

# Domestic Mass Shooters

## *The Association With Unmedicated and Untreated Psychiatric Illness*

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### Abstract:

**Background:** Given the relative lack of psychiatric information and data on the perpetrators of US mass shootings, the aim of our study was to understand who these “mass shooters” were and whether they had a psychiatric illness. If so, were they competently diagnosed, and if so, were they treated with appropriate medication for their diagnoses before the violence?

**Methods:** Because a prospective study of diagnosis and treatment could not, for obvious reasons, be carried out, we designed a retrospective, observational study of mass shooters, defined as those who killed 4 or more people with firearms between 1982 and 2012 or who killed 3 or more people with firearms between 2013 and 2019 in the United States. We used the *Mother Jones* database—a database of 115 persons identified as committing a mass shooting in the United States between January 1982 and September 2019. In the vast majority of the incidents identified in the database, the perpetrator died either during or shortly after the crime, leaving little reliable information about their history—especially psychiatric history. We focused on the 35 mass shooters who survived and for which legal proceedings were instituted because these cases presented the most reliable psychiatric information. For each of these 35 mass shootings, we interviewed forensic psychiatrists and forensic psychologists who examined the perpetrator after the crime and/or collected the testimony and reports by psychiatrist(s) at trial or in the postconviction proceedings contained in the court record. In addition, we reviewed available information from the court proceedings, public records, a videotaped interview of assailant by law enforcement, social media postings of the assailant, and writings of the assailant. After collecting the clinical information from multiple sources on each case to make a *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*, diagnosis, we also completed a Sheehan Diagnostic Scale. After this, 20 additional cases where the assailant died at the crime were randomly selected from the remaining 80, to determine whether there were differences in psychiatric diagnoses and treatment between such assailants and those who survived.

**Results:** Twenty-eight of 35 cases in which the assailant survived had a psychiatric diagnosis—18 with schizophrenia, 3 with bipolar I disorders, 2 with delusional disorders, persecutory type, 2 with personality disorders (1 paranoid and 1 borderline), 2 with substance-related disorders without other psychiatric diagnoses, and 1 with posttraumatic stress disorder. Four had no psychiatric diagnosis, and in 3, we did not have enough information to make a diagnosis.

Of 15 of 20 cases in which the assailant died, 8 had schizophrenia. None of those diagnosed with psychiatric illnesses were treated with medication.

**Conclusions:** A significant proportion of mass shooters experienced unmedicated and untreated psychiatric disorder.

**Key Words:** psychiatric disorders, prevalence, psychopharmacologic treatment

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Mass killings in the United States and the rest of the world are almost a weekly occurrence. Many observers have proffered various familial, historical, political, religious, and social influences that may motivate the assailants in these tragedies. Psychiatric research—as opposed to articles from media—on the nature and the incidence of mental illness among mass shooters, however, remains largely understudied.

Given the absence of psychiatric data, we sought to advance the understanding of whether perpetrators of mass killings experienced psychiatric illness and, if so, they were diagnosed correctly and then adequately medicated. The few psychiatric or psychological studies associated with “violent behavior” (broadly defined) that have been conducted suggest that there is a strong link to the symptoms of mental illness (broadly defined) and that medication for the psychiatric disorder reduces the risk for violent behavior.<sup>1–3</sup>

The idea for this study originated from one of the authors (I.D.G.), who believed that from his clinical experience, many, if not most, mass shooters were people with unidentified psychiatric illness complicated by lack of family or significant other support. That is, they may have been undiagnosed or misdiagnosed and be experiencing an either improper medication or inappropriate dosage for their psychiatric illness. As such, they might have been unmedicated and acting on paranoid auditory hallucinations or delusions.

## METHODS

### Overall Design

Because a prospective study of diagnosis and treatment cannot, for obvious reasons, be conducted, we designed a retrospective, observational study of mass shooters, defined as those who killed 4 or more people with firearms between 1982 and 2012 or who killed 3 or more people with firearms between 2013 and 2019 in the United States. Our primary objective was to determine the prevalence of psychiatric diagnoses among those who have committed mass killings and whether they had been treated with medication before their crimes.

### Subjects

We started from the most complete database that we could find—the *Mother Jones* database—that is, a database of 115 persons identified as committing a mass shooting in the United States between January 1982 and September 2019.<sup>4</sup> We recognized at the onset of our study that there is neither a uniform definition of a “mass shooting” nor a complete list of those who have committed such an offense.<sup>5</sup> Indeed, it was not until 2013 that the US

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Government had an official definition of “mass killings” as 3 or more killings during an incident, excluding the death of the assailant.<sup>6</sup> The database that we selected sought to inventory every indiscriminate rampage in public places during this period. It excludes shootings stemming from more conventionally motivated crimes, such as armed robbery or gang violence. Although a more complete compilation would be desirable, we considered this database to be the best available representation of the universe of the assailants that we sought to study, particularly those assailants who survived the crime and were subjected to the scrutiny of the legal system.<sup>7</sup>

In the vast majority of the incidents identified in the database, the perpetrator died either during or shortly after the crime. As such, we first examined every case in which the assailant survived, which was 35 cases, and criminal proceedings were instituted. These cases were our main focus because their records and medical workup seemed to be relatively complete and presented the best information on the legal, adversarially tested presentations of the perpetrators' symptoms of mental illness and psychiatric presentations. In such cases, counsel for the government and the defendant are obligated to explore symptoms of mental illness as they are relevant to assessments of guilt and punishment. Indeed, in 21 of the 35 cases, the court found sufficient evidence to order a psychiatric evaluation to determine whether the assailant was competent to stand trial or there was sufficient evidence to warrant an insanity verdict.

For each of these 35 mass shootings, we interviewed forensic psychiatrists and/or forensic psychologists who examined the perpetrator after the crime and/or collected the testimony and reports by psychiatrist(s) at trial or in the postconviction proceedings contained in the court record. In addition, we reviewed available information from the court proceedings, public records, videotape interview of assailant by law enforcement, social media postings of the assailant, and writings of the assailant.

To determine whether there were differences in the psychiatric diagnosis based on the source of information from media accounts (in which the assailant died) versus interviewing forensic psychiatrists and reviewing psychiatric court evaluations (in those who survived), we then selected an additional 20 cases—on a random basis—from the remaining 80 incidents in the database. For these 20 cases, no psychiatric evaluation had been conducted, and coding of the questionnaire necessarily relied on psychiatrists gathering available news reports of the perpetrator's mental health, background, and behavior—so our data and diagnostic evaluations are less reliable.

## Data Collection

We developed a uniform, comprehensive questionnaire to guide and compile the data collection and record our psychiatric assessments of the assailants, using *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)* criteria. One of the 2 interviewing psychiatrists (N.C., D.K.) were each assigned a different case and used our questionnaire to collect psychiatric data to determine the diagnosis of mental illnesses and determine whether precrime medication was prescribed. The clinical data were then reviewed by a second researcher (I.D.G.) to ensure that the *DSM-5* criteria were met or not met for any psychiatric diagnoses.

On each of the 35 cases in which the assailant survived, our interviewers spent on average 30 hours and, in some cases, more than 60 hours, assessing clinical information obtained from the multiple sources, including interviewing forensic psychiatrists and reviewing court documents, taped-video interview of assailant by law enforcement, videotape of the assailant discussing his rampage, and writings of the assailant on websites and diaries. Although there was a massive amount of clinical information gathered from multiple sources for each case, as mentioned previously, the primary

sources used to complete our questionnaire for each of the 35 surviving-assailant domestic mass shooters were as follows: interviews with forensic psychiatrists who had assessed the assailant after the crime (4 cases), information from psychiatric evaluations, all but one of which were conducted during the postcrime judicial proceedings (22 cases), and information from informants, who observed the assailants before or during the crime, plus media reports of the assailants' medical history, background, and behavior (9 cases).

Although we made every attempt to contact and interview the forensic psychiatrist who had assessed the assailant, there were several reasons beyond our control that prevented us from doing so including the following: their confidentiality concerns, the case was still in litigation, the forensic psychiatrist had retired, and/or the perpetrator had refused psychiatric evaluation. When the information was insufficient, or the presence of diagnostic criteria was unclear, we did not make a diagnosis.

To make sure that we covered the range of psychiatric diagnosis, and to decrease interviewer bias, we had each interviewer, after she collected and analyzed all the clinical information from multiple sources on each case, complete a Sheehan Diagnostic Scale.<sup>8</sup> This task was accomplished based on the available information (as hereinabove) as clinical interviews of the perpetrators were not possible.

## RESULTS

Table 1 provides the results regarding the prevalence of psychiatric illness among these domestic mass shooters. Of the 35 cases in which the assailant survived, criminal proceedings were instituted, and a diagnosis could be ascertained (32 cases), 28 (87.5%) had a *DSM-5* diagnosis: 18 (56%) had schizophrenia, whereas 10 (31%) had other psychiatric diagnoses: 3 had bipolar I disorders, 2 had delusional disorders (persecutory type), 2 had personality disorders (1 paranoid and 1 borderline disorder), 2 had substance-related (1 alcohol-related and 1 multiple substance-related) disorders without another diagnosis that we could clearly identify, and 1 with posttraumatic stress disorder. Four assailants (12.5%) had no psychiatric diagnosis that we could find. There was insufficient information to make a diagnosis in 3 cases. The percentage of those experiencing a psychiatric illness might have been higher, as in some cases, the available clinical information suggested a *DSM* diagnosis. For example, 1 assailant was court ordered to be psychiatrically hospitalized for “being found incompetent due to psychosis,” but we were unable to find further clinical information to definitively verify that he met diagnostic criteria.

Of the 18 surviving-assailant cases with schizophrenia, and the 10 having other psychiatric diagnoses, none were medicated or received other treatment before the crime.

Table 2 details clinical case information, including age, sex, primary psychiatric diagnosis, symptoms, and whether adequately medicated from the surviving mass shooters.

Somewhat parenthetically, of the 20 cases in which the assailant died and were based on media reports (vs interviewing forensic

**TABLE 1.** Psychiatric Disorders and Those Medicated Among Mass Shooters

Diagnoses	Mass Shooters Who Survived the Crime (n = 35)	Mass Shooters Who Died at the Crime Scene (n = 20)	No. Medicated (n = 55)
Schizophrenia	18	8	0
Other diagnoses	10	7	0
Diagnoses unknown	3	5	0
No diagnosis	4	0	0

**TABLE 2.** Clinical Information on Key Rated Features of Primary Psychiatric Diagnosis of Surviving Mass Shooters

Case	Age at Time of Crime	Sex	Primary DSM-5 Diagnosis	Clinical Features Present						Continuous Overall Low Functioning Level	Appropriately Medicated for Psychiatric Diagnosis
				Delusions	Hallucinations	Disorganized Speech	Disorganized Behavior	Negative Symptoms			
501	25	Male	Schizophrenia	X	X	X				No	
502	19	Male	Schizophrenia		X		X	X	X	No	
503	35	Male	Schizophrenia	X		X		X	X	No	
504	26	Male	Schizophrenia	X	X			X	X	No	
505	43	Male	Bipolar I	X			X			No	
506	21	Male	Unknown							Unknown	
507	43	Male	Schizophrenia	X	X		X	X		No	
508	29	Male	Schizophrenia	X				X	X	No	
509	20	Male	Substance use disorder: severe				X		X	No	
510	19	Male	Bipolar I (with psychotic features)	X	X	X	X			No	
511	22	Male	Schizophrenia	X		X	X	X	X	No	
512	15	Male	Schizophrenia	X	X				X	No	
513	21	Male	None						X	NA	
514	36	Male	Schizophrenia	X	X		X			No	
515	57	Male	Delusion disorder: persecutory	X		X	X			No	
516	38	Male	None					X		NA	
517	42	Male	Schizophrenia	X	X				X	No	
518	43	Male	Paranoid personality disorder						X	No	
519	46	Male	Schizophrenia	X				X	X	No	
520	44	Female	None							NA	
521	21	Male	Schizophrenia	X					X	No	
522	20	Male	Bipolar I		X			X		No	
523	47	Male	Schizophrenia	X	X			X	X	No	
524	22	Male	None				X			NA	
525	40	Male	Schizophrenia	X		X			X	No	
526	40	Male	Schizophrenia	X					X	No	
527	45	Male	Substance use disorder: severe					X	X	No	
528	17	Male	Unknown							Unknown	
529	39	Male	Delusional disorder	X						No	
530	42	Male	PTSD						X	No	
531	13	Male	Personality disorder: mixed, paranoid, and borderline	X				X	X	No	
532	39	Male	Schizophrenia	X	X	X			X	No	
533	38	Male	Schizophrenia	X					X	No	
534	39	Male	Unknown				X			NA	
535	59	Male	Schizophrenia	X	X	X			X	No	

We have not included all the diagnostic features of the bipolar disorders, delusional disorder, PTSD, substance use disorders, or personality disorders. NA, not applicable; PTSD, posttraumatic stress disorder.

psychiatrists and reviewing court records), in 5 cases, there was not enough information to make a diagnosis. Of the remaining 15 cases, 8 (53%) had schizophrenia. In the other 7, there was “mention” of psychosis in some, but there was insufficient clinical information to make a psychiatric diagnosis. In 1 of these 7 cases, our clinical judgment based on a neuropathology report of his brain was to suggest a combination of diagnoses including the following: (1) temporal lobe epilepsy, (2) neurocognitive disorder probably secondary to pathology in the corpora amyloacea, (3) an alcohol substance-related disorder, and probably all associated with (4) a long-standing paranoid personality disorder. Similarly, none of the 8 deceased mass shooters with schizophrenia or any of the other shooters who were dead had histories of being medicated.

## DISCUSSION

We are aware that mass shooting and related violence are multifactorial outcome measures; they have not only biological and pharmacological determinants but also political and sociological, legal determinants. In this naturalistic, retrospective study of domestic mass shooters, we found a high percentage had untreated, unmedicated psychiatric illness.

Having said that, the vast majority of the seriously mentally ill, who are appropriately diagnosed and treated with medication, are not more violent and do not commit violent crimes more frequently than the rest of the population.<sup>9,10</sup> Furthermore, poor medication adherence, usually associated with substance use, but not just baseline symptoms of psychosis, significantly predicts violence.<sup>9</sup> Not only that, most criminal activity for patients with schizophrenia usually occurs before treatment begins. Importantly, the initial and long-term treatment of schizophrenia with antipsychotic medication improves global outcome and most likely decreases violence.<sup>11,12</sup>

Strikingly, however, we found that most mass shooters in our study experienced undiagnosed and unmedicated psychiatric illness. Without losing sight of the larger perspective that most who are violent are not mentally ill, and most of the mentally ill are not violent, our message is that mental health providers, lawyers, and the public should be made aware that some unmedicated patients do pose an increased risk of violence.<sup>13,14</sup>

Many clinicians know that despite having schizophrenia or other psychiatric illnesses, many patients, including those in our study, possess sufficient cognitive functioning to permit them to plan their violent acts in a methodical manner. For example, 1 teenager, who was psychotic, could still plan and execute violent acts as some parts of his cognitive thinking were relatively unaffected by his underlying psychopathology.

We made the diagnosis of psychiatric illness conservatively, that is, only where we were clearly able to identify that appropriate diagnostic criteria were met. In the cases where we made the diagnosis of schizophrenia, typical psychotic symptoms included the following: command auditory hallucinations to “kill, burn or destroy,” messages from God or demons, or paranoid delusions. Similarly, negative symptoms and poor level of functioning were prevalent; many of the assailants were unable to maintain employment, housing, or social relationships once they developed a disorder. It is important to note that if patients have psychotic thinking, they may kill not only because of symptoms of schizophrenia like command auditory hallucinations but also, like other people without psychiatric illness, for other reasons, like revenge or commonly when associated with substance use.

The limitations of our research include that the study was naturalistic, observational, and retrospective with a limited sample size of 35 and without a control group. We also do not know that an age- and sex-controlled group incarcerated for violent crime also might have had a high percentage of untreated psychiatric

illness. Moreover, none of our interviewing psychiatrists were able to directly interview the mass shooters studied.

Given these limitations, we caution against overreliance on the findings of our study. Nonetheless, our data suggest that persons who commit domestic mass murders may experience compromising and untreated psychiatric illness. There remains a vital need to decrease the stigma of mental illness to enable those experiencing mental health illnesses to be less marginalized and receive treatment. Most of the cases of domestic mass murders possibly might have been prevented had the assailant, after typically being identified as “troubled” by secondary support systems like families, significant others, case workers, schools, as well as legal and medical systems, been more consistently assisted to receive a correct diagnosis, including reviewing previous histories of treatment—diagnosis followed by psychiatric medication treatment appropriate and adequate for their diagnosis and includes psychotherapeutic treatment, that is, actually talking to patients and their significant others—to save lives.

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## AUTHOR DISCLOSURE INFORMATION

The authors declare no conflicts of interest.

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