LONE WOLF TERRORISM & SCHOOL SHOOTERS:
A COMPARATIVE ANALYSIS

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1. INTRODUCTION

"It's the lone-wolf strategy that I think we have to pay attention to as the main threat to this country."
- Leon Panetta, CIA Director, February 2010 –

The threat of terrorism on modern society has been prevalent ever since the 9/11 attacks in New York (2001). These attacks were followed by those in Madrid (2004) and London (2007) on European soil. This threat of mostly terrorist groups and organisations called for action from governments both in the United States and Europe. Mainly through intelligence efforts, counterterrorism policies have attempted to cope with this threat in order to prevent such devastating terrorist attacks in the future (Instituut voor Crisis- en Veiligheidsmanagement, 2007). Nevertheless, media coverage of terrorist attacks conducted by individuals has increased dramatically over the last years. For example, the attack by Anders Behring Breivik in Oslo costed 77 people their lives and got over 100 people injured. Even though this attack had the largest amount of victims, many other incidents have occurred. These kinds of incidents receive much media attention and have an enormous impact on society.

Governments in Europe are increasingly worried by the threat of these attacks by individuals, often referred to as 'lone wolf terrorism' (EUROPOL, 2012). Terrorism is usually viewed as a collective activity that has been combated by preventative counter terrorism strategies. These rely heavily on intelligence, which helps to visualize actors within networks and detect threats (Instituut voor Crisis- en Veiligheidsmanagement, 2007). Individuals such as Anders Breivik operate outside of a network, which makes it challenging for law enforcement agencies to infiltrate and conduct investigations (Kaplan, 1997; Michael, 2012).

These developments highlight the need for more research on the topic. The amount of media and political attention is in contrast with the amount of academic literature on the phenomenon of lone wolf terrorism. Multiple studies state the problem of lone wolf terrorism (Bakker & de Graaf, 2010;; Nijboer, 2012; Hamm, 2012). Others have attempted to develop a clear definition or a typology of the lone wolf (Hewitt, 2003; Pantucci, 2011; Nesser, 2012; Feldman, 2013). A limited number of studies (Spaaij, 2010; Gruenewald, Chermak & Freilich, 2013; Gill, Horgan & Deckert, 2013) empirically examine characteristics of lone wolves, arguing that lone wolves differ from other offenders. Supposedly school shooters tend to have the same characteristics as lone wolves. Comparing characteristics of school shooters

to those of lone wolves may be helpful in developing effective counterterrorism policies to prevent future attacks. Hence, this study compares incidents of lone wolf terrorism to incidents of school shootings. Literature on lone wolf terrorism and school shooters focuses primarily on the United States, thus this study focuses on Europe exclusively. As shown subsequently, a large number of claims on both similarities on and differences between lone wolves and school shooters is documented in academic literature. Unfortunately, empirical research in this field of study is still lacking. Gruenewald et al (2013) specifically recommend to compare lone wolves to school shooters. Response strategies for school shootings may be useful in preventing lone wolf attacks. This research aims to fill this gap and hopes to add to the body of empirical studies by investigating commonalities between lone wolves and school shooters. The underlying assumption is that lone wolves and school shooters actually share commonalities. The research question presented in this study is:

To what extent can commonalities be found between lone wolves and school shooters?

This study unfolds in six sections. In the justification section the reasons and need for this particular study will be discussed. Then 20 hypotheses on commonalities between lone wolves and school shooters are deduced from a review of literature. Subsequently the working definitions on lone wolves and school shooters used in this research are outlined. In the methods section the ways of case selection, data collection, description of analysis and limitations on the research are discussed. After the findings are presented conclusions are drawn in the last section, with some recommendations for future research.

2. JUSTIFICATION

This research is an important contribution to the current body of literature for several reasons. Lone wolf terrorism is politically relevant and has an impact on society. Research needs to be done specifically for incidents in Europe and lone wolves should be compared to other groups, like school shooters. These points will be explained subsequently.

First of all, research on lone wolf terrorism is necessary for policy implications. Partially due to extensive media coverage, much political attention has been given to lone wolf terrorism. Its political relevance has increased over the last years, especially after the Norway attacks in 2011. President Obama explained the threat as follows: '…the risk that we're especially concerned over right now is the lone wolf terrorist, somebody with a single weapon being able to carry out wide-scale massacres of the sort that we saw in Norway recently. You know, when you've got one person who is deranged or driven by a hateful ideology, they can do a lot of damage, and it's a lot harder to trace those lone wolf operators' (Associated Press, 2011). Not only in the United States this concern is discussed by politicians. This threat has also been recognised by EU Commissioner for Home Affairs Cecilia Malmström: 'Radicalisation into violent extremism and lone wolf attacks represents a significant threat for European citizens and have led to many tragedies, such as in Norway. We must reinforce our efforts to prevent violent extremism by becoming better at identifying individuals at risk of radicalisation' (EUROPOL, 2012). There is a need for counterterrorism strategies that aim to prevent lone wolf terrorism. In order to develop effective policies and legislation, empirical studies need to be conducted. This research aims to do so.

Second, this study is socially significant. The public and media are currently greatly interested in lone wolves as a result of recent spectacular attacks of loners with ideological agendas (Bakker & de Graaf, 2010). As was mentioned before, extensive media coverage on lone wolf attacks have an enormous impact on society. As a result, the public has the perception that lone wolf terrorism is a great threat to national security. Although lone wolf terrorist attacks are in fact rare events, they receive much media attention. For example, It appears as if the number of incidents has increased, while scholars disagree on the validity of this claim. For example, Spaaij's research (2010) concluded there does not appear to have been a comparable increase in lone wolf terrorism. This perceived threat of lone wolf terrorism in society on the one hand and the almost exclusively scholarly focus on group-based terrorism on the other

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hand indicates the need for more conceptual and empirical analysis to enable a better understanding of lone wolf terrorism (Simon, 2013).

Third, lone wolf terrorism challenges law enforcement and security services around the world. Research on lone wolf terrorism indicates the difficulty of its prevention (Spaaij, 2012; Gruenewald, Chermak & Freilich, 2013; Borum, Fein & Vossekuil, 2012). These incidents are even considered to be the 'most puzzling and unpredictable forms of terrorism' (Bakker & de Graaf, 2010), while some scholars even argue that lone wolf attacks are not preventable (Barnes, 2012). Especially the detection of lone wolf terrorism is significant as this is the most challenging part of prevention. Traditional counter terrorism strategies rely heavily on intelligence gathering and infiltrating in terrorism networks. As lone wolves by definition operate alone, these strategies are not effective for lone wolf terrorism. Strategies in response to school shootings may help in the prevention of lone wolf attacks. This research examines to what extent prevention of these loner attacks can be extracted from school shooter attacks.

Fourth, this study is a relevant contribution to the existing body of literature on lone wolf terrorism. Several studies (Gruenewald et al, 2013; Borum et al, 2012; McCauley et al, 2013; Weimann, 2012) highlight the similarities between lone wolves and school shooters. The Safe School Initiative, a study of 37 school attacks over the last 25 years jointly conducted by the U.S. Secret Service and U.S. Department of Education, found that school shooters are male, nearly always use guns as a weapon and attacks were rarely impulsive acts. Instead, attacks were planned and publicly discussed with others (Vossekuil et al, 2004). Studies on lone wolf terrorism indicate similar characteristics for lone wolves. These similarities will be empirically tested in this study. This comparison substitutes to existing literature that does not compare loners to another group of offenders (Spaaij, 2010; Moskalenko & McCauley, 2011; Hamm, 2012).

Most empirical studies remain focused on the United States. Both lone wolf terrorism and school shootings seem more prevalent in the United States, providing richer data for empirical analysis. The empirical study conducted by Ramon Spaaij (2010) covers cases of lone wolf terrorism in fifteen countries. This geographical framework offers important insights, as many studies remain focused on the United States. 'Lone wolf terrorism is shown to be more prevalent in the United States than in the other countries under study' (Spaaij, 2010). Nesser contributes to this argument, concluding that his 15 European lone-wolf terrorists differ from American cases (2012). Solely looking at the United States, Eby (2012) identified 53 lone

wolf terrorists since 9/11. Jasparro (2010) has identified 14 specifically jihadist lone wolf terrorists. The present study extends research on the topic by empirically testing lone wolf terrorism in Europe, and comparing it to school shooters. It is essential to conduct similar empirical research in Europe, as this will add to academic research on lone wolf terrorism and school shooters.

Furthermore, the empirical studies that do compare loners to other groups of offenders recommend to compare loners to school shooters. Gruenewald et al (2013) compare far-right loner extremists to a control group of other far-right extremists in the United States. Based on their findings, they suggest how policymakers can address loner violence. Their recommendation is to better understand loner terrorists by comparing them to school shooters. Strategies used in respond to school shootings may have 'promising application to preventing loner violence' (Gruenewald et al, 2013: pp. 29). The underlying assumption is that school shooters and lone wolves share commonalities. This study aims to fill this gap in research and compares that what extent lone wolves and school shooters share commonalities.

3. LITERATURE REVIEW

Previous studies generally assume that lone wolf terrorists and school shooters have both similarities and differences. The previous section has clarified the need to fill this gap in research for policy implications. This study emphasises on the commonalities between lone wolves and school shooters. These need to be tested empirically and hypotheses should be formulated. It was decided to divide the review and hypotheses in four sets of variables. The categorisation into these particular sets of variables was done so for the purpose of organisation of the literature. Previous research has functioned as a guideline in the categorical division (Gruenewald, Chermak & Freilich, 2013; Gill, Horgan & Deckert, 2013).

This study compares personal characteristics, attack style, ideologies and leakage. The first category covers personal characteristics. These sociodemographic details on the perpetrator also includes social interaction details such as mental illness or social isolation indicators. These characteristics are important to provide a general picture of the perpetrator. The second category covers the attack style characteristics, which focuses on the details of the incident. These details shed a light on how perpetrators attack their victims. Variables on inspiration form the third category and aim to capture the inspiration and ideologies for an incident. Previous research highlights that lone wolves and school shooters tend to have specific motivations for attacks and arguably get their inspiration from others (Gruenewald et al, 2013; Gill et al, 2013). The fourth and last category covers leakage characteristics that entail interactions with others prior to the attack. The perpetrator's interactions with others prior to an incident are helpful in the prevention of attacks (Gill et al, 2013). Similarities are expected to be found in these categories of variables, which is based on existing academic literature.

3.1 Personal Characteristics

In this category personal and social similarities between lone wolf terrorists and school shooters are expected. First of all, both groups are more likely to be male. Gruenewald, Chermak & Freilich (2013) and McCauley, Moskalenko & van Son (2013) even found that offenders are predominantly white males. Secondly, lone wolves are likely to be older than school shooters. School shooters are typically current students of the targeted school (McCauley et al, 2013; Vossekuil, Fein, Reddy, Borum & Modzeleski, 2004) and are thus expected to be younger than lone wolf terrorists. As a result, school shooters are less likely to have obtained higher education as they had less time to do so (McCauley et al, 2013). Thus,

lone wolf terrorists are more likely to have obtained higher education, which is supported by several studies (Gill, Horgan & Deckert, 2014; Gruenewald et al, 2013; Kaati & Svenson, 2011).

Both groups are expected to be socially isolated (Gill et al, 2014; Moskalenko & McCauley, 2011; Nijboer, 2012; Spaaij, 2010; O'Toole, 2000; McGee & DeBernardo, 1999). For example, Bakker & de Graaf (2010) argue that despite the lack of a uniform profile of lone wolves, a common characteristic is that they do not 'work and play well with others'. By definition lone wolves act alone (Burton and Stewart, 2008; Spaaij, 2012; COT, 2007). Additionally, in his cross-national study Spaaij (2010) found evidence of social ineptitude among lone wolves, as they were loners with few friends and generally preferred to act alone. Moskalenko and McCauley (2011) similarly found that loners are withdrawn. An indicator of social isolation is relationship status. Both lone wolf terrorists and school shooters are expected not to be married, nor have children (Gill et al, 2014; Gruenewald et al, 2013). School shooters are even less likely to be married or have children, as they had less time (McCauley et al, 2013). Lone wolf terrorists are more likely to be separated, divorced or widower. They are also likely to live alone or with individuals other than family and intimate partners (Gruenewald et al, 2013). Gill et al (2014) recently added that loners often live alone and are unemployed, highlighting that loners are social outsiders. While due to their age school shooters are less likely to live alone (McCauley et al, 2013), their social isolation is prevalent in research. McGee & DeBernardo (1999) found that school shooters are loners. The FBI study by O'Toole (2000) adds that school shooters are often alienated and have a closed social group if any. The study by McCauley et al (2013) links mental health issues in school shooters to their inability to connect to others.

Although scholars have argued that terrorists are usually psychologically stable (Nijboer, 2012), many recent studies have indicated that both groups are likely to have a history of mental health issues (Gruenewald et al, 2013; Gill et al, 2014; Spaaij, 2010; McCauley et al, 2013; McGee & DeBernardo, 1999; O'Toole, 2000; Vossekuil et al, 2004). For example, both Spaaij (2010) and Bakker & de Graaf (2010) argue that although they do not suffer from any 'identifiable psychopathology, the rate of psychological disturbance appears to be higher among lone wolf terrorists' (Hewitt, 2003: pp. 80). This highlights that a diagnosis might be lacking but mental health issues are indeed apparent. Gill et al (2014) found that many had a history of mental illness or personality disorder, which is indicated on the basis on diagnosis. In line with these findings, Gruenewald et al (2013) found that loners were significantly more

likely to have reported mental health issues than far-right extremists. Eby (2012) also found some indication of mental disorder among his sample of lone wolf terrorists in the United States. Among school shooters, McCauley et al (2013) found high rates of mental health problems. McGee & DeBernardo (1999) also argue that school shooters tend to have a mental illness or personality disorder. As with lone wolves, a diagnosis might be lacking but mental health issues are apparent. Vossekuil et al (2004) found history of depression and suicidal problems, even though often a mental health diagnosis or evaluation was not conducted. Overall, both groups are likely to have a history of mental health issues.

3.2 Attack Style

In terms of the details of the attack several commonalities between lone wolf terrorists and school shooters can be expected. Spaaij (2010) states that lone wolf terrorists principally target civilians, followed by government officials. In addition, Gruenewald et al (2013) argue that loners tend to target government and military officials, even though this was compared to other far-right homicides. School shooters by definition target their fellow students, teachers or the school itself (Vossekuil et al, 2004). Thus, both groups are more likely to target civilians and government targets.

Furthermore, both groups are more likely to use firearms, as opposed to other types of weapons. According to Spaaij (2010), loners are not the most likely candidates to use weapons of mass destruction and firearms are the most common type of weapon. Loners are more likely to rely on firearms (Gruenewald et al, 2013). School shooters tend to have access to firearms, which allows them to make use of them (O'Toole, 2000; Vossekuil et al, 2004). Newman (2004) also argues that school shooters often have access to firearms and are thus more likely to choose firearms as a weapon. These studies have been conducted in the United States, where gun laws are more liberal. However, it is interesting to test whether or not this is similar in Europe.

Then, both groups are likely to attack more than one victim. By definition, lone wolves aim to away lives (Bakker & de Graaf, 2010; CoT, 2007). Both lone wolf attacks and school shootings do not occur often but have a large impact. These incidents tend to have multiple victims and thus receive much media attention (Bakker & de Graaf, 2010). Gruenewald et al (2013) found out loners are indeed more likely to attack more than one victim. Even though Spaaij (2010) argues that the number of casualties resulting from lone wolf terrorism has been rather limited, they do target multiple victims. The number of victims for school shootings

seems to depend on its definition. In case of targeted school violence (Fein, Vossekuil & Holden, 1995; Muschert, 2007), school shooters specifically target their victims. This includes incidents where only one specific target is selected but also multiple targets (Muschert, 2007). However, incidents of rampage school shootings involve random targets. In these shootings targets are rather symbolic, and school shooters want to target as many as possible. Thus, rampage school shootings typically have multiple victims (Newman, 2004; Muschert, 2007; Langman, 2009). Overall, it can be expected that both lone wolves and school shooters are likely to attack more than one victim.

Also, both groups tend to have at least an interest in violence. Lone wolves are more likely to have actual military experience. Gill et al (2014) recently found that a significant part of their sample had served in the military, which is in line with findings from other studies (Gruenewald et al, 2013; Kaati & Svenson, 2011). School shooters are generally younger than lone wolves and thus had less time to serve in the military (McCauley et al, 2013). Nevertheless, the same study by McCauley et al (2013) found an interest in violence by school shooters, which is supported by findings from other studies (McGee & DeBernardo, 1999; O'Toole, 2000; Vossekuil et al, 2004).

Next, both lone wolves and school shooters are likely to die in the commission of an event. Frequently, loners are either killed by law enforcement or by suicide (Borum, Fein & Vossekuil, 2012; Moskalenko & McCauley, 2011). Gruenewald et al (2013) even found that loners are likely to be on a suicide mission. Both Vossekuil et al (2004) and O'Toole (2000) highlight history of depression and mental health issues in school shooters, which is linked to their tendency to commit suicide. School shooters tend to have difficulties to cope with noteworthy events, and many have considered or attempted suicide (Vossekuil et al, 2004). McCauley et al (2013) add that school shooters are likely to have histories of depression, despair, and suicidal ideation. Consequently, school shooters are likely to commit suicide in the commission of an event. For this study it is thus expected that both groups are likely to die in the commission of an event, either by law enforcement or suicide.

Lastly, concerning the attack style, both groups are likely to plan their attack. Gill et al (2014) found that lone wolf terrorist events are rarely sudden and impulsive. As with lone wolf attacks, Vossekuil et al (2004) argue that school shootings are rarely sudden, impulsive acts. Instead, school shootings appear to be the end result of a comprehensible process of thinking and behaviour.

3.3 Inspiration

By definition, a lone wolf might be inspired by a certain group but is not under its command (Sageman, 2004; Spaaij, 2012). Thus, lone wolves may identify or sympathize with extremist movements or have been a member or affiliate of such a movement in the past (Spaaij, 2010). In accordance, Gill et al (2014) found that lone wolves are regularly engaged in a detectable and observable range of behaviours and activities with a wider pressure group, social movement or terrorist organization. Additionally, school shooters are typically inspired by another incident (Malkki, 2014). Both groups are likely to get inspiration for an attack.

An important indicator is the ideology of either the lone wolf or the school shooter. In literature different findings have been published. Spaaij (2010) found that 'lone wolf terrorists tend to create their own ideologies that combine personal frustrations and aversion with broader political, social, or religious aims' (Spaaij, 2010: pp. 866). This is supported by Gill et al's study (2014), which found that there are distinguishable differences between lone wolves' ideologies. Bates (2012) concurs by stating lone wolves can be motivated by personal agendas. Conversely, Weimann (2011) considers lone wolves to share a common ideology with a group even though they do not communicate with that group. Simon (2013) elaborates that lone wolves are liberated from the group ideology and are thus free to combine ideology with personal, psychological or criminal motives. For school shooters prevalence of grief is more likely to be personal than political (McCauley et al, 2013). Malkki's recent study (2014) found that even though school shooters explain their act in political terms, their real motivation often derives from the personal problems of the shooter. In line with Spaaij's argument, perpetrators are likely to mix ideologies and interpret personal problems in terms of some larger political problem or cause (Malkki, 2014).

Both lone wolves and school shooters are likely to distribute their ideas. Bakker & de Graaf (2010) argue that it is common among lone wolves to 'distribute their ideas or manifestos to the outside world, in some cases even prior to the actual attack' (Bakker & de Graaf, 2010: pp. 4). Spaaij (2010) adds to this argument, as he states lone wolves may influence wider movements. A well-known example is the manifesto written by Anders Breivik, in which he calls upon action from a greater European fascist movement (Pantucci, 2011). Nevertheless, Gruenewald et al (2013) found that loners are actually less likely to take part in movement-related activities, such as publishing or distributing movement materials and attending protests or rallies. School shootings may influence a wider movement as well, even though it

is difficult to determine whether or not an incident is influenced by a preceding event (Malkki, 2014). For example, the Columbine school shootings in the United States in 1999 seemingly have influenced other school shooters through a written manifesto. Malkki (2014) even uses 'Columbine influenced school shootings as one category in her typology of school shooters. Overall, both lone wolves and school shooters are likely to distribute their ideas.

Recent studies have highlighted the importance of the Internet in both incidents of lone wolf terrorism and school shootings. Simon (2013) highlights the importance of the Internet in this 'technological wave of terrorism'. In accordance, Sageman (2008) also suggests the idea of this wave and claims that the Internet can encourage lone wolves. Similarly, Weimann (2011) states that lone wolves are likely to make use of the Internet for inspiration among other things. Spaaij (2012) argues that individuals can consult terrorist propaganda online, but they can also interact with one another on chat forums. Bakker & de Graaf (2010) rightfully state that nowadays 'the Internet allows anyone to post his or her extremist ideology on the Web (Bakker & de Graaf, 2010: pp.4). In his typology of lone wolf terrorists, Pantucci (2011) also links ideology to the Internet. 'They may be troubled individuals who seek solace in the extremist ideology—an ideology that while for the most part remains self-taught, also appears to be reinforced through online contact with extremists' (Pantucci, 2011: pp. 20). The research by Gruenewald et al (2013) found that loners use the Internet as a tool for recruitment, sharing of tactics, and attack planning. Similar to lone wolves, school shooters also tend to turn to the Internet for inspiration. O'Toole (2000) highlights that school shooters tend to have unlimited access to the Internet, without any supervision. In her research Malkki (2014) found that multiple school shooters made use of the Internet, to look for and to provide others with inspiration. It can therefore be expected that both lone wolves and school shooters are likely to make use of the Internet, either for inspiration or to influence others.

3.4 Leakage

Previous research suggests that both lone wolves and school shooters are likely to discuss their intentions with others. Eager to distribute their ideas, some loners post their ideology or manifesto online even prior to the incident (Bakker & de Graaf, 2010). This statement links the lone wolf's vulnerability of detection by law enforcement, which is put forward as a method of detection by Hamm (2012). He states that research in this area has 'profound implications for the prediction and prevention of lone wolf terrorism' (Hamm, 2012: pp. 11). In his research, Spaaij (2010) explained how loners broadcast their intentions. Gill et al's

recent study (2014) highlights the importance of leakage done by loners as other people generally knew about the offender's grievance, extremist ideology, views or the intent to engage in violence. Gruenewald et al's research (2013) suggests that loners tend to publicly discuss their intentions in some way with others. The study even links this tendency to that of school shooters, who are likely to do so as well (Borum, Cornell, Modzeleski & Jimerson, 2010). 'Friends, acquantances, coworkers, and people on the Internet are likely to have interacted with these loners' (Gruenewald et al, 2013: pp. 87).

Several other studies found the same leakage prior to a school shooting. Borum et al (2010) argues that even though some reports said that the attacks came without any warning, the vast majority of attackers communicated their ideas or plans before the incident. In her study conducted for the FBI, O'Toole (2000) argues school shootings often have some form of leakage prior to the incident. Leakage occurs when a student 'intentionally or unintentionally reveals clues to feelings, thoughts, fantasies, attitudes, or intentions that may signal an impending violent act'(O'Toole, 2000: pp. 16). One of the major findings in the research by Vossekuil et al (2004) was that at least one person had information that the attacker was thinking about or planning the school shooting in over three quarters of the cases. For two-thirds of the cases, even more than one person knew. Typically, they told friends or other peer acquaintances.

Both studies (O'Toole, 2000; Vossekuil et al, 2004) stress that school shooters had behavioural changes prior to the incident. O'Toole (2000) argues that 'the student appears to be increasingly occupied in activities that could be related to carrying out a threat', such as practising with firearms. The Safe School Initiative even found that this behaviour caused other concern or indicated a need for help in almost all cases (Vossekuil et al, 2004). Nevertheless, most attackers did not threaten their targets directly prior to the incident (Fein et al, 2002; Vossekuil et al, 2004). The recommendation is to use threat assessment, some sort of profiling, in responding to school shootings. Gruenewald et al (2013) argues this threat assessment approach can be promising for application in preventing lone wolf terrorism as well. Hence, it can be expected that both lone wolves and school shooters are likely to have some form of leakage prior to an incident, as well as behavioural changes.

4.1 Lone Wolf

Existing literature on lone wolf terrorism indicates a lack of consensus on terminologies and definitions. This kind of terrorism has been called lone wolf terrorism, individual terrorism, solo terrorism, lone operator terrorism, leaderless resistance and freelance terrorism. The term 'lone wolf' originates in American white supremacist movements in the 1990s. Louis Beam popularised 'leaderless resistance' (Kaplan, 1997), the notion that 'all individuals and groups operate independently of each other, and never report to a central headquarters or single leader for direction or instruction' (Beam, 1992). Moreover, it is an operation in which 'an individual, or a very small and highly cohesive group, engages in acts of anti-state violence independent of any movement, leader or network support' (Kaplan, 1997). White supremacists Tom Metzger and Alex Curtis tactically extended this strategy by encouraging fellow racists to commit violent crimes. These attacks against the government or other targets would be committed by 'lone wolves'; racist warriors acting alone or in small groups. In pursuit of particularly Alex Curtis the FBI named its investigation *Operation Lone Wolf*. The term lone wolf terrorism has since been frequently used in academic literature. Lacqueur describes this new terrorism that is 'motivated by religious belief and is more fanatical, deadly and pervasive than the older and more instrumental forms of terrorism the world had grown accustomed' (Lacqueur, 1999). The idea is that this new form of terrorism differs from traditional terrorism in the way it is organized, and in its goals and methods. It is thus challenging for law enforcement agencies to infiltrate groups and conduct investigations (Bakker & de Graaf, 2011; Kaplan, 1997; Michael, 2012).

Hewitt refers to 'freelancers', which he defines as characterizing 'individuals who are not members of a terrorist group, or members of an extremist organization under the orders of an official of the organization' (Hewitt, 2003; pp. 79). The Danish Intelligence Service uses the term solo terrorism. This is characterised by 'the perpetrator, as indicated by the term, carrying out the act alone, {though} the planning and possibly training to a small or great extent has been made together with other persons' (Danish Intelligence Service, 2011). This differs from the 'lone wolf terrorist', who has no contact to terror groups and consequently acts completely isolated (Danish Intelligence Service, 2011). Spaaij adds to this classification, as he claims 'terrorist attacks carried out by couples or by very small terrorist cells do not, strictly speaking, as lone wolf terrorism' (Spaaij, 2010). In addition, he distinguishes between

the lone wolf terrorist and the lone assassin. The latter entails political assassinations, which arguably have different political, ideological, or religious aims. However, it can be difficult to underpin the motivations of shootings. This underlines the inherent difficulties in defining lone wolf terrorism (Spaaij, 2010).

In her thesis, van der Heijde uses the term 'lone operator terrorism'. This includes both the traditional individual as the smallest networks (e.g. two persons, autonomous cells, leaderless jihadism) almost undetectable by intelligence agencies. 'Lone-operators are individuals who are not part of a larger network but who solely decide, plan and perform their act, inspired rather than instructed' (van der Heijde, 2011).

As this phenomenon is not clearly defined in literature, it is thus necessary for the research to outline a clear definition. The indicators that the research uses are based on academic literature. Firstly, an attack of a lone wolf has to be conducted by a person who acts on his/her own without orders or connections to an organisation (Burton and Stewart, 2008; Spaaij, 2012; COT, 2007). Secondly, this individual might be inspired by a certain group but is not under its command (Sageman, 2004; Spaaij, 2012), building on the definition of lone operators, who are 'inspired rather than instructed' by a larger network (van der Heide, 2011). Thirdly, the number of fatalities or injuries such an individual claims is an indicator. Lone wolves aim to take away lives (Bakker & de Graaf, 2010, CoT, 2010). Lastly, the motive of a lone wolf is significant, as a lone wolf has its own ideologies that combine personal frustrations and aversion with broader political, social or religious aims (Spaaij, 2012; Nijboer, 2012). This extends on the idea of leaderless resistance, as it has different beliefs, methods and goals than traditional terrorism (Lacqueur, 1999). Although Spaaij (2010) differentiates between lone wolves and lone assassins, this difference is primarily based upon ideologies. Therefore this research will include political assassinations, as they can be classified as lone wolves under the used indicators.

The lack of consensus on a definition has been prevalent in academic literature. A project named the 'Countering Lone-Actor Terrorism' project aims to understand lone-actor terrorism in a European context. The first part of the project included the development of a working definition that can be used in collecting cases for its database. Through discussion between academics from the field a working definition was created:

'The threat or use of violence by a single perpetrator (or small cell), not acting out of purely personal material reasons, with the aim of influencing a wider audience, and who acts without

any direct support in the planning, preparation and execution of the attack, and whose decision to act is not directed by any group or other individuals, although possibly inspired by others' (Bakker & van Zuijdewijn, 2015: pp. 9). This definition includes small cells and individuals who are not necessarily ideologically motivated, such as school shooters. This definition is useful for this research, as it too includes both small cells and school shooters as lone wolves.

4.2 School shooter

Similar to the term lone wolf, literature on school shootings indicates a lack of consensus on the definition. School shootings or school shooters have been classified as targeted school violence, rampage school shootings, school mass murders, terrorist attacks, classroom avengers. Newman (2004) uses the term rampage school shootings, which are expressive, non-targeted attacks on a school institution. 'An institutional attack takes place on a public stage before an audience, is committed by a member of former member of the institution, and involves multiple victims, some chosen for their symbolic significance or at random. This final condition signifies that it is the organization, not the individuals, who are important' (Newman, 2004: pp. 231). These rampage school shootings do not include shootings of specific individuals due to a conflict, such as rival gang shootings on school grounds (Newman, 2004). While most school shootings take place on high schools, some shootings occurring on universities or other higher educational institutions also fit this category (Muschert, 2007).

McGee and DeBernardo (1999) use the term 'classroom avenger', which is closely linked to the rampage school shooting. These classroom avengers are adolescents who engage in school-related mass murder. The presumption is that the motivation is to attain power or exact revenge on the community or large groups within the community. Attacking the school can be understood as an attempt to attack the community (McGee & DeBernardo, 1999).

Using a more elaborate definition of school shootings, Muschert (2007) includes mass murder incidents, terrorist attacks, and targeted incidents in addition to rampage school shootings. In a mass murder incident, an individual who has not necessarily been part of the school community targets individuals or the institution in general for symbolic importance. In a terrorist attack the school or its students can be selected as a symbolic target in a politically motivated attack. In a targeted incident, 'a member or former member of the institution specifically attacks an individual or group of individuals in order to exact revenge for some

real or perceived mistreatment' (Muschert, 2007: pp. 64). The targeted incident on schools, although rather similar, can be distinguished from a rampage school shooting, as it is not a symbolic attack on the entire school (Muschert, 2007).

As school shootings are most prevalent in the United States, its government called for research on which policies could be based. The Secret Service conducted a five-year study, the Exceptional Case Study Project (ECSP) wherein the term 'targeted violence' emerged. This study examined the behaviour of individuals who have carried out, or attempted a lethal attack on a public official or prominent individual. The ECSP defines targeted violence as 'any incident of violence where a known or knowable attacker selects a particular target prior to their violent attack' (Fein, Vossekuil & Holden, 1995). In addition other types of this 'targeted violence' in which a victim is targeted specifically are examined in the ECSP, including school violence. With targeted school violence, the target can be a specific individual such as a particular classmate or teacher, or a group of individuals such as the football team. The target may even be the school itself as an institution (Fein, Vossekuil & Holden, 1995).

After the Columbine School Shooting in 1999, the Secret Service and Department of Education began to work on the Safe School Initiative. The study extended the ECSP by emphasising on pre-incident thinking and behaviour in order to explore information that could aid in preventing future school attacks. An incident of targeted school violence was defined by means of two indicators. Firstly, a current student or recent former student attacked someone at his or her school with lethal means such as a gun or knife. Secondly, the student attacker purposefully chose his or her school as the location of the attack. In line with Newman's definition of rampage school shootings, incidents where the school was chosen simply as a site of opportunity are not included (Vossekuil, Fein, Reddy, Borum & Modzeleski, 2004).

For this study the following definition of school shootings will be used. Firstly, the attacker is usually a member or former member of the school community (Newman, 2004; McGee & DeBernardo, 1999; Muschert, 2004; Fein et al, 1995; Vossekuil et al, 2004). However, it can also include individuals that are not member of the community, following Muschert (2004). He includes attackers of mass murder incidents on schools and terrorist attacks on schools in his definition (Muschert, 2004). Secondly, the target is the school or individual(s) within the school. This can be the community of the classroom (McGee & DeBernardo, 1999), the

school as a symbol with random targets (Newman, 2004), or specific targeted individuals that may or may not be symbolic (Muschert, 2004; Fein et al, 1995; Vossekuil et al, 2004). The school can either be a high school or institute of higher education such as a university (Muschert, 2004). Lastly, a school shooting typically is conducted with firearms but can also be conducted by other lethal means (Vossekuil et al, 2004).

5.1 Case selection

The sample presented in this research derives from a variety of sources. The cases fit the criteria provided for by the definitions in this study. Academic literature was examined in order to produce a dataset. Several empirical studies provide cases that fit the criteria. Gruenewald et al (2013), Spaaij (2010), and Gill et al (2014) provide cases of lone wolf terrorism, whereas McCauley et al (2013) and Malkki (2014) provide several cases of school shootings. However, these empirical studies are primarily focused on the United States. As the focus is on Europe, this study relies primarily on open source case selection. Cases were identified through tailored search options, consisting of many variations on 'lone wolf terrorism' and 'school shootings'. In addition, cases were selected from the Global Terrorism Database. Incidents that were labelled 'individual' under perpetrator group were selected for the sample in this study.

The decision was made to include dyads and tryads in the sample. This is in accordance with the definition used, as the smallest networks are included. Characteristics of these dyads and tryads are similar to those of individuals (Gill et al, 2014). For example, the Columbine school shooting was executed by a dyad. Eric Harris and Dylan Klebold are considered to be classic examples of school shooters. As this study aims to measure the commonalities among the sample, dyads and tryads are included in the sample. The dyads and tryads are included as separate individuals in the sample because characteristics among these individuals might differ. Also, the goal of the research is to compare individuals.

The sample has both spatial and temporal limits. The sample is limited to the European Union, as these countries share cultural and historical characteristics. Moreover, conclusions on similarities between school shooters and lone wolves can be drawn specifically for the European Union. Switzerland and Norway are included in the sample as well, even though neither country belongs to the European Union. This was decided as both countries share the cultural and historical characteristics with the other countries in the sample. Furthermore, the sample is limited to incidents that occurred after the change of the millennium. As was stated in previous sections, both lone wolf terrorism and school shootings have received increased public and policy attention in this century. It is most interesting to limit the sample to this

period in time. Cases up to the summer of 2015 were included in the sample. Conclusions on similarities can be drawn specifically for cases that occurred in this time frame.

5.2 Data collection

The codebook used in this study was based on a review of literature on lone wolf terrorism and school shooters. Data for the 145 cases was collected for a large number of variables, that are not all included in the research. The variables used for analysis were selected on the basis of the literature review. As was mentioned afore, it was decided to divide the review and hypotheses into four sets of variables. The variables in this research are firstly personal variables of the perpetrator, containing sociodemographic details such as age and gender. Secondly, the process variables are divided into three categories, namely attack style, inspiration, and leakage. These variables derive from the review of academic literature and are based on the categorisation of variables in other academic studies (Gruenewald et al, 2013; Gill et al, 2014). Hypotheses are created from all four categories of variables, which can be found in table 1. The research is based primarily on these hypotheses.

The vast majority of the sources came from tailored online searches. Search terms included multiple varieties on the terms lone wolf and school shooter, such as 'lone operator', 'loner attack' or 'solo terrorism'. Search terms in other languages also provided data, like 'einzelganger' and 'eenling'. Data was gathered primarily from prestigious national and international news agencies, such as the New York Times, BBC News, and The Guardian. News articles often referred to similar incidents, providing more data. Information was furthermore collected from the Global Terrorism Database. Only the perpetrators that were labelled 'Individual' were examined due to the sheer amount of incidents in the Database. Where possible, data was collected from scholarly articles. Data of prior empirical studies was used, tracked down via bibliographies and appendices. These provided rich data that was supplemented by online searches. Relevant documents such as court trial proceedings and extensive background reports were also analysed for data collection. Due to time constraints, few efforts were made to check the authenticity of data.

5.3 Description of Analysis

All variables in the sample were coded either numeric (i.e. age), categorical (weapon type), or binary (yes/no questions). The codebook can be found in table 1, alongside the hypotheses.

Missing data were filtered for analysis and thus 'unknown' data was not included in the analysis.

The created hypotheses are tested through bivariate comparative analysis. Cross tabulation allows for examination of differences between groups, in this case between lone wolves and school shooters. The chi-square test calculates to what degree these groups differ from one another. For variables with small outcomes, the Fisher exact test was used. T-tests were used to calculate the means of numeric variables. In addition to the variables for the hypotheses, several other variables were tested. The variables with significant results were discussed in the results section of this research.

5.4 Limitations

It is important to emphasise some limitations inherent in the sources used in this study. First, it is possible incidents were missed as the sample relies heavily on incidents that were reported in the media. Incidents might not have received international or national media interest, or incidents might not have been made public by security forces. Additionally, the Global Terrorism Database cases that were indicated as 'individual' were examined. As incidents that were indicated as 'unknown' were not analysed due to the sheer amount, some cases might have been missed. Secondly, the amount of data collected for individuals differs significantly between incidents. What could reasonably be collected was limited in many cases. For example, information available about individuals that committed suicide was often incomplete, and information on individuals facing trial was limited due to the privacy of suspects. Thirdly, due to the nature of the open source data collection, it is difficult to distinguish between missing data and the answer 'no'. For example, it can reasonably be assumed that adolescents under the age of 18 in the sample do not have any military experience. However, news reports frequently do not include this information, as it is not relevant. These variables are thus 'unknown' and not included in the analysis. Lastly, due to the amount of missing data the sample for some variables is particularly small. Conclusions can only be drawn with caution as the sample is often too small to do so. In the findings this limitation is taken into account, as the number of observations is mentioned for small samples.

6.1 Description of dataset

The dataset contains a total of 145 individuals. For each individual data was collected in the way described in the previous section. This data was organised in a sheet, containing over fifty variables. Not all variables are discussed in the research. Before discussing the results of the analysis, it is useful to describe the database.

The perpetrator type for the majority of the sample is an individual. The school shooter sample consists of 18 individuals and 1 dyad. The lone wolf group is made up out of 86 individuals, 9 dyads, and 7 tryads. Over three quarters of the sample consists of single incidents. The cases with multiple incidents occurred on the same day or even months later. The geographical variation of the sample is depicted in graph 1. Most incidents took place in Great Britain, followed by Italy, France and Spain. Graph 2 outlines the temporal variation of the sample. Most incidents occurred between 2008 and 2014. There seems to be an increase of incidents in the last years.

A chronological summary of all the cases can be found in the appendix. Several observations are interesting to discuss. First, almost a quarter of the cases are copycat or inspired incidents. Especially school shooters tend to take inspiration from previous incidents (Malkki, 2014). Pekka-Eric Auvinen, Matti Juhani Saari, and Michael Piggin were all incredibly inspired by the Columbine school shooting. The most notorious lone wolf in Europe, Anders Behring Breivik, also inspired others. Dyad John Rodd and Tobias Ruth branded each other with hot irons as an initiation into Breivik's Order of the Knights Templar. Some attacks ignite a chain of events out of revenge, such as the murder of British soldier Lee Rigby in 2013 by dyad Michael Adebolajo and Michael Adebowale. Several right-wing fanatics wanted to avenge the murder even hours after the attack, while others were inspired to conduct a similar attack.

Secondly, the prevention of these incidents is point of discussion within the academic world. Of all the attacks in the sample 29 percent was prevented, for both groups a similar percentage. Particularly in Great Britain, law enforcement has prevented many possible incidents. Individuals have been arrested with explosives in their possession, often discovered through house searches. These were conducted as a result of their online activity or their concerned environment that alerted the authorities. For example, 19-year-old Michael Piggin planned to launch an large attack with multiple targets but was discovered through his online

activity. An unidentified dyad told their intentions to their parents, after which the police found explosives in their possession during a house search in 2014.

Lastly, the dataset contains several assassinations or attempted assassinations of politicians. In 2002 Dutch politician Pim Fortuyn was assassinated by Volkert van der Graaf. A year later Mijailo Mijailovic assassinated Anna Lindh, Swedish minister of Foreign Affairs. Pavel Vondrouš attempted to assassinate the president of the Czech Republic in 2013. In addition to politicians, other public figures were targeted as well. Several artists were targeted for their depictions of prophet Mohammed, such as cartoonists Kurt Westengaard and Lars Vilks.

6.2 Bivariate findings

The empirical findings will be discussed in the aforementioned four groups of variables. For some variables comparisons are based on rather small sample sizes, so interpretation of the results should be done cautiously.

The first set of variables contains the hypotheses on personal characteristics. As was expected, the sample is heavily male-oriented. In both groups at least 90 percent of the perpetrators is male, supporting the hypothesis. Bivariate findings confirmed the hypothesis that lone wolves would be more likely to be older than school shooters. Lone wolves were on average 31 years old at the time of the incident, while school shooters were on average 18 years old. Another interesting finding regarding personal characteristics is that the level of education differs significantly between lone wolves and school shooters. It was expected that school shooters would not have obtained higher education due to their age. In addition, only 22 percent of lone wolves have obtained higher education, while it was expected that this would be a majority. Furthermore, all school shooters were indeed not married nor did they have children, as was expected due to their age. Supporting the hypothesis, lone wolves were also not likely to be married or have children. Of the 67 cases for whom relationship status data was available, only 33 percent was engaged or married. Furthermore, 30 percent of the available 88 cases had children. Indications of social isolation and of a mental illness were the last personal characteristics examined. Although bivariate significance tests indicated no important differences across groups, there were some differences found. Opposite of what was expected, school shooters are more likely to be socially isolated. There was an indication of social isolation in 28 percent of lone wolves and 47 percent of school shooters. School shooters are also slightly more likely to have a mental illness. In 47 percent of school shooters and 35 percent of lone wolves a mental health disorder was indicated.

The next set of variables attempted to capture the attack style characteristics. As for the targets, it was expected that both groups tend to primarily target government and civilians. For school shooters, all 20 attacks targeted civilians; high school students and staff in particular. Of the 113 lone wolf observations, 43 percent targeted civilians and 15 percent the government. In addition, 13 cases had multiple targets that might include both government targets or civilians. Although religious targets account for the second largest targets with 17 percent, the hypothesis is supported. Then, the preferred weapon type is expected to be firearms. For school shooters both firearms and multiple weapons each comprise for 40 percent. Not in concordance with the hypothesis, lone wolves used explosives more frequently than firearms, covering respectively 33 percent and 21 percent. Concerning the number of injured and killed victims it is most interesting to calculate the average without the attacks that were prevented. The prevented attacks do not any provide information on victim count, thus should not be included. The average number of injured victims in the 99 observed cases was 5 for lone wolves and 3.5 for school shooters. In the 102 observed cases for fatalities the average was 2.3 for lone wolves and 3.6 for school shooters. Nonetheless, these results are difficult to interpret as they do not explain how many people were targeted. In many cases the perpetrator aimed to take more lives away, while in other cases the perpetrator might have not intended to kill anyone. Thus, the hypothesis fails to be tested significantly. It was expected that both groups were likely to have military experience. Of the 18 observed school shooters only 3 had military experience, explained by having had less time due to their age. Almost 30 percent of the observed 86 lone wolves had gained military experience. Both groups have been reported to die in the commission of an event, either by suicide or killed by law enforcement. However, 89 percent of lone wolves survived the attack. Only 11 committed suicide and 3 were killed by law enforcement. The hypothesis is supported for the group of 20 observed school shooters. Half of them survived the incident, while the other half committed suicide.

The next set of variables concerns the inspiration of an attack. It was firstly expected that incidents are likely to be inspired by a previous attack. In 53 percent of school shooters this was the case, supporting the hypothesis. Yet, only 17 percent of the lone wolf attacks was inspired by a previous attack. Lone wolves and school shooters were furthermore expected to have expressed a justification. Supporting the hypothesis, 73 percent of lone wolves and 61 percent of school shooters expressed a justification of their act. In line with literature, the ideology of almost all school shooters was a single issue. Only 14 percent of lone wolf attacks

was a single issue. Rejecting the hypothesis, ideologies were more political than personal. The dominant ideology, in 45 percent of the cases, was religion. The second largest ideology was right-wing in 36 percent of lone wolves. Another interesting variable on inspiration covers the tendency to distribute ideas. Even though a vast majority expresses a justification, some sort of manifesto was left in only a few observed cases. Solely 10 percent of lone wolves and 30 percent of school shooters, thus the hypothesis can be rejected. Lastly, this research expects both groups to make use of the Internet for inspiration. In many cases it is unknown whether or not online research was conducted, thus the number of observed cases for this variable is rather small. Nevertheless, most observed school shooters had an indication of online research, as did 40 percent of lone wolves.

The last set of variables captures leakage, which contains interesting findings for future research. The hypothesis that individuals discussed their intentions with others found support. Almost half of lone wolves did so and 82 percent of school shooters. Against expectations, lone wolves leaked to a friend or family member in one third of the cases that did discuss their intentions. Only 22 percent posted their intentions online, while it was expected that lone wolves would be more likely to discuss their intentions online than to personal contacts. School shooters were expected to be more likely to discuss their intentions to personal contacts than post them online. However, the number of observed cases is equal for posting online and leaking to personal contacts. Of the cases that did discuss their intentions with others, most did not leak details or a specific plan of the attack. Instead, of the lone wolves 35 percent merely leaked their ideology and 43 percent discussed their intention to act. The majority of 57 percent of school shooters discussed their intention to act. It seems school shooters are slightly more likely to discuss details of their attack. Another interesting variable of leakage is the change of behaviour prior to an incident, which was expected in both groups. An indication of behavioural changes prior to the incident was found in 40 percent of both lone wolves and school shooters, supporting the hypothesis.

6.3 Additional findings

In addition to the hypotheses other variables from the database were tested. Numerous variables were interesting and shall be discussed as well, such as the employment of the observed cases. As can be expected, 69 percent of school shooters was still a student at the time of the attack. Out of the 92 observed lone wolves for this variable, 48 percent was employed and 42 percent unemployed. Hence, lone wolves are not more likely to be either

employed or unemployed. The same conclusion was reached by Gruenewald et al (2013) in their research. Then, a lone wolf is by definition an individual that may be under the command of an extremist group (Sageman, 2004; Spaaij, 2012). In this sample 36 percent of lone wolves had links to an extreme group. Even though this is not a majority, for a group of individuals this percentage is rather high. The criminal background of particularly lone wolves was remarkable as well. Of the 93 observed cases 47 percent had at least one previous conviction, ranging from petty crimes to murder. A vast majority of lone wolves and even a third of school shooters was known to law enforcement. However, only 40 percent of lone wolves was under investigation at the time of the attack, and a third of school shooters was. The hypothesis that both groups were expected to have a mental illness was supported. Out of the 60 observations, 35 percent received mental health services. For school shooters this was 24 percent out of 17 observations. The last interesting variable is the indication of a noteworthy event prior to the incident, functioning as a trigger for the attack. This was observed in 58 percent of lone wolves and 67 percent of school shooters. These additional findings have interesting implications for further research, which will be discussed in the next section.

7. CONCLUSION AND DISCUSSION

Empirical research on the topic of lone wolf terrorism and school shootings is rather scarce. The field of study is still rather limited, even though its significance has been highlighted in political and public arenas. The existing literature focuses primarily on the United States, thus this study aims to add to empirical findings in Europe. The goal of this study was to find commonalities between lone wolves and school shooters. The tested personal and process variables were divided into four categories, namely personal characteristics, attack style, inspiration, and leakage. Commonalities between lone wolves and school shooters were written down in hypotheses and found in all four categories. As was expected, both groups were predominantly male, single and not likely to have children. Indications of social isolation, mental illness and military experience were also prevalent. Particularly civilians and the government were targeted. In most cases an ideology or justification was expressed, although rarely in a written statement. Previous literature already indicated that both lone wolves and school shooters were likely to discuss their intentions with others. This was confirmed, in most cases they leaked either online or to personal contacts. Behavioural changes prior to the incident were present in a majority of cases. In addition to the expected commonalities several differences were found. Against expectations, only school shooters were more likely to use firearms as a weapon. The vast majority of lone wolves survived the incident, while school shooters are significantly more likely to die in the commission of an event. School shooters tend to be inspired by a previous attack and conduct online research. Lone wolves are less likely to do so. The expected commonalities in these hypotheses were not significant enough and were thus rejected.

Besides the hypotheses several additional findings were interesting. In line with Gruenewald et al's findings (2013), this study found that lone wolves are as likely to be employed as unemployed. Hence, employment does not provide additional information on lone wolves. Then, interestingly enough several lone wolves had links to an extreme group, while the lone wolf is supposedly an individual. The vast majority of the individuals in the sample experienced a noteworthy life event prior to the incident. Such a life event can suffice as an important trigger to conduct an attack and initiate behavioural changes leading up to the incident.

The empirical study conducted by Spaaij (2010) concluded there was no comparable increase of lone wolf terrorism. The temporal variation of the sample in this research indicates that

there has been an increase of incidents over the last years. The explanation for this is unknown. Yet, it has been argued that lone wolves have filled a terrorism void, originated as a result of successful counterterrorism strategies for other types of terrorism (Barnes, 2012). However, the current technological era with the rise of the Internet might have had an impact as well. Further research might provide some important insights into why individual attacks appear to have increased.

Another interesting finding is that almost a third of the attacks in the sample was prevented. This finding is in contrast with the conclusions by Barnes (2012), who argues that the best approach to responding to lone wolves is to do nothing. Lone wolves are supposedly tactically inferior and current approaches are not applicable to lone wolves (Barnes, 2012). However, other research by Strom et al (2010) suggests that more lone wolf attacks have been prevented than successfully completed in the United States since 2001. This research concluded that law enforcement activities were particularly important for prevention of such attacks (Strom et al, 2010). This is supported by the findings in the current study. The vast majority of the sample was known to law enforcement, and particularly lone wolves often had a criminal record. Still, considerably fewer lone wolves were under current investigation. Additional research is thus necessary to better understand the connections between law enforcement efforts and the prevention of attacks. Nevertheless, it can be concluded that preventing lone wolf attacks and school shootings is possible.

7.1 Recommendations

The conducted research highlights the complexity of the phenomenon lone wolf terrorism. Although important conclusions can be drawn from this study, much can still be done. One important limitation of this research is the lack of a control group. The findings indicating mental illness, social isolation and military experience should be compared to a control group in order to fully realise the significance of the empirical findings. This study has concluded that these findings are common in both lone wolves and school shooters. Conducting a comparable analysis to other groups would indicate whether or not the findings are illustrative specifically for lone wolves and school shooters or can be found in other terrorists as well.

This research has highlighted the importance of behavioural changes prior to the incident rather than sociodemographic characteristics. This study found that like school shooters lone wolves tend to discuss their intentions with others, either online or to their direct environment. Research should be done how this knowledge can help to prevent future attacks. The criminal

background and interactions with law enforcement suggest that analysis through a criminal perspective might be worthy. Such a perspective can help to determine how individuals transit from criminal activities to terrorism.

Threat assessment of school shooters is based on academic research (O'Toole, 2000; Vossekuil et al, 2004). These threat assessments are used as a guideline to identify potential school shooters. Instead of focusing on stereotypes, threat assessments emphasise the importance of behaviour displayed by an individual. This may help to identify and reduce the risk posed by a potential school shooter. Threat assessments may have a promising application for lone wolves as well. The emphasis on behaviour instead of stereotypes may help to identify and reduce risks posed by lone wolves. For example, this study found that lone wolves often have a criminal background and a change of behaviour prior to an attack. The intelligence community, law enforcement agencies, and mental health services could make use of threat assessments. Of particular importance for threat assessments is the provision of tips and leads from a loner's direct environment, such as family, friends, neighbours, and co-workers. This study has indicated that this direct environment often has important knowledge prior to an incident. If the number of reported tips and leads can be increased, law enforcement can make use of an effective response system. Still, extensive additional research should be done to provide more direction towards an effective threat assessment for lone wolves.

In addition to empirical research there is also a need for qualitative research. Valuable insights can be gained from interviews with lone wolves and school shooters. The importance of a behavioural analysis was pointed out. This can be conducted most successfully through in-depth interviews. In this empirical research data collection is rather limited, primarily due to open source data gathering. In many cases information simply was not available for numerous reasons. Quantitative research can provide more information on individuals that qualitative research lacks.

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Chronological Summary of Cases

1. **May 2000 – Vedran Senčić**

Former soldier Vedran Senčić blew up the post office in Vinkovci, Croatia, after being refused to withdraw money for not having ID. He died in the grenade blast.

2. **March 2000 – Michael F.**

Sixteen-year-old Michael F. murdered the head of his boarding school, located in Brannenburg, Germany. He tried to commit suicide and has been in a coma ever since. His attack was an act of revenge for being expelled.

3. **September 2000 – Beate Zschäpe**

Together with fellow neo Nazis Uwe Mundlos and Uwe Böhnhardt, Beate Zschäpe conducted multiple attacks on immigrant shopkeepers in Germany over a period of seven years. She eventually surrendered and is awaiting trial.

4. **September 2000 – Uwe Mundlos**

Together with fellow neo Nazis Beate Zschäpe and Uwe Mundlos, Uwe Böhnhardt conducted multiple attacks on immigrant shopkeepers in Germany over a period of seven years. He eventually committed suicide.

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Together with fellow neo Nazis Uwe Böhnhardt and Beate Zschäpe, Uwe Mundlos conducted multiple attacks on immigrant shopkeepers in Germany over a period of seven years. He eventually committed suicide.

6. **January 2001 – Joe Erling Jahr**

Together with two other members of the Neo Nazi gang 'Boot Boys', Ole Nicolai Kvisler and Veronica Andreassen, 19-year-old Joe Erling Jahr stabbed 15-year-old Benjamin Hermansen to death in Oslo, Norway. This attack was preceded by another attack in December 2000. Both attacks were racially motivated. Jahr was sentenced to 16 years imprisonment.

7.   January 2001 – Ole Nicolai Kvisler

Together with two other members of the Neo Nazi gang 'Boot Boys', Joe Erling Jahr and Veronica Andreassen, 21-year-old Ole Nicolai Kvisler stabbed 15-year-old Benjamin Hermansen to death in Oslo, Norway. This attack was preceded by another attack in December 2000. Both attacks were racially motivated. Kvisler was sentenced to 15 years imprisonment.

8.   January 2001 – Veronica Andreassen

Together with Neo Nazi gang 'Boot Boys' members Joe Erling Jahr and Ole Nicolai Kvisler, Veronica Andreassen formed a triad. Jahr and Kvisler stabbed 15-year-old Benjamin Hermansen. Andreassen was physically not part of the murder but was involved during a precedent attack in December 2000. For her involvement she was sentenced to 3 years imprisonment.

9.   September 2001 – Friedrich Heinz Leibachen

In Lug, Switzerland, Friedrich Heinz Leibachen attacked the Canton's parliament, killing 18 people and injuring 14. His primary victims were magistrates and politicians. Leibachen wanted to revenge the legal system, which he saw as the mafia.

10.   October 2001 – Jean-Pierre Roux-Durraffourt

Jean Pierre Roux-Durraffourt shot people at random in Tours, France. He injured 11 people, of whom 4 fatally. Among his victims were policemen and his act was directed at society in general. He received the maximum sentence, life imprisonment.

11.   November 2001 – Domenica Quaranta

Domenica Quaranta was arrested after explosives in the subway of Milan failed to explode. He became a Muslim fundamentalist during previous imprisonment for petty crimes. He was religiously inspired and angry with the United States for its War on Terror in Afghanistan. In November 2001 he unsuccessfully tried to blow up his car in Agrigento, Italy, followed by another failed attempt in February 2002. He was sentenced to 16 years imprisonment.

12.   February 2002 – David Tovey

Right wing extremist David Tovey was arrested by police in Oxford. He had targeted approximately twelve Asian and black families, in addition to a mosque in Swindon. In his possession several firearms and explosives were found.

13. February 2002 – Adam Labus

22-year-old Adam Labus attacked his boss for firing him. In addition, he killed the principal of his former school, as revenge for being expelled. Labus committed suicide on the same day. The attacks occurred in Freisingen, Germany.

14. March 2002 – Richard Durn

French police arrested Richard Durn after he opened fire during a town council meeting in Nanterre, France. Eight people died and nineteen got injured during the shooting, which lasted only fifty seconds. During police questioning Durn committed suicide by jumping off a window.

15. April 2002 – Robert Steinhauser

Expelled high school student Robert Steinhauser, age 19, shot sixteen fellow students in Erfurt, Germany. Steinhauser committed suicide after the attack.

16. April 2002 – Dragoslav Petkovic

17-year-old student Dragoslav Petkovic targeted his high school teachers, after which he committed suicide. This school shooting in Vlasenica, Bosnia, was suggested to be inspired by the Erfurt school shooting in Germany earlier that month.

17. May 2002 – Volkert van der Graaf

Animal activist Volkert van der Graaf was arrested in Hilversum, the Netherlands. He murdered high-profile Dutch politician Pim Fortuyn shortly before national elections. He was convicted for murder.

18. July 2002 – Maxime Brunerie

Student Maxime Brunerie attempted to murder French president Jacques Chirac during Bastille day in Paris. He was known to be a right-wing enthusiast and was unsatisfied with the election of Chirac as president. He was convicted for ten years imprisonment for attempted murder.

19. December 2002 – Giorgos Sandalis

Recently elected mayor of Athens, Dora Bakoyianni, and her bodyguard got injured after Giorgos Sandalis shot them. Sandalis was arrested following the incident.

20. February 2003 – Jefferson Azervado

Inspired by Timothy McVeigh, Jefferson Azervado send multiple letters containing small amounts of caustic soda to government officials in Great Britain. In addition, he planted a hoax bomb near a highway. He was arrested in relation to both offences and was charged with offences under anti-terrorism laws. Azervado was convicted for four years imprisonment.

21. June 2003 – Nabeel T.

Asylum seeker Nabeel T. send toxic letters to primarily government targets in Belgium. He injured twenty people and was arrested by authorities.

22. July 2003 – Florian Klein

16-year-old high school student Florian Klein fired multiple guns at his high school in Erfurt, Germany. Klein injured only one person and committed suicide.

23. September 2003 – Mijailo Mijailovic

The Swedish minister of Foreign Affairs, Anna Lindh was assassinated by Mijailo Mijailovic. She was shopping with a friend in Stockholm, when she was stabbed bij Mijailovic. He was sentenced to life imprisonment for murder.

24. September 2003 – Terry Collins

Over a longer period of time Terry Collins terrorised multiple Asian families in their homes in Eastbourne. This right-wing fanatic had joined the British National Party after he had been attacked by a gang of youths from an ethnic minority. He was convicted for arson, racially-aggravated harassment and criminal damage, for which he was sentenced to five years imprisonment.

25. December 2003 – Muhammed Al-Khatib

Immigrant Muhammed Al-Khatib committed suicide in Modena, Italy. His car contained a bomb that was meant to explode in front of a synagogue. His attack was religiously inspired.

26. January 2004 – Murat Demir

16-year-old student Murat Demir murdered the principal of his school Terra College in The Hague, the Netherlands. The shooting was an act of revenge for his upcoming suspension. Demir was tried as an adult and sentenced to five years and TBS.

27. March 2004 – Moustafa Chaouki

Moustafa Chaouki meant to blow up his car in front of a McDonald's in Brescia, Italy. The four cylinders of kitchen gas failed to explode. Chaouki committed suicide but no one else was injured. The incident was presumably religiously inspired.

28. April 2004 – Allen Boyce

Involved in far-right politics, Allen Boyce planned an attack to a hotel in Eastbourne, Great Britain, that harboured asylum seekers. He was arrested before an attack could occur and he admitted his intentions.

29. September 2004 – Brahim Bouteraa

Brahim Bouteraa hijacked a small aircraft in Norway. His asylum application was rejected by the Norwegian government and was suspected of having connections to Islamic circles in North Africa. Bouteraa was sentenced to fifteen years imprisonment.

30. November 2004 – Mohammed Bouyeri

Dutch filmmaker Theo van Gogh was murdered on the streets of Amsterdam by Mohammed Bouyeri. He saw van Gogh as an enemy of the Islam who had to die. In a letter pinned to van Gogh's chest Bouyeri also threatened others. He was sentenced to life imprisonment for murder with terrorist intent.

31. November 2004 – Yehya Kaddouri

Yehya Kaddouri, age 17, tried to plant a bomb in the Israeli embassy in the Netherlands. He wanted to inspire others to attack Jews and the Netherlands for their pro-Israeli politics. Kaddouri was the first to be convicted under new Dutch terrorism laws and received four years for preparing a terrorist attack.

32. March 2005 – Maximilian H.

In Rötz, Germany, 14-year-old student Maximilian H. tried to shoot his high school teacher. He expressed his intentions to other students prior to the incident. He was arrested by police.

33. December 2005 – Paul Nikain

Together with Andreas Fahlen and Albert Ramic, Paul Nikain planned to bomb an evangelical church in Uppsala, Sweden for its support of Israel. The triad communicated online on their fascination with radical Islam and hatred of democracy. In addition, Nikain and Fahlen attacked a polling station in Stockholm. They were convicted for attempting to and conspiring to commit an act of terrorism.

34. December 2005 – Andreas Fahlen

Together with Paul Nikain and Albert Ramic, Andreas Fahlen planned to bomb an evangelical church in Uppsala, Sweden for its support of Israel. The triad communicated online on their fascination with radical Islam and hatred of democracy. In addition, Nikain and Fahlen attacked a polling station in Stockholm. They were convicted for attempting to and conspiring to commit an act of terrorism.

35. December 2005 – Albert Ramic

Together with Paul Nikain and Andreas Fahlen, Albert Ramic planned to bomb an evangelical church in Uppsala, Sweden for its support of Israel. The triad communicated online on their fascination with radical Islam and hatred of democracy. They were convicted for attempting to and conspiring to commit an act of terrorism.

36. January 2006 – Robert Cottage

Robert Cottage was an active member of the British National Party. He believed uncontrolled immigration would lead to a civil war and wanted to protect civilisation. After his wife got concerned with his radicalised views, he was arrested by police.

37. September 2006 – Arfan Qadeer Bhatti

Arfan Qadeer Bhatti fired with an automatic weapon inside a synagogue in Oslo, Norway. He was suspected to have links with Islamic extremist groups. He had a criminal record and was diagnosed with mental illness during previous trials.

38. November 2006 – Sebastian Bosse

Sebastian Bosse fired his gun at high school in Emsdetten, Germany. He was due to appear in court for illegal gun possession. Five students got injured and Bosse committed suicide.

39. November 2006 – Michael Stone

Michael Stone attempted to murder Sinn Fein leaders Gerard Adams and Martin McGuinness in Belfast, Northern Ireland. On his way to the attack he made the taxi driver post letters with specific details of the attack. The day of the attack marked significant progress in the devolution of power to Northern Ireland. Stone was a committed loyalist and member of several violent loyalist groups.

40. January 2007 – Miles Cooper

Anarchist Miles Cooper sent seven letters bombs to British government targets that he believed were connected to government surveillance. Police found three more devices and bomb-making equipment in his house. Stone injured a total of nine people.

41. June 2007 – Kafeel Ahmed

Together with Bilal Abdullah, Kafeel Ahmed had car bombs explode on three targets. Two were in London and the last on Glasgow International Airport. The attack was planned via Yahoo email and both shared radical Islamic views. In total five people got injured. Ahmed died in the last attack.

42. June 2007 – Bilal Abdullah

Together with Kafeel Ahmed, Bilal Abdullah had car bombs explode on three targets. Two were in London and the last on Glasgow International Airport. The attack was planned via Yahoo email and both shared radical Islamic views. In total five people got injured. Abdullah was sentenced to life imprisonment for conspiracy to murder and to cause explosions.

43. October 2007 – Asim Cejvanovic

Asim Cejvanovic attempted to place a bomb in the US Embassy in Vienna, Austria. Cejvanovic suffered from PTSD from the war in Bosnia. He was considered mentally ill and claimed his neighbour put him up to the attack.

44. October 2007 – Martyn Gilleard

Martyn Gilleard had the intention to target Muslims, Jewish and black people with home-made bombs. His intention was to start a racial was. He was active in far-right politics and under investigation by police, which led to his arrest. Gilleard was sentenced to sixteen years.

45. November 2007 – Pekka-Eric Auvinen

At Jokela High School in Finland, Pekka-Eric Auvinen shot six fellow students, his head teacher, and the school nurse. Auvinen was inspired by other school shootings, primarily Columbine. He was being treated for mental illness and was socially isolated. Online he posted videos and communicated his intentions. He wanted others to be inspired by his attack, in which he committed suicide.

46. November 2007 – Unidentified individual

A local man from Crissier, Switzerland, opened fire at worshippers in an Islamic centre. He wanted them to pray in the way he wanted them to pray.

47. January 2008 – Owen Dodds

Neo-Nazi Owen Dodds got injured while testing on his explosive devices, after which he was forced to call an ambulance. This prompted the investigation, which led to his arrest by British authorities. He possessed a pipe bomb, other bomb-making equipment. In addition Neo-Nazi flags, literature and music was found in his room.

48. January 2008 – Nathan Worrell

Nathan Worrell was arrested by police for the possession of articles for terrorist purposes under the Terrorism Act in British law. Worrell was known as a far-right extremist and belonged to multiple right-wing nationalist groups.

49. April 2008 – Andrew Ibrahim

Andrew Ibrahim intended to blow up a shopping centre but was arrested beforehand. Police were contacted by concerned members of the Muslim community, where he had been heard to express radical views and had been seen with burns and other explosive related injuries.

50. April 2008 – Philippe

In Meyzieu, France, 15-year-old Philippe attacked seven or eight specific fellow students with three knifes. His attack was an act of revenge for being bullied and he had been inspired by

American school shootings. Philippe looked up instructions online and tried to commit suicide but failed. He was charged with attempt of pre-emptive assassinations.

51. May 2008 – Nicholas Roddis

Socially isolated Nicholas Roddis planted a hoax bomb on a public bus in Rotherham, Great Britain. His extreme views were expressed to Muslim colleagues. He downloaded bomb making instructions and signed his bomb in the name of Al-Qaeda. He was found guilty of engaging in an act of terrorism.

52. May 2008 – Nicky Reilly

Self-radicalised Nicky Reilly targeted a public restaurant in Exeter, Great Britain, with three home-made bombs. Motivation for his attack was defending weak and oppressed Muslims, as well as anti-Israel views. Reilly conducted research on explosive devices online and expressed his views to others prior to the attack.

53. May 2008 – Saeed Ghafoor

Saeed Ghafoor first threatened to blow up a shopping centre in Kent and later a hospital in Southampton by the use of limousines filled with explosives. He claimed he was protesting at the involvement of British and American troops in Afghanistan.

54. August 2008 – Krenar Lusha

British authorities arrested Krenar Lusha for having links to Ishaq Kanmi, who was posing online as the leader of Al-Qaeda in Britain. Bomb-making instructions and other materials were found in his possession. Lusha was convicted for five offences of possessing documents for the purposes of terrorism.

55. September 2008 – Matti Juhani Saari

Matti Juhani Saari killed ten and injured one of his fellow classmates, particularly females, in Kauhajoki, Finland. Saari was known to be mentally ill and socially isolated. His mother reported that he was being bullied severely. He was under police investigation for the possession of firearms and had uploaded videos to YouTube of him firing weapons. Saari was inspired by particularly the Columbine school shooting but more so by the Jokela school shooting in his own country the year before. He committed suicide during the incident.

56. September 2008 – Ali Behesti

Ali Behesti set fire to a publishing company in London, together with Abbas Taj and Abrar Mirza. The perpetrators were under surveillance by authorities and arrested at the scene of the attack. All three individuals were prosecuted under criminal law. The attack was religiously inspired as they claimed a book published by the company insulted the Islam.

57. September 2008 – Abbas Taj

Abbas Taj set fire to a publishing company in London, together with Ali Behesti and Abrar Mirza. The perpetrators were under surveillance by authorities and arrested at the scene of the attack. All three individuals were prosecuted under criminal law. The attack was religiously inspired as they claimed a book published by the company insulted the Islam.

58. September 2008 – Abrar Mirza

Abrar Mirza set fire to a publishing company in London, together with Abbas Taj and Ali Behesti. The perpetrators were under surveillance by authorities and arrested at the scene of the attack. All three individuals were prosecuted under criminal law. The attack was religiously inspired as they claimed a book published by the company insulted the Islam.

59. October 2008 – Neil Lewington

After Neil Lewington was arrested for public order offences in Suffolk, Great Britain, after which explosives were found in a subsequent house search. A precise attack had not been selected but the court concluded Lewington intended to attack black and Asian civilians. He admired other loners like Timothy McVeigh and David Copeland. Lewington was convicted of seven counts of preparation of acts of terrorism.

60. December 2008 – Wissam Freijeh

Two Israeli men were shot in a shopping mall in Odense, Denmark. Perpetrator Wissam Freijeh allegedly felt threatened, possibly influenced by the Israeli-Palestinian conflict. He was charged with attempt of murder.

61. March 2009 – Tim Kretschmer

Tim Kretschmer killed nine and injured fifteen fellow students of Winnenden High School in Germany. He was being bullied and considered mentally ill. Kretschmer committed suicide.

62. April 2009 – Tristan van der Vlis

Tristan van der Vlis opened fire at a shopping centre in Alphen aan de Rijn, the Netherlands. He was mentally ill and authorities knew about his gun possession, which has later been greatly criticised. People in his environment knew he desired to become a mass murderer. Van der Vlis injured seventeen and killed seven people, including himself.

63. April 2009 – Dimitris Patmanidis

Dimitris Patmanidis injured three students and committed suicide at Athens Vocational School in Greece. The attack was revenge for being ridiculed by fellow students. He announced the attack on MySpace prior to the attack.

64. April 2009 – Karst Tates

By driving his car into a crowd during the national holiday Queensday in Apeldoorn, the Netherlands, Karst Tates killed seven and injured ten bystanders. His aim was to hit the bus containing the Royal Family as he thought the crown prince was racist and fascist. Tates died on the scene of the attack as a result of his injuries.

65. May 2009 – Terrence Gavan

Police searched the home of Terrence Gavan in Yorkshire, after he purchased explosive manuals. Multiple home-made explosives were found, for which he was convicted. Gavan had extreme right-wing views and was a member of the British National Party. He had strong hostility towards immigrants, which may have been the target of an attack.

66. May 2009 – Tanja Otto

16-year-old Tanja Otto attacked fellow students of her school in Sankt Augustin, Germany with multiple weapons. Prior to the attack she threatened to attack the school, for which a meeting with the school psychologist was planned. She was sentenced to five years imprisonment for attempted murder.

67. June 2009 – Ian Davison

Neo-Nazi Ian Davison and his 19-year-old son Nicky Davison were arrested for planning an attack with the chemical weapon ricin in Durham, Great Britain. The dyad posted their intentions online, after which the police began their investigation that led to their arrest. The

father and son found instructions online to produce ricin and expressed their hatred of Muslims and Jews. In addition, Davison created the Aryan Strike Force, in which Hitler was idolised.

68. June 2009 – Nicky Davison

Together with his father Ian Davison, 19-year-old Neo-Nazi Nicky Davison was arrested for planning an attack with the chemical weapon ricin in Durham, Great Britain. The dyad posted their intentions online, after which the police began their investigation that led to their arrest. The father and son found instructions online to produce ricin and expressed their hatred of Muslims and Jews. In addition, Davison joined his father's Aryan Strike Force, in which Hitler was idolised.

69. October 2009 – Moulay Abel Samad Lahrifi

Moulay Abel Samad Lahrifi was arrested with several explosive devices in his car in La Jonquera, Spain. He stopped taking his medication for his mental illness due to his failed relationship, which led to a mental breakdown. The prevented attack was religiously inspired.

70. October 2009 – Peter Mangs

Peter Mangs has targeted immigrants in Malmö, Sweden, throughout 2009 and 2010. He was uncomfortable with immigrants and believed in ethnic supremacy. Mangs used the Internet actively for distribution of his ideas. He was convicted for two counts of murder and at least eight counts of attempted murder.

71. October 2009 – Mohammed Game

Mohammed Game bombed the military barracks of the carabinieri in Milan, Italy. His accomplices were Imbaeya Israfel and Abdel Hady Abdelaziz Mahmoud Kol. The triad developed extremist views as a result of Italian involvement in Afghanistan. Game was sentenced to fourteen years imprisonment.

72. October 2009 – Imbaeya Israfel

Together with Abdel Hady Abdelaziz Mahmoud Kol, Imbaeya Israfel was an accomplice to the bombing of the military barracks of the carabinieri by Mohammed Game in Milan, Italy. The triad developed extremist views as a result of Italian involvement in Afghanistan. He was sentenced to three and a half years imprisonment.

73. October 2009 – Abdel Hady Abdelaziz Mahmoud Kol

Together with Imbaeya Israfel, Abdel Hady Abdelaziz Mahmoud Kol was an accomplice to the bombing of the military barracks of the carabinieri by Mohammed Game in Milan, Italy. The triad developed extremist views as a result of Italian involvement in Afghanistan. He was sentenced to four years imprisonment.

74. November 2009 – Akos Gere

Akos Gere shot four classmates at his pharmaceutical school in Pecs, Hungary, killing one. Even though Gere was known mental health services, he was sentenced to life imprisonment.

75. January 2010 – Muhudiin Mohamed Geele

Muhudiin Mohamed Geele attempted to assassinate cartoonist Kurt Westengaard in Aarhus, Denmark. Westengaard was targeted as he made caricatures of the prophet Mohammed. Geele allegedly had ties to both Al Qaeda and al-Shabaab.

76. February 2010 – Florian K.

In Ludwigshafen, Germany, 23-year-old Florian murdered his former teacher as revenge for receiving bad grades. He had glorified the Erfurt school shooting online prior to the attack. He was sentenced to fifteen years imprisonment for murder.

77. May 2010 – Roshonara Choudhry

Roshonara Choudhry attacked Member of Parliament Stephen Timms with a knife in London, Great Britain. Timms was targeted as he had voted in favour of the war in Iraq. Choudhry possessed a list of other Members of Parliament that voted in favour. She was sentenced to life imprisonment for attempted murder.

78. May 2010 – Mensur Alija

Together with his brother Mentor Alija, Mensur Alija attempted to assassinate cartoonist Lars Vilks in Nyhamnsläge, Sweden. Vilks depicted the prophet Mohammed as a 'roundabout dog', which outraged the brothers and provoked their attack.

79. May 2010 – Mentor Alija

Together with his brother Mensur Alija, Mentor Alija attempted to assassinate cartoonist Lars Vilks in Nyhamnsläge, Sweden. Vilks depicted the prophet Mohammed as a 'roundabout dog', which outraged the brothers and provoked their attack.

80. September 2010 – Lors Doukaev

While he was in Copenhagen, Denmark, Lors Doukaev made a hotel explode. The hypothesis is that the offices of the Jyllands-Posten newspaper was the intended target, as he had researched it online. He was religiously inspired and linked to extremist networks in Germany, France and Luxembourg.

81. December 2010 – Taimour Abdulwahab Al-Abdaly

Taimour Abdulwahab Al-Abdaly bombed Christmas shoppers on a busy pedestrian street in Stockholm, Sweden. He felt that Muslims were being humiliated worldwide, for which he wanted revenge. He appeared to have been a member of online extremist communities. Al-Abdaly committed suicide.

82. March 2011 – Arid Uka

Arid Uka shot five US Airmen, of which he killed two in Frankfurt, Germany. He had seen a video of US Soldiers raping Muslim women, and he wanted to avenge the presence of American troops in the Middle East. Uka read and watched a lot of Islamic fundamentalist propaganda and was sentenced to life imprisonment.

83. June 2011 – Rafal K.

Rafal K. placed random home-made bombs in the streets of Krakow, Poland. He had been arrested before for petty crimes and police found more bomb-making materials in his house. He expressed anger at those who displeased him.

84. July 2011 – Anders Behring Breivik

Right-wing fanatic Anders Behring Breivik set off a home-made bomb in central Oslo, Norway, after which he opened fire at a the island Utøya. In total, he murdered 77 people and injured another 75, for which he received 21 years imprisonment, the maximum sentence in Norway. Experts disagreed on his mental stability but the court ruled he was sane. He was socially isolated and wrote a manifesto, in which he described his attack as his revolutionary right to start a civil war. Breivik was active member of online platforms and discussions; he

found bomb-making instructions, his inspiration for his attack, practiced with video games, connected with like-minded others and distributed his manifesto. He had also been active in far-right politics.

85. July 2011 – Shasta Khan

Inspired by Al Qaeda propaganda, Islamic extremists Shasta Khan and Mohammed Sajid Khan wanted to target Jewish people and synagogues. Police in Manchester, Great Britain, arrested the married couple after a relative had suggested they were planning an act of terrorism, for which they got convicted under British terrorism laws.

86. July 2011 – Mohammed Sajid Khan

Inspired by Al Qaeda propaganda, Islamic extremists Shasta Khan and Mohammed Sajid Khan wanted to target Jewish people and synagogues. Police in Manchester, Great Britain, arrested the married couple after a relative had suggested they were planning an act of terrorism, for which they got convicted under British terrorism laws.

87. August 2011 – Karen Drambjan

Karen Drambjan stormed the Ministry of Defence building in Talinn, Estonia and shot around indiscriminately. He injured one person and got killed by law enforcement. In his manifesto he wrote about a civil war between the Estonian government and the ethnic Russian minority.

88. December 2011 – Nordine Amrani

Nordine Amrani murdered six and injured 125 others when he opened fire on Saint-Lambert Square in Liège, Belgium. He was on parole, had a grudge against society, and feared imprisonment. Amrani died in the attack.

89. December 2011 – Gianluca Casseri

Gianluca Casseri murdered two Senegalese market traders in Florence, Italy, and injured three others. The attacks were racial hate crimes, as Casseri was involved in far-right and anti-immigration politics. He committed suicide.

90. December 2011 – Ladislav K.

Ladislav K. made multiple threats and eventually left a home-made bomb outside a McDonald's restaurant in Košice, Slovakia. He set up his own group, the 'Animal Rights Army'. He was sentenced to twenty-five years imprisonment.

91. March 2012 – Mohammed Merah

Inspired by and helped by his older brother Abdelkader Merah, Mohammed Merah shot and killed four soldiers in Montauban and Toulouse, France. Later that month, he killed four people, including three children outside a Jewish school in Toulouse. He was killed during an intervention by an anti-terrorism unit in his house, during which six people got injured. During the raid he shouted that he was an Al-Qaeda fighter and wanted to take revenge for foreign interventions of the French military in Afghanistan.

92. March 2012 – Abdelkader Merah

Abdelkader Merah inspired and helped his brother Mohammed Merah, who killed four soldiers in Montauban and Toulouse, France. He later killed four other people, including three children outside a Jewish school in Toulouse. Merah was considered more radically religious than his younger brother and intelligence agencies considered him the inspiration behind the attacks. He was charged with conspiracy for planning terrorist attacks.

93. March 2012 – Rachid El Bukhari

Rachid El Bukhari attacked a Shiiti mosque in Brussels, Belgium. He wanted to avenge the Shia for fighting the Sunnis in Syria. He killed one and injured another, which led to a sentence of 27 years imprisonment.

94. March 2012 – Mohammed Jarmoune

Mohammed Jarmoune was suspected of planning an attack on a synagogue in Brescia, Italy. He was known as an international jihadist and very active online. Here he was talking to others and seeking radical material. Jarmoune was arrested before he could conduct an attack and sentenced to over five years imprisonment for having distributed jihadist material with terrorist intentions.

95. May 2012 – Giovanni Vantaggiato

Originally Giovanni Vantaggiato targeted the courthouse and public prosecutor. Due to the amount of cameras he shifted to a nearby school, where he put explosives hidden in garbage

cans. There was one fatality and five injuries. He had financial problems and supposedly ties to the mafia. Vantaggiato was sentenced to life imprisonment.

96. May 2012 – Eero Samuli Hiltunen

Eero Samulti Hiltunen randomly targeted a crowd of people in Hyvinkää, Finland. Two people died and seven got injured. Hiltunen was known to have mental health issues and was sentenced to life imprisonment for counts of murder, attempted murder and public endangerment.

97. June 2012 – Brahim Bahrir

Brahim Bahrir stabbed two policemen in the subway of Brussels, Belgium. He travelled from Paris as an act of retaliation for how the police handled an incident with a niqab-wearing woman in Molenbeek.

98. June 2012 – Milan Juhasz

Milan Juhasz shot a Roma family in Hurbanova, Slovakia, killing three and wounding two. He was an anti-Roma right-wing fanatic and was sentenced to nine years imprisonment.

99. June 2012 – Fetih Bouhaza

Fetih Bouhaza took four employees of a bank in Toulouse, France, hostage. He claimed to be part of Al-Qaeda but this has not been confirmed. Bouhaza was charged with criminal charges, not for terrorism.

100. August 2012 – Eldar Magomedov

In cooperation with Mohammed Adamov and Cengiz Yalcin, Eldar Magomedov was planning an attack using explosives in La Linea, Spain. The triad supposedly had links to Al Qaeda and was arrested before an attack could occur.

101. August 2012 – Mohammed Adamov

In cooperation with Eldar Magomedov and Cengiz Yalcin, Mohammed Adamov was planning an attack using explosives in La Linea, Spain. The triad supposedly had links to Al Qaeda and was arrested before an attack could occur.

102. August 2012 – Cengiz Yalcin

In cooperation with Mohammed Adamov and Eldar Magomedov, Cengiz Yalcin was planning an attack using explosives in La Linea, Spain. The triad supposedly had links to Al Qaeda and was arrested before an attack could occur.

103. August 2012 – Christophe Lavigne

Christophe Lavigne threw a Molotov cocktail into a mosque in Lisbourne, France. He was psychologically fragile and part of a far-right, racist, anti-Muslim group. Lavigne was suspected of preparing a shooting at another mosque but was not found guilty of these charges. He was found guilty of charges in relation to terrorism.

104. September 2012 – Pavel Vondrouš

Pavel Vondrouš attempted to assassinate the president of the Czech Republic out of anger against the government. He set up his own anarchist political party after being expelled from the Communist Party.

105. September 2012 – Fraser Rae

Fraser Rae made a threat with a knife and explosives at a mosque in Glasgow, Great Britain. He wanted to avenge his brothers, whom he lost in the Iraq war. Rae had been a soldier in Iraq and had signs of PTSD after he returned.

106. October 2012 – Juan Manuel Morales Sierra

Juan Manuel Morales Sierra had the plan to use explosives on his university in Palma, Spain. Sierra was inspired by the Columbine school shooting. Due to the discussion of this admiration online, police arrested him and he was sentenced to four years imprisonment.

107. November 2012 – Brunon Kwiecień

Brunon Kwiecień planned to blow up the Polish Parliament in Warsaw while in session. He was anti-government and inspired by Anders Breivik. He caught the attention of security services due to his online activity, after which he was arrested. In addition to the planned explosion of the parliament, Kwiecień confessed to have been planning assassinations on state leaders.

108. January 2013 – John Roddy

Dyad John Roddy and Tobias Ruth sent threatening letters to mosques in Torquay, Great Britain. Additionally, they possessed instructions on how to produce explosives. They expressed extreme right-wing views and branded each other with hot irons as initiation to Breivik's Order of the Knights Templar.

109. January 2013 – Tobias Ruth

Dyad John Roddy and Tobias Ruth sent threatening letters to mosques in Torquay, Great Britain. Additionally, they possessed instructions on how to produce explosives. They expressed extreme right-wing views and branded each other with hot irons as initiation to Breivik's Order of the Knights Templar.

110. January 2013 – Oktai Enimehmedov

Ahmed Dogan, head of the MRF party in Bulgaria was shot in Sofia by Oktai Enomehmedov, a right-wing nationalist. He claimed he did not intend to kill Dogan.

111. February 2013 – Mohamed Echaabi

In Valencia, Spain, 22-year-old Mohamed Echaabi was charged with terrorism offences. He was linked to Al Qaeda and his targets were European.

112. February 2013 – Michael Piggin

Michael Piggin, age 17, was arrested before he could launch an attack of multiple targets in Gloucester, Great Britain, including his university, the local council building, a cinema, and a mosque. He had a history of being bullied and his attack was against the 'Islamic invasion of Europe'. He wanted to inspire others to revolt and was discovered by authorities because of his online activity. Piggin was charged with preparation of an act of terrorism, in addition to the possession of explosives.

113. April 2013 – Luigi Preiti

Luigi Preiti attempted to kill a police officer and two bystanders in Rome, Italy. He had several personal problems and was angry with the government. He was sentenced to sixteen years imprisonment for multiple attempted murders.

114. April 2013 – Pavlo Lapshyn

Pavlo Lapshyn bombed three mosques in Great Britain, spread over several months. With a knife he murdered Mohammed Saleem, a senior Muslim citizen returning from prayers at the mosque. Timothy McVeigh was his inspiration and he held right-wing views and racial hatred. He had previously been arrested for experimenting with explosives. Lapshyn was sentenced to life imprisonment for charges of murder and acts of terrorism.

115. May 2013 – Nadir Louchène

Nadir Louchène attacked two gendarmes with a knife inside a gendarmerie in Roussillon, France. His behaviour had changed radically upon returning from Mecca, after which his wife decided to leave with their two children.

116. May 2013 - Michael Adebolajo

Together with Michael Adebolawe, Michael Adebolajo murdered soldier Lee Rigby in Woolwich, Great Britain. The two were Islamic extremists and claimed the attack happened only due to British foreign policy. Both had links to extremist groups and showed signs of radicalisation. Adebolajo was sentenced to life imprisonment for murder.

117. May 2013 – Michael Adebolawe

Together with Michael Adebolawe, Michael Adebolajo murdered soldier Lee Rigby in Woolwich, Great Britain. The two were Islamic extremists and claimed the attack happened only due to British foreign policy. Both had links to extremist groups and showed signs of radicalisation. Adebolawe was charged with murder and sentenced to a minimum term of 45 years imprisonment.

118. May 2013 – Geoffrey Ryan

Right-wing fanatic Geoffrey Ryan threw a smoke bomb into an Islamic centre in Braintree, Great Britain. He was also carrying a knife. The attack occurred just hours after the murder of Lee Rigby. Ryan stated that he wanted revenge and send a message to Muslims.

119. May 2013 – John Parkin

Also wanting to avenge the murder of Lee Rigby, John Parkin attempted to set fire to a mosque in Rhyl, Wales. He was right-wing orientated and had a hatred for Muslims.

120. May 2013 – Alexandre Dhaussy

Private Cedric Cordier was stabbed by Alexandre Dhaussy in Paris, France. The attack was inspired by the murder of Lee Rigby. Dhaussy had converted to Islam and estranged himself from family and friends. He was charged with attempted assassination to a terrorist enterprise. As his mental health affected his actions, he will probably be placed in a psychiatric hospital.

121. May 2013 – Gavin Humphries

Triad Gavin Humphries, Stuart Harness, and Daniel Cressey used home-made bombs to set fire to an Islamic cultural centre in Grimsby, Great Britain. The right-wing triad wanted to avenge the murder of Lee Rigby, which occurred four days prior to the attack. All three were sentenced to six years imprisonment.

122. May 2013 – Stuart Harness

Triad Gavin Humphries, Stuart Harness, and Daniel Cressey used home-made bombs to set fire to an Islamic cultural centre in Grimsby, Great Britain. The right-wing triad wanted to avenge the murder of Lee Rigby, which occurred four days prior to the attack. All three were sentenced to six years imprisonment.

123. May 2013 – Daniel Cressey

Triad Gavin Humphries, Stuart Harness, and Daniel Cressey used home-made bombs to set fire to an Islamic cultural centre in Grimsby, Great Britain. The right-wing triad wanted to avenge the murder of Lee Rigby, which occurred four days prior to the attack. All three were sentenced to six years imprisonment.

124. June 2013 – Paul Leverseidge

Paul Leverseidge used a bomb at the office of a Conservative Member of Parliament in Bourne, Great Britain. He suffered from a multitude of personal problems.

125. June 2013 – Clive Ceronne

Together with Ashley Juggins, Clive Ceronne set a fire outside a mosque in Gloucester, Great Britain. The dyad had right-wing views and were politically active, both online and offline. Judges believed the attack was revenge for the murder of Lee Rigby. Ceronne was found guilty of arson and sentenced to 54 months in prison.

126. June 2013 – Ashley Juggins

Together with Clive Ceronne, Ashley Juggins set a fire outside a mosque in Gloucester, Great Britain. The dyad had right-wing views and were politically active, both online and offline. Judges believed the attack was revenge for the murder of Lee Rigby. Juggins was found guilty of arson and sentenced to 54 months in prison.

127. July 2013 – Oliver Florin Stan

During a psychosis, Oliver Florin Stan attacked the police in Iasi, Romania. He wanted to detonate explosives near police officers but was arrested and put in a psychiatric facility.

128. September 2013 – Ryan McGee

20-year-old Ryan McGee was arrested with explosives in his possession in Salford, Great Britain. Police stumbled upon the explosives when they searched their family home in relation to his brother. McGee held right-wing views, hatred of immigration, and admired Hitler.

129. October 2013 – Kazi Islam

Kazi Islam, age 18, attacked several soldiers in London, Great Britain. He was inspired by the murder on Lee Rigby and the radicalisation of Nicky Reilly. He had ties to extreme groups and attended several meetings. Due to leakage both online and to others led to his arrest. He was convicted of preparing to commit acts of terrorism and received 8 years imprisonment.

130. October 2013 – Name not released

A 16-year-old student attacked four fellow students with a knife in Oulu, Finland. He had previously been questioned by police for posting a threat to 'shoot up his school' on an Internet forum. He was charged with four counts of attempted of murder.

131. November 2013 – Abdelhakim Dekhar

Abdelhakim Dekbar targeted multiple civilian buildings over a period of several days in Paris, France, such as headquarters of a bank. Dekhar had been a suspect in previous attacks with the Rey-Maupin couple in 1994. He is in custody awaiting trial.

132. March 2014 – Richard Bevington

Richard Bevington started a fire in a mosque in Milton Keynes, Great Britain. He appeared to be right-wing orientated, as he had previously been charged with a racially and religiously aggravated offence. He was sentenced to 4 years imprisonment.

133. March 2014 – Josef Andrei Hannu

Together with Nita-Minttu Tirkkonnen, Josef Andrei Hannu planned to attack the University of Helsinki, Finland and about fifty randomly selected targets. The dyad shared a deep hatred for society and wanted revenge for bullying and public humiliation. They met via an online discussion forum related to school shootings and planned to spread a video and manifesto online. Police were led to the duo by a 17-year-old female, who the dyad tried to bring into the plot. Both were sentenced to three years imprisonment for planning a terrorist attack.

134. March 2014 – Nita-Minttu Tirkkonnen

Together with Nita-Minttu Tirkkonnen, Josef Andrei Hannu planned to attack the University of Helsinki, Finland and about fifty randomly selected targets. The dyad shared a deep hatred for society and wanted revenge for bullying and public humiliation. They met via an online discussion forum related to school shootings and planned to spread a video and manifesto online. Police were led to the duo by a 17-year-old female, who the dyad tried to bring into the plot. Both were sentenced to three years imprisonment for planning a terrorist attack.

135. May 2014 – Mehdi Nemmouche

Mehdi Nemmouche opened fire at visitors of a Jewish museum in Brussels, Belgium. The attack was religiously inspired. Nemmouche had ties to ISIS and was known to authorities. He was sentenced to life imprisonment for four murders.

136. June 2014 – Mark Colborne

Mark Colborne wanted to blow up a pub or town centre in Southampton, Great Britain. He was known to be socially isolated, bullied, and mentally ill. Colborne was inspired by Timothy McVeigh and Anders Breivik, and he wanted to conduct a similar mass terrorist attack. Police arrested him after his mother and brother found chemicals in his room.

137. June 2014 – Vladimir Aust

18-year-old Vladimir Aust was charged with the possession of explosives by police in Newcastle, Great Britain. He held right-wing views, which he discussed online. His dorm was searched after suspicious items were found in a university building.

138. August 2014 – Brusthom Ziamani

Brusthom Ziamini wanted to become a marthyr by murdering a soldier in London, Great Britain. His goal was to implement Shari'a law in the UK and he idolised the murder of Lee Rigby. He was on bail on suspicion of committing an terrorism offence and leaked his intentions to others. Ziamini was arrested and sentenced to 22 years imprisonment.

139. December 2014 – Name not released

Two 15-year-olds planned to conduct an attack using home-made explosives. Possible targets included the Houses of Parliament, Buckingham Palace, a local public school and shopping centre in Newcastle, Great Britain. The dyad communicated online and also found instructions online. They told some attack details to their parents, who contacted the police. Both were sentenced to 12 months in youth custody.

140. December 2014 – Name not released

Two 15-year-olds planned to conduct an attack using home-made explosives. Possible targets included the Houses of Parliament, Buckingham Palace, a local public school and shopping centre in Newcastle, Great Britain. The dyad communicated online and also found instructions online. They told some attack details to their parents, who contacted the police. Both were sentenced to 12 months in youth custody.

141. December 2014 – Daniel Perez Berlanga

With explosives in his car, Daniel Perez Berlanga wanted to blow up the headquarters of the People's Party in Madrid, Spain. He blamed politicians for his dismissal at a wood company. Even though authorities wanted him to be charged with terrorist crimes, a judge overruled this for the lack of evidence suggesting terrorism.

142. December 2014 – Bertrand Nzohabonayo

Bertrand Nzohabonayo assaulted four police officers with a knife inside a Joué-les-Tours police station in France. Witnesses heard him shout 'Allah Akbar' and he felt inspired by ISIS. He was killed during the arrest.

143. December 2014 – "Nasser"

An assailant hit a total of thirteen pedestrians with his car in Dijon, France. The individual was described as mentally ill, having visited the mental hospital 157 times between 2001 and

2014, which is why this is not considered as an act of terrorism. 'Nasser' shouted "Allah Akbar" and told the police the attack was for the children of Chechnya and Palestine.

144. December 2014 – Sébastien Sarron

Sébastien Sarron hit several passers-by with his van, killing one and injuring nine, at a Christmas market in Nantes, France. Sarron attempted to stab himself with a knife but was prevented to do so by passers-by. He had expressed his hatred against society, willingness to kill as many innocent people as possible, and the risk of being killed by law enforcement in his diary. He had alienated himself from his family.

145. April 2015 – Name not released

A 14-year-old male brought a crossbow and machete to his school in Barcelona, Spain. He murdered one person and injured three others. He kept a list of 25 teachers and students who he said he was going to kill. It was suggested that he was suffering from a psychotic episode.

Table 1: Stated Hypotheses and Variable Measurements

Hypotheses	Variable Measurements
Personal	
1) Both groups tend to be male (Gender)	0= Female 1= Male
2) Lone wolves are more likely to be older (Age)	Age at time of attack
3) Lone wolves are more likely to have higher education (Education)	1= Primary education 2= Secondary education 3= Higher education 99= Unknown
4) Both groups are not likely to be married (Relationship status)	1= Single 2= In a relationship 3= Engaged or Married 4= Separated or Divorced 99= Unknown
5) Both groups are not likely to have children (Children)	0= No 1= Yes 99= Unknown
6) Both groups are likely to be socially isolated (Indication of social isolation)	0= No 1= Yes 99= Unknown
7) Both groups are likely to have a history of mental illness (Indication of mental health disorder)	0= No 1= Yes 99= Unknown
Attack style	
8) Both groups are more likely to have civilian and government targets (Target type)	1= Government 2= Police 3= Military 4= Civilians 5= Religious 6= Transport 7= Multiple 99= Unknown
9) Both groups are more likely to use firearms (Weapon type)	1= Explosives 2= Firearms 3= Knife or similar 4= Vehicle 5= Biological/Chemical 6= Other 7= Multiple 99= Unknown
10) Both groups tend to attack more than one victim (Injured, Fatalities)	Number of victims injured Number of victims fatalities

Table 1: Continued

Hypotheses	Variable Measurements
11) Both groups are likely to have military experience	0= No 1= Yes 99= Unknown
12) Both groups are likely to die in the commission of an incident (Incident end)	0= Survived attack 1= Suicide 2= Killed by law enforcement 99= Unknown

Inspiration

Hypotheses	Variable Measurements
13) Both are likely to be inspired (Copycat or inspired attack)	0= No 1= Yes 99= Unknown
14) Both groups are likely to have an ideology (Justification expressed)	0= No 1= Yes 99= Unknown
15) Ideologies tend to be more personal than political (Ideology)	1= Religiously inspired 2= Ethno-Nationalist and Separatist 3= Left-Wing and Anarchist 4= Right-Wing 5= Single Issue 6= Other 99= Unknown
16) Both groups are likely to distribute their ideas and influence a wider movement (Detailed manifesto)	0= No 1= Yes 99= Unknown
17) Both groups are likely to make use of the Internet for inspiration (Indication of online research)	0= No 1= Yes 99= Unknown

Leakage

Hypotheses	Variable Measurements
18) Both groups are likely to discuss their intentions with others (Leakage)	0= No 1= Yes 99= Unknown
19) Loners are likely to leak their plans online, and school shooters are likely to leak to personal contacts (Audience)	1= Friend or family member 2= Stranger 3= Posted online 4= Professional 5= Multiple 6= Other 99= Unknown
20) Both groups are likely to have behavioural changes prior to the incident (Change in behaviour)	0= No 1= Yes 99= Unknown

Table 2: Bivariate statistics for lone wolves and school shooters

Variables	Total (n=145)		Lone wolves (n=125)		School shooters (n=20)		Chi-square/ t-test
	n	Percent	*n*	Percent	*n*	Percent	
Personal characteristics							
Male	139	95.9	121	96.8	18	90.0	.193 *
Age	145	29.4	125	31.2	20	18.4	.003
		(avg.)		(avg.)		(avg.)	
Education	95		75		20		.000
Primary education	8	8.4	0	0.0	8	40.0	
Secondary education	55	57.9	48	64.0	7	35.0	
Higher education	32	33.7	27	21.6	5	25.0	
Relationship status	81		67		14		.005
Single	46	56.8	32	47.8	14	100.0	
In a relationship	6	7.4	6	9.0	0	0.0	
Engaged or married	22	27.2	22	32.8	0	0.0	
Separated or divorced	7	8.6	7	10.4	0	0.0	
Children	26	24.8	26	29.5	0	0.0	.006
Social isolation	41	30.4	33	28.0	8	47.1	.109
Mental health disorder	47	36.2	39	34.5	8	47.1	.315
Attack style							
Target type	133		113		20		.001
Government	17	12.8	17	15.0	0	0.0	
Police	5	3.8	5	4.4	0	0.0	
Military	9	6.8	9	8.0	0	0.0	
Civilians	68	51.1	48	42.5	20	100.0	
Religious	19	14.3	19	16.8	0	0.0	
Transport	2	1.5	2	1.8	0	0.0	
Multiple	13	9.8	13	11.5	0	0.0	
Weapon type	144						.050
Explosives	42	29.2	41	33.1	1	5.0	
Firearms	34	23.6	26	21.0	8	40.0	
Knife or similar	15	10.4	12	9.7	3	15.0	
Vehicle	3	2.1	3	2.4	0	0.0	
Biological/Chemical	4	2.8	4	3.2	0	0.0	
Incendiary	10	6.9	10	8.1	0	0.0	
Multiple	36	25.0	28	22.6	8	40.0	
Injured victims	138	3.5	120	3.6	18	2.8	.005
		(avg.)		(avg.)		(avg.)	
Without prevented attacks	99	4.8	85	5.0	14	3.5	.061
		(avg.)		(avg.)		(avg.)	
Killed victims	141	1.8	123	1.6	18	2.8	.017
				(avg.)		(avg.)	
Without prevented attacks	102	2.5	88	2.3	14	3.6	.027
		(avg.)		(avg.)		(avg.)	
Military experience	28	26.9	25	29.1	3	16.7	.386 *
Incident end	145						.000
Survived	121	83.4	111	88.8	10	50.0	

Table 2: Continued

Variables	Total (n=145)		Lone wolves (n=125)		School shooters (n=20)		Chi-square/ t-test
	n	Percent	*n*	Percent	*n*	Percent	
Suicide	21	14.5	11	8.8	10	50.0	
Killed by law enforcement	3	2.1	3	2.4	0	0.0	
Inspiration							
Inspired attack	24	22.4	16	17.4	8	53.3	.005 *
Expressed justification	96	71.1	85	72.6	11	61.1	.315
Ideology							.000
Religion	52	40.0	52	45.6	0	0.0	
Ethno-Nationalist and Separatist	2	1.5	2	1.8	0	0.0	
Left-Wing/Anarchist	3	2.3	3	2.6	0	0.0	
Right-Wing	42	32.3	41	36.0	1	6.3	
Single Issue	31	23.8	16	14.0	15	93.8	
Distribute ideas	18	12.6	12	9.7	6	30.0	.025
Online research	43	44.3	36	40.9	7	77.8	.007
Leakage							
Discuss intentions	68	53.5	54	49.1	14	82.4	.010
Audience							.696
Friend or family	23	33.8	18	33.3	5	35.7	
Stranger	9	13.2	7	13.0	2	14.3	
Posted online	17	25.0	12	22.2	5	35.7	
Professional	7	10.3	7	13.0	0	0.0	
Other	4	5.9	3	5.6	1	7.1	
Multiple	8	11.8	7	13.0	1	7.1	
Change in behaviour	50	39.7	42	39.6	8	40.0	.975
Leakage details							.487
Ideology	21	30.9	19	35.2	2	14.3	
Intention to act	31	45.6	23	42.6	8	57.1	
Attack details	13	19.1	10	18.5	3	21.4	
Specific plan	3	4.4	2	3.7	1	7.1	
Other variables							
Perpetrator type							.096
Individual	104	71.7	86	68.8	18	90.0	
Dyad	20	13.8	18	14.4	2	10.0	
Tryad	21	14.5	21	16.8	0	0.0	
Incident type							.072 *
Single	99	79.2	80	76.2	19	95.0	
Multiple	26	20.8	25	23.8	1	5.0	
Attack prevented	42	29.0	36	28.8	6	30.0	.913

* The Fisher's exact test was used for small sample sizes (n ≤ 5)

Table 3: Additional findings

Variables	Total (n=145)		Lone wolves (n=125)		School shooters (n=20)		Chi-square
	n	Percent	*n*	Percent	*n*	Percent	
Employment							.000
Employed	44	40.7	44	47.8	0	0.0	
Student	20	18.5	9	9.8	11	68.8	
Unemployed	44	40.7	39	42.4	5	31.3	
Link to extreme group	43	31.9	41	35.7	2	10.0	.004 *
Previous conviction	45	41.7	44	47.3	1	6.7	
Law enforcement	80	60.6	73	64.6	7	36.8	.022
Under investigation	50	38.8	44	40.0	6	31.6	.487
Mental health services	25	32.5	21	35.0	4	23.5	.373
Noteworthy life event	72	59.5	60	58.3	12	66.7	.502

* The Fisher's exact test was used for small sample sizes (n ≤ 5)

Graph 1: Incidents by country

Legend:
- Great Britain
- Italy
- Poland
- Czech Republic
- Slovakia
- Croatia
- Finland
- Sweden
- Denmark
- Norway
- Estonia
- France
- Spain
- Romania
- Bulgaria
- Greece
- Netherlands
- Belgium
- Germany
- Austria
- Switzerland
- Hungary
- Bosnia
- Northern Ireland
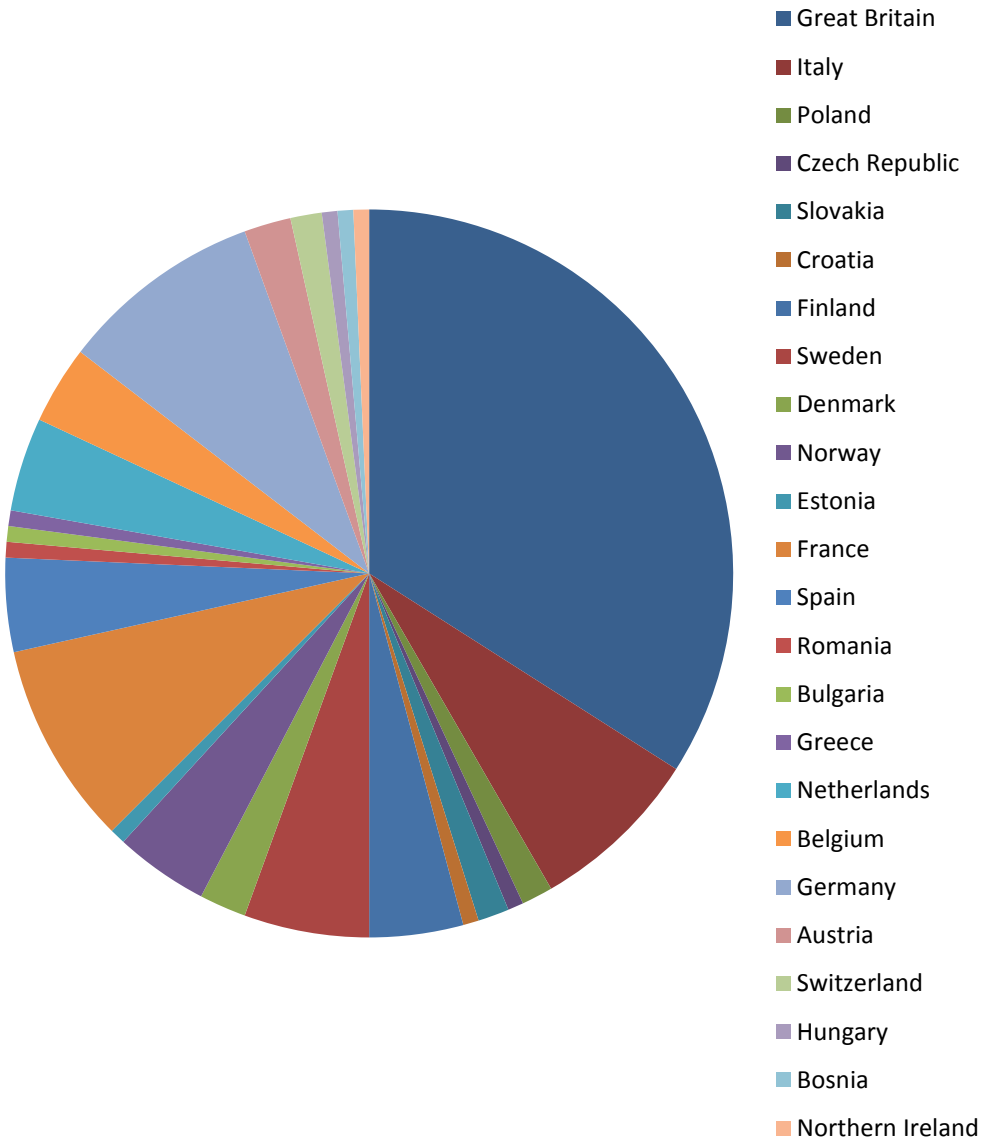
Graph 2: Incidents by year