

Putting community risk in perspective: A look at correlations, causes and controls[☆]

Virginia Aldige Hiday *

Sociology and Anthropology, 1911 Bldg 310, Box 8107, NCSU Campus, Raleigh, NC 27695, United States

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Abstract

Much research, but not all, appears to show that persons with severe mental illness are more dangerous and violent than others; but it is misleading and feeds the stigma cannon. This paper critically reviews reported correlations between severe mental illness and violence, examines their statistical confounds, highlights studies which seek causal mechanisms explaining the associations, points to what those causal mechanisms tell us about controlling risk in the community, and reviews legal attempts to control community risk in light of those causal mechanisms.

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1. Introduction

Researchers summarizing their own empirical studies or reviewing the empirical studies of others have asserted that there is a clear association between mental illness and violence, or between major mental disorder and violence, or between schizophrenia and violence¹ (Hodgins, Mednick, Brennan, Schulsinger, & Engberg, 1996; Nestor, 2002; Swanson, Holzer, Ganju, & Jono, 1990). A number of them are careful to note that the association is small or moderate

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* Tel.: +1 919 515 9007; fax: +1 919 515 2610.

E-mail address: ginnie_aldige@ncsu.edu.

¹ There is considerable heterogeneity in defining violence empirically. It ranges from broad definitions which can include hostile statements, verbal threats with no action taken or no weapon in hand, and getting in fights regardless of who starts them; to narrow definitions restricting violence to threats with lethal weapons (gun/knife), fights with lethal weapons or causing injury to another, and homicides. Regardless of definition, almost all studies dichotomize violence as present or absent, that is a person/case is either violent or not; thus, much information is lost and analysis is simplified. Analysis is also simplified in ignoring other variation in violence such as the target of the violence (family, friend, acquaintance, stranger), the situation in which violence occurs (home, office/school, street/public place), and the outcome (no harm, psychological harm, minor to severe physical harm). Heterogeneity occurs as well in sources of violence. Researchers have not often attended to source, implying and/or assuming the source to be mental illness. Some researchers have attempted to specify the source within the psychosis from which violence arises such as command hallucinations to harm others (McNiel, Eisner, & Binden, 2000), threat-control override symptoms (Link & Stueve, 1994), and delusions (Taylor, 1998). Others, as we shall see, have studied violence in persons with severe mental illness arising from outside sources such as interpersonal conflict or strained social situations (Estroff & Zimmer, 1994; Silver, 2000) and victimization (Hiday et al., 2001; Silver, 2002; Swanson et al., 2002). Still others have sought the source in co-occurring conditions such as alcohol/drug abuse/dependence and from ASPD/psychopathy (Volavka & Citrome, 2000).

Table 1
Relative risk of violence by persons with severe mental illness, substance use disorder (adapted from Eronen et al., 1998)

Studies	Major mental disorders	Schizophrenia/Schizophrenia related disorders	Substance use disorder
Stockholm Birth Cohort ^a	4.2 m; 27.4 f		15.4 m; 54.6 f
Danish Birth Cohort ^b	4.5 m; 8.7 f		8.7 m; 15.1 f
Israeli Epidemiological Study ^c	3.6 m+f		
Swiss Psychiatric Patients ^d		3.9 m	
Stockholm Birth Cohort ^e		3.9 m	
Swiss Psychiatric Patients ^f		3.1 m	6.5 m
US Epidemiological Study ^g		4.1 m+f	10.4 m+f
Finnish Birth Cohort ^h		7.2 m	6.7 m; 14.9 f

^a Hodgins, 1992.

^b Hodgins et al., 1996.

^c Stueve & Link, 1997.

^d Modestin & Ammann, 1996.

^e Lindqvist & Allebeck, 1990.

^f Modestin & Ammann, 1995.

^g Swanson et al., 1990.

^h Tiihonen et al., 1997.

(Eronen, Angermeyer, & Schulze, 1998; Hiday, Swanson, Swartz, Borum, & Wagner, 2001; Hiday, Swartz, Swanson, Borum, & Wagner, 1998; Link, Andrews, & Cullen, 1992; Link & Stueve, 1994, 1995; Link, Stueve, & Phelan, 1998; Monahan, 1992; Swanson, 1994; Walsh, Buchanan, & Fahy, 2002; Walsh & Fahy, 2002; Wessely, 1998; Wessely & Castle, 1998). Some point out that the attributable risk (the proportion of violence in society which can be apportioned to persons with major mental disorder or schizophrenia) is quite small, less than 5% by most estimates (Arboleda-Florez, Holley, & Crisanti, 1998; Eronen, Angermeyer, & Schulze, 1998; Link, Andrews, & Cullen, 1992; Link & Stueve, 1994, 1995; Monahan, 1992; Swanson, 1994; Walsh, Buchanan, & Fahy, 2002).

Yet researchers most often present their results not in terms of attributable risk but in terms of relative risk, that is, they use statistics indicating how much greater or lesser chance there is of a person with severe mental illness acting violently than someone without a psychiatric diagnosis. As can be seen in Table 1, the relative risks reported range from 3 to 7 times greater for males with major mental disorder than for males in the general population² (Eronen, Angermeyer, & Schulze, 1998). These hardly seem like small or moderate risks. On the other hand, compared with the relative risk of violence for persons with substance use disorders (given in the far right column of Table 1), their risk does not seem so great. In all cases the risk of violence is markedly higher, double or more, for those with substance use disorders than for those with severe mental illness.

The studies which have produced these rates of relative risk vary widely in their sampling procedures, their indicators of mental illness and violence, and their research designs; yet their findings are consistent in showing a significant correlation or association between major mental illness and violence. These studies imply, if not explicitly attribute, cause to the mental illness; however, a causal interpretation of the statistical association between mental illness and violence is problematic because all of these studies have selection bias deriving from their sampling and/or measurement.³ Most of them also suffer from poor control comparisons and confounding. Reviewers have minimized these shortcomings, arguing that we do not have to worry about the biases because the strengths of one design cancel the weaknesses of another (Hodgins, Mednick, Brennan, Schulsinger, & Engberg, 1998; Link & Stueve, 1995).

Challenging this conclusion, Arboleda-Florez et al. (1998) argue that we do have to worry about the biases when correlations are spurious and when they are used to support a causal relationship between mental illness and violence. Instead of the design weaknesses canceling each other, they contend the weaknesses can build upon each other, yielding an inaccurate and distorted picture.

² Females in Hodgins and colleagues' two studies show higher rates.

³ Because they have been well discussed by others (Arboleda-Florez et al., 1998; Link & Stueve, 1995; Walsh et al., 2002; Wessely & Castle, 1998), I will not go into selection biases here.

2. Confounding

This paper focuses on one of those weaknesses, confounding. Confounding occurs when researchers omit important explanatory factors which are intertwined with the supposed causal variable. In the case of the severe mental illness and violence association, confounding occurs when a large proportion of those who have a major mental disorder also have other characteristics which cause violence. Most commonly, researchers who attend to possible confounding variables in assessing the relationship between severe mental illness and violence control the demographic characteristics of age, gender, race and marital status, which are well established in the empirical literature as factors which influence diverse behavioral outcomes among all population groups. There are, however, a number of other variables which have substantial empirical support as important factors influencing violence in the general population that need to be controlled. These factors have not been sufficiently taken into account in much of the research on mental illness and violence; thus, most models linking severe mental illness to violence are misspecified, and the conclusion that major mental disorder causes violence, even a small attributable risk, is unjustified or even incorrect.

In this paper, I shall discuss four of these factors affecting violence among persons with severe mental illness, two of which, substance abuse and psychopathy/ASPD, are often controlled but have not been taken into account sufficiently and two of which, victimization and community disorganization, have been almost totally ignored in empirical studies of the association. Besides these four, there are many other variables which have been shown to affect violence in the general population, such as television viewing, lack of social support, unemployment, lack of achievement in school, serious deficits in social skills, and strained relations (Catalano, Dolley, Novaco, Wilson, & Hough, 1993; Johnson, Cohen, Smailes, Kasen, & Brook, 2002; Paik & Comstock, 1994; Raine, Brennan, & Mednick, 1996; Silver, 2002; Swanson et al., 2000). These variables are likely to affect violence in persons with severe mental illness as well; but it is impossible to delve into all of them here.

2.1. Substance misuse

Among the four important but neglected causal factors, substance misuse is controlled more often than the others; but as we saw in Table 1, a number of important empirical studies have not accounted for it. Substance misuse should always be controlled because of its strong impact on violent behavior among the general population as well as among persons with severe mental illness, and because persons with severe mental illness are more likely to abuse alcohol and illegal drugs (Eronen, Hakola, & Tiihonen, 1996; Mueser, Drake, & Noordsy, 1998; Mueser et al., 1997; Scott et al., 1998; Soyka, 2000; Steadman et al., 1998; Swartz et al., 1998; Swanson, 1994; Swanson et al., 2000, 2002; Wallace et al., 1998).

Fig. 1 presents the MacArthur Risk Assessment findings on substance abuse and violence among patients in their first 10 weeks of discharge from psychiatric inpatient facilities (Steadman et al., 1998). MacArthur violence captures more violent behavior than the studies in Table 1 because information is not only from official records but also from reports by both respondents and collateral informants. It defines violence as fights⁴ resulting in physical injury to an opponent or patient's use of a weapon, or sexual assaults; or threats with a weapon in hand.⁵ Fig. 1 demonstrates the strong impact substance misuse has on violence among mental patients and the low risk of violence for severe mental illness alone. One can see on the left side of the figure that patients with major mental disorder without substance misuse⁶ are almost 3 times (2.7) less likely to be violent as those who are misuse alcohol and/or illegal drugs (6.7% to 17.9%), and three times (3.0) less likely to be violent as other mental patients without major mental disorder, who misuse substances (6.7% to 22.3%).⁷ The right portion of the figure compares all mental patients – including not just those with major mental disorders – from one of its sites with a matched sample of nonpatients from the same site and same neighborhoods to which the patients were discharged. This comparison shows that mental patients without drug or alcohol abuse symptoms are not significantly more likely to be violent than the community controls; and they are

⁴ The MacArthur Risk Assessment Study asked respondents and collaterals whether respondents had been in a physical fight in the prior 10 weeks in which someone got hit, slapped, kicked, grabbed, shoved, bitten, hurt with a knife or gun or got something thrown at them, even if the person did not start it; plus a series of probes to obtain information on the number, opponent, weapon, injury, etc. of the fight.

⁵ The MacArthur Study also examined lesser violence, fights that did not result in physical injury, calling them "Other Aggressive Acts."

⁶ Substance Abuse is indicated by a DSMIII-R diagnosis of substance abuse or dependence.

⁷ Differences in lesser violence, Other Aggressive Acts, are only minor between the three patient groups (not shown).

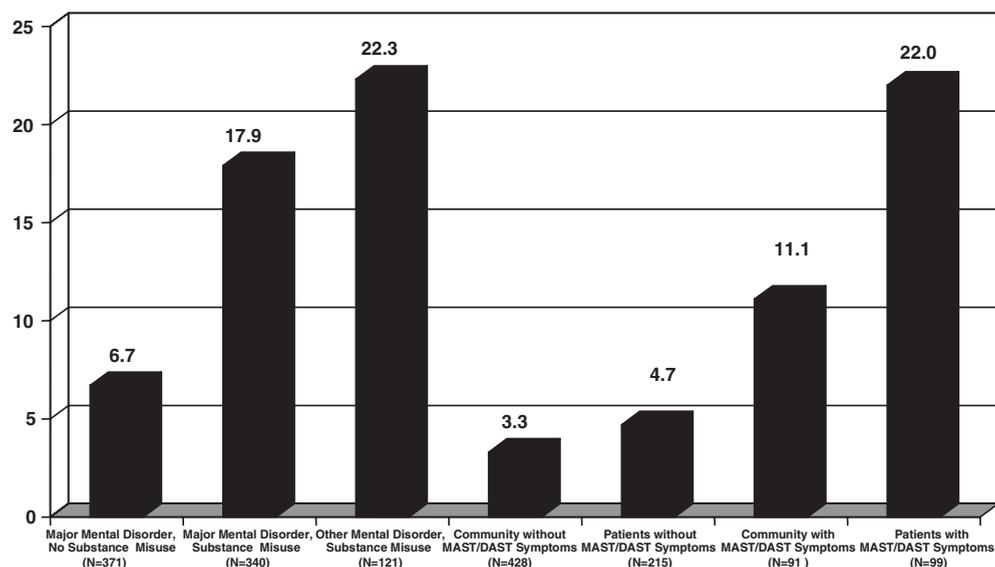


Fig. 1. MacArthur violence risk assessment study: prevalence of violence. Adapted from Steadman et al. (1998).

much less likely to be violent than the community controls who have substance abuse symptoms (4.7% to 11.1%).⁸ On the other hand, it shows that those mental patients who have substance abuse symptoms are almost twice as likely to be violent as their community counterparts with such symptoms (22.0% to 11.1%).

Often when substance misuse is taken into account in studies, it is not taken into account adequately. Viewing Fig. 2 in which violence is measured by court convictions for violent offences and/or two or more self-reported violent offences, note how very violent persons with schizophrenia-spectrum disorders⁹ appear. This figure shows the proportion of violent among those with schizophrenia-spectrum disorders to be more than eight times greater than among those with no psychiatric diagnosis. When sex, socioeconomic status and all other concurrent disorders are controlled, their relative risk of violence declines substantially. Still, persons with schizophrenia-spectrum disorders are 2.5 times more likely to be violent than controls (Arseneault et al., 2000). That is not a small risk; but it is misleading. Of the 39 persons with this diagnosis, there is only a small number who are not co-morbid ($N=6$, 15.4%). Furthermore the co-morbid diagnosis is substance dependence, excluding substance abuse; and the only substances included are alcohol and marijuana. It is likely that were substance abuse and other drugs included in co-morbidity, the number of pure schizophrenia-spectrum cases would be even less than 6. Such a small number is hardly sufficient to make a causal statement about schizophrenia and violence. It is frequently the case, as in this study, that there are only small numbers of non-substance abusing persons diagnosed with schizophrenia in studies linking major mental disorder and violence.

2.2. Psychopathy/Antisocial personality disorder

The second confound which needs to be taken into account is psychopathy or antisocial personality disorder (ASPD). Rates of the personality trait cluster of psychopathy or the similar ASPD are high among incarcerated populations (Fazel & Danesh, 2002). For instance, over two-thirds of Teplin's well known jail detainees with major mental illness met criteria for ASPD (Abram & Teplin, 1991). Psychopathy and ASPD are highly predictive of future aggression and violence among both mentally ill criminal offenders and non-mentally ill criminal offenders (Crocker et al., 2005; Mueser et al., 1997; Rice & Harris, 1995). Of course, violent behavior is a defining feature of ASPD; but psychopathy without violence predicts future violence too. Among civil psychiatric patients, psychopathy has also

⁸ For this comparison, patients and community controls were counted as having substance abuse symptoms if they had one or more symptoms on the MAST (Michigan Alcoholism Screening Test) or DAST (Drug Abuse Screening Test).

⁹ Schizophrenia-spectrum disorders include persons who responded "yes, definitely" to items about having positive symptoms of schizophrenia (delusions and hallucinations), ruling out symptoms with other plausible explanations or which occurred during a major depressive episode or under the influence of alcohol or drugs.

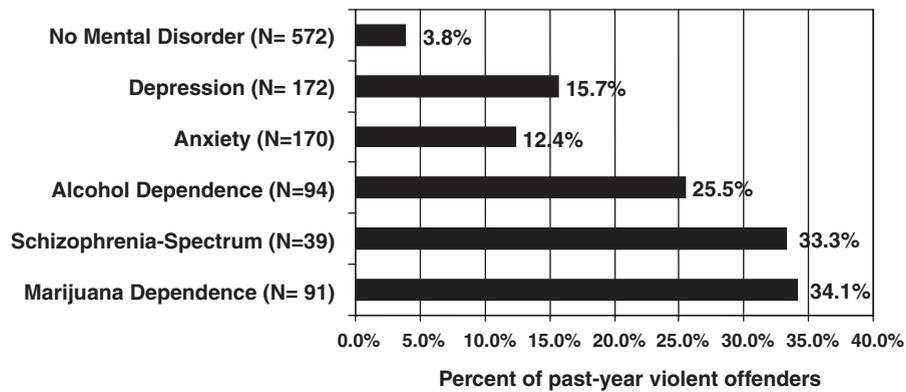


Fig. 2. Dunedin birth cohort study: risk of violent offending. Adapted from [Arseneault et al. \(2000\)](#).

been found to predict future violent behavior over both a short 10-week period and longer periods of 1 and 2 years ([Monahan et al., 2001](#), [Skeem & Mulvey, 2001](#)). In the large community samples of the ECA study, ASPD and substance abuse completely explained the association between crime and severe mental illness ([Robins, 1993](#)).¹⁰

2.3. Victimization

The third neglected factor influencing violence is victimization. Victimization, especially child abuse, has received much attention for its leading to negative mental health outcomes such as depression, anxiety, substance abuse, post-traumatic stress disorder and adverse brain development and functioning ([Arboleda-Florez & Wade, 2001](#); [Beers & De Bellis, 2002](#); [DeBellis et al., 2002](#); [Caspi et al., 2002](#); [Molnar et al., 2001](#); [Mullen, Anderson, Romans, & Herbison, 1993](#); [Mullen, Martin, Anderson, Romans, & Herbison, 1996](#); [Mullen, Wallon, Ramans-Clarkson, & Herbison, 1988](#); [Paolucci, Genuis, & Violato, 2001](#); [Stein, Leslie, & Nyamathi, 2002](#); [Widom, 1999](#)). Little attention, however, has been given to victimization as a cause of violence among persons with major mental disorder. In the general population, child abuse has been associated with angry reactive violence and with expressive violence in childhood, adolescence and adulthood; and with violent criminal offending in adolescence and adulthood ([Athens, 1989](#); [Dodge, 1993](#); [Kessler et al., 2001](#); [Lansford et al., 2002](#); [Lewis, Yeager, Lovely, Stern, & Cobhan-Portorreal, 1994](#); [Widom, 1990](#)). Psychiatric patients have higher rates than the general population of both child abuse and victimization as adults ([Brekke, Prindle, Bae, & Long, 2001](#); [Cascardi et al., 1996](#); [Cloverdale & Turbott, 2000](#); [Goodman et al., 1997, 2001](#); [Hiday et al., 1999](#); [Jicha et al., 2005](#); [Mueser, Drake et al., 1998](#); [Mueser, Goodman et al., 1998](#); [Mullen et al., 1988](#); [Teplin et al., 2005](#); [Walsh et al., 2003](#)); yet few studies addressing the association between mental illness and violence control for either. The MacArthur Risk Assessment Study found serious and frequent childhood physical abuse to be highly significant in predicting adult violence among their sample of discharged psychiatric patients ([Monahan et al., 2001](#)). Among the Duke Mental Health Study patients with severe and persistent mental illness, recent criminal victimization was more predictive of violence in multivariate analysis than any other variable except substance abuse ([Hiday et al., 2001](#)). [Fig. 3](#) shows how those who were victimized by either violent or nonviolent crimes were significantly more likely to engage in violent behavior of both the more serious and less serious forms as measured by the MacArthur violence and other aggressive behavior measures respectively.

2.4. Community disorganization

The fourth neglected causal variable in the severe mental illness and violence association is the community in which the person with mental illness lives. Multiple empirical studies provide evidence that mental illness, substance abuse, violence and other deviant behaviors are more frequent in socially disorganized communities ([Aneshensel & Sucoff,](#)

¹⁰ [Hodgins \(2000\)](#) proposes that persons with major mental disorder who are also ASPD constitute a separate group whom she calls “Early Starters” because they begin offending and acting violently before the onset of symptoms in contrast to other persons with major mental disorder whose violence occurs later.

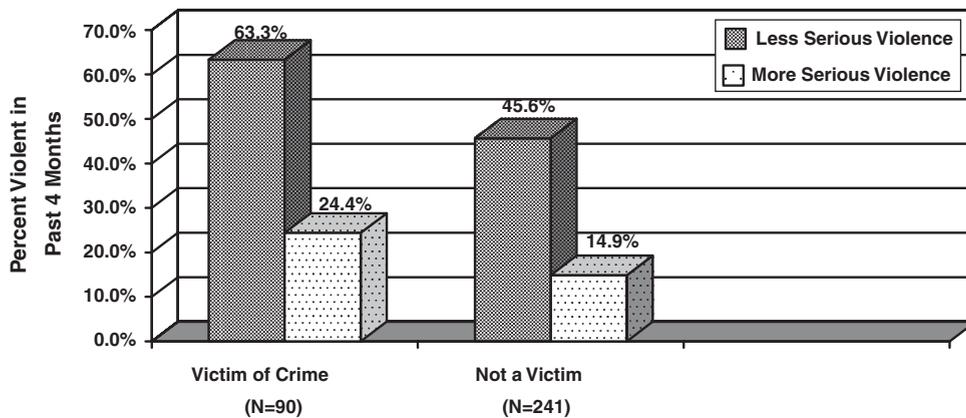


Fig. 3. Association between victimization and violent behavior among persons with severe mental illness (Hiday et al., 2001).

1996; Boardman et al., 2001; Faris & Dunham, 1939; Lankin & Curry, 2003; Leighton et al., 1963; Levanthal & Brooks-Gunn, 2000; Moffitt et al., 2001; Pearlin, Lieberman, Menaghan, & Mullan, 1981; Sampson & Lauritsen, 1993; Sampson et al., 1997; Silver, 2000; Silver et al., 2001; Srole, Langer, Michael, Opler, & Rennie, 1962). These communities are marked by long-term, unremitting concentrated poverty; high unemployment; low levels of education; meager opportunities; resource deprivation; physical deterioration; and the breakdown of micro institutions, especially the family, which give meaning, guidance, and sustenance to individuals, and which exert social control over them. In such communities, one finds violence both in families and outside the home on the streets (Dodge et al., 1990; Kessler et al., 2001; Land, McCall, & Cohen, 1990; Mullen et al., 1993, 1996; National Research Council, 1993; Silver, 2000; Silver et al., 2001; Turner, Wheaton, & Lloyd, 1995). Persons with severe mental illness who grow up and live in these communities learn to be violent just as everyone else who becomes violent in them learns that behavior (Wickrama et al., 1999). Elijah Anderson (1999) describes the process in disorganized homes in these communities as follows:

“They often learn to fight at an early age, using short-tempered adults around them as role models. The ... home may be fraught with anger, verbal disputes, physical aggression, even mayhem. The children are victimized by these goings-on and quickly learn to hit those who cross them” (p.49).

Unfortunately, a disproportionate number of persons with severe mental illness are reared in or filter down through other neighborhoods to these socially disorganized communities. Yet, only recently have a few researchers begun to take into account the violence risk among persons with mental illness from living in such communities. They have found that residence in socially disorganized neighborhoods significantly raises the likelihood of violence above the likelihood predicted by individual risk factors (Silver, 2000; Silver et al., 2001; Swanson et al., 2002).

2.5. Compounding confounds

Each of these factors, substance misuse, psychopathy/ASPD, victimization and living in disorganized communities has a high prevalence among persons with severe mental illness who are violent, which makes each a potential confounder in the association between severe mental illness and violence. Not only may each of them alone be a partial cause of the violence of persons with major mental disorders; but also when they occur at the same time, as they commonly do, they may explain much of the association between severe mental illness and violence, that is, when these four major confounds occur together, their effects will be compounded and may explain much of the association between mental illness and violence.¹¹

Thus far, no study has controlled all these variables. But one large study of persons with severe mental illness in treatment in the public mental health sectors in the U.S. included three of these confounds: substance use disorders,

¹¹ Furthermore, in combination with other known causes of violence such as television viewing, strained relations, lack of social skills, unemployment, etc., they might explain most of the violence of persons with major mental disorder given that such persons often spend excessive time in TV viewing, have strained relations with family/friends, and low levels of social skills, and lack employment.

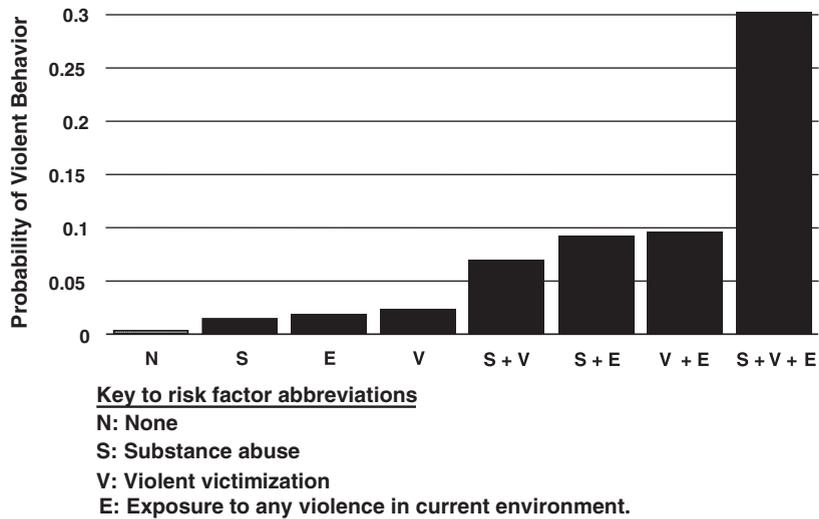


Fig. 4. Effects of the combination of substance abuse, community violence and victimization. Predicted probability of serious violent behavior in the past year by combined risk factors: substance abuse, exposure to violence in current environment, and victimization history (Swanson et al., 2002).

victimization (any physical or sexual abuse in childhood or later), and community violence, which can be seen as a proxy for socially disorganized communities (Swanson et al., 2002). Fig. 4 presents data from that study of the predicted probability of serious violence by these three confounds singularly and in all combinations. One can see that as each of these three variables are added, the amount of violence explained increases, when other significant predictors (cohabitation, homelessness, poor subjective mental health status, and lifetime psychiatric admissions) are controlled. It is likely that a larger proportion of variance would be explained had our fourth confound, psychopathy/ASPD, been measured and entered into the equation which produced this figure.

2.6. Confounding by sampling

The problem of confounding is particularly likely to occur when samples have high rates of substance abuse, high rates of child abuse and adult victimization, high rates of psychopathy/ASPD, and large proportions who have lived in poor, unstable, problem-inflicted families in disorganized communities. Studies reporting major mental disorder among incarcerated offenders, and studies reporting violent behavior among public hospital psychiatric patients, which represent a substantial proportion of the empirical research reporting the association, employ just such samples. There is nothing wrong with using rates of mental disorder among prisoners or among violent offenders to investigate whether there are relatively more persons with severe mental illness in prisons or among violent offenders, respectively, than in the general population; but it is not correct to use those rates, as many of these studies do, to say that persons with severe mental illness (without more) are more likely to offend or to offend violently. Similarly, it is permissible to use rates of violent offending among public hospital psychiatric patients with major mental disorders to investigate whether patients with major mental disorders admitted to public hospitals are more likely to have been charged with violent offenses; but it is methodologically incorrect to use those rates to say that persons with major mental disorder, which would include those without recent hospitalization and not in the public mental health sector, are more likely to be violent than the general population. There is too much confounding of causes hidden in such samples to allow generalization to the population of persons with severe mental illness.

3. Causal mechanisms

One way to avoid confounding errors is to do what Arboleda-Florez et al. (1998) suggest: develop and follow a detailed etiologic theory. Such a theory should incorporate both the neurobiological factors underlying severe mental disorders and all other relevant factors in the social context which affect violence in the general population; and it

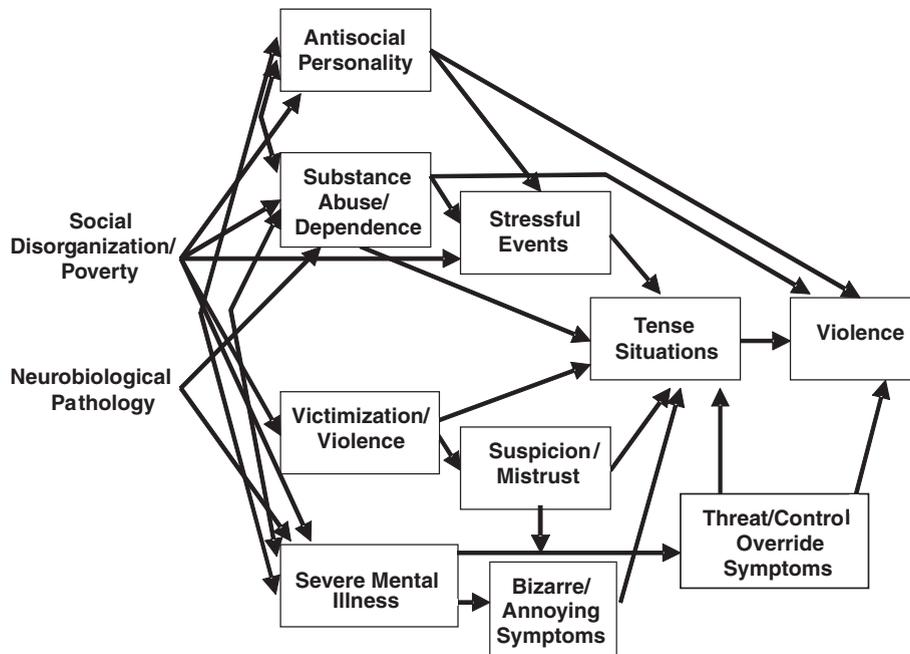


Fig. 5. Causal model linking severe mental illness and violence (Hiday, 1997).

should attend to the indirect as well as direct paths through which these factors can bring about violence. Fig. 5 presents the only such model published in the literature (Hiday, 1995, 1997).

This theoretical model includes the four confounds discussed earlier plus variables which are part of processes through which they work.¹² In this model, the underlying causes of violence are seen to be both neurobiological pathology and socially disorganized communities. Following the arrows, socially disorganized communities are shown to affect all of the second tier of variables (ASPD/psychopathy, substance misuse, victimization and violence, and severe mental illness) plus stressful events such as early death of parents, being fired, flunking a grade in school, etc. Neurobiological pathology is shown to have a causal effect only on two variables in the second tier: severe mental illness and substance misuse, that is, it does not affect violence directly; but rather operates through other variables to have an effect on violence. Psychopathy/ASPD, substance misuse, and severe mental illness have curved lines to each other indicating their close, intricate associations which have not been clearly unraveled. These three variables along with victimization/violence affect the variables in the third and fourth tiers, and eventually affect violence. All these links are logically drawn from empirical studies in various specialty areas such as psychology, anthropology, sociology, criminology, and epidemiology; and all are rather non-controversial except the indirect linkage between severe mental illness and violence.

This theoretical model hypothesizes that there is no direct link to violence from severe mental illness and its underlying neurobiological pathology. Rather the model posits that severe mental illness causes violence only indirectly through two paths: (1) through bizarre and/or annoying symptoms which lead to tense situations, which in the context of the other variables, leads to violence; and (2) through “Threat/Control Override Symptoms” (Link & Stueve, 1994; Link et al., 1998). These include fearful delusions and hallucinations which threaten and take control away from the individual. This link posits that severe mental illness in interaction with the suspicion/mistrust [which developed out of the experience of victimization and violence] produces Threat/Control Override Symptoms. These symptoms may directly lead to violence or may lead to tense situations that result in violence.

This model has not been tested; but each causal link embodies a hypothesis which has been supported with empirical data in one or more studies. Support of the full model awaits a large community study with all hypothesized causal variables measured. As mentioned previously, there are other variables which empirical studies have shown to

¹² To reflect the common co-occurrence of witnessing violence and victimization, victimization is paired with violence which happened prior to the violence of the dependent variable.

influence violent behavior which are not included in the model such as unemployment, lack of social support, and television viewing. A complete theory which directs research in avoiding all confounds would include those variables as well. Unfortunately, it will be difficult to include all of them in one study, given the need for a sample large enough to provide an adequate number of cases of persons with severe mental illness and violent behavior.¹³

4. Controlling community risk

Recognizing these neglected confounds and having an etiological theory cannot only improve our understanding and prediction of violence among persons with severe mental illness but also give direction in our attempts to control community risk among persons with serious mental illness. They point us beyond treatment of the psychosis to addressing these four important causes of violence.

Although the major mental disorders may not directly propel violence except in relatively few cases, neurobiological pathology is operative (Kasai et al., 2002; Kendler & Silverman, 1991; Szeszko et al., 2000) and according to the model has indirect and interaction effects with other variables; thus to control violence among persons with major mental disorder, the psychosis needs to be treated. Important is an appropriate medication regimen with which the patient complies. Since noncompliance with medication is common, it is crucial that clinicians work with patients to find the most acceptable drugs and dosage (Swartz et al., 1998). Several studies have reported that some older psychopharmaceuticals and new atypical antipsychotics reduce violent behavior among inpatients with major mental disorders (for a review, see Tiihonen & Swartz, 2000). New atypical antipsychotics may be more promising in their ability to reduce hostility and aggression, specifically and independent of sedation or functioning [Citrome et al., 2001; Swanson et al., 2004; Volavka & Citrome, 2000]. But most of these studies have been limited in sample size, limited in measurement of violence, conducted only on inpatients, and have not controlled for confounds. It is too simplistic to think that treating the psychosis alone will be effective in reducing violence, given the complexity of causation.

4.1. Substance abuse

The need to incorporate substance abuse treatment in programs and management strategies which address violence is now recognized as an essential component to reduce violence among persons with mental illness (Bloom et al., 2000; Drake, Mercer-McFadden, Mueser, McHugo, & Bond, 1998; Hoyer, 2000; Mueser, Drake et al., 1998; Mueser, Goodman et al., 1998). Most promising is integrated dual diagnosis treatment using one or a single group of clinicians who treat both the substance abuse and mental illness concurrently, and using assertive outreach over the long term to engage and monitor persons who tend to be noncompliant (Mueser, Drake et al., 1998; Mueser, Goodman et al., 1998). The most successful also provide living environments protective of physical and substance safety, and address the multiple needs of clients including housing, employment, social relations and overall functioning (Drake, Mercer-McFadden et al., 1998; Mueser, Drake et al., 1998; Mueser, Goodman et al., 1998).

4.2. Psychopathy/Antisocial personality disorder

Despite the prominence of psychopathy/ASPD in risk assessment of violence, the literature on reducing violence among persons with severe mental illness in the community is noticeably lacking in describing approaches to reducing psychopathy/ASPD, much less evaluating any programs which target it (Heilbrun & Peters, 2000; Hoyer, 2000). Perhaps psychopathy/ASPD is seen as too intractable to address; yet recent reports of interventions with youth suggest that primary prevention programs may have an answer. Raine et al. (2003) describe a 2-year nutritional, educational and exercise enrichment program for 3–5 year olds. The enriched, stimulating environment resulted in a number of positive outcomes 14–20 years later for those from adverse backgrounds (malnourished at age 3) compared to nonmalnourished controls in the enriched program and to children not in the program. Those from adverse backgrounds were significantly less likely to have a diagnosis of conduct disorder (a precursor of ASPD) at age 17 and to have a significantly lower rate of criminal offending (not necessarily violent) at ages 23–26 years. A second longitudinal study had an unanticipated consequence of an intervention which moved a proportion of the families in

¹³ For a full discussion of the theoretical and empirical underpinnings of this model, see Hiday 1995, 1997.

poverty out of poverty midway through the study (Costello et al., 2003). It reported that children whose families rose above the poverty line had a significant reduction in conduct disorder between the beginning of the study and 8 years later.

4.3. *Victimization*

Improving housing of persons with major mental disorder can go a long way in reducing victimization [Drake et al., 1991; Hoyer, 2000; Tsemberis et al., 2004] not only for persons with severe mental illness who are homeless but also for those housed with others who behave violently (Hodgins, 2001). Social skills training to improve judgment to avoid violent encounters could help prevent victimization both in the home and on the streets (Bloom et al., 2000). Incorporation of families in conflict avoidance training is important for those who face violence at home. Employment and clubhouse involvement could provide safe, engaging, and purposeful activity (Bond et al., 1997). Crucial to reducing victimization is treatment of the mental illness and substance abuse to improve symptoms and functioning, and to reduce the motivation to seek substances in dangerous places with dangerous people (Hiday et al., 2002). Counteracting the effects of early experience of victimization is more difficult (Athens, 1989); but therapeutic group techniques have been successful in addressing trauma among persons with severe mental illness (Harris, 1998; Morrissey et al., 2005; Rosenberg et al., 2001).

4.4. *Community disorganization*

Changing disorganized communities into organized ones is a very difficult, long-term political and economic process which is beyond the resources of mental health and social services. But providing housing and employment in neighborhoods that are supportive and where violence is not the norm should be imperative (Hodgins, 2001). In addition, training in anger management and nonviolent ways of settling differences will be helpful in reducing their resorting to violence in the new residential and work environments. The major challenges to providing these services along with other needed psychosocial services are two: acquiring the necessary financial resources and obtaining community cooperation (Hiday & Wales, 2003).

5. **Legal interventions**

These four important factors influencing violence among persons with severe mental illness also may act as barriers to seeking and accepting mental health treatment. For those persons with severe mental illness who may not seek and may resist treatment, and who also become dangerous, legal intervention may be necessary (Hodgins, 2001). Assertive outreach and intensive case management, particularly ACT (Assertive Community Treatment) programs, would be preferable to legal intervention in order to avoid obvious coercion (Drake et al., 1998a, 1998b); but such programs may not work for many of those at high risk of violence. Besides offering treatment and services on a voluntary basis, the legal system may have to be employed to engage them, to provide monitoring, and to sustain their treatment while providing needed services to control their risk of violence.

For civil patients, community treatment orders or outpatient commitment (OPC) can be a tool to bring treatment and services to an otherwise unreachable group. The weight of empirical evidence indicates that when these orders are carried out, they can be effective in reducing violence and arrests (for reviews of U.S. and international studies see respectively Hiday, 2003a, 2003b).¹⁴ Being carried out means that the orders must be accompanied by provision of needed services and monitoring. The Duke Mental Health Study found that OPC reduced violence¹⁵ among persons with severe mental illness over 1 year following discharge from a short involuntary hospitalization when the order was extended (6 months or more) and when it was combined with regular services (3 or more a month) (Swanson et al., 2000).¹⁶ Neither an OPC order, extended OPC, nor regular services alone made a significant difference in violence.

¹⁴ Although results of the New York City random controlled experiment appear to contradict these results, there were too many methodological problems in that study to draw any conclusions about outpatient commitment's effectiveness (Hiday, 2003a).

¹⁵ Violence in the Duke Mental Health Study included both violence and other aggressive acts as defined by the MacArthur Risk Assessment Study.

¹⁶ This finding was derived from multivariate analyses when controlling for the significant baseline variables of age, cohabitation, social support, substance misuse, medication nonadherence, and serious violence.

The impact of extended OPC and regular services can be seen in Fig. 6 which contrasts the predicted probabilities of violence over 12 months of follow-up between two groups in the Duke Mental Health Study. It shows that those who had extended treatment orders and regular services had half the risk of violence as those who had no extended OPC and no regular services (24% to 48%). Other analysis indicated that the combination of extended treatment orders and regular services works to lower the risk of violence by reducing substance abuse and improving medication compliance (Swanson et al., 2000). The Duke Mental Health Study also found that OPC reduced victimization among its sample (Hiday et al., 2002). Community treatment orders, thus, can lower violence risk among persons with severe mental illness indirectly through two of our confounds, substance misuse and victimization, as well as by treating the neurobiological pathology (as indicated by medication compliance).

For those who have been caught in the criminal justice net, there are several alternatives which involve diversion out of the net and which can occur at different stages: (1) before arrest with crisis teams or mental health consultants who route persons with severe mental illness to treatment facilities, or with reliable drop-off mental health crisis facilities where police can be sure the person will be attended; (2) at arraignment or at first hearing with mental health screeners or more informally with counsel, state and judge agreeing to the dismissal in exchange for mental health treatment; and (3) at sentencing with mental health treatment being the condition of probation (Cooke, 1994; Lamb et al., 1996; Steadman et al., 1995, 2000; Swaminath et al., 2002).

A promising innovation is mental health courts. These relatively new special jurisdiction courts are modeled on drug courts but are more gentle in handling defendants. They work by marshaling resources, cooperating closely with mental health providers, monitoring offenders' behavior, and having the threat of criminal prosecution and sanctions for noncompliance with treatment and/or resumption of negative behaviors. Because they are in their early stages, there is not much empirical evidence on their effectiveness. Case studies and anecdotal reports claim that mental health courts reduce recidivism; and empirical studies of mental health courts in a variety of locations have found not only reduced recidivism but also reduced substance abuse, increased services and improved medication compliance (Boothroyd et al., 2003; Burvill et al., 2003; Christy et al., 2005; Cosden et al., 2003, 2005; Herinckx et al., 2005; Hiday et al., 2005; Trupin & Richards, 2003).

Though not a diversion, mental health treatment can also be ordered after serving incarceration time, as a condition of parole. Assertive case management at this stage can be useful in reducing criminal and violent recidivism (Draine & Solomon, 1995; Dvoskin & Steadman, 1994; Ventura et al., 1998). A major mechanism by which this is accomplished is close monitoring which returns patients to the forensic hospital when signs of possible deterioration or nonadherence appear (Bloom et al., 1986; Heilbrun & Peters, 2000). An order of mental health treatment by itself will not address the causes of violence among persons with severe mental illness. The order must be accompanied by appropriate mental health treatment and services which address the neurobiological pathology, substance abuse, psychopathy/ASPD, victimization and community disorganization.

Unfortunately, diverted persons and prisoners with severe mental illness are more often released with little or no provision for meaningful services and they return to disorganized communities (Lovell et al., 2002; Silver, 2000) with

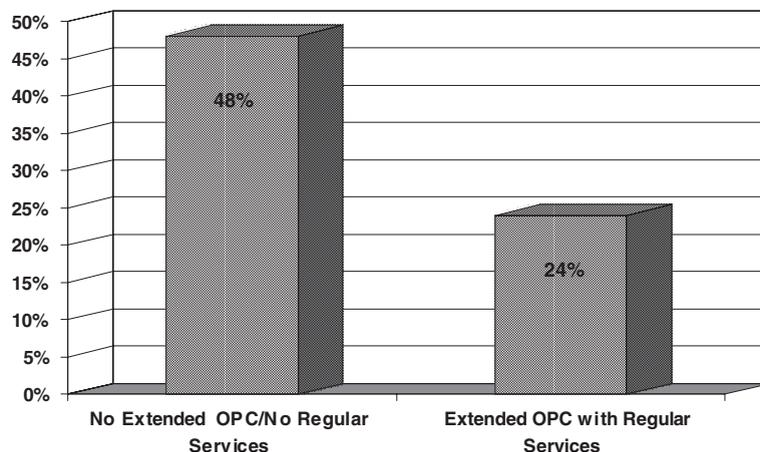


Fig. 6. Risk of violence among persons with severe mental illness in the Duke Mental Health Study (Swanson et al., 2000).

all the same factors to affect their behavior as were causal in getting them arrested and into prison in the first place. Too often mental health programs do not have sufficient resources to be able to provide needed services, especially housing in supportive environments (Hiday & Wales, 2003). Returning persons with major mental disorder to poor, socially disorganized communities with high rates of substance misuse and victimization, and with no provision for housing and needed psycho-social services means that the four major variables which increase risk of violence will continue to operate in their lives.

6. Conclusions

Future studies of mental illness and violence should control for all four of these confounds. Failure to control for them will have negative effects in three areas. Most basically, future studies are likely to find statistical associations between severe mental illness and violence which will be spurious. Policy makers not recognizing the spuriousness of the studies' correlations will be misled in efforts to reduce community risk. More broadly, such correlations will act to support the stereotype of the violent mentally ill person and to sustain the stigma of mental illness.

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