The Threat to Air and Ground Transportation Posed by Mentally Disordered Assailants

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16. Abstract

While few in number, attacks by persons with mental disorders in public surface transportation and commercial aviation venues can be lethal and pose special security challenges. This report reviews the history of attacks by mentally ill persons in these two domains.

Attacks by mentally disordered persons in surface transportation facilities have increased sharply in recent years. The average lethality of these is lower than those carried out by jihadist terrorists, but can still generate major fatalities. The greater number and most lethal attacks are concentrated in different geographic regions from terrorist and major criminal attacks. The attack methods also differ.

The number of all attacks against airliners and commercial airports since 9/11 has been relatively low compared with earlier decades, indicating considerable success in aviation security. These numbers are particularly low when looking at attacks conducted within secured areas of the airport terminal and airport tarmac, and even lower when looking at attacks in western countries. However, attacks in the public areas of the airports have been growing. Against this backdrop, there have been a considerable number of attacks by persons with mental disorders, including hijackings with hoax devices that result in no fatalities, suicidal pilots intentionally crashing their aircraft, killing all on board, and shootings in public areas of airports.

Decades of psychological analysis suggest that the mental stability of those who operate as members of terrorist organizations is not that much different than the general population, whereas those who are inspired by terrorist propaganda to act alone may have more psychological problems – blurring the line between terrorist and disordered person attacks.

The challenges of dealing with potential attackers with mental disorders are considerable. Stigmatizing rather than treating mental disorders clearly is not the answer. Nor is there any effective way of screening such persons at transportation sites. Police, who are often on the front line in dealing with the mentally ill, face difficult choices when required to intervene in violent situations. To protect others and themselves, they are required to quickly neutralize an unpredictable attacker who may be suicidal.

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Transportation; transit; aviation; terrorism; security; mental disorder

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TRANSPORTATION SECURITY PERSPECTIVE

On January 6, 2017, an arriving passenger at Fort Lauderdale International Airport picked up his checked bag, retrieved a semi-automatic handgun, loaded it in the restroom, and returned to the baggage claim area, where he opened fire on other passengers. In less than 80 seconds, five people were dead and six more had been wounded. Several dozen others suffered injuries in the ensuing panic.

The event initially was seen as another homegrown-terrorist attack, but as more details were learned about the attacker, a different portrait emerged. The shooter was a 26-year-old Iraq War veteran struggling with mental problems. He had had previous brushes with the law, including an arrest for assaulting his girlfriend. He had complained to the FBI in his home state of Alaska that the government was forcing him to watch ISIS videos and that he heard voices telling him to join the terrorist organization. He later told investigators that he had participated in jihadi online chat rooms, although this has not yet been corroborated. The incident looked less like terrorism than an unfortunate case of mental illness, but it raises a number of questions about how society categorizes violent perpetrators and whether the threats they pose differ significantly from terrorist attacks.[1]

On March 9, 2017, a 36-year old man from Kosovo, armed with an axe, began attacking people at random in the main train station in Dusseldorf Germany. Nine people were injured in the assault, three of them seriously, before the attacker tried to get away. He was promptly apprehended by police after injuring himself in a jump from an overpass. German authorities indicated that the attack had no apparent connection to terrorism, but that the assailant had previously been diagnosed as mentally ill. Then, just hours later at the same train station, an elderly man was attacked by a machete-wielding assailant who escaped.

These two incidents were the latest in a series of random attacks in Germany, including an attack on train passengers in Würzburg in July 2016. These attacks can be best described as "running amok"—a sudden homicidal frenzy by an individual often armed with knives, an axe or machetes. But attackers have also used guns and even vehicles as a weapon. Some of these attacks appear to have been inspired by terrorist ideology. Others appear to have been carried out by mentally disordered assailants. Such attacks have occurred in the United States as well.

This security perspective reviews violent attacks on public surface transportation and commercial aviation carried out by individuals who can be described as suffering from mental disorders. The attacks appear under the general heading of "Individual with Unknown Intentions" in accordance with the Transportation Security Administration's categorization of motives for attacks. Other categories of motives include guerrilla/terrorist (which has several subcategories), criminal, and tribal.

The tribal category refers to groups waging guerrilla or terrorist campaigns in several parts of the world on behalf of local tribal issues, as distinguished from ideological or other political motivations. Tribal is a separate category because in many respects tribally motivated campaigns reflect unique local circumstances and should not be extrapolated

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[1] Brian Michael Jenkins, "When Is a Terrorist Really a Terrorist?" *The Hill,* January 26, 2017, http://thehill.com/blogs/pundits-blog/homeland-security/316400-when-is-a-terrorist-really-a-terrorist.

into a broader global threat. All of the categories are, of course, very broad, but they are nonetheless useful for analytical purposes, in particular, for helping those charged with security look at the kinds of attacks that are more likely to occur in the United States.

The analysis described in this essay is based on the Mineta Transportation Institute's (MTI's) database of attacks on public surface transportation (primarily buses, trains, stations, and passenger ferries) and a separate database compiled by the authors, which includes attacks against scheduled airliners (including commuter airlines) serving the public and commercial airports. Eventually, this database will be extended back to the 1970s to match the MTI database, but for the time being, we have included only events since the 9/11 attacks.

How do We Define a "Mentally Disordered" Attacker?

The distinction between mentally disordered and ideologically committed can sometimes be difficult to discern. We have excluded cases where a political or religious cause was strongly espoused or a crime such as robbery was committed. We have included only those cases where the narratives suggest the individual had elements of mental instability or acted for unclear idiosyncratic reasons (such as, but not limited to, suicide). The attackers we categorize as "mentally disordered" exhibited clearly bizarre or confused motives and behavior at the time of the event; some of them had documented histories of, or were described as having, mental illness. Perpetrators of other events may have been suffering from a psychotic episode or temporary mental breakdown. Obviously, opinions may differ on a few of the episodes included in this study, but their inclusion or exclusion would not significantly change the overall analysis.

We are interested here in assessing the nature of the threat posed by the "mentally disordered" category of perpetrators. Do they employ particular tactics or attack particular target sets? Are they more or less lethal than attackers in other categories? And did the events they initiated have other unique aspects?

What We are Not Saying

There is understandable concern among mental health professionals about stigmatizing the mentally ill, who are often incorrectly portrayed as violent.[2] Therefore, it is important to understand what this review of attacks on public transportation does *not* imply. First, we offer no independent diagnosis of the attackers who fall into the "mentally disordered" category. We rely on the narratives of the attacks and what is publicly reported about the attackers, and we provide no further views on what may be complex psychiatric histories.

Second, we are not saying that the mentally unstable represent a significant threat to society or to public transportation. In fact, the number of attacks on surface transportation by mentally disordered individuals is very small—a total of 53 over a period of more than four and a half decades. More mentally stable actors with ideological motives pose a far greater threat.

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[2]   These concerns are discussed in Jonathan M. Metzel and Kenneth T. MacLeish, "Mental Illness, Mass Shootings, and the Politics of American Firearms," *American Journal of Public Health,* Vol. 105, No. 2, February 2015, pp. 240–249, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4318286/.

Third, we offer no opinion on the contentious issue of mass shootings in the United States, most of which have been carried out by loners, some of whom appear to be mentally unstable. The mass shootings have led to calls for more intensive background checks for firearms ownership. Readers will have their own views about gun control. We offer no opinion about whether those who have suffered mental illness should be denied gun ownership. We note, however, that a majority of the attacks carried out by mentally disordered individuals on public transportation involved the use of weapons other than firearms, and that the most deadly incidents involved arson.

Finally, we do not suggest that terrorism can be explained by mental illness, and we do not try to fathom whether some of those categorized as terrorists may also suffer serious mental problems. We have tried to exclude ideologically motivated terrorists from the mentally disordered assailants addressed here, including only those attacks where mental illness is stated in the public narrative, is clearly evident, or can easily be inferred.

Some cases require a judgment call. We would not, for example, include in this analysis the shooters in the 2015 Chattanooga attack or the 2016 Orlando attack if they had attacked public transportation, and we would leave them in the terrorist category, despite reports of both attackers having prior mental problems. However, on the basis of what is known about the shooter at Fort Lauderdale International Airport, we would include him in the mentally disordered category. Other analysts may offer different views. We recognize that the nexus between mental illness and terrorist action, both in general and in specific cases, is a subject of debate.

Are Terrorists "Crazy"?

While the line between ideologically motivated and mentally disordered attackers is sometimes blurry, it is clear that those who join terrorist groups are seldom society's well-adjusted citizens. They tend to be dissatisfied with their lives and disillusioned; they are fanatics who embrace extreme ideologies, are determined to impose their views on others, and are willing to use violence to do so. They see the world in black and white and are ready to take the lives of others—usually innocent bystanders—to achieve what appear to most people as impossible goals. They often also seem eager to expose themselves to danger as evidence of their commitment—some are ready to sacrifice their own lives in suicide attacks. Many appear to have an unusual fascination with firearms and explosives. In the popular mind, their actions are crazy. But are terrorists "mentally disordered" in the clinical sense of the term?

Most studies say, No. At least, the ranks of terrorists contain no more mentally unstable persons than does society at large. "Crazy" behavior does not necessarily indicate crazy actors. Detailed studies of left-wing terrorists in Germany and Italy in the 1970s and 1980s found troubled individuals; many of them came from broken families, had severe conflicts with their parents, and had prior convictions as juveniles. Some clearly were unstable, but there was no evidence of gross psychopathology.[3]

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[3] Federal Republic of Germany, Ministry of the Interior, *Analysen Zum Terrorismus 1-4*, Darmstadt: Deutscher Verlag, 1981, 1982, 1983, 1984.

However, a number of the recent homegrown terrorist attackers have histories of substance abuse, mental problems, and aggression. Such individuals would be unreliable recruits in any kind of organization but may be attracted to the violent rhetoric and images that terrorist groups post on the Internet. The Islamic State of Iraq and Syria (ISIS), in particular, has used social media to reach a broad audience, which it constantly exhorts to carry out violent attacks, and it applauds the attackers when they do so. Reportedly, ISIS actively targets people with violent backgrounds and those with mental-health issues.[4] How does it find them?

Since ISIS probably lacks the ability to identify and target the mentally unstable in advance, it would most likely have to select them by looking for behavioral clues in communications initiated by self-radicalizing subjects and prioritizing proselytizing efforts to exploit their suggestibility.

The same behavioral issues, however, might make the subjects vulnerable to informants in undercover police operations as well, raising the possibility that the universe of those arrested for plotting attacks is itself biased. This would lead to a greater percentage of mentally unstable individuals among arrestees.

A recent study looked at the question of whether ISIS recruits manifest greater evidence of mental illness. The researchers concluded that, according to media reports, 27.6% of those involved in attacks in the West directed or inspired by ISIS "had a history of apparent psychological instability, a percentage comparable to that found in the general population."[5]

Not surprisingly, those involved in ISIS-*directed* attacks had a lower incidence of mental problems than those involved in ISIS-*inspired* attacks. In fact, the researchers were not able to find any evidence of mental instability among the participants in the ISIS-directed terrorist attacks in Paris in 2015 and Brussels in 2016. In contrast, 34.4% of those involved in ISIS-inspired attacks—i.e., attacks in which there was no physical connection between ISIS and the attacker—reportedly showed some symptoms of mental instability.

The attacks in Paris and Brussels were part of an ongoing terrorist campaign carried out by radicals, many of whom had known each other in criminal gangs for years. Some who had traveled to Syria to join ISIS were selected for participation in this campaign.[6] Mental instability would have made criminal gang members and those recruited for terrorist attacks unreliable operatives. They are likely to be avoided or weeded out. On the other hand, mental problems would have made the same persons susceptible to remote exhortation. And reliability was not a criterion, as they posed no risk to the organization or to any ongoing operations.

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[4]   Tom Porter, "ISIS Targeting Misfits and Mentally Ill to Commit Lone-Wolf Attacks, Claims UK Police Chief," *International Business Times,* April 23, 2015, citing comments by Assistant Commissioner Mark Rowley of the London Metropolitan Police, http://www.ibtimes.co.uk/isis-targetting-misfits-mentally-ill-commit-lone-wolf-terror-attacks-claims-uk-police-chief-1497968.

[5]   Emily Corner and Paul Gill, "Is There a Nexus Between Terrorist Involvement and Mental Health in the Age of the Islamic State?" *CTC Sentinel*, West Point, NY: Combating Terrorism Center, United States Military Academy, January 23, 2017, https://www.ctc.usma.edu/posts/is-there-a-nexus-between-terrorist-involvement-and-mental-health-in-the-age-of-the-islamic-state.

[6]   Brian Michael Jenkins and Jean-François Clair, *Trains, Concert Halls, Airports, and Restaurants—All Soft Targets: What the Terrorist Campaign in France and Belgium Tells Us About the Future of Jihadist Terrorism in Europe,"* San Jose, CA: Mineta Transportation Institute, 2016, http://transweb.sjsu.edu/project/1532.html.

It would also seem that mentally disordered individuals might not work well together in a group enterprise. This hypothesis would seem to be confirmed by another study that showed that lone actors were more likely than terrorist group members to suffer from mental illness.[7]

The higher percentage of apparent mental illness among ISIS-inspired attackers may reflect little more than the organization's greater reach through social media and its strategy of persuading homegrown terrorists to do whatever they can. A separate study of lone-wolf terrorists (LWTs) by the Georgetown National Security Critical Issue Task Force noted that "most LWTs are likely to suffer from some psychological disturbance, increasing the likelihood of extremist ideologies resonating."[8]

We are not enamored of the term "lone wolf," which is often inaccurate and romanticizes individual terrorists. However, it is important to note that in 66 of the 68 cases examined in this analysis (97%), the assailants acted alone. We can thus conclude that acting alone is an attribute of the mentally disordered attacker.

The Corner and Gill study of ISIS members cited above pointed out many of the difficulties in assessing the role of mental illness in terrorism. Clinical diagnoses of assailants are often unavailable. Researchers must rely on accounts by acquaintances of odd behavior, the popular prejudice that terrorists must be "crazy," efforts by friends and family members to explain or excuse the individual's actions, or the news media's focus on mental illness as an explanation for terrorism.

Psychiatrists and psychologists often disagree on the interpretation of mental illness as it applies to crime. Expert testimony at the trials of terrorists who survive may reflect the differing motives of the prosecution and the defense. Whether a defendant is deemed fit to stand trial or not reflects the law's more restricted definition of mental incompetency, which may vary from country to country.

Mental disorder does not rule out the capacity to plan and carry out complex tasks over long periods of time. The shooter at Fort Lauderdale International Airport planned his actions. As we see in the cases of the Unabomber and the Alphabet Bomber, discussed later in this essay, two individuals, both described as "mad bombers" and diagnosed as suffering from paranoid schizophrenia, were able to plan their campaigns, build complicated explosive devices, select targets, and carry out bombings over a period of years.

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[7] Emily Corner, Paul Gill, and Oliver Mason, "Mental Health Disorders and the Terrorist: A Research Note Probing Selection Effects and Disorder Prevalence," *Studies in Conflict and Terrorism,* Vol. 39, No. 6, 2016, pp. 560–568.

[8] Lydia Alfaro-Gonzales, et al., Georgetown National Security Critical Issue Task Force, "Lone Wolf Terrorism," *Georgetown Security Studies Review*, Washington, DC: Georgetown University, 2015, http://georgetownsecuritystudiesreview.org/wp-content/uploads/2015/08/NCITF-Final-Paper.pdf.

The World Health Organization's estimate that one-quarter of the world's population has experienced some form of mental illness[9] suggests a very broad definition. According to the National Institute of Mental Health, every year, 17.9% of the U.S. adult population suffers from some mental illness.[10] Obviously, there are degrees of mental illness—only about 4% of American adults, for example, are estimated to suffer from serious mental illness.[11]

Human behavior reflects a complex mix of motives. We should not expect to find any single explanation for why one becomes a terrorist. Except in cases where the individual is obviously delusional, weighting the role of mental illness versus ideological fanaticism is difficult. It is as easy to inflate the role of mental disorders as it is to underestimate them as a factor.

The Threat to Public Surface Transportation

Attacks on public surface transportation by attackers categorized as mentally disordered constitute just 1.1% of the 5,047 attacks in the MTI database as of March 1, 2017. According to recent studies, only about 4% of the total violence in the United States can be attributed to people diagnosed with mental illness.[12] Much depends on the definition of mental illness, but given the small number in the MTI database, the difference is not significant.

The database contains 53 attacks by mentally disordered individuals. These attacks resulted in 301 fatalities (2.6% of the total) and 666 injuries (1.7% of the total). In terms of fatalities and injuries, therefore, the mentally disordered do not represent a major threat. (The only motive category with smaller percentages is "tribal.")

Despite the small total number of attacks by mentally disordered individuals, the trend shows a clear upward movement, particularly since 2000, as indicated in the chart below. There was only one such attack in the 1970s, one in the 1980s, and five in the 1990s, then a surge of attacks occurred after 2000—eight attacks in the 2000s, and 39 between January 1, 2010, and March 1, 2017.

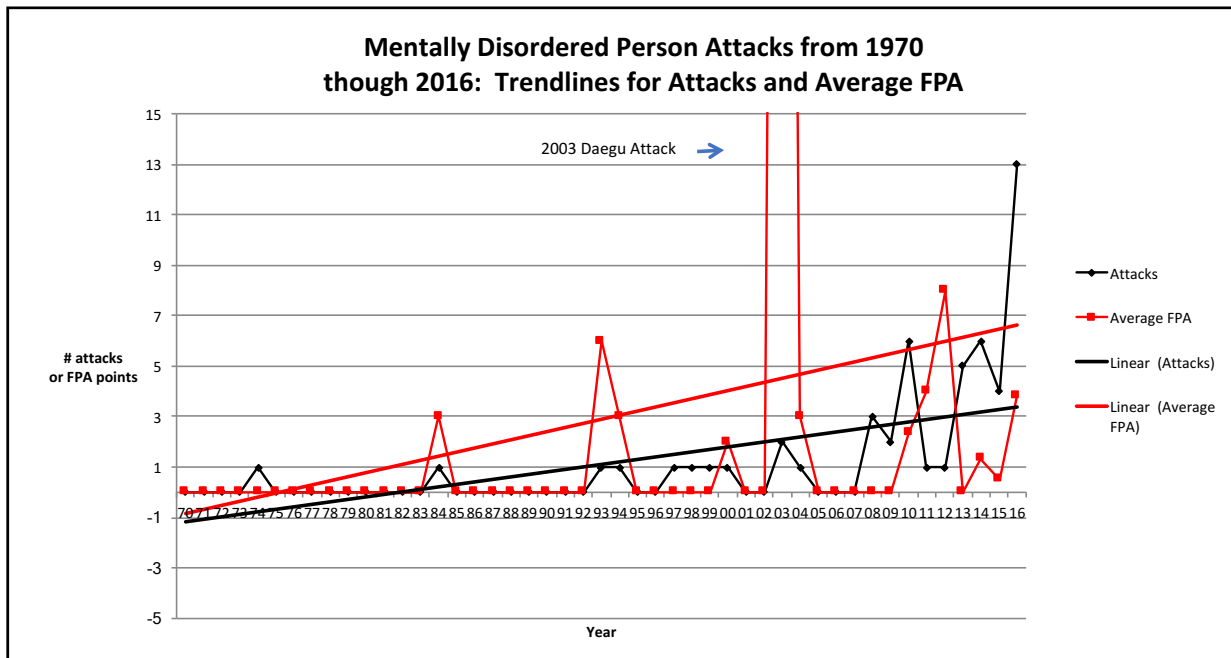| Time Period	# Attacks
1/1/1970 to 12/31/1979	1
1/1/1980 to 12/31/1989	1
1/1/1990 to 12/31/1999	5
1/1/2000 to 12/31/2009	8
1/1/2010 to 3/1/2017	38
TOTAL	53

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[9]   World Health Organization, "Mental Disorders Affect One in Four People," *World Health Report,* October 4, 2001, http://www.who.int/whr/2001/media_centre/press_release/en/.

[10] National Institute of Mental Health, "Any Mental Illness (AMI) Among U.S. Adults," 2015, https://www.nimh.nih.gov/health/statistics/prevalence/any-mental-illness-ami-among-us-adults.shtml.

[11] National Institute of Mental Health, "Serious Mental Illness (SMI) Among U.S. Adults," 2015, https://www.nimh.nih.gov/health/statistics/prevalence/serious-mental-illness-smi-among-us-adults.shtml.

[12] Merzel and MacLeish, op. cit.

Attacks by mentally disordered individuals also appear to be growing more lethal, as shown in the following graph.

Mentally Disordered Person Attacks from 1970 though 2016: Trendlines for Attacks and Average FPA

Such attacks resulted in an overall average of 5.7 deaths and 12.6 injuries for each attack. This average is second only to that of jihadist attacks—8.0 deaths and 23.2 injuries. The vast majority of attacks (46 attacks, or 87%) by mentally disordered attackers were not considered attempts at suicide; of the remaining 13%, four were considered actual suicide attempts, and three were considered possible attempts.

It should be noted, however, that one attack—suicide by arson attempted by a mentally disordered man in a subway car in Daegu, South Korea, in 2003 killed 198 people and wounded 147. However, this is a statistical outlier.

If we exclude the Daegu incident, the average numbers of fatalities and injuries per incident drop to 1.9 and 9.8, respectively, slightly less than the numbers in incidents by tribal groups (2.1 and 4.2) but still higher than in attacks by groups with secular motivations such as the Basque separatists, anarchists, and left- and right-wing extremists. An attack by a neo-fascist group at the Bologna train station in August 1981 killed 85 people—the most in any single-bomb attack in a Western country. Attackers with secular motives are clearly still lethal, and their attacks also illustrate the danger posed by explosives or fire in confined spaces.

The Geographic Pattern of Attacks

A total of 30% of the attacks by mentally disordered individuals took place in East Asia; 25% occurred in Western Europe; and 19% occurred in North America. This is a reversal of the usual geographic pattern of terrorist attacks. East Asia, for example, has experienced only 1.0% of the total number of attacks by terrorists and those in other motive categories; North America also accounts for only 1.0%; and Western Europe accounts for 9.2%. The vast majority of attacks for all motives have taken place in South Asia (40.7%) and the Middle East and North Africa (20.4%).

The highest lethality of attacks by mentally disordered assailants was seen in East Asia (18.3 fatalities per attack [FPA], or 3.3 FPA if the Daegu attack is excluded); lethality in Southeast Asia was 5.5 FPA, and in South Asia it was 4.0. The lethality levels in North America and Western Europe, by contrast, were only 1.4 and 0.6 FPA, respectively. The contrast of lethality of attacks by mentally disordered attackers with that of attacks in all other attacker categories is significant. The FPA for attacks by other types of assailants was 4.0 in East Asia, 1.8 in Southeast Asia, and 2.3 in South Asia. The difference in North America was insignificant, 0.04 FPA, down from 1.4, and the FPA in Western Europe increased slightly, from 0.6 for mentally disordered assailants to 1.0 for others.

The greatest increases in the frequency of attacks by mentally disordered assailants have been seen in East Asia, followed by Western and Eastern Europe combined, and finally, North America.

The United States has experienced the greatest number of attacks by mentally disordered assailants (eight attacks, or 15% of the total); China is next with six attacks (11 %), Taiwan with four attacks (7.5%), Germany with four attacks (7.5%), and Japan and Australia with three attacks each (5.7%). No other country has experienced more than one or two attacks.

The pattern of lethality of attacks by the mentally disordered is also different from the pattern of overall attacks, although this is influenced by the body counts of just one or two events. The average lethality of these attacks worldwide (including the Daegu incident) is 5.7 FPA. Korea has the highest FPA, because of the Daegu event, which had an FPA of 99.0; the Philippines has an FPA of 8.0, Taiwan has an FPA of 7.3, and Egypt has 6.0. The FPA of such attacks in the United States is only 1.4.

Tactics and Weapons

In contrast to attacks by other categories of attackers, 77% of which involve improvised explosive devices (IEDs) or automatic or semiautomatic weapons (often combined with other weapons), only 28% of attacks by mentally disordered persons involve these types of weapons. In 13 bus hijackings by mentally disordered individuals (25% of all attacks), the hijacker was either not armed (five attacks) or armed with a knife (four attacks), other type of weapon (three attacks), or kerosene (one attack). Mentally disordered persons also carried out 12 stabbings (23% of the total).

The hijackings and stabbings in the MTI database began in 1997 and accelerated in 2008. Together they were concentrated in Western Europe, which experienced eight attacks, seven of which occurred since 2013; there were seven attacks in East Asia, starting in 1997 and spread more evenly; and there were five attacks in North America, all occurring since 2010, four taking place in the United States.

The remaining attacks involved (usually homemade) IEDs—10 attacks (19%)—and arson—eight attacks (15%). All but one of the arson incidents took place in East Asia, and only one of them involved an improvised incendiary device (IID) rather than a flammable liquid. Except for the Daegu incident, all of these arson attacks occurred after 2014.

Arson attacks are clearly the most deadly type of attack; they include the subway attack in Daegu and attacks on buses in China and Taiwan that resulted in 30.4 FPA. Armed hijackings have a lethality of only 1.5 FPA, and the IEDs have an FPA of 1.1. Stabbings, as horrific as they appear, achieve an FPA of only 0.8, which is understandable, given the ability of victims to flee and of authorities to intervene. The greater number of arson attacks in East Asia may reflect the difficulty of obtaining firearms or the ingredients for explosives.

Targets

The targets of mentally disordered attackers include passenger trains (including intercity and transit), buses (scheduled, tourist, company), and passenger train stations, bus depots, and bus stops. Attacks against or in these types of targets constitute all but one of the attacks on ground transit by mentally disordered individuals in the MTI database, a nonlethal derailment attempt of a freight train in Croatia. Passenger buses were the targets of 49% of the attacks, followed by passenger trains at 30%, and passenger train stations at 13%.

The top three targets of other attacker groups are the same: Buses were the most common targets (40%), followed by passenger trains (14%) and train stations (8%). However, 21% of the attacks were directed at road and rail infrastructure (where few casualties are involved), and bus stations or stops featured more prominently (10%, as opposed to 6%).

Although none of the reported attacks by mentally disordered persons were directed at infrastructure rather than places where people gather, this may not reflect reality, because vandalism against transportation infrastructure and property may simply not be adequately reported, and when it is, there is often no way of identifying the perpetrator.

The Threat to Airliners and Airports

Airline hijackers in the 1960s and 1970s fell into several broad categories. Many were attempting to escape from communist countries to the West, while some were hijacking planes in the United States in order to fly to Cuba. Others were extortionists demanding ransom or escaping criminals. Many hijackers were mentally disordered. As passenger screening measures improved and governments became less willing to grant asylum to hijackers but instead increasingly returned them for prosecution, the number of hijacking attempts steadily declined.

The security measures in place on September 11, 2001, did not prevent hijackers armed with blades and mace from taking over four planes and carrying out the deadliest attack in the annals of terrorism. The event did lead to more-stringent security measures, and some might now assert that more-stringent passenger screening, improved technology, locked and armored cockpit doors, and the reaction of terrified passengers faced with an attempted hijacking have rendered the tactic extremely difficult to carry out.

Has Security been a Success?

Security measures have not eliminated the terrorist threat. Terrorists carrying more-concealable weapons or substances or perhaps assisted by insiders might still try to take over commercial airliners. Nonetheless, given the terrorists' continuing focus on or even obsession with aviation attacks, efforts to secure commercial airliners have achieved some undeniable success.

Since 9/11, there have been only 132 actual or attempted attacks of all types against scheduled airliners and commercial airports.[13] These attacks include hijackings, sabotage of airliners, attacks in the secured areas of the ramp and terminal, and attacks in publicly accessible portions of airports. Another 22 attacks have been made against airline ticket offices and navigational aids that are off-airport. Together, all the attacks killed 692 people and injured 832. The majority (123, or 80%) of the attacks took place in developing countries, and of these, 23 were in areas of active regular or irregular warfare. Only 31 attacks on airliners or airports have taken place in the developed world since 9/11.

Another way of making the same point—for Western audiences in particular—is to look at attacks that took place in developed countries, including North America and Western Europe. If we do not count the four attacks that took place in the Russian Federation, which include twin suicide bombings in Moscow in 2014 and an assault at the Moscow airport in 2011, only 27 attacks took place in developed countries. Just seven of these attacks resulted in fatalities, and only three resulted in five or more fatalities (the 2015 deliberate crash of an airliner by a suicidal pilot in Germany, the 2016 bombing at the Brussels airport, and the 2017 shooting at Fort Lauderdale International Airport). Two of these three attacks were made by mentally unstable individuals.

There are patterns in the methods of attacks against aviation. In a total of eight hijackings, five involved a hoax device or threat. (This is an important point, since a verbal threat or the display of a hoax device, which may be nothing more than a box with some exposed wiring, does not indicate a breach in passenger screening.) Hijackers neither brought down planes nor killed anyone.

There were also only 10 attempts to bomb aircraft. Three of these caused crashes with, of course, serious consequences. The suicide bombings by Chechens of two Russian airliners departing from Moscow in 2004 killed 88 people, and the bombing of a Russian Metrojet departing from Egypt killed 224 people, for a total of 312 deaths. In 2016, a bomb exploded on a Somali airliner, killing the bomber and injuring two other people. Just over a month later, another bomb killed a single soldier searching through luggage at an airport in Somalia.

In addition to the 22 attacks on airline ticket offices and navigational aids, 39 attacks on airports were launched from outside the airport perimeter. Most of the attacks used rockets, mortars, rocket-propelled grenades, or automatic weapons. All but four took place in developing countries. These attacks killed six people and injured 20.

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[13] These and the following statistics regarding attacks on commercial airliners and airports derive from a private proprietary database compiled by the authors.

That brings us to an area of increasing lethality: the public areas of airports, including the check-in and baggage claim areas, which are outside of the passenger screening checkpoints. There has been considerable lethality in such attacks, including the 2016 attacks in Istanbul (42 deaths) and Brussels (16 deaths), the 2014 attack in Karachi (28 deaths), and the 2011 Moscow attack (37 deaths). Altogether, 46 attacks were launched from public areas of airports; these attacks killed 148 people and injured 568. The attack at Fort Lauderdale in January 2017 killed five and injured six.

The Involvement of Mentally Disordered Assailants in Attacks on Aviation

What has been the role of mentally disordered individuals in attacks on airliners and airports?

Suicidal pilots. Airline pilots suffering mental illness, often reported as acute depression, have caused the deadliest aviation incidents by deliberately crashing their planes, killing all on board. There have been seven such events since 1970 (although some of these cases are still disputed), killing a total of 492. One of these occurred on October 31, 1999, when a distraught co-pilot of an Egyptair flight intentionally crashed his plane into the Atlantic Ocean, killing all 217 on board.

There were two such events in the post-9/11 period considered in this analysis. In 2013, the pilot of a Mozambique Airlines flight locked the co-pilot out of the cockpit and deliberately crashed his plane in Namibia, killing all 33 people on board. In 2015, the co-pilot of a German Wings flight who had been previously diagnosed as suicidal deliberately crashed his plane into the Alps, killing 150 passengers and crew. These two incidents account for 181 deaths, or 26% of the fatalities caused by suicidal pilots.

Hijackings. It appears that mentally disordered hijackers are not easily deterred by security measures. Five of the eight attempted hijackings since 9/11 were carried out by individuals apparently suffering mental problems. Some of these individuals claimed to have bombs, all of which turned out to be hoax devices. The other three attempts were made by FARC (or ETA) guerrillas in Colombia, Darfur rebels (the Sudanese Liberation Movement) in Sudan, and Uighur separatists in China. There may have been more hijackings in Colombia that did not result in fatalities, but they were not captured in any of the datasets the authors searched.

None of the hijacking attempts resulted in fatalities. The only injuries occurred in the 2012 hijacking in China, in which according to Chinese authorities, six Uighur men attempted to storm the plane's cockpit, using metal rods from disassembled crutches. Passengers and police who were on board the flight overpowered the hijackers. In 2008, Chinese authorities reported that police had foiled another hijacking plot, but details were not provided and the incident could not be corroborated.

Sabotage. As far as we know, none of the sabotage attempts on commercial planes since 9/11 have been linked to mentally disordered persons. However, an older case is instructive of the kind of threat such individuals could pose.

Beginning in 1978, the so-called Unabomber, a mentally disordered serial killer, mailed or hand-delivered increasingly sophisticated bombs to his victims, including professors, scientists, computer engineers, airline officials, a publicity-firm executive, and a computer-store owner. During his 17-year campaign, the Unabomber delivered 16 bombs, which killed three persons and injured 24 others. In 1979, one of his bombs ignited in the cargo hold of a commercial flight between Chicago and Washington, D.C. Because of a failure in the timing mechanism, the device—a homemade altimeter—did not detonate but began smoking, forcing the pilot to make an emergency landing. Some passengers were treated for smoke inhalation.

In 1995, the Unabomber threatened to destroy an airliner leaving Los Angeles International Airport unless newspapers published his manifesto. He authenticated that he was the author, using a code he had employed in prior communications, and he designated a specific altitude for the explosion, indicating that he was going to use a barometric-pressure trigger. The analysis of the remains of the bomb that caught fire in the hold of the 1979 flight indicated that the Unabomber was capable of constructing a working barometric trigger. To avoid the risk of further casualties, several newspapers published the Unabomber's manifesto. This, ironically, led to his identification and subsequent apprehension in 1996.[14]

Attacks at airports. As far as we know, all of the bombings at airports since 9/11 have been carried out by terrorists, not mentally disordered individuals. But again, an older case is instructive.

In 1974, a bomb exploded at Los Angeles International Airport, killing three people and injuring 36 others. A group calling itself Aliens of America claimed responsibility for the explosion and warned that it would spell out its name with bombs. A was for airport. A second device was discovered in a locker (L for locker) at the Los Angeles Greyhound Bus station and was disarmed by police. The news media dubbed the perpetrator the Alphabet Bomber. Aliens of America turned out to be an imaginary group created by a disturbed individual who claimed to be the Messiah and who was apprehended several weeks later. He was judged to be insane at his first trial and was sent to a state facility for the criminally insane. He was brought to trial a second time in 1981 and was sent to prison for life.

Mentally disordered assailants have been responsible for several shootings at airports, including a 2013 incident at the Houston Airport in which the gunman fired shots and then killed himself, and an attack at Los Angeles International Airport in 2013, which left one person dead and several injured. The gunman, who survived, intended the attack as part of a suicide scheme. The most recent airport shooting was the attack at Fort Lauderdale.

Calls for More Security

Bombings and shootings at airports have prompted calls for increased security. Some have argued for the creation of new security perimeters at the entrances to airline terminals, although this would create queues of people waiting to enter the airport that would still be vulnerable to terrorist attacks. It would also offer little net security benefit, as determined shooters could still easily carry out their attacks at other public assemblies. Increased

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[14] We are indebted to William Wilkening for the additional details of this case.

presence and surveillance by uniformed and plainclothes officers could be more effective in deterring attacks or, more importantly, in stopping them more quickly if they began.[15]

The Fort Lauderdale International Airport attack led to calls to ban the now-legal transport of firearms in checked baggage, but this would not prevent someone with a weapon from walking into the terminal from the outside, as happened in Houston and Los Angeles. It is simply difficult to protect public places from determined attackers.

Confrontations with mentally disordered assailants are more likely to end in the death of the assailant. In 12 of the 53 cases involving surface transportation and 3 of the 15 cases involving aviation targets (22% of the attacks in the two categories combined), the perpetrator died. Some of the attackers committed suicide, while others may have intended the incident to end with their death at the hands of police. Some assailants who persisted in their rampage, threatened hostages, failed to drop their weapons, or otherwise endangered others were killed by police. (Several other assailants were shot by police but survived.) This contrasts with the 5.2% of cases not involving mentally disordered assailants that ended in perpetrator deaths—a figure that includes suicide terrorist attacks. Confrontations with mentally ill assailants in venues other than transportation sites have also often ended violently.

Despite the lethality of jihadist attacks in public surface transport and aviation, we believe it important to focus on the mentally troubled in transportation. As the Ft. Lauderdale attack and, even more, pilot suicides have shown, the consequences can be deadly. Attacks by mentally disordered assailants pose several difficulties. There is no easy screening or interrogation – no radar to detect troubled souls – in the transit environment or at airports. Families, neighbors, communities and mental health professionals are best equipped to prevent these individuals from carrying out attacks in the first place.

Also, once an event starts, police are in a difficult spot. They have been criticized for their use of deadly force in dealing with the mentally ill. At the same time, rapid intervention is often required to neutralize active shooters (or persons wielding axes or knives). These circumstances call for instant decisions—dialogue and de-escalation may not be an option. It is, however, important that transit and airport police be trained to deal with such situations and that they be given clear guidelines regarding the use of deadly force.

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[15] Brian Michael Jenkins, "The Response to Every Terrorist Attack Cannot Be Another Checkpoint," *The Hill,* July 1, 2016, http://thehill.com/blogs/pundits-blog/homeland-security/286226-the-response-to-every-terrorist-attack-cannot-be-another.

ABOUT THE AUTHORS

BRIAN MICHAEL JENKINS

Brian Michael Jenkins is the director of the Mineta Transportation Institute's National Transportation Center and since 1997 has directed the Institute's continuing research on protecting surface transportation against terrorism and other serious forms of crime.

He received a Bachelor of Arts degree in fine arts and a Masters degree in history, both from UCLA. He also studied at the University of Guanajuato, Mexico, and in the Department of Humanities at the University of San Carlos, Guatemala, where he was a Fulbright Fellow and received a second fellowship from the Organization of American States.

Commissioned in the infantry at the age of 19, Mr. Jenkins became a paratrooper and ultimately a captain in the Green Berets. He is a decorated combat veteran, having served in the Seventh Special Forces Group in the Dominican Republic during the American intervention and later as a member of the Fifth Special Forces Group in Vietnam (1966–1967). He returned to Vietnam on a special assignment in 1968 to serve as a member of the Long Range Planning Task Group; he remained with the Group until the end of 1969, receiving the Department of the Army's highest award for his service. Mr. Jenkins returned to Vietnam on an additional special assignment in 1971.

In 1983, Mr. Jenkins served as an advisor to the Long Commission, convened to examine the circumstances and response to the bombing of the U.S. Marine barracks in Lebanon. In 1984, he assisted the Inman Panel in examining the security of American diplomatic facilities abroad. In 1985–1986, he served as a member of the Committee of the Embassy of the Future, which established new guidelines for the construction of U.S. diplomatic posts. In 1989, Mr. Jenkins served as an advisor to the national commission established to review terrorist threats following the bombing of Pan Am 103. In 1993, he served as a member of the team contracted by the Port Authority of New York & New Jersey to review threats and develop new security measures for the World Trade Center following the bombing in February of that year. In 1996, President Clinton appointed Mr. Jenkins to the White House Commission on Aviation Safety and Security. From 1999 to 2000, he served as an advisor to the National Commission on Terrorism, and since 2000, he has been a member of the U.S. Comptroller General's Advisory Board.

Mr. Jenkins serves as a Senior Advisor to the President of the RAND Corporation. He is a Special Advisor to the International Chamber of Commerce (ICC) and a member of the advisory board of the ICC's investigative arm, the Commercial Crime Services. Over the years, he has served as a consultant to or carried out assignments for a number of government agencies, including the Department of Homeland Security. As part of its international project to create a global strategy to combat terrorism, the Club of Madrid in 2004 appointed Mr. Jenkins to lead an international working group on the role of intelligence. Mr. Jenkins is the author of numerous published research reports, books, and articles on terrorism and security.

BRUCE R. BUTTERWORTH

Bruce Butterworth has had a distinguished government career, working at congressional, senior policy, and operational levels. Between 1975 and 1980, as a professional staff member for the House Government Operations Committee, he ran investigations and hearings on many transportation-safety issues, particularly in aviation. He spent 11 years in the Department of Transportation, eight of them in the Office of the Secretary. He managed negotiations on air and maritime services in the General Agreement on Tariffs and Trade (GATT) (now the World Trade Organization [WTO]), chaired U.S. delegations to United Nations committees, dealt with transport and aviation issues related to border inspections, and was part of the response to the bombing of Pan Am 103.

Mr. Butterworth held two executive posts in aviation security and in both worked closely with Congress as the informal but primary liaison. He was Director of Policy and Planning (1991–1995), establishing strategic, long-term, and contingency plans and federal rules. As Director of Operations (1995–2000), he was responsible for federal air marshals, hijacking response, and 900 field agents; he worked to improve security and the performance of security measures at U.S. airports and by U.S. airlines worldwide. He ran the FAA's aviation command center, successfully managing the resolution of hijackings and security emergencies. He launched a successful program of dangerous-goods regulation and cargo security after the 1995 ValuJet crash, oversaw the conversion of the air-marshal program to a full-time program with high standards, was a key player in the response to the ValuJet and TWA 800 accidents, and was a frequent media spokesperson. He worked closely with Congress, the National Security Council staff, the intelligence community, law enforcement agencies, and authorities of other nations.

From 2000 to 2003, he was an associate director at the U.S. Holocaust Memorial Museum, responsible for security and building operations. He designed and implemented a "best practice" procedure to deal with mail that could contain anthrax, and he developed and conducted new, comprehensive emergency planning procedures and exercises. Between January 2003 and September 2007, he was one of two deputy directors in a 1,300-person engineering directorate at NASA's Goddard Space Flight Center, managing workforce planning, budgeting, and human-capital management for complex robotics space missions, substantially reducing overhead and improving workplace safety there. He also worked with the Department of Homeland Security (DHS) on information sharing.

Mr. Butterworth is a research associate at the Mineta Transportation Institute. In this capacity, he has co-authored several reports with Brian Michael Jenkins, including one for the State of California on security risks created by highway-borne hazardous materials. In February 2009, he published with Mr. Jenkins an opinion piece on information sharing, and on March 23, 2010, he published an article in the Washington Post on intelligence and aviation security.

In 2011, his leading role in creating MTI's unique database of attacks on public surface transportation and in creating and delivering nearly all the briefings to the Transportation Safety Administration's (TSA's) front-line bomb-appraisal officers was recognized in a DHS High Impact award.

Mr. Butterworth received a Master of Science degree from the London School of Economics in 1974 and a Bachelor of Arts degree from the University of the Pacific in 1972 (magna cum laude). He was a California State Scholar and a Rotary Foundation Fellow. He has received numerous special achievement and performance awards.