^2	df	Sig.
Breadth of behavioral inpatient civil commitment criteria: broader criterion = 2; dangerousness criterion = 1	−0.27	0.11	5.99	1	0.014	–	–	–	–	–
Interaction of breadth of behavioral inpatient civil commitment criteria with breath of outpatient commitment criterion: broader criterion = 2; dangerousness criterion = 1	–	–	–	–	–	−0.33	0.084	17.63	1	0.000
Inpatient additions per 100,000	0.00	0.00	1.98	1	0.159	0.00	0.00	5.23	1	0.022
Percent of state hospital beds occupied at end of 2004 by patients staying longer than 90 days	0.00	0.00	0.94	1	0.333	0.00	0.00	0.23	1	0.631
Duration of initial outpatient commitment order in days	0.00	0.00	1.64	1	0.200	0.00	0.01	1.61	1	0.205
IOC frequency of use in 2004	0.02	0.03	0.43	1	0.513	0.03	0.03	1.59	1	0.207
IOC stringency compared with inpatient criterion	−0.03	0.10	0.09	1	0.763	−0.06	0.07	0.72	1	0.397
Global state mental health service grades 2005	−0.06	0.03	4.20	1	0.040	−0.07	0.02	11.20	1	0.001
Psychiatric inpatient bed access	−0.20	0.09	4.83	1	0.028	−0.32	0.08	16.84	1	0.000
Firearm law restrictiveness	−0.09	0.08	1.18	1	0.277	−0.12	0.063	3.44	1	0.064
Predicted homicide rate from structural covariates	0.18	0.03	25.79	1	0.000	0.18	0.027	44.25	1	0.000

Omnibus tests compare the fitted model against the intercept-only model

Model C likelihood ratio χ^2 = 108.47; *df* = 10; *p* = 0.000, *Model D* likelihood ratio χ^2 = 122.90; *df* = 10; *p* = 0.000