“Lone Wolf” Terrorists:

The Palestinian Case Study

The Characteristics of the Terrorism and Assailants during the “Knives Intifada” In Israel (2015-2017)

November 2019

Draft Version of Research Report

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Executive Summary Findings

Questions regarding the "lone wolf" terrorism have been accumulating in the last decade and attracting more attention from scholars and policy makers, as assailants who seemed to be acting alone began to outnumber other terrorists. However, studies on lone wolf terrorism remain scarce and are commonly plagued by methodological and conceptual difficulties .

This study focused on the Palestinian "lone wolf" phenomenon against Israeli targets during the terrorism wave eruption of 2015-2017. It examined the patterns of the attacks and the personal traits of the assailants – including age, education and socio-economic status – using a unique dataset constructed for the purposes of the paper, consisting of 420 assailants that perpetrated 363 terrorist attacks. Multiple statistical methods – including chi-squared tests, hazard estimates and logistic regressions – were employed to gain insight about this recent terrorism upsurge .

Overall, what came to be known as the "lone wolfs intifada" or the "Knives Intifada" was comprised of three phases. In the first three months, until the end of 2015, Israelis were hit by terrorist attacks approximately twice a week. Then, between January and April 2016, the pace decreased to an average of about 1.5 attacks per week. Following that period and until the end of 2017, they experienced about one attack each week. Throughout almost the entire research period, the hazard of an attack was lower than 5%, but this risk was enough to cause the newspapers, the general public and the politician to discuss a "new type of Intifada", demonstrating the massive psychological and social impacts of terrorism, even when unorganized and scattered .

Without a steering hand, the terrorist attacks tended to spread in a viral way. In fact, one of the strongest predictors of the volume of attacks in a certain week was the number of attacks on the previous week. Specifically, once an attack happened, the hazard of an additional attack peaked at about 30%-40% for three consecutive days. These results

support the portrayal of the "lone wolf" terrorism as an epidemic, following a pattern of contagion, outbreak, containment, and low-grade continuity.

Jerusalem was the main victim of this "plague'. Throughout the research period it experienced over 100 attacks, more than any other locality inside or outside the Green line. Its main role in the terrorism wave was evident from its estimated hazard rate, which was sometimes double the overall hazard. Additionally, the terrorism hazard continually fluctuated following each terrorist attack, creating a constant sense of threat.

Jerusalem stood at the center of attention from the first days of the "Knives Intifada", which erupted against the backdrop of Palestinian uproar regarding the Temple Mount, one of the most sacred sites to Jews and Muslims alike. The wave of violence began when Palestinian activists gathered on the Temple Mount to prevent Jews from visiting the site on the Eve of the Jewish New Year, throwing firebombs and rocks at Israeli police who attempted to disperse them with tear gas and rubber bullets. The tensions surrounding the visits of about 300 Jews, including the Israeli Agricultural Minister Uri Ariel, quickly sparked into violence .

These events bring to mind the outburst of the Second Intifada, following a visit by then Israeli Opposition Leader, Ariel Sharon, to the Temple Mount for the Jewish New year in 2000. However, the terrorism of 2015-2017 was substantially different than in the early 2000s. The "Knives Intifada" ended within two years and caused significantly less damage, resulting in less fatalities and casualties from both sides. In contrast, it bears similarities to the First Intifada, which was characterized by simple attack methods and the use of knives, stones and petrol bombs. Without guidance and logistical support from terrorist organizations, the assailants were not able to carry out complex attacks and most of them committed stabbings or ramming attacks. In practice, their willingness to risk death for the purpose of killing or wounding Jews was their key weapon .

In light of the above, the main aim of this paper was to shed light on the "lone wolf" terrorists in Israel and describe their typical profile. The data regarding the assailants conveys information on many aspects of their personal backgrounds, as was detailed throughout the paper – their ages, residence locations, criminal experience, education, economics status, social media activity and so on. By combining these aspects, one may construct several typical archetypes, describing the multifaceted profiles of the assailants .

First are the radical young Palestinians, in the ages of 18-25, who act out of a strong drive, either ideological or religious, to fight against Israel. They tend to be educated and many of them were high school or university students at the time of the attack. A second group consists of Palestinian teenagers from the West Bank (usually from the districts of Hebron or Nablus), who seek revenge after a close relative or friend was killed, wounded or arrested by Israeli security forces. Many of them resided in poor villages or refugee camps and they often had some kind of connections to other terror activists. In addition, their activity on social media websites constantly exposes them to propaganda and inflaming messages.

A third group is comprised of Palestinians and Israeli-Arabs in different ages from various backgrounds, who suffer from difficulties in their private lives– personality disorders, domestic violence, sexual harassment – and turn to terrorism as a way out or as an effective suicide method, which doesn't cause shame but instead brings pride to the assailant and his or hers family .

In comparison to previous terrorists in Israel, despite being very similar in age, the "lone wolf" terrorist turned out to be significantly different in terms of education level. Interestingly, the "lone wolves" were characterized by polarized results: a high share of academic students and graduates, many of whom studied engineering or accounting at

the university, but also assailants who dropped out at an early age, usually to help providing for the family .

The terrorism wave of 2015-2017 also saw a substantial increase in the role of female terrorists, who constituted 20% of the sample. They were similar to the male attackers in term of age and lack of criminal past, but were more prone to have a family, with a higher percentage of married and parents among them. In addition, they tended to attack soldiers and police officers rather than civilians, and were much more likely to be stopped in advance.

Furthermore, unlike previous terrorists in Israel, the vast majority of terrorists in 2015-2017 did not have prior criminal-terrorist background, and therefore no experience. The motivations of the aforementioned groups of assailants may have been varied, but the eruption of the terrorism pushed all of them to action, pointing to the importance of social factors in the spread-out of terrorism. 15% of the assailants have actually posted terrorism-related contents on their personal accounts in social media and after their photos and quotes often became viral following their attacks. The "lone wolf" might be lonely in terms of organizational support, but this paper suggests that he/she is not lonely at all but acts as a part of a wider social network that communicates through the media's traditional and new channels and the assailant's close environment .

To conclude, there is not one clear figure of the "lone wolf" Palestinian terrorist: the assailants came from all walks of society. To illustrate – Imad Aghbar, who stabbed three Israeli men and one woman on the Tel Aviv beach promenade, was eighteen years old, came from a wealthy and normative family and was enrolled to study Mathematics at al-Najah University in Nablus. He told investigators that he decided "to kill Jews because they are Jews […] to turn into a martyr or hero". Ataya Abu Eisha, a 28 years old resident of Jerusalem's Kfar Aqab, came from a poor family of 14 brothers and sisters. She worked at a military sewing workshop in the Atarot Industrial Area before taking a screwdriver

and heading out to Jerusalem to perpetrate an attack. Afterwards, she said that she wanted to die because of a romantic relationship .

Nevertheless, is seems that the assailants can be divided into several main archetypes who should be researched more thoroughly. Further research and richer data are required in order to reach a better understanding of these groups and facilitate better policy decisions to deal with them. Their varied personal characteristics demonstrate that there is no single mechanism which generates correlation between social-economic status or education and the tendency to participate in a terrorist activity .

Presumably, terrorist organizations do eliminate the least-educated candidates, as claimed by Bueno De Mesquita and others, but other factors play a part in forming the connection between higher education and terrorism – for instance, the exposure to radical ideologies .

In other words, the organizations' screening process assists in explaining why poor and uneducated individuals were less likely to be involved in terrorist activity in the past, but do not explain why wealthy and well-educated individuals are involved in them. The significant links found in this paper between education and being a "lone wolf" terrorist, in contrary to the ambiguous results regarding poverty, points to one area that should be further researched.

Abstract

"Lone wolf" terrorism, perpetrated by independent assailants without organizational support, has been attracting growing attention from scholars and policy makers in recent years, as the phenomenon is becoming more and more widespread around the world. Nevertheless, the research on "lone wolf" assailants is still in its infancy, especially in the Israeli-Palestinian case, where this type of terrorism fully erupted only in 2015.

In light of the above, this paper examines the characteristics of the terrorist attacks and the personal traits of the assailants during the "Knives Intifada" In Israel (2015-2017) in order to shed some light on the "lone wolf" Palestinian terrorism. This terrorism wave is analyzed employing advanced statistical methods, using a unique dataset constructed for the purpose of this paper, consisting of 363 terrorist attacks that were perpetrated by 420 assailants between October 2015 and December 2017.

The empirical analysis suggests that even though these assailants usually acted without any help or guidance, they were not completely alone – but acted as a part of a wide social network that gave them moral support and motivation, causing the attacks to spread like an epidemic – especially in the city of Jerusalem.

Furthermore, the "lone wolf" terrorists, though lacking in criminal experience or training, were quite similar to their "organized" predecessors in terms of age and family status. The initial evidence also indicates that they weren't considerably poor or uneducated. Since they weren't screened by a terrorist organization for their skills – additional explanations are needed in order to explain the negative correlation previously observed in the literature between terrorism and poverty or lack of education.

1. Introduction

During December 2015, several hours after 14 civilians were injured in a terror attack at a Jerusalem bus stop, the Israeli Prime Minister Benjamin Netanyahu declared that Israel is facing a "new type of terrorism" – the individuals' terrorism, which challenges counties all around the world – and vowed to fight it.[1]

In the months following this statement, Israel suffered dozens of terrorist attacks that wounded hundreds of civilians and caused multiple fatalities, in what came to be known as the "Knives Intifada" or the "Intifada of the Individuals". Unlike previous terrorist outbreaks in the Israeli-Palestinian conflict, this upsurge was characterized by "lone-wolf" attacks that were un-orchestrated and untraceable to any particular organization, raising one key question: Has a new type of terrorism truly emerged?

This paper examines the characteristics of the terrorist attacks and the personal traits of the assailants during the "Knives Intifada" In Israel (2015-2017) with the aim of shedding light on this query. The paper revolves around three main research questions: Who are the new terrorists that act against Israel? What are their activity patterns? How do they differ from previous terrorists, who acted as part of terrorist organizations?

I investigate these questions by using data on 363 terrorist attacks that were perpetrated by 420 assailants between October 2015 and December 2017. The dataset, which was constructed for the purpose of this paper, includes varied information, both on the attacks (their timing, location, target and the resulting damage) and on the assailants (their age, residence locality, economics status, education, criminal past, etc.). To analyze the data, I employ various statistical methods: chi-squared tests, duration analysis methods

[1] Omri Efraim and Yael Freidson (2015), "Eleven Wounded in Vehicular Attack in Jerusalem", *Ynet*, 14 December 2015, retrieved from: https://www.ynetnews.com/articles/0,7340,L-4739169,00.html (Last accessed: 20.09.2018).

(specifically the Kaplan–Meier hazard model), ordinary least squares (OLS) regressions and logistic regressions. These techniques are used to examine whether the empirical results hold statistically when introducing control variables.

Following the empirical analysis, I find that the "Knives Intifada" was comprised of three main phases: the peak of the eruption (October 2015-December 2015), a period of continued intensity (January-April 2016) and a slowdown in the pace of attacks (May 2016 until today). December 2017 was chosen as the end of the research period for practical reasons, but to this day the terrorism has not ceased completely.

Without the direction and control of terrorist organizations, since the initial eruption the attacks spread out in a viral way. Specifically, once an attack happened, the hazard of an additional attack peaked at about 30%-40% for three days. The hazard was extremely high in Jerusalem, which suffered over 100 attacks – more than any other locality.

As for the assailants, I find that they can be roughly divided into three main profiles. First, the radical young Palestinian: usually a male in the ages of 18-25, relatively educated, who acts out of a strong ideological or religious drive. Secondly, the Palestinian teenager who is riled up by the social and traditional media and seeks revenge, often after a close acquaintance was hurt by Israeli security forces. Thirdly, the troubled attacker: male or female, Palestinian or Israeli-Arab, who experiences personal difficulties and turns to terrorism as a way out – weather via imprisonment or death.

In comparison to previous terrorist, the "lone wolf" assailants lacked prior criminal experience and usually acted without help or guidance. However, they were not in fact alone, but acted as a part of a wider social network that gave them moral support and motivation. In other domains, they were not significantly different than their predecessors, for example in terms of age, family status and economic background.

The most prominent difference between the generations of terrorist was the role of females, who constituted 20% of the assailants in 2015-2017. They were similar to the male attackers in term of age and lack of criminal past, but were more prone to have a family. In addition, they tended to attack soldiers and police officers rather than civilians, and were much more likely to be stopped in advance.

Nevertheless, I find considerable dissimilarities between the "Knives Intifada" and the two previous major terrorism waves in Israel – the First and Second Intifada. Mainly, it was much shorter and caused significantly less damage, resulting in less fatalities and casualties, both among Israelis and Palestinians. The terrorism of 2015-2017 was particularly different in comparison the Second Intifada of the early 2000s, when suicide bombings happened on a regular basis. Without operational support from terrorist organizations, the assailants nowadays were not able to carry out complex attacks and usually committed stabbings or ramming attacks. Actually, their use of simple weapons such as knives, stones and petrol bombs bears resemblance to the First Intifada (1987-1993) – but without the wide public participation. The "Knives Intifada" was not characterized by mobilization of the masses, but was carried out by individuals.

Even though countless studies explored the profile of terrorists, the research on individual "lone wolf" assailants is still in its infancy – especially in the Israeli-Palestinian case. This paper contributes to the literature in two principal ways. First, it provides a comprehensive picture of the development of the "Knives Intifada" over time, analyzing the patterns of the attacks and the personal traits of the assailants employing advanced statistical methods. Despite the limitations of the data, which bound the credibility of the findings, it constitutes a meaningful step towards better understanding the present-day Palestinian terrorism in Israel.

Moreover, the study is the first to examine how the elimination of the organizational factor influenced the social-economic status and the education level of the assailants. Previous studies found that contrary to popular belief, terrorists tend to be more wealthy and educated than the overall population, both in general and particularly in the Palestinian case. One leading explanation for this finding, offered by Bueno de Mesquita, was that terrorist organizations screen volunteers for quality and select the most skilled among them to carry out operations. The unique dataset constructed for this paper allows examining whether the removal of the mediating factor – the terror organization – also eliminated the negative correlation between terrorism and poverty or lack of education. But the initial evidence suggests that "lone wolf" assailants are not poor or uneducated, indicating that other elements play a part in forming the connection between terrorism and socio-economic factors.

These issues are important not only from a scholarly view: terrorism has massive social, political, diplomatic and economic implications. Thus, comprehending its characteristics is crucial for policy makers and security forces who attempt to protect citizens from violence. In light of the above, this paper serves not only to enrich the existing literature, but also to assist in the decision making regarding current terrorism.

The paper proceeds as follows. Section 2 reviews the existing literature regarding terrorism, its connections to socio-economic factors and evidence from the Israeli-Palestinian case. Section 3 describes the data used in this paper and its limitations. Section 4 reports the summary statistics of the "Knives Intifada" and the "lone wolf" terrorists, illustrating their main characteristics. After Section 5 explains the empirical strategies employed in the paper, Section 6 presents the empirical analysis of the terrorist attacks and the assailants. Section 7 compares the new terrorism to previous terrorist waves in Israel. Section 8 concludes.

2. Literature Review

This paper builds upon the rich literature regarding terror, and more specifically the literature regarding the relations between terror and socio-economic conditions. This review will introduce the main developments in the field throughout the last decades and its main findings, in the following order: Section 2.1 presents the main conceptual challenge of the literature – defining terrorism. Section 2.2 briefly reviews the evolution of terrorism research and maps its main trends. Section 2.3 focuses on the literature about the links between terrorism and economic factors. Section 2.4 reviews evidence about these links in the Israeli-Palestinian case study. Section 2.5 presents recent studies who examined the "lone wolf" terrorism in Israel since 2015.

2.1 Defining Terror

The discussion of the definition of terror, or rather the lack of such a definition, has become the hallmark of academic writing dealing with terrorism. The political sensitivities involved in deciding who is a terrorist accompany the field since its very beginning. Although the subject has been debated extensively and thoroughly,[2] the literature reached no consensus and there is no widely agreed definition.[3]

For the purposes of this research, I rely on the definition offered by Enders and Sandler in *The Political Economy of Terrorism*,[4] one of the first works to present a comprehensive

[2] See for example: Alex Schmid and Albert Jongman (1988), "Terrorism and Related Concepts: Definition", *Political Terrorism* (Oxford: North-Holland Publishing Company): pp. 1-38; James Poland (1988), "Concepts of Terror and Terrorism", *Understanding Terrorism: Groups, Strategies, and Responses* (New Jersey: Prentice-Hall): pp. 1-21; Andrew Silke (2004), "An Introduction to Terrorism Research", in: Andrew Silke (Ed.), *Research on Terrorism: Trends, Achievements and Failures* (London: Frank Cass): pp.1-29; Joseph K. Young and Michael G. Findley (2011), "Promise and Pitfalls of Terrorism Research", *International Studies Review* 13 (3): pp. 1–21.

[3] Andrew Silke (2004), "An Introduction to Terrorism Research".

[4] Walter Enders and Todd Sandler (2012), *The Political Economy of Terrorism* (Cambridge: Cambridge University Press).

economic approach to the study of terrorists. Their definition is also consistent with others in the literature.[5] It reads as follows:

Terrorism is the premeditated use or threat to use violence by individuals or subnational groups to obtain a political or social objective through the intimidation of a large audience beyond that of the immediate victims.

According to this definition, a violent attack is considered to be an act of terror if it answers three cumulative conditions: first, it is committed by a subnational agent (individual or group);[6] second, it bears a political message; third, it is intended to influence not only the immediate victim of the attack but a larger audience.

In recent years, much of the research in the field has accepted an additional condition, regarding the identity of the violence's goal – demanding that the target would be civilian.[7] The purpose of this prerequisite is to distinguish between terrorism and guerilla warfare, which targets are armed forces.

However, different scholars adopted different approaches regarding this condition. For example, the definition in Hudson's seminal work, which analyzes the social and psychological profile of terrorists, requires that the violence would target "noncombatants (including, in addition to civilians, off-duty military and security personnel)".[8]

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[5] Bruce Hoffman (2006), *Inside Terrorism, revised edn.* (New York: Columbia University Press); RAND (2012), *RAND Database of Worldwide Terrorism Incidents* (www.rand.org/nsrd/projects/terrorism- incidents.html).

[6] There are reservations regarding the necessity of the subnational condition, but since it's not relevant to the Palestinian case (since it is a subnational group), it won't be discussed here.

[7] Charles W. Mahoney (2017), "More Data, New Problems: Audiences, Ahistoricity, and Selection Bias in Terrorism and Insurgency Research", *International Studies Review*: pp. 1-26.

[8] Rex A. Hudson (1999), "The Sociology and Psychology of Terrorism: Who Becomes a Terrorist and Why?", *Federal Research Division, Library of Congress*.

Furthermore, many national governments, including the United Kingdom and the United States, do not specify the identity of the target at all in their definitions of terror.[9] Therefore, the necessity for the target's identity condition remains ambivalent.

2.2 The Research of Terrorism

While the conceptual barrier has not been crossed, the literature on terrorism has evolved significantly since its early days. The study of terrorism is a relatively new development: it has been an active field of research since the late 1960s and especially since the 1970s.[10] As terrorism became an eminent global threat,[11] it received growing attention from the general public, politicians and social scientists in various fields – economy, criminology, psychology, etc.[12]

At first, the research was dominated by a historical approach, which focused on the causes of terrorism, the identity of the primary terrorist groups and their ideology.[13] Even though the topic spawned numerous books, essays and monographs, few attempts were made to systematically study terror activities or terrorists.[14] Schmid and Jongman (1988) found that out of over 6,000 works published on terrorism since 1968, almost none tried to uncover in an empirical manner the terrorist operation patterns.[15] Most works relied largely on journalistic analysis and descriptive statistics, without applying advanced statistical methods, which limited the validity and reliability of the findings.

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[9] Andrew Silke (2004), "An Introduction to Terrorism Research".
[10] Reuben Miller, "The Literature of Terrorism", *Terrorism* 11 (1): pp. 63-87.
[11] Martha Crenshaw (1997), "The Beginning of International Terrorism", in: Crenshaw and John Pimlott [Eds.], *Encyclopedia of World Terrorism* (Armonk, NY: M.E. Sharpe): pp 298-300.
[12] Todd Sandler (2014), "The Analytical Study of Terrorism: Taking Stock", *Journal of Peace Research 51* (2): pp. 257-271.
[13] *Ibid.*
[14] Andrew Silke (2004), "An Introduction to Terrorism Research".
[15] Alex Schmid and Albert Jongman (1988), *Political Terrorism.*

During the late 1980s and 1990s, the literature began employing more broadly quantitative methodologies and aiming at theory building. Thus, they began to make use of larger databases. A consortium of West German social scientists, for instance, gathered information about the social background and psychology of 250 terrorists in order to portray the average terrorist profile. They concluded that the majority of the perpetrators demonstrated a pattern of failure both educationally and vocationally in their personal lives.[16]

Similarly, Russell and Miller (1983) collected information on more than 350 terrorists from different countries that were active during 1966-1975 in an attempt to characterize the modern urban terrorist.They identified the common traits of terrorists in terms of [17] age, sex, marital status, education, occupation, method of recruitment and political philosophy. Hudson and Majeska (1990) too investigated the socio-economic characteristics of thousands of terrorists who were active during the Cold War. [18]

The empirical trend gained further momentum in the 2000s. After the historical attack on the World Trade Center on 11 September 2001, the massive interest in terrorism brought about an eruption of new literature.[19] In addition, the collection of event data in large datasets, such as the Global Terrorism database (GTD) and the RAND database, allowed for a more analytic analysis by various researchers. The research employed more advanced statistical methods, such as regressions and probability analysis, to explore terrorism.

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[16] H. Jager, G. Schmidtchen and L. Sullwold (Eds.) (1981), *Analysen zum Terrorismus* [Analysis of Terrorism] (Oplanden, West Germany: Verlgag).

[17] Charles Russell and Bowman Miller (1983), "Profile of a Terrorist," in: Lawrence Zelic Freedman and Alexander Yonah (Eds.), *Perspectives on Terrorism* (Wilmington, Del.: Scholarly Resources Inc.): pp. 45-60.

[18] Rex A. Hudson and Marilyn Lundell Majeska (1999), "The Sociology and Psychology of Terrorism: Who Becomes a Terrorist and Why", *Library of Congress*.

[19] Todd Sandler (2014), "The Analytical Study of Terrorism: Taking Stock",

Nevertheless, the empirical research of "lone wolf" terrorists is still relatively scarce. Since historically terrorism was carried out by organizations, researchers have tended to focus on group dynamics (such as charismatic leadership and top-down recruitment) to explain individual pathways to terrorism.[20] The focus on risk factors at the level of societies also led scholars to focus on collective analysis. Therefore, there are only few studies concerning "lone wolf" terrorists.

One recent example is the seminal work of Hamm and Spaaij (2017), who identified 124 instances of "lone wolf" terrorist attacks in the United States between 1940 and 2016 and assessed their recurring patterns.[21] But their conclusions, though enlightening, are not focused on the Islamic "lone wolf" terrorism that erupted in recent years. Other studies, which limited their attention to this type of assailants, brought up multiple motivations, attitudes and attributes that could characterize the "lone wolves", without reaching a consensual understanding of the issue.[22] Also, they tended to focus on the psychological view.

In general, the current attempts to systematically explain acts of terrorism include works in multiple fields, including International Relations, Public Policy, Sociology, Psychology and Economics. The complexity of the issue calls for multi-disciplinary cooperation in order to shed more light on the terrorism phenomenon. Nonetheless, this paper will mainly draw upon the economic literature, which explored the connection between socio-

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[20] Mark S. Hamm and Ramón Spaaij (2017), *Age of Lone Wolf Terrorism* (New York: Columbia University Press).

[21] *Ibid.*

[22] See: Raffaello Pantucci (2011), "A Typology of Lone Wolves: Preliminary Analysis of Lone Islamist Terrorists" (London, England: International Centre for the Study of Radicalisation and Political Violence); Clark McCauley and Sophia Moskalenko (2014), "Toward a Profile of Lone Wolf Terrorists: What Moves an Individual from Radical Opinion to Radical Action", *Terrorism and Political Violence* 26 (1): pp. 69-85; Aaron Richman and Yair Sharan [Eds] (2014), *Lone Actors – An Emerging Security Threat* (Amsterdam, Netherlands: IOS Press).

economic attributes and terrorism, as will be described in more detail in the following section.

2.3 Terrorism and Economic Characteristics

Numerous works explored the connection between socio-economic conditions and terrorism, both at the individual level and the national level. Contrary to the common belief that poverty and illiteracy harbor terrorism,[23] starting from the 1980's, studies began pointing to the fact that terrorism does not correlate with low socio-economic status or lack of education. Russell and Miller (1983), whose research has been mentioned above, found that two thirds of the terrorists active during 1966-1976 had academic education – a much higher rate than in the general population.[24]

Similarly, the aforementioned work by Hudson and Majeska (1999) showed that terrorists tend to be more educated than the average person.[25] Hassan, who interviewed about 250 families of terror activists as part of her work for the *Red Cross*, discovered that none of them was extremely poor or uneducated.[26] In fact, many of them belonged to the middle class and two of them were the sons of millionaires. Sageman (2006), who interviewed more than 400 terrorists (mostly members of Al Qaeda), also found that the majority of them came from solid economic background and about two thirds had an academic training.[27]

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[23] Joseph Kahn and Tim Weiner, "World Leaders Rethinking Strategy on Aid to Poor," *The New York Times*. New York, March 18, 2002, Sec. A, p. 3.
[24] Charles Russell and Bowman Miller (1983), "Profile of a Terrorist".
[25] Rex A. Hudson and Marilyn Lundell Majeska (1999), "The Sociology and Psychology of Terrorism: Who Becomes a Terrorist and Why".
[26] Nasra Hassan (2001), "An Arsenal of Believers," *The New Yorker*, November 19, 2001, pp. 36–41.
[27] Marc Sageman (2006), "Islam and al Qaeda", in: Ami Pedhzur (Ed.), *Root Causes of Suicide Terrorism: The Globalization of Martyrdom* (Abingdon, United Kingdom: Routledge): pp. 122-131.

These works and others like them examined statistical correlations, but did not make use of econometric methods that could allow inferring a causal link. They suffered from problems such as convenience sampling, partial data and a focus on famous terrorists, possibly leading to biased results.

In recent years, the emergence of new data has allowed researchers to perform more systematical analysis and make theoretical generalizations about the relationships between socio-economic attributes and terrorism.[28] Krueger and Maleckova (2003), for instance, examined 129 biographies of Hezbollah activists between the 1980s and the 1990s.[29] They compared them to the general Lebanese population, using a national survey that was conducted in that period and found that they were more educated and less likely to come from a broken family.

Krueger (2008) compared 63 "homegrown" Muslim-American terrorists to a control group of Muslims that grew up in the United States using probit regressions.[30] According to his research, the terrorists tended to be younger and more educated than the control group, although almost half of them have not completed their academic studies.

Specifically per "lone wolves" terrorists, currently only few studies used formal statistical models to analyze their socio-economic characteristics. Brent et al. (2015), for example, used data from the American Terrorism Study (ATS) to examine 268 federal terrorism

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[28] Charles W. Mahoney (2017), "More Data, New Problems".

[29] Alan B. Krueger and Jitka Maleckova (2003), "Education, Poverty and Terrorism: Is There a Causal Connection?", *The Journal of Economic Perspectives* 17 (4): pp. 119–144.

[30] Alan B. Krueger (2008), "What Makes a Homegrown Terrorist? Human Capital and Participation in Domestic Islamic Terrorist Groups in the U.S.A.", *Economic Letters* 101: pp. 293-296.

"indictees" and compared loners to those who had no assistance.[31] They found that lone wolf terrorists were more educated than group-based assailants.

Eby (2012) focused on individual terrorists that operated in the United States after 9/11.[32] He concluded that no single profile of a lone-wolf terrorist exists: only few out of the 53 cases he examined were similar in multiple characteristics. Nevertheless, he did find that the terrorists were not necessarily lower-class residents and were about as likely to be employed as unemployed. At least third of them had attended college.

In contrast, scholars did find a positive relationship between economic and lower socio-economic status on the macro level. In other words, even though it seems that individual terror activists are not prone to be poor and uneducated, worsening economic conditions seem to be positively correlated with terrorism.

Blooberg, Hess and Weerapana (2004), for example, examined a cross section of 127 countries using Markov processes and showed that for democratic high-income countries, economic contractions lead to increased likelihood of terrorist activities.[33] They argued that when the resource base of the economy shrinks, dissident groups are less likely to be satisfied with their low share of the smaller pie and are likely to engage in terrorism.

As opposed to that, Piazza (2006) used data on terrorism in 96 countries during 1986-2002 and did not find a significant correlation with economic factors such as poverty,

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[31] Brent L. Smith et al (2015), "The Emergence of Lone Wolf Terrorism: Patterns of Behavior and Implications for Intervention", In: Mathieu Deflem (Ed.), *Terrorism and Counterterrorism Today – Sociology of Crime, Law and Deviance, Volume 20* (Bingley: Emerald Group Publishing Limited): pp 89.110.

[32] Charles A. Eby (2012), "The Nation that Cried Lone Wolf: A Data-Driven Analysis of Individual Terrorists in the United States since 9/11", *Dissertation*, Monterey, California: Naval Postgraduate School.

[33] Brock S. Blomberg, Gregory D. Hess and Akila Weerapana (2004), "Economic Conditions and Terrorism", *European Journal of Political Economy* 20 (2): pp. 463–478.

unemployment, inequality or inflation. [34] Krueger and Laitin (2008) explored 781 significant terror attacks around the world using social and economic variables and showed that neither country GDP nor illiteracy is a good predictor of terrorist origins.[35]

Enders, Hoover and Sandler (2016) claimed that the relationship between economic conditions and terrorism is nonlinear: in poor countries, the population is more focused on day-to-day survival, while in rich countries there are fewer grievances to fuel terrorism.[36] Therefore, middle income countries are more conducive to terrorism.

Trying to settle these contradictory findings, Gassebner and Luechinger (2011) applied extreme bound analysis to identify robust determinants of terrorism.[37] They used several global datasets and performed different panel runs for terrorism's victim and venue countries using various economic indicators. For the victim countries, they found that GDP per capita is a positive determinant of terrorist attacks. Economic freedoms were a negative determinant for both venue and victim countries.

On the theoretical side, Bueno de Mesquita (2005) offered an explanation for the various results regarding economic conditions and terrorism.[38] He constructed a generalized model of interaction between a government, a terrorist organization and potential terrorist volunteers. According to the model, individuals with low ability or little education are most likely to volunteer to join the terrorist organization, but the

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[34] James A. Piazza (2006), "Rooted in Poverty? Terrorism, Poor Economic Development, and Social Cleavages", *Terrorism and Political Violence* 18 (1): pp. 159–177.

[35] Alan B. Krueger and David D. Laitin (2008), "Kto Kogo? A Cross-Country Study of the Origins and Targets of Terrorism", in: Philip Keefer and Norman Loayza [Eds.], *Terrorism, Economic Development, and Political Openness* (New York: Cambridge University Press): pp. 148–173

[36] Walter Enders, Gary. A. Hoover and Tood Sandler (2016), "The Changing Nonlinear Relationship between Income and Terrorism", *The Journal of Conflict Resolution* 60 (2): pp. 195-225.

[37] Martin Gassebner and Simon Luechinger (2011), "Lock, Stock, and Barrel: A Comprehensive Assessment of the Determinants of Terror", *Public Choice* 149 (3–4): pp. 235–261.

[38] Ethan Bueno de Mesquita (2005), "The Quality of Terror", *American Journal of Political Science* 49 (3): pp. 515-530.

organization screens the volunteers for quality and selects the most skilled among them. As a result, actual terrorists are not poor or lacking in education. However, economic deterioration is expected to be positively linked with terrorism, since it increases the supply of willing volunteers, allowing the terror organization to be more selective.

Thus, the model is consistent with the seemingly contradictory empirical findings, according to which lack of economic opportunity and recessionary economies are positively correlated with terrorism but terrorists are usually not poor or uneducated. The model was not yet adapted to the case "lone wolf" terrorists, but there are initial attempts to construct an analytical framework that would analyze "lone wolf" assailants as rational agents who make choices to maximize their utility.[39]

2.4 Terror and Economics – Evidence from the Israeli-Palestinian Case

In the Israeli context, Berrebi (2007) was the first to examine the link between education, poverty and terror among Palestinians using advanced econometric methods.[40] He exploited the religious Muslim duty to publish praises for "Shaheed"s – an honorific for Muslims who have died fulfilling a religious commandment, especially those who die waging jihad – in order to gather information on every Palestinian terrorist during the research period (1980-2002).

This full sample, which included the biographies of 285 terrorists, was compared to the general Muslim male population in the ages of 15-56, using the Palestinian Labor Force Survey for 1993. Using logistic regressions, Berrebi found a significant positive link

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[39] Peter J. Phillips (2011), "Lone Wolf Terrorism", *Peace Economics, Peace Science and Public Policy* 17 (1): pp. 1-29; Peter J. Phillips and Gabriela Pohl (2012), "Economic Profiling of the Lone Wolf Terrorist: Can Economics Provide Behavioral Investigative Advice?", *Journal of Applied Security Research* 7 (2): pp. 151-177.

[40] Claude Berrebi (2007),"Evidence about the Link between Education, Poverty and Terrorism Among Palestinians," *Peace Economics, Peace Science and Public Policy* 13(1): pp. 1-36.

between education and terrorism on the one hand and a negative significant link between poverty and terrorism on the other hand.

On the macro level, Palestinian terrorism showed an opposite relationship, as predicted by Bueno de Mesquita's model. Caruso and Gavrilova (2012), who analyzed the relationship between youth unemployment and Palestinian violence, found a positive association between the growth rate of youth unemployment and the brutality and incidence of violence.[41] Sayre (2009) estimated count data regression models of the occurrence of Palestinian terrorist attacks in 1993-2004 and concluded that deteriorating local labor market conditions during the al-Aqsa Intifada accounted for nearly half of the increase in suicide bombings during that time. [42]

As stated, these findings can possibly be explained using the quality of terrorism model. In fact, Ben-Melech, Berrebi and Klor (2012) provided empirical evidence in support of Bueno de Mesquita's hypothesis.unds of 157 Palestinian They analyzed the backgro[43] suicide terrorists who acted against Israeli targets in 2000–2006 and found that high levels of unemployment enabled terror organizations to recruit better educated, more mature and more experienced suicide terrorists.

This raises an interesting question: what were to happen if the mediating factor – the terror organization – was eliminated? The latest terror wave in Israel, which stands at the heart of this thesis, provides a unique opportunity for testing this exact query.

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[41] Raul Caruso and Evelina Gavrilova (2012), "Youth Unemployment, Terrorism and Political Violence, Evidence from the Israeli/Palestinian Conflict", P*eace Economics, Peace Science and Public Policy* 18 (2).
[42] Edward A. Sayre (2009), "Labor Market Conditions, Political Events and Palestinian Suicide Bombings", *Peace Economics, Peace Science and Public Policy* 15 (1).
[43] Efraim Benmelech, Claude Berrebi and Esteban F. Klor (2012), "Economic Conditions and the Quality of Suicide Terrorism", *The Journal of Politics* 74 (1): pp. 1-16.

2.5 The Knives Intifada

The "Knives Intifada", also known as the "Intifada of the Individuals", burst in October 2015.[44] Within months, hundreds of Palestinian individuals perpetrated multiple terror attacks, mostly using knives. The terror wave cost the lives of dozens and wounded hundreds of Israelis. In addition, it imposed economic costs by increasing security expenditure, reducing tourism and hurting local businesses.[45]

The "lone-wolf" attacks that characterized this upsurge deviated from the patterns of previous terrorist outbreaks of the Israeli-Palestinian conflict. In contrast to the First and Second Intifadas, this terror wave seemed un-orchestrated and untraceable to any particular organization.[46] Palestinian political organizations such as Hamas, PIJ and Fatah showed little direct involvement in it.[47] Therefore, it provides an apt field study for the Quality of Terrorism hypothesis.

Since the "lone wolf" terrorism in Israel is a relatively new phenomenon, it has yet to be extensively researched. However, several preliminary studies are worth mentioning.

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[44] Amos Harel, (2017) "Israel Arrested 400 Palestinians Suspected of Planning Attacks After Monitoring Social Networks", *Haaertz*, 18 April 2017, retrieved from: https://www.haaretz.com/israel-news/how-israel-uses-big-data-to-fight-palestinian-terror-1.5461381 (Last accessed: 11.03.2018); Harel Chorev (2017), "Palestinian Social Media and Lone-Wolf Attacks: Subculture, Legitimization, and Epidemic", *Terrorism and Political Violence*: pp. 1-23.

[45] See for example: Gad Lior (2018), "Another NIS 1,400 a Month for Every Policeman in Jerusalem", *ynet*, 17 July 2018, retrieved from: https://www.ynet.co.il/articles/0,7340,L-5311451,00.html (Last accessed: 20.09.2018). [*In Hebrew*]; Jamie Halper and Kayla Steinberg, "Jerusalem Terrorism Deters Old City Tourism, Hurts Shops", *Jerusalem Post*, 17 July 2017, retrieved from: https://www.jpost.com/Arab-Israeli-Conflict/Old-City-terrorism-deters-tourism-hurts-shops-499900 (Last accessed: 20.09.2018); Tali Kayam (2015), "The Knives were Pulled Out: How Much did the Wave of Terrorism Hit Jerusalem's Cultural Institutions?", *Walla! News*, 30 November 2015, retrieved from https://e.walla.co.il/item/2911080 (Last accessed: 20.09.2018). [*In Hebrew*]

[46] Hirsh Goodman and Yossi Kuperwasser (2017), "The Knife and the Message: The Roots of the New Palestinian Uprising", *Jerusalem Center for Public Affairs*.

[47] Harel Chorev (2017), "Palestinian Social Media and Lone-Wolf Attacks: Subculture, Legitimization, and Epidemic".

Chorev (2017), for example, examined the impact of social media on the terrorism wave from October 2015 through September 2016.[48] He analyzed the attacks' patterns alongside the corresponding discourse in social networking sites and argued that Social media played a critical role in transforming the terrorist attacks into a social epidemic with continuity, even without the guidance of terrorist organizations.

Frisch and Bartal's (2017) research about "lone wolves" in Israel focused on terrorists that operated in Jerusalem between October 2015 and May 2016, and compared them with perpetrators from previous terrorism waves.[49] Specifically, the researches sought to examine whether the new terrorists were indeed "lone wolves" with no organizational background. They counted 74 terrorists (in comparison to 420 assailants in this paper), among then 64 who acted out on their own initiative, but only 13 that had no connection of some sort to terror organizations. They concluded that the new terrorists were less effective than their predecessors, but did not investigate their personal attributes.

Goodman and Kuperwasser (2017), who reviewed the first few months of the Knives Intifada, also claimed that the so-called "lone wolf" terrorists were actually receiving tailwind from wider organizational frameworks – most importantly, the Palestinian Authority itself and the Palestinian faction that leads it, Fatah. [50] The essays published in the collection they edited inquired this issue from different angles, all revolving around the question of external involvement in the terrorist acts (through funding, incitement,

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[48] *Ibid*.

[49] Hillel Frisch and Shaul Bartal (May 2017), "Are Lone Wolves Really Acting Alone? The Wave of Terror 2008-2015", *Begin-Sadat Center for Strategic Studies*, retrieved from: https://besacenter.org/wp-content/uploads/2017/05/MSPS132_HE.pdf (Last accessed: 20.09.2018). [*In Hebrew*]

[50] Hirsh Goodman and Yossi Kuperwasser [Eds.], *The Knife and the Message: The Roots of the New Palestinian Uprising*.

etc.). They did not explore in depth the terrorists themselves, with the exception of Elashvili's paper.

Elashvili (2017) assembled the profiles of 181 terrorists that operated between September 2015 and January 2016.majority of the assailants were the According to these profiles,[51] males between the ages of 15 and 23, usually unmarried and without a previous security record. Elashvili states that many of the terrorists were high school students or recent graduates, unemployed or employed at low-paying, while some were university students – without reaching a clear conclusion regarding their socio-economic status or education. Moreover, her study, while meticulous and insightful, addressed only part of the period researched in this paper and did not code the terrorists' profiles into a dataset that allowed for a statistical analysis.

In addition to these works, a new study about the "lone wolf" terrorists is Israel throughout 2015-2017, conducted by Merari and Ganor in partnership with the Israel Ministry of Public Security, has yet to be published.[52] However, the researchers have presented some of their findings and pointed at several important characteristics of the recent terrorists, such as extensive use of social media and strong ideological motivation (combined with psychological and personal factors). Even though they focused on the same period as this thesis, with a wider dataset of 560 attacks and 700 attackers, their focus was somewhat different – mainly exploring the personal motivations behind the terrorist attacks from a psychological point of view and the means to cope with them from a political science perception.

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[51] Tamara Elashvili (2017), "Breakdown: The Stabbers and the Message that Motivates Them", in: Hirsh Goodman and Yossi Kuperwasser [Eds.], *The Knife and the Message: The Roots of the New Palestinian Uprising*.

[52] Ministry of Public Security (2018), "Study: Terrorists Post Info on Social Media before Attacking", 12 June 2018, retrieved from: https://www.gov.il/en/Departments/news/study_on_lone_wolf_terror_phenomena_120618 (Last access: 20.09.2018)

In addition, Merari and Ganor focused on in-depth interviews of a sample group of 45 imprisoned terrorists. They found that two-thirds of the imprisoned terrorists suffered from mental disorders, psychosis or suicidal tendencies. The tendency of familial problems was particularly high among the female attackers. Nevertheless, it should be noted that this finding might be the result of a selection bias – possibly, assailants that operated due to personal problems behaved differently than other assailants, and therefore were more likely to wind up in prison, causing an over-representation of this attribute in the sample group in comparison to the entire pool of terrorists. This potential bias gives reason to further explore the "lone wolf" terrorists in a complementary effort, employing quantities methods, in order to reinforce or counter the current findings – as will be done in this paper.

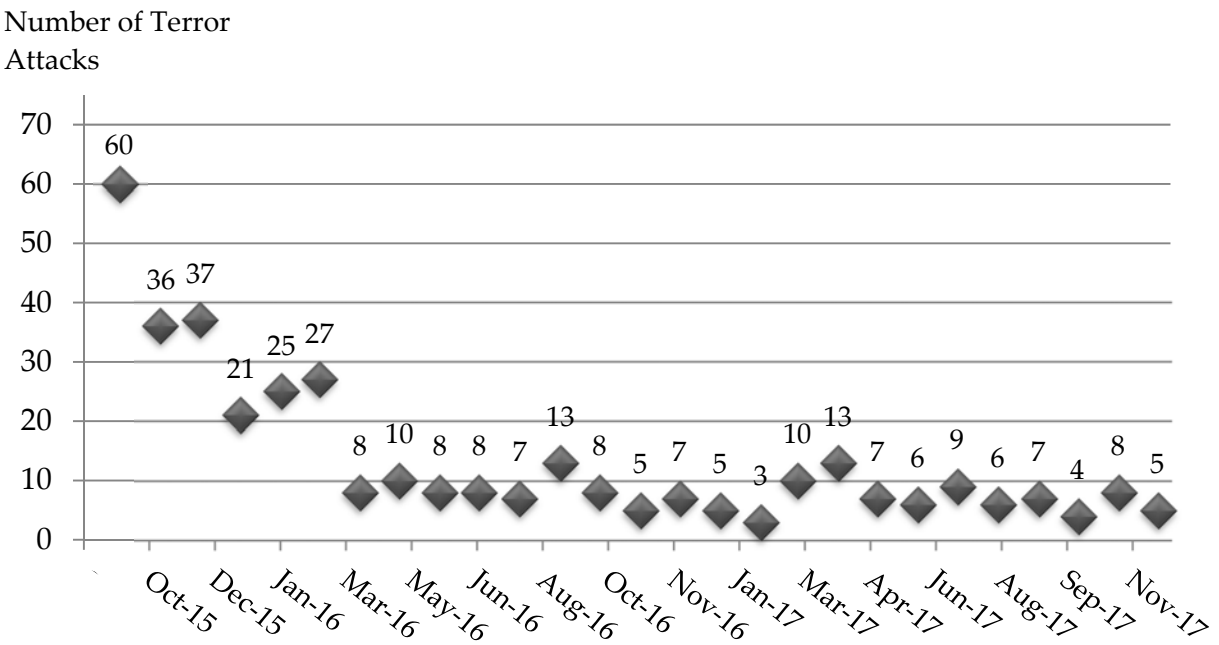
3. Data and Assumptions

To analyze the personal characteristics of the "lone wolf" terrorism in Israel, I constructed a cross section dataset consisting of terrorism data and personal attributes for 363 terror attacks that occurred in Israel between October 2015 and December 2017 (see Chart 1), perpetrated by 420 assailants.

The starting month was chosen since the media, the security establishment and the research literature address it as the beginning of a "new wave" of terrorism and perhaps even as a third "Intifada".[53] Out of convenience, the dataset ends on December 2017, since this work was written throughout 2018.

[53] Hirsh Goodman (2017), "The Knife and the Message: The First 100 Days of the New Palestinian Uprising (October 2015 – January 2016)", in: Hirsh Goodman and Yossi Kuperwasser [Eds.], *The Knife and the Message: The Roots of the New Palestinian Uprising;* Amos Harel, (2017) "Israel Arrested 400 Palestinians Suspected of Planning Attacks After Monitoring Social Networks".

Chart 1: Frequency of Terror Attacks throughout October 2015-December 2017



Each observation in the database represents one terrorist (if numerous terrorists worked together, their attack would constitute several observations, with each terrorist in a separate line). It includes information about the attack itself and about the attacker, as will be clarified in the following sections.

3.1 The Scope of Terror Attacks in this Paper

As discussed earlier, there is no clear definition of terror. For the purposes of the data compilation, I have chosen to rely the definition offered by Enders and Sandler,[54] that stipulates three conditions for defining a violent act as a terrorist one: it has to be committed by a subnational agent, in a pursuit of a political goal, third, in order to influence not only the immediate target of the attack but a larger audience.

[54] Walter Enders and Todd Sandler (2012), *The Political Economy of Terrorism*.

As for the optional condition regarding the target's nature – the Israeli-Palestinian case presents a dilemma in this respect, since many of the Palestinian violent attacks in recent years targeted soldiers, police officers and security personnel, but in a civilian environment – shopping malls, bus stations or in the middle of the street. In addition, military personnel are often being attacked at security checkpoints or border crosses, outside of a warfare scenario, rendering the guerilla label unfit.

Moreover, the Israeli public and the media label these attacks as "terror acts" for all intents and purposes, and do not distinguish between them and violent acts committed against non-combatants. As a result, the social and political effect of these attacks is similar, as known to the attackers who commit them precisely to achieve this effect. Therefore, socially speaking it is reasonable to consider them as terror acts.

In addition, The Israeli government also considers these acts as terrorism, and responds to them as such. Hence, defining these attacks as terrorist makes sense from a public policy point of view.

Consequently, in this thesis, I consider as a terror incident every violent attack committed by a Palestinian or a Muslin resident of Israel,[55] in which the assailant didn't have a personal motive to hurt his or her victim (such as robbery or revenge), but a political motive – acting against Israelis or Jews in the context of an ongoing political conflict. I consider attacks against soldiers as terrorism if the soldiers were on duty, but did not initiate an interaction with the attacker – that is to say, the terrorist decided to violently hurt the soldier outside of a confrontational situation, in order to fulfill a pre-planned decision to use violence for psychological, political or religious causes as described above.

[55] I focused on terror acts that were committed by residents of Israel and the Palestinian Authority. Therefore, the dataset does not include two terror attacks that were committed by Jordanian citizens who came to Israel for the sake of the attack, and presumably require a separate analysis.

That being said, the dataset constructed for this research does not include every terror attack, but focuses on acts of stabbing, car ramming, shooting (from a close range) and self-bombing. I excluded from the dataset events of rock throwing, petrol bombs throwing or sniper shooting, for several reasons.

First of all, pragmatically, the focus of this research is on personal characteristics of terrorists and there is usually no available information on individuals who participated in these terror activities. Stone throwing, petrol bombs throwing and sniper shooting are usually done from afar, thus limiting the chances to identify the attackers (especially stone throwing by Palestinians, which is committed by groups on a regular basis).

Secondly, even though these types of terror acts are very dangerous and potentially life threating, in average they cause less damage then stabbing, car ramming, self-bombing and shooting. To illustrate this point, Israeli authorities document thousands of cases of stone throwing each year,[56] but the last time a person was killed by a rock thrown at his car was in 2015.[57] Sniper shooting can of course be deadly, but is relatively rare compared to the other terror attacks. Therefore, Policywise, the most urgent problem is not the abovementioned types of terror attack, but rather the acts of stabbing, shooting, self-bombing and car ramming– they cause the majority of terror casualties.

Thirdly, from a research literature point of view, the study of terrorists' personal characteristics is largely motivated by the aspiration to understand the individual terrorist – the incentives and considerations that push him or her into risking his/her own life for an ideological purpose, a seemingly "irrational" decision. From this perspective,

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[56] Elitzafan Rosenberg, "Director of the Tax Authority: We Handle 10,000 Cases of Stone Throwing in a Year", *Ynet*, 8 February 2017, retrieved from: http://www.ynet.co.il/articles/0,7340,L-4919262,00.html (Last accessed: 20.09.2018). [*In Hebrew*]

[57] Times of Israel, "Man Killed in Jerusalem Rock-Throwing Attack Named as Alexander Levlovitz", 14 September 2015, retrieved from: https://www.timesofisrael.com/man-killed-in-jerusalem-rock-throwing-attack-named-as-alexander-levlovitz/ (Last accessed: 20.09.2018).

the focus of this analysis should be on terrorists that put themselves in risk in order to commit a terror act. Snipers and throwers of stones and petrol bombs are usually not immediately caught and sometimes pay no price for their actions – therefore, they are less relevant to the aim of the research.

In light of the above, the dataset only includes individuals who initiated a terror attack, whether by stabbing, shooting or car ramming (and one terrorist who tried to activate a bomb while in the car). It excludes Palestinians who were killed during riots or mass confrontations with the Israeli army. As for individuals who were caught with a knife and arrested before committing a terror attack, they were included in the database, but the analysis was done separately with and without them.

3.2 The Terror Attacks' Data

In order to construct the database, I used three main information sources to identify terror attacks in Israel. First, The Meir Amit Intelligence and Terrorism Information Center's weekly reports, called "News of Terrorism and the Israeli-Palestinian Conflict".[58] These reports, available on the Meir Amit Center's website, include detailed information about the terror acts committed in Israel each week and personal information about the assailants from the open media.

Secondly, I used the online database "Stabbing Intifada Stats 2015",[59] published by a freelance data analyst, Nehemia Gershuni-Aylho, on his website "Meyda".[60] This database lists every terror event that happened in Israel between January 2015 and

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[58] The Meir Amit Intelligence and Terrorism Information Center (No date), "General Information", retrieved from: http://www.terrorism-info.org.il/en/c/general-information/ (Last accessed: 20.09.2018).
[59] "Stabbing Intifada Stats 2015" (No date), retrieved from: https://docs.google.com/spreadsheets/d/1MHAKzza4EpjnVstnIM5STTWeqb59q2q8hMtrYna6zJE/edit#gid=999074856 (Last accessed: 20.09.2018). [*In Hebrew*]
[60] Meyda (No date), retrieved from: http://infomeyda.com (Last accessed: 20.09.2018). [*In Hebrew*]

January 2016 and provides information about the timing and location of the attack, its victims and, for some observations, about the assailant.

Thirdly, I used the "Xoox" web portal,[61] which gathers reports from the main news websites in Israel by date – including news about terror attacks. The portal provides access to reports from newspapers' websites (Haaretz, Israel Hayom, Maariv/Nrg, Yediot Ahronot/Ynet), TV channels' websites (Arutz 7, Nana10) and other web portals (Walla, Mako, Rotter, Kikar HaShabat).

The integration of these sources allowed me to build a comprehensive dataset of terror attacks in Israel throughout the research period, including information about the attacks' details as described hereinafter:

- Type of the attack (shooting, stabbing, car ramming, self-bombing).
- Location variables – verbal description, quadrants (latitude, longitude), sovereignty (Israel, Area A, Area B, Area C), local authority.
- Time variables – date, day of the week, time of the day (hour).
- The attack's outcomes – number of casualties and fatalities, the status of the assailant following the attack, the target type (civilian, police officers, soldiers).
- The assailant – age, residence locality, citizenship (Israeli or Palestinian). This information was available for the vast majority of the attacks.

3.3 The Terror Assailants' Data

In order to complete the dataset, I researched each assailant using multiple sources and added his or her personal characteristics, as listed in Table 1.

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[61] Xoox (No date), "News", retrieved from: http://news.xoox.co.il/mobile/alldate.php (Last accessed: 20.09.2018). [*In Hebrew*]

The main source of information was the Meir Amit Intelligence and Terrorism Information Center's periodical reports about terrorist profiles and its weekly reports on terrorism.[62] These reports note various personal details (such as age, place of residence, profession and connections to terrorist organizations) of many of the Palestinian attackers. In addition, I drew information from Frisch and Bartal's research about "lone wolves" in Israel in 2008-2015[63] and from Elashvili's study on Palestinian terrorists that attacked between September 2015 and January 2016.[64]

More basic information was obtained from WAFA, the official news agency of the Palestinian Authority, which publishes personal details such as year of birth, marital status and residence governorate of Palestinians from the West Bank that were killed by Israeli forces during 2015-2017.[65]

Table 1: List of Main Research Variables

The Terror Attack	
Type of Attack	**Location**
- Stabbing/Ramming/Shooting/Bombing	- Name of Locality
Timing	- Latitude

[62] The Meir Amit Intelligence and Terrorism Information Center (November 2015), "Interim Findings of the Profile of Palestinians Who Carried Out Attacks in Judea and Samaria in the Current Terrorist Campaign (September 14 – November 15, 2015)", retrieved from: http://www.terrorism-info.org.il/en/20917 (Last accessed: 20.09.2018) ; The Meir Amit Intelligence and Terrorism Information Center (November 2015), "Interim Findings of the Profile of Palestinians Who Were Killed in Confrontations with Israeli Security Forces in Judea, Samaria and the Gaza Strip (October 3 – November 22, 2015)", retrieved from: http://www.terrorism-info.org.il/en/20924 (Last accessed: 20.09.2018); The Meir Amit Intelligence and Terrorism Information Center (No date), "Terrorism Information", retrieved from: https://www.terrorism-info.org.il/en/terrorism-information/ (Last accessed: 20.09.2018)

[63] Hillel Frisch and Shaul Bartal (May 2017), "Are Lone Wolves Really Acting Alone? The Wave of Terror 2008-2015".

[64] Tamara Elashvili (2017), "Breakdown: The Stabbers and the Message that Motivates Them".

[65] WAFA (No date), "Martyrs of the West Bank", retrieved from: info.wafa.ps/atemplate.aspx?id=7565 (Last accessed: 20.09.2018). [*In Arabic*]

- Date
- Hour
- Day of the Week

Weather and Temperature

Attack's Target

- Type (Militray/Police/Civil)

Was the Attack Stopped in Advance

- Longitude
- District
- Sovereignty (Israel/A/B/C)

Results

- Number of Wounded
- Number of Killed
- Was the assailant Killed

The Assailant

Name

Citizenship (Israeli/Palestinian)

Place of Residence

- Name of Locality
- Latitude
- Longitude
- District
- Sovereignty (Israel/A/B/C)

Connections to Terrorism

- Terror Organization Association
- Terror Organization Formal Membership
- Relatives Involved in Terror
- Criminal Past

Personal Traits

- Age
- Gender
- Marital Status
- Number of Children
- Social Media Activity
- Known Personal/Mental Problem

Socio-Economic Status

- Education Status
- Poverty (Poor/Not Poor)
- Work Profession
- Worked In Israel (Dummy V.)

Further data was obtained from legal records. One useful source was Takdin,[66] a website which publicizes judicial verdicts from Israeli courts. The rulings against terrorists who were arrested and prosecuted in Israel usually provide additional personal details, such as marital status, socio-economic conditions, profession and so on. In addition, the military court reports written by the Israeli non-profit organization MachsomWatch

[66] Tadkin (No date), retrieved from: http://www.takdin.co.il (Last accessed: 20.09.2018). [*In Hebrew*]

document many of the legal procedures relating to terrorist acts committed by residents of the West Bank and provide further personal information of some terrorists.[67]

Furthermore, I used open media reports about terrorists. Gideon Levy, for example, wrote numerous articles about Palestinian assailants who were killed or injured during the 2015-2017 terror wave and provided rich descriptions of their lives and their social-economic status in his journalist section "Twilight Zone".[68] In addition to his reports, I collected information from assorted articles in Arabic media (Aljazeera, Al-Araby Al-Jadeed, Wattan TV, Al-Masry Al-Youm, Marssad News) and Israeli media (Haaretz, Israel Hayom, Maariv/Nrg, Yediot Ahronot/Ynet, Mako, Actualic).

Other than that, I looked for information in various websites and social media accounts in Hebrew, English and Arabic. For example, I used the Arabic website "Al Intifada" (الانتفاضه, the Arabic term for uprising or resistance)[69] that praises terrorist attacks against Israelis and publishes biographies of "Shaheed"s (deceased "martyrs").[70]

To complete these written recorded, I conducted interviews with the team of the Advisor to the Mayor of Jerusalem for Arab and eastern Jerusalem, who are responsible for community relations and strategic development of the Muslim and Christian sectors of the city and are familiar with the Arabic population of Jerusalem.

Combining all of these information sources, I assembled as detailed as possible profile for each terrorist in the dataset. These profiles were coded into the variables listed in Table 1.

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[67] Machsom Watch (No date), "Reports from Military Courts", retrieved from: https://machsomwatch.org/en/daily-reports/military-courts (Last accessed: 12.09.2018).

[68] Haaretz (No date), "Israel News – Twilight Zone", retrieved from: https://www.haaretz.com/israel-news/twilight-zone (Last accessed: 20.09.2018).

[69] Edward W. Said (1989), "Intifada and Independence", in: Zachary Lockman and Joel Beinin [Eds.], *Intifada: the Palestinian Uprising against Israeli Occupation* (Cambridge: South End Press): pp. 5-22.

[70] Al Intifada (No date), retrieved from: http://intefada.ps/ (Last accessed: 20.09.2018). [*In Arabic*]

3.4 Further Assumptions and Data Cleansing

As can be expected, not all variables were available for all observations. First of all, for some terror attacks, the identity of the assailant could not be obtained. However, except for one observation where the terrorist managed to escape, the assailant's gender and age were almost always publicized. For some observations, different ages were reported in different sources – in these cases, I used the mean age of all reports. The attacker's place of residence was also available for the vast majority of cases.

Variables such as marital status and number of children were more difficult to obtain. For minors under the age of 18, I assumed (unless otherwise known) that the assailants were single and had no children. If the marital status was known to be single, I assumed they had no children as well. This rule of thumb appeared to be in line with the actual data: in the observations with fuller information, minors were usually indeed single and single individuals did not have children.

As for membership in or association to a terror organization, a work place in Israel, a criminal past (in terror activity) and having relatives who were involved in terrorism – I assumed that they were all null (equal to 0), unless otherwise known. The reasoning behind this decision is that the information sources I used, as described above, are inclined to positive reporting: they do not describe the lack of these characteristics. It is reasonable to assume that if an assailant was related to a terror organization, was involved in terror before, worked in Israel or had relatives who were involved in terror – this information would be published afterwards by Israeli or Palestinian sources.

Inferring poverty status presented more of a challenge. The "Poor" variable, which is equal to 1 if the individual is poor, was coded using the unique information on each observation. I constructed three different variables, with varying levels of credibility, based on multiple classification heuristics (see Table 2).

To illustrate – some terrorists' economic difficulties were reported in their verdicts or in articles written about them, allowing me to label them as poor with high confidence level. For others, if their profession or education was known, I determined that employed university graduates, owners of free professions (doctors, accountants, engineers, etc.) or business owners were not poor – at a medium level of credibility. Additionally, I assumed that individuals whose profiles included signs of socio-economic strength (recent vacation abroad, known rich relatives, lavish housing) were not poor. Other criteria are shown in Table 2. While not accurate, this classification does shed light on the economic status of many of the terrorists in the dataset.

Similarly, I constructed two variables for education. The first variable records the level of education according to published report, with no further assumptions. The second variable adds the likely level of education for terrorists without documented studies, based on two reasonable assumptions: if a minor is working, he probably dropped out and therefore did not complete 12 years of schooling; is one is a teacher, he probably has completed 12 years of schooling.

Table 2: Main Criteria for Socio-Economic Classification

High Credibility

Poor	**Not Poor**
– Mention of poverty in Probation survey	– No mention of poverty in Probation survey
– Detailed description of poverty in media	– Detailed description of wealth in media
– Dropped out of school in order to work	– Employee of the Palestinian Authority
– Resident of Shu'fat/Qalandiya refugee camp	
– Sole provider for more than three children	

Medium Credibility

Poor	Not Poor
– Works in difficult manual labor	– Works in difficult manual labor
– Sole provider for three children	– Sole provider for three children
– Helps parents to provide	– Helps parents to provide
– Works in difficult manual labor	– Works in difficult manual labor
– Sole provider for three children	– Sole provider for three children
– Helps parents to provide	– Helps parents to provide
– Works in difficult manual labor	– Works in difficult manual labor
– Sole provider for three children	– Sole provider for three children
– Helps parents to provide	– Helps parents to provide

Low Credibility

Poor	Not Poor
– Hasn't completed high school	– University/College graduate
– Photos of house show neglect	– Works as a freelancer
– Resident of any refugee camp	

3.5 Reservations

As described above, the dataset has significant limitations. For some individuals, main variables of interest (particularly poverty) were inferred on the basis of existing information. For some variables and observations, no information was obtained. This limits the ability to use the dataset in order to reach decisive conclusions about the research population and its similarity to or difference from past terrorist activity in Israel.

Another concern comes from the fact that the lack in information might not be randomly assigned, creating bias in the results – for instance, if most of the media reports focus on

poor terrorists, therefore giving them a wider presence in the dataset. However, the reliance on multiple sources of information, both Israeli and Palestinian, of different types (online databases, previous studies, social media, newspapers, judicial verdicts), in several languages, suggests that there is no clear bias in a certain direction in the information gathering.

To conclude, the changing patterns of terror, which raise great interest among scholars and decision makers, calls for further investigation. Despite the limitations of the dataset, this unique sample of terrorists does provide information on the characteristics of individuals recently engaged in terror attacks in Israel. Given the lack of empirical research on the "lone wolf" terrorists in Israel, this initial study could provide a meaningful contribution to the understanding of this relatively new phenomenon, and give a basis for further analysis.

4. Descriptive Statistics

4.1 Characteristics of the "Knives Intifada"

As was mentioned above, the dataset includes 363 terror incidents that occurred between October 2015 and December 2017, involving 420 terrorists. Analyzing these attacks shed light on the distribution of the attacks over time and space.

4.1.1 Geographical Distribution of the Attacks

The terrorist attacks spread all across the state of Israel (see Chart 2). About 60% of them took place in Judea and Samaria, beyond the "Green Line" that represents the Israeli pre-1967 borders (see Table 3). Among these attacks, almost 90% occurred in Area C, where Israel holds the governmental civil and security authorities, according to the Oslo agreement.[71] This can be at least partially attributed to the fact that Palestinians in the West bank can easily access Israeli targets – both soldiers, police officers and citizens – in Area C, without having to pass the security checks at the Israeli border. Therefore, it became the most popular location for attacks.

However, a significant portion of the attacks (about 40%) happened in Israel, despite the construction of the separation wall between Israel and the West bank following the Second Intifada. Specifically, 72% Out of the terrorism incidents that took place inside the Green line were perpetrated in Jerusalem. The capital city of Israel was a main target for "lone wolf" terrorism, as reflected in the term "Intifadat Al-Kuds" (loosely translated as the uprising of Jerusalem), that surfaced as early as October 2015.[72]

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[71] *Israeli-Palestinian Interim Agreement on the West Bank and the Gaza Strip* (1995), retrieved from: https://web.archive.org/web/20021115180646/http://knesset.gov.il:80/process/docs/heskemb_eng.htm (Last accessed: 05.08.2018).

[72] Avi Issacharoff (2015), "The 'Jerusalem Intifadah' Began: Israel is Fighting the Invisible Terrorists", *Walla! News*, 13 October 2015, retrieved from: https://news.walla.co.il/item/2897009 (Last accessed: 20.09.2018). [*In Hebrew*]

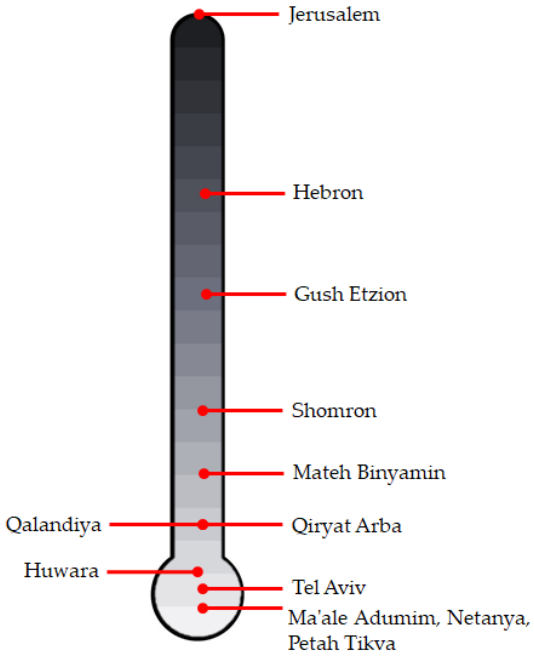
Chart 2: Geographical Distribution of the Terrorist Attacks in Israel (2015-2017)

The main role of the Jerusalem in this terrorist wave is evident when examining the data (see Chart 3). The city suffered more than 100 different attacks throughout the examined period, mostly in the eastern neighborhoods or the "seam zone" between the east and the west. Damascus Gate, one of the main entrances to the Old City of Jerusalem, was the most common venue for terrorism – no less than 24 terrorist attacks happened there.

Table 3: Distribution of Terror Attacks by Region

	Region	Obs.	Share of Attacks
Outside the Green Line	Area A	4	1%
	Area B	21	6%
	Area C	190	52%
Inside the Green Line	Jerusalem District	103	28%
	Center District	20	6%
	South District	9	2%
	Tel Aviv District	7	2%
	Haifa District	3	1%
	North District	2	1%
	Unknown (in Israel)	1	0%
Unknown (Anywhere) [73]		3	1%
Total		363	100%

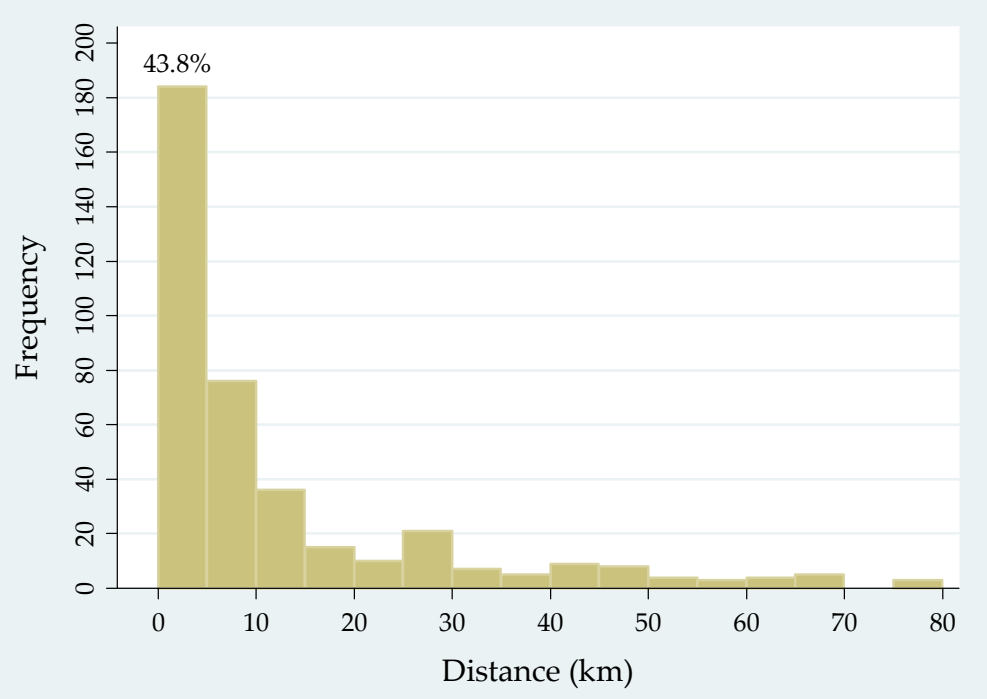
Chart 3: Terrorism Risk Thermometer – According to Number of Attacks in Locality



[73] Several attacks were stopped while the terrorists were still on their way to the target, so the final place of the attack is unknown.

It seems that proximity to Israeli targets was a significant factor in choosing the location of the attacks. On average, the distance between the assailant's residence locality and the place he or she attacked was 12.6 kilometers. However, about one third of the terrorists acted close to home and travelled less than 3 kilometers to their chosen location (see Chart 4). The maximum distance was 300 kilometers: a residence of Umm al-Pahem committed a terror attack in Eilat, near the southern border of Israel.

Chart 4: Distribution of the Distance between the Assailant's Residence Locality and the Location of the Attack



4.1.2 Outcomes of the Terrorist Attacks

About 80% of the terror incidents were classified as stabbing attempts – hence the "Knives Intifada" label (see Table 4). The other 20% are split mostly between ramming attacks (11%) and shooting attacks (7%). Unlike the suicide bombers of the Second Intifada, most of the Palestinian attackers in this terror wave did not use explosives but simple tools such as knives and screwdrivers. Therefore, their capability to cause extensive damages

was limited – almost 50% of the total attacks resulted with no people injured. Female assailants in particular were less likely to cause harm, with an average of 0.4 wounded people per attack and no casualties.

Table 4: Consequences of Terror Attacks by Type

Type of Attack	Obs.	Share of Sample	Mean Number of Casualties	Mean Number of Wounded
Stabbing	293	80.7%	0.1	0.7
Ramming	41	11.3%	0.2	2.4
Shooting	24	6.6%	1.2	5.3
Bombing	3	0.8%	0	7
Unknown[74]	2	0.6%	0	0
Total	363	100%	0.2	1.2

Despite the stabbers' limitations, in 10% of the terror attacks there was at least one casualty. As could be expected, ramming and shooting proved to be much more harmful, killing and wounding more individuals that stabbing attacks (see Table 4). For example, a shooting attack in the central bus station in the southern city Be'er Sheva at the very beginning of the terror wave, in October 2015, injured 35 people (the average per attack is 1.2). Furthermore, the chances to stop an attacker equipped with a knife were much higher in comparison to other attackers – about 27%. The real rate could be even higher, if some of the arrests were not reported on the news.

As for the outcomes for the assailants themselves, 53% of them were arrested and 47% were killed during the attack (see Table 5).[75] Out of the assailants who came to carry out an attack, and weren't caught in advance with a knife in their equipment, about 40% were

[74] Several attacks were stopped while the terrorists were still on their way to the target and their intended method was not reported.
[75] Throughout the research period, only one assailant escaped.

arrested and 60% were killed during the attack or died from their wounds. Female attackers were slightly more likely to be arrested – 70% of all the female attackers and 52% of the females who carried out an attack were put in custody.

Table 5: Comparison between Assailants who were Arrested and Assailants who were Killed in the Attack

	Assailants who were arrested	Assailants that were killed in the Attack	P-value for chi-squared test
Share of sample	53%	47%	
Mean age	20.8	23.4	0.078
Share of males	74%	88%	0.000
Share of married	12%	19%	0.078
Share of attackers who worked in Israel before/during the attack	22%	13%	0.025
Mean number of wounded	0.9	1.6	0.000
Mean number of casualties	0.2	0.2	0.418
Observations	223	196	

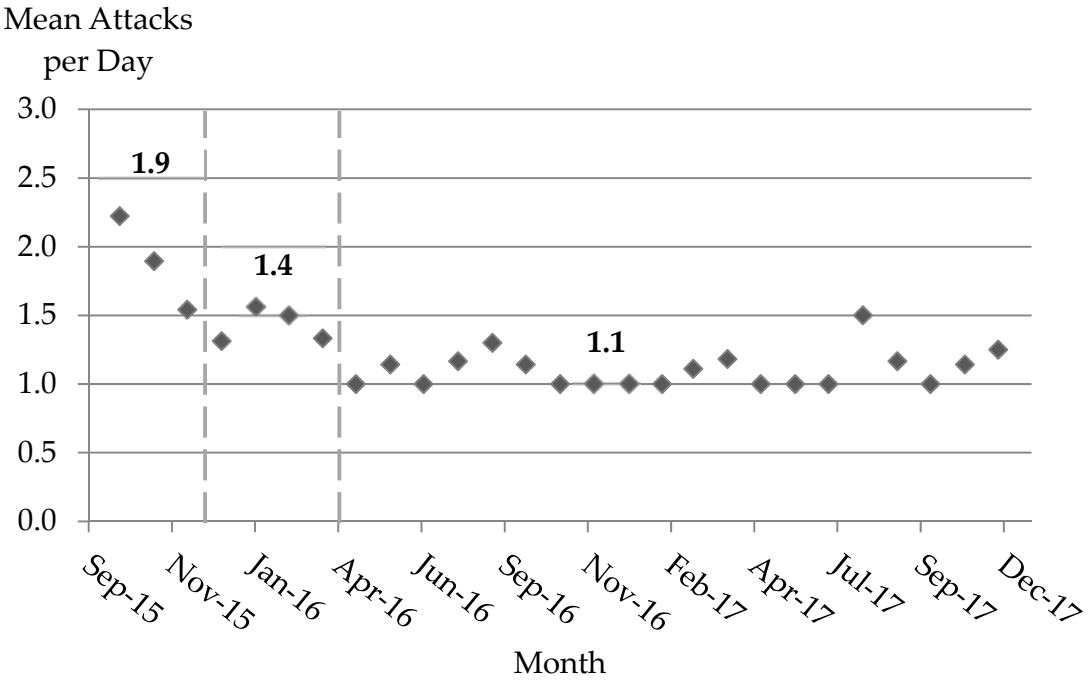
Note: Chi-square test refers to a test of the null hypothesis that the characteristic is independent of the attacker's final status – killed or arrested.

4.1.3 The Dynamics of the Terrorism Wave

The terrorism wave that erupted in Israel in October 2015 wasn't homogenous throughout the entire research period up until December 2017. It peaked in the last months of 2015, with 44.3 attacks per month on average (1-2 daily attacks), then experienced a certain slowdown to an average of 24.3 attacks between January and March April. Afterwards and until the end of the research period, the terrorism wave dwindled to a daily mean of 1.1 attacks per month – with local peaks every 3-4 months (see Chart

5). This dynamic pattern calls for speculation and will be discussed more thoroughly in Section 6 of the paper.

Chart 5: Monthly Mean of Terrorist Attacks per Day



4.2 Characteristics of the "Lone Wolf" Terrorists

The main research question of this paper concerns the identity of the "lone wolf" terrorists. Who are they? This complex question can be broken down into several key characteristics.

4.2.1 Nationality

The vast majority of the attackers in the latest terror wave, 82% of the sample, were Palestinians residing in the West Bank under the governance of the Palestinian Authority (**see Table 6**). Other 15% were Palestinians who live in Israel as permanent residents, usually in East Jerusalem, and can move freely inside Israel. Less than 5% of the attackers

were Israeli-Arabs with an Israeli citizenship. One terrorist was a Sudanese national that infiltrated into Israel from Egypt and was motivated by ISIS.[76]

Table 6: Assailants' Personal Characteristics by Nationality

	Palestinian	Blue-ID	Israeli-Arab
Share of sample	82%	15%	3%
Mean age	22.2	21.7	21.3
Share of males	82%	76%	71%
Share of married	15%	20%	0%
Mean number of children	0.6	0.7	0.1
Share of drop-outs	37%	67%	33%
Mean distance	12.9	6.2	45.5
Share of attackers who worked in Israel	10%	45%	75%
Mean number of Wounded	0.9	2.2	4.6
Mean number of casualties	0.2	0.2	0.8
Share of assailants that attacked in Jerusalem	20%	89%	21%
Observations	343	62	14

The comparison between assailants of different nationality raises several points of interest. Noticeably, each group has at least one attribute that sets it apart from the other two: the Palestinian assailants are older in average and comprise a higher share of males; the blue-id owners seems to be significantly less educated; and the Israeli-Arab attackers were all singles under the age of 30, and caused more damage than the other assailants. These differences could indicate that despite the mutual denominator of participation in the terrorism wave, their motivations and characteristics are not identical and demand separate research

[76] Gili Cohen (2016), "Shin Bet: Recent Stabbing by Sudanese National Was ISIS-inspired Attack", *Haaretz*, 25 February 2016, retrieved from: https://www.haaretz.com/israel-news/shin-bet-attack-by-sudanese-national-was-inspired-by-isis-1.5409309 (Last accessed: 20.09.2018).

4.2.2 Gender

Unlike previous terror waves in Israel, a significant share of the "Knives Intifada" terrorists were female – almost 20% of the sample (see Table 7). They were similar to the male attackers in term of age, but were more prone to have a family, with a higher percentage of married and parents among them.

In addition, female assailants tended to attack soldiers and police officers rather than civilians – possibly contributing to relatively low damage they caused in terms of casualties and injuries. Despite a similar share of assailants with relatives who were involved in terrorist activity (about 20%), only 3% of the female attackers had criminal past themselves.

Table 7: Assailants' Personal Characteristics by Gender

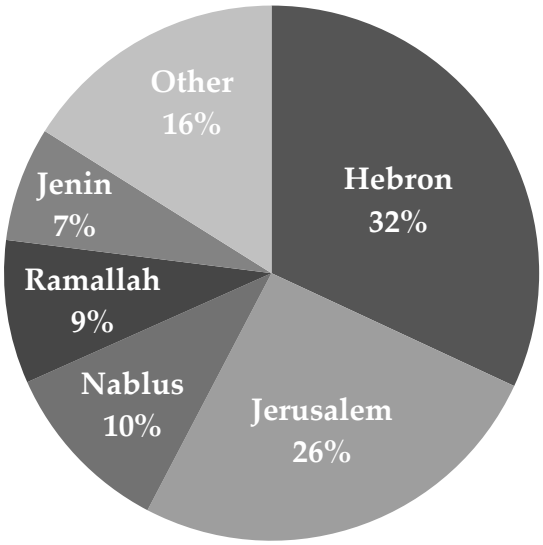
	Males	**Females**	**P-value for chi-squared test**
Share of sample	81%	19%	
Mean age	22.1	22.2	0.011
Share of married	12%	30%	0.000
Mean number of children	0.4	1.2	0.001
Share of attackers who dropped out of school	40%	53%	0.163
Worked in Israel	20%	8%	0.024
Had a criminal past	15%	3%	0.005
Had relatives with criminal past	23%	20%	0.641
Share of Israeli residents (owners of blue ID)	14%	19%	0.264
Mean number of wounded people per attack	1.4	0.4	0.036
Mean number of casualties per attack	0.3	0.0	0.007
Share of attackers who attacked civilian targets	42%	21%	0.001
Observations	340	80	

Chi-square test refers to a test of the null hypothesis that the characteristic is independent of gender.

4.2.3 Place of Residence

The assailants were rather concentrated geographically. The majority of them came from Hebron, Jerusalem and their nearby villages and towns – almost 60% of the assailants came from these two regions (see Chart 6). Only 17 assailants (4% of the sample) came from Israeli localities other than Jerusalem.

Chart 6: Distribution of the Assailants' Origin Region[77]



Moreover, when focusing only on terrorists that resided in the West Bank, 46% of them originated from just ten localities (out of more than almost 650 localities in the Palestinian Authority). Out of these then localities, half belong to the Hebron district: the city of Hebron itself, Yata, Si'ir, Bani Na'im and Dura. Over 100 assailants originated from these localities alone. Presumably, Hebron's salience can be at least partly attributed to its status as the "capital city" of the Hamas in the West Bank.[78] It is the largest and most

[77] Residents of Jerusalem and residents of the Jerusalem governorate of the Palestinian Authority were both considered as residents of the region of Jerusalem, whether they lived inside Israel or not.

[78] Yoav Zitun (2014), "Three Attacks, Zero Case Solving: Herbon, a City of Terrorism", *Ynet*, 16 June 2014, retrieved from: https://www.ynet.co.il/articles/0,7340,L-4531086,00.html (Last accessed: 20.09.2018) [*In Hebrew*]; Nadav Shragai (2015), "The Hand Holding the Knife", *Israel Hayom*, 5 November 2015, retrieved

religious city in the West Bank, with a strong Hamas presence in the streets and the city institutions (such as the universities).[79] In addition, it is the only city in the Palestinian Authority where both Jews and Muslims live side by side.

Furthermore, similarly to Jerusalem, Hebron is home to a historic site that is holy for all three major monotheistic religions. It hosts the Cave of the Patriarchs (as it is called by Jews) or the Ibrahimi Mosque (as it called by Muslims), an ancient religious site where according to tradition the biblical figures of Abraham and Sarah and several others are buried. It is also a known spot for violent clashes, including a shooting massacre carried out by the Israeli Baruch Goldstein in 1994 and multiple Palestinian terrorist attacks.[80] The prominence of these two governorates, Jerusalem and Hebron, indicate that religious tensions constitute an influential factor when studying the Israeli-Palestinian conflict in general and the Palestinian terrorism in particular.

The geographical concentration of the assailants' residence locations came across not only in their origin governorate, but in the case of Jerusalem – in the distribution of origin neighborhoods. Out of approximately fifteen areas, almost 50% of the East Jerusalem assailants came from Kafr Aqab and Jabel Mukaber, and other 20% came from Isawiya and Beit Hanina. According to the team of the Advisor to the Mayor of Jerusalem for Arab and eastern Jerusalem, these prominent neighborhoods notably vary from one

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from: https://www.israelhayom.co.il/article/327257 (Last accessed: 20.09.2018) [*In Hebrew*]; Amir Bohbot (2018), "On the Brink of Explosion since Ever and Forever: a Combat Patrol in the Heart of Hamas' Terrorist Capital in the West Bank", *Walla! News*, 2 February 2018, retrieved from: https://news.walla.co.il/item/3131917 (Last accessed: 20.09.2018) [*In Hebrew*].

[79] Peter Beaumont (2015), "Inside Hebron's Pressure Cooker: the West Bank's Most Troubled City", *The Guardian*, 14 November 2015, retrieved from: https://www.theguardian.com/world/2015/nov/14/hebron-west-bank-troubled-city-palestine-israel (Last accessed: 20.09.2018).

[80] Yitzhak Reiter (2009), "Contest or Cohabitation in Shared Holy Places? The Cave of the Patriarchs and Samuel's Tomb", In: Marshall J. Breger, Yitzhak Reiter and Leonard Hammer [Eds.], *Holy Places in the Israeli-Palestinian Conflict* (Abingdon, United Kingdom: Routledge): pp. 170-189.

another in terms of demographics, economic status, religious character, level of infrastructures, etc.[81]

To illustrate – Beit Hanina, for instance, it not religious, it enjoys municipal services and its socio-economic status is considered relatively high (though it remains very low according to Israeli standards). The majority of the population has a status of permanent residents that allows unrestricted movement, employment and education inside Israel. On the other hand, Kafr Aqab is located outside of the security barrier of Jerusalem and is practically disconnected from the city and its municipal services. Its lacking law enforcement and low renting prices attract diversified populations: young couples, families who wants to save their revenues, but also criminals, drug dealers and fugitives. In contrast, Isawiya is located within the area of the security barrier, but it stills suffers from bad infrastructures and relatively low socio-economic status. And Jabel Mukaber, also inside the city of Jerusalem, does not suffer from extreme poverty, but is very religious and characterized by a strong Hamas presence. In summary, the neighborhood's features are not enough to explain its residents' involvement in terrorism – individual traits should be taken into account.

Comparing the personal characteristics of assailants from different regions reveals several notable differences, which will be further explored in Section 6 (see Table 8). On the surface, it seems that assailants from Hebron and Jerusalem – the two main origin regions for terrorism – were somewhat younger than other assailants, were less prone to have a criminal past and travelled shorter distances to their chosen place of attack. While 50% of the Hebron assailants were students at the time of the attack, assailants from Jerusalem were more prone to drop-out of school than any other group. In addition, the

[81] David Koren (15 January 2018), personal interview; Ben Avrahami (7 March 2018), personal interview.

Jerusalem assailants were rather involved in the Israeli society – most of them were permanent Israeli resident with a blue ID and about a third worked in Israel.

Table 8: Assailants' Personal Characteristics by Origin Region[82]

	West Bank	Hebron	Jerusalem	Israel
Share of Sample	37%	31%	25%	4%
Mean age	22.9	21.5	21.8	22.9
Males	83%	83%	78%	71%
Married	20%	12%	16%	6%
Mean Number of Children	0.6	0.6	0.7	0.3
Students at Time of Attack	42%	50%	29%	30%
Share of Drop-outs	45%	32%	49%	40%
Mean Distance	17.1	9.9	6.6	41.6
Worked in Israel	11%	11%	27%	79%
Share of Blue ID Owners	1%	1%	56%	6%
Mean number of Wounded	1.1	1.0	1.5	3.8
Mean number of Fatalities	0.2	0.2	0.3	0.6
Had Criminal Past	19%	8%	10%	13%
Attacked Civilian Targets	33%	30%	53%	53%
Observations	155	129	104	17

4.2.4 Socio-Economic Characteristics

As was described in the data section, the dataset includes three different variables for socio-economic status, at different levels of credibility. According to all three, the share of poor attackers in the sample is estimated at 12%-19%, and is almost always lower than the share of un-poor attackers (see Table 9). This figure is similar to the overall level of

[82] Similarly to Chart 6, both residents of Jerusalem and residents of the Jerusalem governorate of the Palestinian Authority were considered as residents of the region of Jerusalem.

poverty among West Bank residents, estimated at 17.8% by the Palestinian Central Bureau of Statistics.[83]

Table 9: Assailants' Socio-Economic Status

	High Credibility	Medium Credibility	Low Credibility
All sample (420 obs.)			
Poor	12%	16%	19%
Not poor	10%	22%	27%
Missing values	78%	62%	54%
Assailants who carried out attacks (325 obs.)			
Poor	14%	19%	22%
Not poor	13%	26%	33%
Missing values	73%	55%	45%

Among the terrorists that carried out attacks and weren't stopped in advance, 32% were classified as "not poor" at the low level of confidence. This high proportion, about a third of the sample, does not prove a lack of connection between poverty and terrorism, but suggests that socio-economic status by itself cannot explain the decision to risk one's live in order to perpetrate a terrorist attack. This issue will be elaborated on in Section 6.

4.2.5 Education

Due to the average young age of most assailants in the "Knives Intifada", many of them were students at the time of the attack: 26% of the sample and 31% out of the terrorists who carried out an attack. 32% of the attackers in the sample completed 12 years of

[83] Palestinian Central Bureau of Statistics (2014), "On the Eve of the International Population Day", 10 July 2014, retrieved from: www.pcbs.gov.ps/portals/_pcbs/PressRelease/Press_En_IntPopD2014E.pdf (Last accessed: 20.09.2018).

schooling or were still in school while attacking, while only 6% of the attackers are known to drop out.

On the surface, this finding also seems to be consistent with previous research, which found a positive link between education and terrorism – even though the high share of missing values limits the reliability of the results (see Table 10).

Table 10: Assailants' Education Level

		Obs.	Share of Sample
All sample			
Student at time of attack	In School	63	15%
	In University/College	47	11%
Completed studies	12 Years of Schooling	17	4%
	Academic Degree	8	2%
	Less than 12 Years of Schooling	24	6%
Missing values	---	261	62%
Total		420	100%
Only attackers who carried out attacks			
Student at time of attack	In School	55	17%
	In University/College	46	14%
Completed studies	12 Years of Schooling	14	4%
	Academic Degree	8	3%
	Less than 12 Years of Schooling	24	7%
Missing values	---	178	55%
Total		325	100%

4.2.6 Personal Difficulties

As was mentioned in the literature review, a research by Merari and Ganor found that a significant portion of the "lone wolf" terrorists had mental disorders, psychosis or suicidal tendencies. Others, especially female assailants, suffered from

familial problems.[84] This finding could reinforce the claim that a lot of the Palestinian terrorists in the new terror wave weren't in fact interested in the political act, but rather committed "suicide by cop" or "suicide by soldier". In January 2016, a senior IDF officer in the Central Command told *The Times of Israel* that "Most of the people have personal problems with their families or they themselves are unbalanced" and suggested that many of the terrorists carried knives or stabbed Israelis as a method of suicide.[85]

Indeed, about 9% of the assailants in the dataset constructed for this paper – 37 in total – were labeled as having personal or mental problems. Moreover, this figure is likely to be downward biased due to under-reporting. This figure, though not negligible, is notably lower than the 67% found in Merari and Ganor's research.[86] Presumably, this gap could indicate that assailants who suffered from such problems were much more likely to be stopped in advance and get arrested, so their proportion out of the imprisoned terrorists is much higher than in the entire terrorists group.

Such a difference seems plausible in light of the significant differences between the personal characteristics of assailants with a personal or mental problem and other assailants in the sample (see Table 11). To illustrate, 42% of them were female, they were older in average and most of them were married and had at least one child. In addition, they were noticeably less educated, with significantly lower shares of assailants who completed 12 years of education.

However, the troubled assailants caused similar damage in terms of injured people and casualties and had similar chances to get caught in advance. The rates of assailants with

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[84] Ministry of Public Security (2018), "Study: Terrorists Post Info on Social Media before Attacking".
[85] Simona Weinglass (2016), "Are Palestinian Teens Committing 'Suicide by Soldier'?", *The Times of Israel*, 31 January 2016, retrieved from: https://www.timesofisrael.com/are-palestinian-teens-committing-suicide-by-soldier/ (Last accessed: 20.09.2018).
[86] Ministry of Public Security (2018), "Study: Terrorists Post Info on Social Media before Attacking".

a criminal past or with a terrorist relative weren't significantly different between the groups and the poverty share was rather similar.

Table 11: Assailants' with Personal or Mental Problems vs. Other Assailants

	Assailants Without Known Personal/Mental Problem	Assailants With Known Personal/Mental Problem	P-value for chi-squared test
Mean Age	21.5	28.0	0.002
Share of Males	83%	57%	0.000
Share of Married	13%	39%	0.000
Mean Number of Children	0.5	1.7	0.000
Mean Wounded per Attack	1.3	0.9	0.594
Mean Fatalities per Attack	0.2	0.2	0.858
S. of Assailants who were Stopped in Advanced	23%	22%	0.879
Died in the Attack	48%	38%	0.255
Had Criminal Past	13%	14%	0.769
Had Relatives with Criminal Past	23%	16%	0.364
Worked in Israel	15%	38%	0.001
Resided in Israel (Israeli-Arab/Blue-ID)	16%	38%	0.001
Socio-Economic and Education Status			
S. of Poverty	41%	46%	0.601
Dropped out of School	45%	15%	0.038
Completed 12 Years of Education	42%	77%	0.016
Had Academic Training	34%	46%	0.380
Observations	387	33	

Chi-square test refers to a test of the null hypothesis that the characteristic is independent of personal/mental problem.

4.2.7 Activity on Social Media

The role of social media in the latest terrorism wave drew considerable attention from policy makers, researchers and the general public. As mentioned beforehand, Chorev maintains that social media nourished and escalated the terrorism:[87] it offered assailants alternative sources of legitimacy to the traditional authority of families and political organizations, enabled the concept of lone-wolf attacks to spread virally and contributed to shaping the contagious character of the attacks. Gamlieli argues that the incitement contents conveyed in the social media influenced considerable numbers of Palestinian youths who shared it, stirring up ferment on a large scale.[88]

Gilad Erdan, the Israeli Minister of Public Security, even blamed Facebook and its founder Mark Zuckerberg for being partly responsible for the terrorist attacks, saying that "the young generation in the Palestinian Authority suckles all of its incitement against Israel from Facebook and, in the end, goes and commits murders. Some of the blood of the victims of the recent attacks, including that of Hallel, may her memory be blessed is unfortunately on the hands of Mark Zuckerberg, because the police and security forces could have been told about the post of that vile murderer".[89]

Israel's security services have actually started to use the social media in order to thwart potential terror attacks.[90] Following the eruption of "lone wolf" terrorism in Israel, the

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[87] Harel Chorev (2017), "Palestinian Social Media and Lone-Wolf Attacks: Subculture, Legitimization, and Epidemic".

[88] Gilad Gamlieli (2017), "Incitement on Social Media: The Fuel and Detonator of Palestinian Violence", in: Hirsh Goodman and Yossi Kuperwasser [Eds.], *The Knife and the Message: The Roots of the New Palestinian Uprising*.

[89] Gil Hoffman (2016), "Erdan Blames Facebook for Aiding Recent Murders", *Jerusalem Post*, 3 July 2016, retrieved from: https://www.jpost.com/Israel-News/Erdan-blames-Facebook-for-aiding-recent-murders-459328 (Last accessed: 20.09.2018).

[90] Amos Harel, (2017) "Israel Arrested 400 Palestinians Suspected of Planning Attacks After Monitoring Social Networks".

Israel Defense Forces and Shin Bet developed a method to identify suspects using online clues and stop them at the stages of planning and preparing for attacks.

It is therefore interesting to inspect the use of social media as it came across in the dataset, and the personal traits of the assailants who published incriminating posts or contents relating to terrorism before committing an attack. However, it should be noted that the Israeli security forces' attempts to use social media posts in order to stop the assailants may lead to biased results, since the terrorists who weren't stopped in advance may be different in their attributes than those who were stopped.

Table 12: Assailants' Personal Characteristics by Social Media Activity

	Active on Social Media	**Without Known Social Media Activity**	**P-value for chi-squared test**
Share of Sample	15%	85%	
Mean Age	20.8	22.3	0.726
Share of Males	90%	79%	0.042
Share of Married	10%	17%	0.217
Mean Number of Children	0.3	0.7	0.523
Mean Wounded per Attack	1.7	1.2	0.002
Mean Casualties per attack	0.3	0.2	0.089
Assailants who were Stopped in Advance	3%	26%	0.000
Assailants who Died in the Attack	77%	42%	0.000
Had Criminal Past	13%	13%	0.875
Had Relatives with Criminal Past	27%	21%	0.343
Worked in Israel	20%	17%	0.540
Israeli residents	21%	18%	0.531
Share of Poverty	34%	44%	0.236
Dropped out of School	35%	46%	0.225

Completed 12 Years of Schooling	56%	41%	0.102
Had Academic Background	49%	30%	0.026
Observations	62	358	

Chi-square test refers to a test of the null hypothesis that the characteristic is independent of known social media activity relating to terrorism.

Nonetheless, it is worthwhile to mention several characteristics of the 62 assailants who used social media to publish terrorism-related contents (see Table 12). First, perhaps surprisingly, they weren't significantly younger than other assailants in the sample – maybe due to the young age of the entire group. Secondly, it seems that they were not less educated or poorer – on the contrary, almost 50% of them had academic background.

Most notable are the results of the attacks they perpetrated: social media activists caused more damage (injured people and casualties), were less likely to get caught before carrying out the attack and usually died in the attack. These finding emphasize the danger embodied in "lone wolf" terrorism: these assailants, who probably did not carry out elaborate planning (otherwise they would have been caught), proved to be dangerous and difficult to stop.

4.2.8 Assailants who were Stopped before the Attack

Another topic that the dataset allows to examine is the difference between "effective" terrorists who carried out their planned attacks and assailants who were caught before the execution, with a knife hidden in their belongings or on their way to the chosen venue. The existence of such a difference is not trivial – it is possible that the Israeli prevention successes are random and therefore there is no systematic distinction between the groups. However, it's reasonable to assume that the assailants' personal attributes, such as skills and motivation, will affect their effectiveness in causing harm.

Benmelech and Berrebei, who studied the relation between the human capital of Palestinian suicide bombers active during 2000-2005 and the outcomes of their suicide attacks, found that older and more-educated suicide bombers are less likely to fail or to be caught during their attacks and are more destructive when assigned to more important targets.[91]

The explanation they offered for this finding was rooted in the growing body of literature that analyzes the rationality of terror organizations. On the supply side, terrorism may offer greater benefits for those with more education; and that on the demand side, terrorist organizations may prefer to select and operate those who have better education. In other words, the involvement of organizations in carrying out terrorist attacks was a prominent component in their analysis. It is therefore interesting to see whether their results hold to "lone wolf" terrorists as well.

Out of the 420 assailants in the dataset, 95 were stopped by the security forces before committing an attack, harming no one. Employing Chi-square tests of their traits point to a similar conclusion to Benmelech and Berrebei: the attackers' success is negatively correlated with poverty and lack of education (see Table 13). The share of assailants with academic background among effective terrorist was four times larger than their share among assailants who were stopped in advance.

In addition, 20% of them were Israeli residents (Israeli-Arabs or owners of a blue ID), compared to 11% of the attackers who got caught. Obviously, terrorists who live inside Israeli can access Israeli targets more easily, and their knowledge in Hebrew and familiarity with the Israeli environment enable them to blend into their surroundings and be more destructive.

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[91] Efraim Benmelech and Claude Berrebi (2007), "Human Capital and the Productivity of Suicide Bombers", *Journal of Economic Perspectives* 21 (3): pp. 223-238.

Table 13: Comparison between Assailants who were Stopped before Attacking and Assailants Carried out the Attack

	Carried out Attack	Got Caught	P-value for chi-squared test
Share of Sample	77%	23%	
Mean Age	22.4	20.7	0.372
Share of Males	85%	66%	0.000
Share of Married	17%	10%	0.189
Mean Number of Children	0.6	0.5	0.453
Had Criminal Past	14%	5%	0.157
Had Relatives with Criminal Past	23%	14%	0.184
Worked in Israel	19%	8%	0.063
Israeli Residents	20%	11%	0.029
Share of Poverty	40%	56%	0.210
Dropped out of School	43%	42%	0.941
Completed 12 Years of Schooling	46%	33%	0.389
Had Academic Background	37%	8%	0.044
Observations	325	95	

Chi-square test refers to a test of the null hypothesis that the characteristic is independent of the committed attack's failure.

5. Estimation Strategies

So far, I described the summary statistics of the 2015-2017 terrorism wave and its assailants. These preliminary tabulations provide insights on the terrorism's characteristics, but further testing in order to determine if the tabulation results hold statistically. In this section, I will employ various inferential analysis methods in the purpose of offering established assertions on the nature of the "Knives Intifada" – as will be explained henceforth.

5.1 Analysis of the "Knives Intifada"

5.1.1 The Changing Risk of a Terrorist Attack

First, following the description of the terrorism dynamics in section 4.1.3, I employed methods of duration analysis in order to map the changing risk of terrorism throughout the research period. To this purpose, I estimated the likelihood of an attack occurring at time t using a variation of the Kaplan–Meier hazard model, as was done by Berrebi and Lakdawalla for terrorism in Israel throughout 1949-2004.[92]

The model is defined as follows: consider a group of N attacks that happened throughout T weeks. Now suppose that $x(1)$ of these attacks occurred in week 1, $x(2)$ occurred in week 2, and more generally, $x(t)$ attacks occurred in week t. The hazard of an attack at time 1 is given by $x(1)/N$, the hazard at time 2 by $x(2)/\big(N - x(1)\big)$ and so on. In general, the hazard of an attack at time i is given by: $\frac{x(i)}{N-x(1)-x(2)-\cdots-x(i-1)}$.

This statistical construct reflects the risk of a terrorist attack at any given time during the "Knives Intifada". It was first calculated for all attacks, and then only for attacks in specific locations (Jerusalem, Hebron, Gush Etzion) due to the different patterns that emerged in different areas.

For the sake of examining the broad trends of the terrorism wave, which might be obscured by outliers and random noise, I also estimated a smoothed hazard rate. Smoothing, an exploratory data-analysis technique, is resistant to isolated outliers and thus provides robustness to spikes in the data and allows clarifying of the general

[92] Claude Berrebi and Darius Lakdawalla (2007), "How Does Terrorism Risk Vary across Space and Time? An Analysis Based on the Israeli Experience", *Defence and Peace Economics* 18 (2): pp. 113-131.

patterns. I applied a running-median smoothing method,[93] a nonlinear procedure suggested by Tukey[94] and modified by Velleman and others[95] that is suitable for equally spaced (or almost equally) spaced time series data with a significant amount of auto-correlation, as is the case in the sample.

5.1.2 The Spacing of Terrorist Attacks

In addition to the overall hazard analysis, I investigated the distribution of waiting times between attacks, also similarly to Berrebi and Lakdawalla.[96] To this purpose, I estimated the probability of an attack occurring at time *t*, given that the last attack occurred at time 0 – which is equivalent to the probability of a waiting period of length *t* between attacks.

Again, the risk was computed using Kaplan–Meier hazard model as defined above, only now $x(i)$ did not stand for the number of attacks in week i, but the number of attacks that occurred i days after the previous attack. In general, the hazard of an attack at time i, given that the last attack occurred at time 0, was given by: $\frac{x(i)}{N-x(1)-x(2)-\cdots-x(i-1)}$.

This statistical construct reflects the hazard of experiencing a terrorist attack i days after the previous attack. It was first calculated for all attacks, and then only for attacks in

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[93] Specifically, the chosen procedure was "4253eh, twice": a combination of even span running median smoothers (4.2), resistance of odd running medians (5.3), end point adjustment (e), the "Hanning" weighted mean smoother (h) and the "reroughing" (twice) step.

[94] John W. Tukey (1977), *Exploratory Data Analysis* (Massachusetts: Addison-Wesley).

[95] Paul F. Velleman (1980), "Definition and Comparison of Robust Nonlinear Data Smoothing Algorithms", *Journal of the American Statistical Association* 75 (371): pp. 609-615; Paul F. Velleman and David C. Hoaglin (1981), *Applications, Basics, and Computing Of Exploratory Data Analysis* (Boston: Duxbury Press,); Colin Goodall (1990), "A Survey of Smoothing Techniques", In: John Fox and J. Scott Long, eds. (1990), *Modern Methods of Data Analysi (*Newbury Park: Sage publications): pp. 58-125; Isaías Salgado-Ugarte, and Jaime Curts Garcia (1992), "Resistant Smoothing using Stata", *Stata Technical Bulletin* 2 (7): pp. 8-11; and Isaías Salgado-Ugarte and Patrick Royston (1993), "Twice Reroughing Procedure for Resistant Nonlinear Smoothing", *Stata Technical Bulletin* 2 (11): pp. 14-16.

[96] Claude Berrebi and Darius Lakdawalla (2007), "How Does Terrorism Risk Vary across Space and Time? An Analysis Based on the Israeli Experience".

specific locations (Jerusalem, Area C) and only for attacks on civilian targets, using each time just the relevant observations from the sample.

5.1.3 Epidemic Patterns in the "Knives Intifada"

After obtaining the hazard function, in order to study the temporal determinants of terrorism risk in Israel during 2015-2017, I performed an ordinary least squares (OLS) regression of the number of weekly terror attacks. Specifically, I modeled the effect of suspected variables of influence (i.e. previous recent attacks, publicity on social media, Jewish and Muslim holidays and weather) on the outcome num_i (number of attacks during week i) as follows:

$$num_i = \beta_1 \cdot num_{i-1} + \beta_2 (num_{i-1})^2 + \beta_3 \cdot google\ serahes_{i-1} + \beta_4 \cdot muslim\ holidays_i + \beta_5 \cdot Ramadan + \beta_6 \cdot jewish\ holidays_i + \beta_6 \cdot season_i + \varepsilon_i$$

When num_{i-1} represents the number of attacks in the preceding week and $google\ serahes_{i-1}$ represents the extent of Google searches of the terms "Inftifada", "Shaheed" and "Al-Kuds". The other controls are dummy variables for religious observances, equal 1 if there is a Muslim or Jewish holiday occurring in week i, or if the week is part of the Ramadan – the ninth month of the Islamic calendar, who is observed by Muslims as a month of commemorating the first revelation of the Quran to Muhammad. Finally, $season$ is a vector of dummy variables for spring, summer or winter, equal 1 or 0 depending on the season of week i.[97] From this regression coefficients, one can learn about the different factors that influence the volume of attacks and determine the level of risk.

5.1.4 Development of the Terrorism over Time

[97] The seasons were defined as follows: Autumn lasts between September 23 and December 20; Winter goes on from December 21 to March 20; Spring takes on March 21 until June 20; and Summer lasts between June 21 and September 22.

It is interest of examining whether the changing intensity of the terrorism wave was also accompanied by changes in the terrorism characteristics, I conducted a series of OLS regressions, where the dependent variable was the week of the attack and the regressor was a variable that represents one characteristic of the terrorist attack (such as the number of casualties or the target's type). That is, the regressions model was: $week_i = \beta_k\ (charactaristic\ k)_i + \varepsilon_i$. The coefficient implies the direction and the magnitude of the correlation between the characteristic and the time that passed since the first terrorist attack in October 2015.

5.2 Analysis of the "Lone Wolf" Terrorists

5.2.1 Assailants from Different Regions

The summary statistics presented notable dissimilarities between assailants who came from different regions. For the purpose of examining whether these differences hold statistically when introducing control characteristics, I used a multinomial logistic probability model. This statistical classification method is used to predict the probabilities of a categorical outcome given a set of variables – in this case, predicting the origin region of the terrorist (Hebron, Jerusalem or the rest of the West Bank) based on the characteristics of the attack and the assailant.

When using multinomial logistic regression, one category of the dependent variable is chosen as the reference category and consequently omitted from the analysis. The other groups are than compared to that reference. In this case, I chose to examine assailants from Hebron and Jerusalem versus the default of assailants from other areas of the West Bank.

Specifically, I modeled the effect of main personal attributes (such as age, poverty status, education) and characteristics of the attack (such as type of target, distance from the

assailant's residence) on the outcome as: $region_{k,i} = \beta_k x_i + \varepsilon_i$, where $region_{k,i}$ equals one of the three possible areas (Hebron, Jerusalem or other regions in the West Bank) for observation i and $\beta_k x_i$ is a regression coefficient associated with the ith explanatory variable and the kth outcome. The coefficients β_k would then represent the change in the odds of the dependent variable being in a particular category (vis-a-vis the reference category), associated with a one unit change of the corresponding variable x_i.

5.2.2 Assailants who were Stopped before the Attack

The preliminary tabulations of personal traits broken down by the success of the assailant to carry out an attack suggested that there are differences between assailants who were stopped in advance and others. I used a logistic probability model in order to see if the tabulation results hold statistically when introducing control characteristics.

The logistic probability statistical method is used to test whether the likelihood of an assailant being stopped in advanced can be predicted based on the assailant's traits. Specifically, I modeled the effect of main personal attributes (such as age, poverty status, education) on the outcome (y_i) as: $y_i = \beta_1 x_i + \beta_2 \cdot age + \beta_3 \cdot poverty + \beta_4 \cdot education + \varepsilon_i$ where y_i is a discrete variable that equals 1 if the assailant was stopped in advance and 0 otherwise. The coefficients β_i would then be the logistic estimates of the effect of age, poverty and so on, the probability of stopping the assailant. From these coefficients, the slope (marginal effect) can be easily calculated.

Since y_i might be a function of several other observed characteristics, x_i, which include the type of the target (civilian or military), the time of the attack, the distance from the assailant's place of residence, etc., those variables were also incorporated in order to increase the odds of producing consistent estimates.

5.2.3 Changes in the Assailants' Traits over Time

In order to explore the development of the assailants' personal traits throughout the research period, I conducted a series of OLS regressions – similarly to the regressions intended to study the changes in the terrorism characteristics over time. Here too the dependent variable was the week of the attack, but the regressors were different trait of the assailant (such as age or nationality). That is, the regressions model was: $week_i = \beta_k\ (trait\ k)_i + \varepsilon_i$, where β_k attests to the direction and proportion of the correlation between trait and the time that passed since the beginning of the terrorism wave.

5.3 Comparison to Previous Terrorism Waves in Israel

5.3.1 Comparing the Characteristics of the Terrorist Attacks

Regrettably, without a comprehensive dataset of the terror attacks in Israel during previous terrorism waves, I was unable to conduct empirical analysis of the various attacks' characteristics examined throughout this paper for different periods of time. However, the extensive information gathered on the "Knives Intifada" for this thesis' purposes allows creating an overall image of the terrorism wave of 2015-2017, consisting of its duration, extent, intensity and other features. Utilizing the scholar knowledge about the First Intifada and the Second Intifada, I compared the three terrorism waves in various criteria, in order to gain insights about the new and conventional aspects of the "Knives Intifada".

5.3.2 Comparing the Characteristics of the Terrorist Assailants

For the purpose of understanding the attributes of the "new terrorist" and studying the generational changes in that occurred in the Palestinian terrorism against Israel, I have used available datasets on previous Palestinian terrorists in Israel. These databases, combined with the dataset constructed for this paper, facilitate a platform to compare the current assailants with their predecessors.

Specifically, I used two existing datasets. First, the dataset assembled by Berrebi for his paper on the links between education, poverty and terrorism in Israel. edcollectBerrebi [98] biographies of 335 Palestinian terrorists who operated during 1987-1995 (around the First Intifada) and 2000-2002 (around the Second Intifada), using formal publications of terrorist organizations. For 281 assailants, this database includes information such as the terrorist's age, marital status, place of residence, criminal past, socio-economic status and education, which enables a comparison with the updated database.

Secondly, I used the dataset compiled by Benmelech, Berrebi and Klor about the quality of suicide terrorism.[99] Their database, based on reports of the Israeli Security Agency (ISA) from 2000-2006, consists of 157 suicide terrorists and includes information about age, membership in terror organization, place of residence, criminal past and whether they had an academic degree or attended an institution of higher education.

In the interest of creating suitable control groups, I excluded from both datasets the assailants who resided in Gaza. Following the Israeli disengagement from Gaza in 2005, its residents can no longer enter Israel, and therefore during 2015-2017 not a single assailant came from Gaza. The substantial differences between Judea and Samaria and Gaza in terms of demography, economy, living conditions, frictions with Israeli security forces, neighboring states and so on – even before the Israeli disengagement – give reasons to focus on West Bank residents only when comparing the datasets.

Afterwards, I compared the assailants of 2015-2017 with the terrorists from each one of the datasets. The comparisons consists of descriptive statistics, followed by a logistic probability model to test if the differences between the groups results hold statistically

[98] Claude Berrebi (2007),"Evidence about the Link between Education, Poverty and Terrorism Among Palestinians".
[99] Efraim Benmelech, Claude Berrebi and Esteban F. Klor (2012), "Economic Conditions and the Quality of Suicide Terrorism".

when introducing control characteristics. The logistic modes serves to test whether the likelihood of an assailant belonging to a certain group (the "Knives Intifada" or the previous Intifadas) can be predicted based on personal attributes such as age, place of residence, economic status, education, criminal past, etc.

Thus, for each of the two additional datasets, I conducted two separate regressions. First, a logistic regressions in which the dependent variable equals 1 if the attacker appears on the 2015-2017 dataset and 0 if the attacker appears on the older dataset ("old vs. new"); Secondly, a logistic regressions in which the dependent variable equals 1 if the assailant was supported by a terrorist organization – whether he operated during 1987-2002, or operated during 2015-2017 but had links to terrorist organizations ("organized vs. lone wolves"). Both regressions were performed multiple times, each version including more regressors, thus adding information but reducing the number of observation due to partial data.

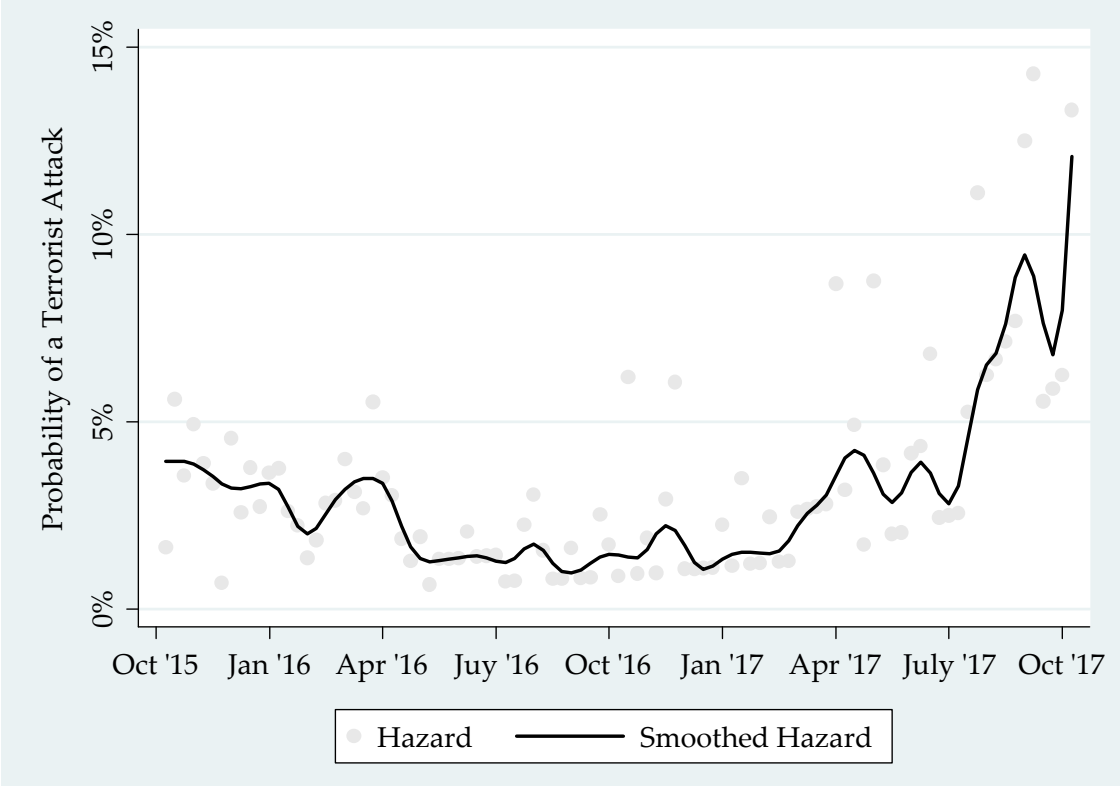
6. Empirical Analysis

6.1 Analysis of the "Knives Intifada"

6.1.1 The Changing Risk of a Terrorist Attack

As was explained in section 5.1, the changing risk of a terrorist attack throughout the research period was computed using a Kaplan–Meier hazard model and then smoothed by a running-median procedure. Due to the significant psychological effect of exposure to continuous terror,[100] this hazard measurement is a key element in understating the social and political implications of the "Knives Intifada".

Chart 7: The Hazard of a Terrorist Attack during October 2015-December 2017



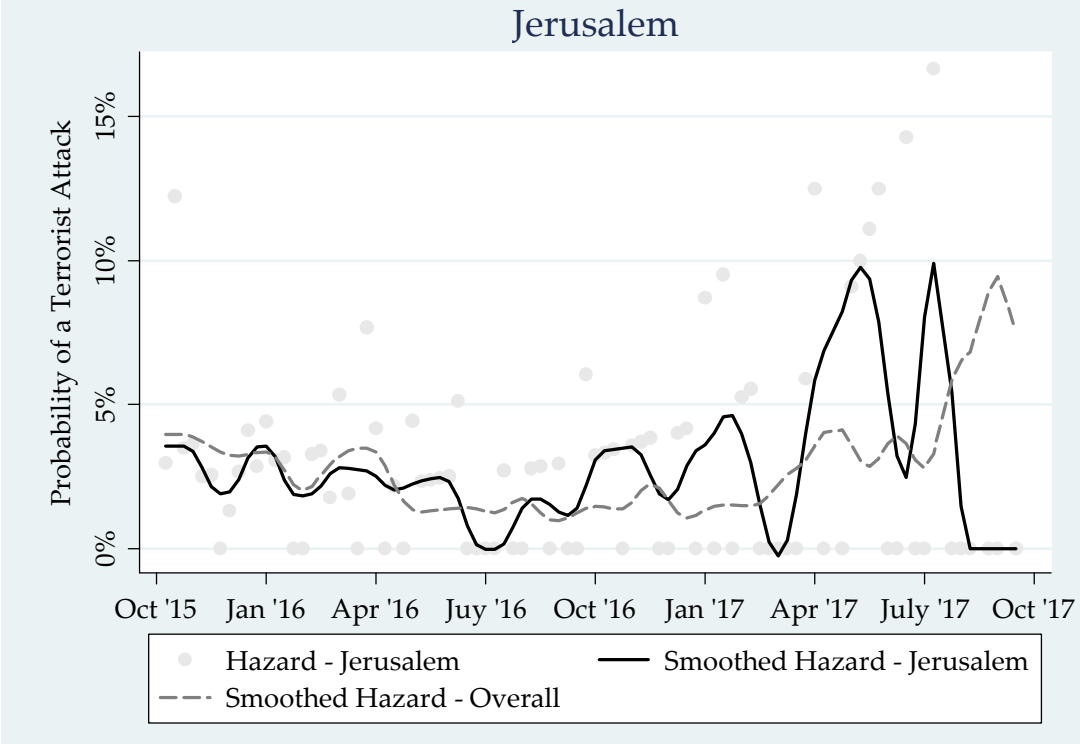
[100] See: Arieh Y. Shalev et al (2006), "Psychological Responses to Continuous Terror: A Study of Two Communities in Israel", *American Journal of Psychiatry* 163 (4): pp. 667-673; Avraham Bleich, Marc Gelkopf and Zahava Solomon (20030, "Exposure to Terrorism, Stress-Related Mental Health Symptoms, and Coping Behaviors Among a Nationally Representative Sample in Israel", *Jama* 290 (5): pp. 612-620.

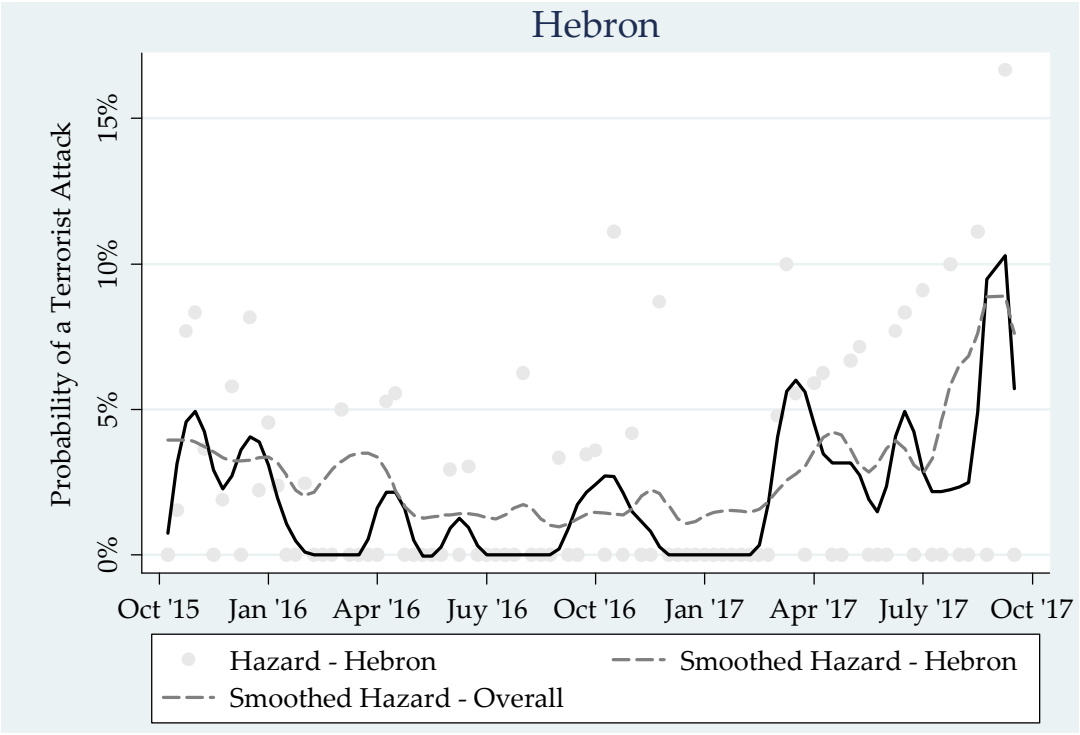
The estimated hazard functions are shown in Chart 7. It should be noted that the peak of the hazard rate at the end of the period stems from a structural feature of the Kaplan-Meier model (due to the fact than at the end of the research period 100% of the attacks have occurred). Other than that, the peaks represent a real uprise in the extent of terrorist attacks – for example in the spring of 2016 and the spring of 2017.

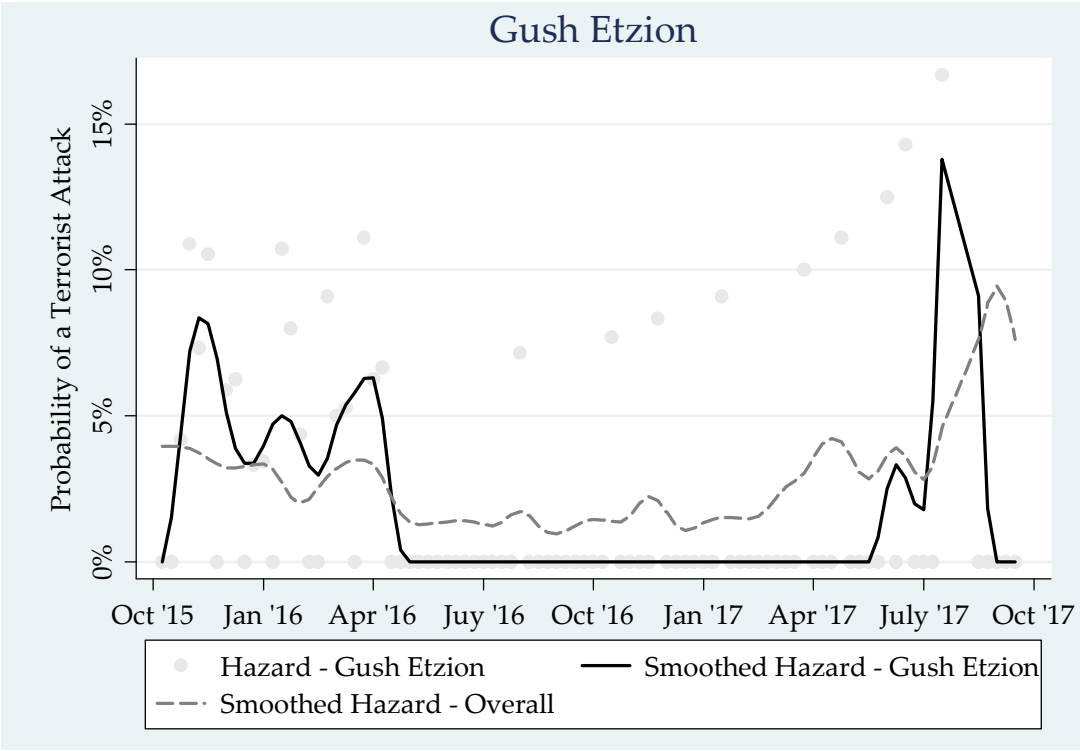
Overall, the risk of an attack throughout the "Knives Intifada" was about 1%-10%, and almost always lower than 5%. The hazard of terror decreased after the first intensive eruption in October 2015, but regained momentum in several points in time, as comes across in the local peaks of the smoothed function.

Considering the prominence of several geographical locations in the terrorism wave (mostly Jerusalem and Area C), as was described earlier, it is worthwhile to examine the terrorism hazard in specific regions, both by themselves and in comparison to the overall hazard.

Chart 8: The Hazard of a Terrorist Attack in Different Locations







The estimated hazard function for a terrorist attack in Jerusalem, for instance, behaved rather similarly to the overall function during the first year of the terrorism wave, but then deviated to a separate independent pattern of its own (see Chart 8). After October 2016, the terrorism hazard in Jerusalem was at times twice the overall hazard (4%-10%), and had significant separate peaks – especially around May 2017 and July 2017.

Indeed, in the summer of 2017 Jerusalem suffered multiple severe terrorist attacks. In June 16, three Palestinian assailants armed with knives and rifles attacked a Border Police position near Damascus Gate in the Old City, killing a 23-year-old officer named Hadas Malka and injuring four other people. On July 4, six Palestinian were arrested by security forces on their way to Jerusalem after a bag filled with knifes, grenades and Molotov cocktails was discovered in their vehicle. Less than two weeks later, three Arab-Israeli men opened fire on Israeli border police officers near the Temple Mount, killing two

officers and injuring two others. The accumulation of attacks was substantial in the eyes of Jerusalem residents, but wasn't reflected in the overall level of terror.

In contrast, the terrorism hazard in Hebron was similar in size to the overall hazard throughout the vast majority of the research period (see Chart 8). However, its behavior was more cyclic, with recurring peaks and calms. It seems that once an assailant attempted to perpetrate an attack in Hebron, other would follow his or hers footsteps.

Gush Etzion, a cluster of Jewish settlements located in the Judaean Mountains of Judea and Samaria, experienced a completely different pattern of terrorism (also see Chart 8). Between May 2016 and May 2017, the smooth hazard function did not elevate above the zero line. However, when the terrorism has erupted there, it was persistent and substantial, both at the beginning and the end of the research period.

6.1.2 The Spacing of Terrorist Attacks

The hazard rate throughout the research period is of interest as a proxy for the intensity of the terrorism wave, but it represents only one aspect of it. The spacing of the terrorist attacks – the time between one attack and the next one – also influences the perceived sense of threat, the public opinion and the policy making. To illustrate, In September 2016 – after 10 terror attacks occurred within the span of one week – the widow of one victim, Ruth Hasno, spoke out about her difficulties to endure the unceasing terrorism.[101] Hasno told that she was sure that they would be the last ones, but the attacks continued non-stop. "We're being stabbed here day after day", she said, calling for the government to take stronger actions.

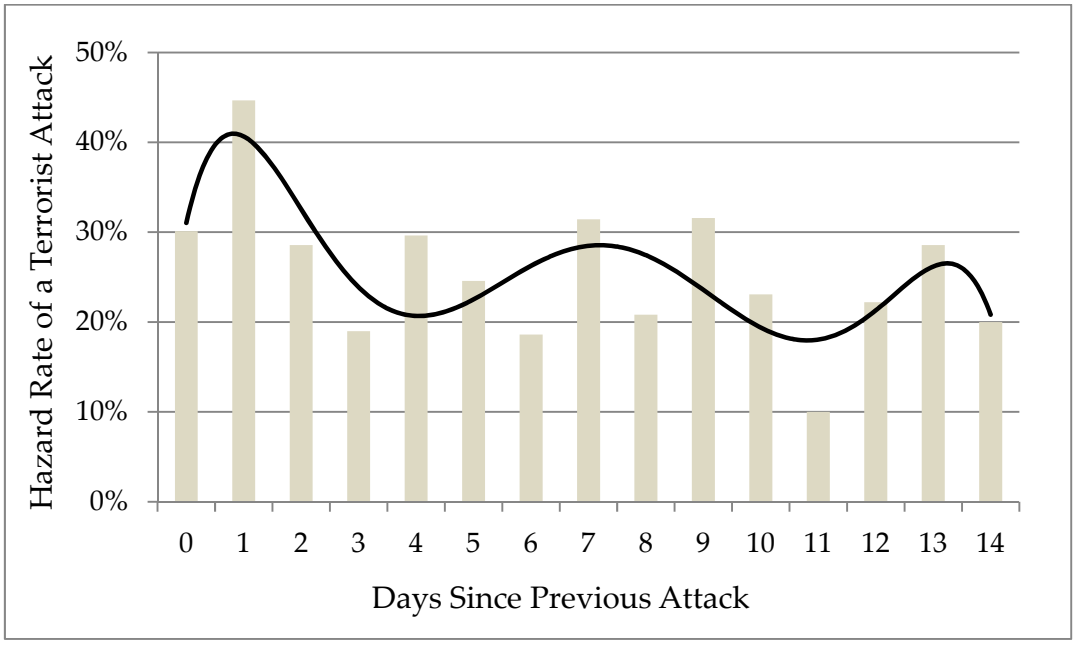
[101] Elisha Ben Kimon and Yael Freidson (2016), "Terror Victims' Families: Israeli Government Failed in Handling of Wave of Violence", *Ynet*, 21 September 2016, Retrieved from: https://www.ynetnews.com/articles/0,7340,L-4857872,00.html (Last accessed: 20.09.2018).

Clearly, three attacks over one weekend would have a different effect than three attacks spread over a full week. But both scenarios would result in an identical hazard rate. That is why the spacing of attacks is worthy of its own examination, especially for specific localities – since the spacing of attacks in one region has a potentially massive impact on the personal sense of security among its residents. In addition, the duration of time between different attacks could attest to the terrorism pattern and whether the "lone wolves" acted independently or imitated each other.[102]

In light of all of the above, I estimated the hazard of experiencing a terrorist attack i days after the previous attack, and constructed a smoothed hazard function. Both are shown in Chart 9, which plots the estimated hazard function for two weeks (99% of the attacks occurred in that time frame), alongside a sixth degree polynomial trend line which displays the general trend.

Chart 9: Waiting Time between Terrorist Attacks (0-14 Days)

[102] Peter J. Phillips (2012), "Lone Wolf Terrorism: Prudence in the Lone Wolf's Planning and the Time Delay between Acts of Lone Wolf Terrorism", *SSRN*, 20 September 2012, Retrieved from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2149894 (Last accessed: 20.09.2018).



The first key finding is that once a terrorist attack happens, the hazard of an additional attack is about 30%-40% for three consecutive days. This finding is somewhat surprising, since it is likely that after an attack the security forces act more vigilantly and solidify their protection against terrorism. The fact that the hazard increases in the following day despite this reaction indicates how motivated the assailant are to perpetuate another attack.

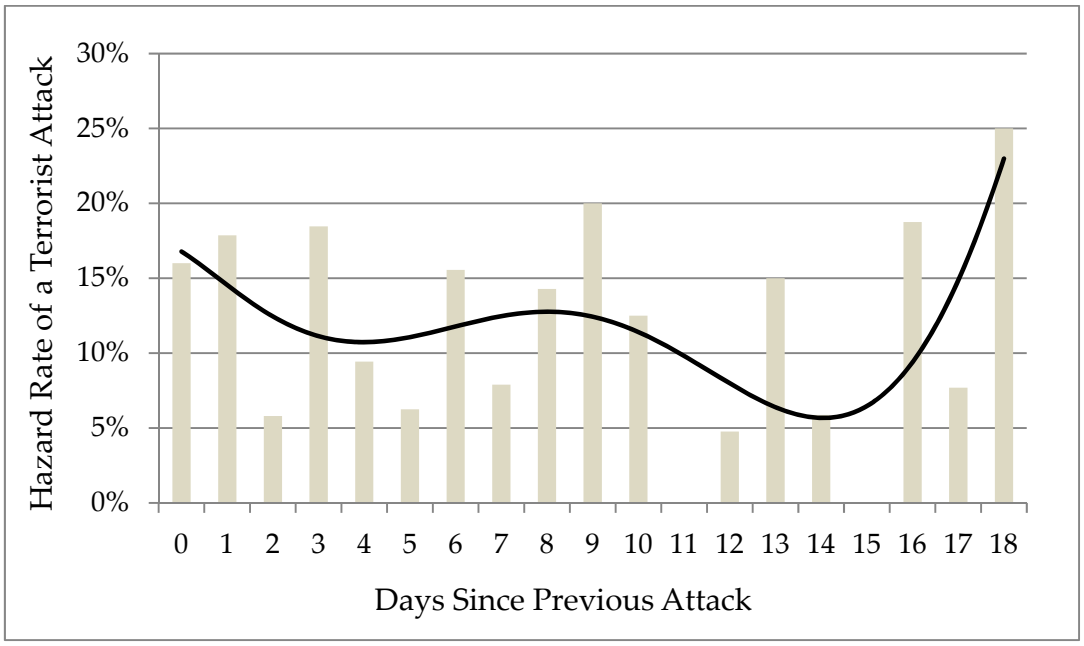
To be exact, given a terrorist attack, the probability of a subsequent attack peaks the day after at about 45%. The hazard peaks again after about one week (7-9 days) and two weeks (13-14 days), as can be seen in the three "hills" of the smoothed polynomial function in Chart 9. It appears then that assailants tend to follow up previous attacks quickly, as was found in former research.[103]

The above pattern holds for terrorist attacks in Area C as well, but striking differences emerge when examining other subgroups of the terrorism wave, such as attacks in

[103] *Ibid.*

Jerusalem and attacks of civilian targets. In Jerusalem, the hazard a subsequent terrorist attack on the same day is similar to an attack on the next day – both stand at about 17%. The general hazard is lower than in the entire sample, perhaps because of the multiple steps taken by the Ministry of Public Security and the police to enhance the security in Jerusalem, such as increasing the number of arrests and expanding the presence of police officers on the streets.[104]

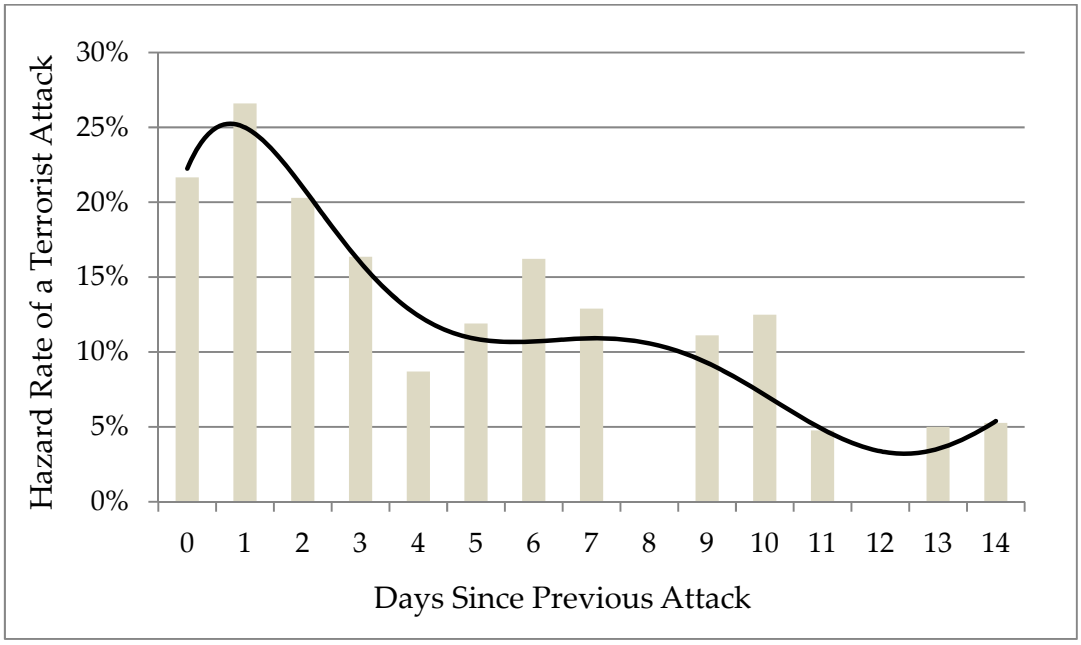
Chart 10: Waiting Time between Terrorist Attacks in Jerusalem (0-18 Days)



After the initial rise in the terrorism hazard, the function fluctuates between 5%-20%, without a clear trend (see Chart 10). There is a certain relaxation after 10 days, but on days 16 and 18 the hazard again rises to about 20% and above. The broad implication is that there was no real time of quiet in Jerusalem: the risk of terrorism remained relatively stable regardless of previous attacks, creating a constant threat.

Chart 11: Waiting Time between Terrorist Attacks on Civilian Targets (0-14 Days)

[104] Roi Yanovsky (2016), "Decline in Terrorism in Jerusalem Area in 2016", *Ynet*, 15 November 2016, retrieved from: https://www.ynetnews.com/articles/0,7340,L-4879308,00.html (Last accessed: 20.09.2018).



Limiting the scope to attack on civilian targets only (as opposed to military bases, security posts or military checkpoints) reveals another pattern (see Chart 11). Here too the probability of a subsequent attack peaks the day after, at about 27%, but then it decreases continuously to a hazard of 0%-5% at the end of the two weeks following the attack. This finding can assist in understanding the aforementioned lack of such a decrease in the general hazard rate in the first days after an attack: security forces maintain a constant level of alertness and therefore do not become more vigilant following a terrorist attack.

The aforesaid analysis sheds light on the time distribution of terrorist attacks during the "Knives Intifada", but does not serve to identify the factors that influenced the frequency of the attacks. The next section would explore some of the mechanisms that drove the terrorist attacks and determined their extent, and particularly – the effect of one terrorist attack on the probability of subsequent attacks.

6.1.3 Epidemic Patterns in the "Knives Intifada"

As was described in the literature review, Chorev argued that the "Knives Intifada" acted like an epidemic, following an epidemiological structure of contagion, outbreak,

containment, and low-grade continuity, allowing the attacks to continue for a long period despite the lack of organizational support.[105] This outline corresponds to the pattern of a medical intermittent outbreak of a disease, when there is a common source that is not well controlled, so outbreaks recur.[106]

Chorev demonstrated this claim using the attacks between October 2015 and September 2016, but the dataset constructed for this paper allows testing his hypothesis empirically over a lengthier period by using regressions to identify the determinants of the scale of attacks.

An OLS regression of the weekly number of terrorist attacks provides some supportive evidence to Chorev's claim: it indicates that one of the strongest predictors of the volume of attacks is the number of attacks in the previous week (see Table 14). The coefficient is positive, significant and almost equal to 1, suggesting that the terror attacks against Israel tended to "duplicate" themselves and spread like an infecting disease.

Table 14: OLS Regression of Weekly Number of Terrorist Attacks

	All Locations	**Jerusalem**	**Area C**
	(1)	(2)	(3)
Number of Attacks Last Week	0.942***	0.249*	0.539***
	(0.231)	(0.132)	(0.170)
Number of Attacks Last Week ^2	-0.032**	-0.012	-0.018*
	(0.014)	(0.008)	(0.009)
Number of Attacks in Area Last Week	---	0.022	-0.012
	---	(0.156)	(0.129)

[105] Harel Chorev (2017), "Palestinian Social Media and Lone-Wolf Attacks: Subculture, Legitimization, and Epidemic".

[106] Soili Larkin and Joshna Mavji (2015), "Principles of Outbreak Management", *Public Health England*, retrieved from: https://www.westmidlandsdeanery.nhs.uk/Portals/0/PH%20Practitioner/2015/5.%20Principles%20of%20Outbreak%20Management.pdf (Last accessed: 20.09.2018).

Google Searches in Previous Week	0.009	0.002	0.008**
	(0.006)	(0.004)	(0.004)
Muslim Holiday	1.977**	0.959*	0.587
	(0.827)	(0.485)	(0.555)
Jewish Holiday	0.114	0.135	-0.382
	(0.621)	(0.358)	(0.406)
Ramadan	-0.418	-0.697	0.617
	(1.015)	(0.589)	(0.664)
Spring	-1.527**	-0.259	-0.896*
	(0.723)	(0.419)	(0.472)
Summer	-0.973	-0.408	-0.300
	(0.782)	(0.449)	(0.509)
Winter	-0.747	-0.275	-0.331
	(0.714)	(0.412)	(0.467)
Observations	103	103	103
R-squared	0.51	0.18	0.47

* significant at 10% ** significant at 5%. *** significant at 1%.

When focusing on attacks in a specific region, Jerusalem or Area C, the link remains positive and significant, even if less strong. On the other hand, the coefficient of the square number of attacks in the previous week is significantly negative for attacks on all locations, indicating that the terrorism wave in general behaved as rising function at a decreasing pace.

Nevertheless, the analysis does not support Chorev's argument regarding the important role of social networks in nourishing the terrorism. Online activity – specifically, the scope of Google searches of terms such as "Inftifada", "Shaheed" and "Al-Kuds" – does not seem to be significantly correlated with the amount of attacks. However, it's possible that the Google searches indicator doesn't fully capture the volume of online discourse in social website like Twitter and Facebook, and therefore gives an underestimation of the effect of online activity.

The regression reveals an additional influential factor in the analysis of the terrorist attacks' intensity – Muslim holidays. More than 10% of the attacks in the sample happened on a holiday, or during the day before or day after. This effect was significant in general and in Jerusalem, but not in Area C localities – perhaps indicating that the motivations for attacks inside Israel were more religious in comparison to the attacks in Area C.

6.1.4 Development of the Terrorism over Time

The dynamic pattern of the terrorism attacks calls for speculation – Have the characteristics of the terror attacks also changed throughout the period? Further regressions were conducted in order to investigate the changes in the terrorism characteristics throughout the research period. The results are presented in Table 15.

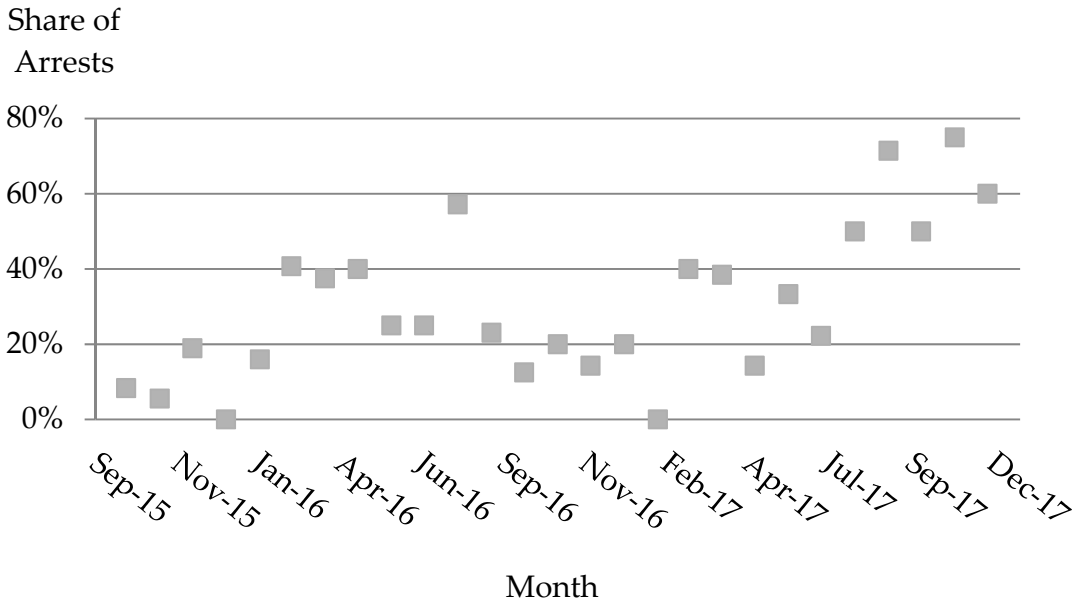
Table 15: OLS Regression of Different Characteristics over Time

	Coeff.	Std. Err.	P-val	Obs.	R2
Number of Wounded	-1.20**	0.55	0.030	418	1%
Number of Casualties	-0.93*	0.49	0.061	418	1%
Group Attack (Multiple Assailants)	-9.26**	3.83	0.016	420	1%
Civilian Target	-14.87***	3.43	0.000	383	5%
The Attack was Stopped In Advance	25.31***	3.74	0.000	420	10%
The Assailant Died During the Attack	-16.20***	3.22	0.000	415	6%
The Assailant was Arrested	16.29***	3.20	0.000	420	6%

The regression's results raise some several insights that are worth mentioning. First, the significant positive correlation between the time that passed since the first terrorist attack and the portion of assailants who were arrested rather than killed during the terrorist

attack. This trend comes across in Chart 12, which depicts the monthly share of terrorist attacks where the assailant was arrested throughout the "Knives Intifada".

Chart 12: The Monthly Share of Attacks who Ended with an Arrest



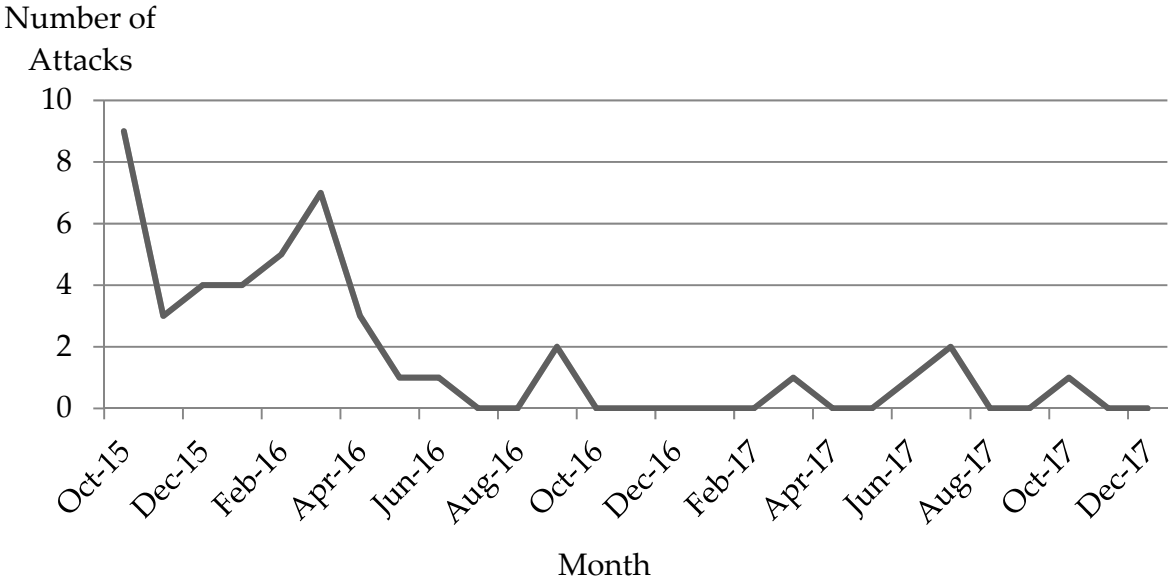
Against the backdrop of a heated public debate in Israel regarding the appropriate treatment of terrorists – especially after a film of an Israeli soldier shooting a wounded "neutralized" stabber went viral and lead to his prosecution[107] – it seems that over time, Israeli security forces became more willing or more adapt at stopping the attacks without killing the assailants. The significant negative correlation with the number of wounded and the overall casualties (injured and killed) and the significant positive correlation with the share of attacks that were stopped in advance could also indicate that the security forces' gained experience contributed to their capabilities in dealing with the attacks.

Another notable change throughout the research period is the decline in group attacks, where several terrorists act together (see Chart 13), as reflected in the significant negative

[107] Allison Kaplan-Sommer (2017), "Why the Hebron Shooter Trial Is Dividing Israel", *Haaretz*, 30 July 2017, retrieved from: https://www.haaretz.com/israel-news/why-the-hebron-shooter-trial-is-dividing-israel-1.5481805 (Last accessed: 20.09.2018).

correlation between this variable and the time of the attack. To exemplify, during the first year of the terrorism wave, 15% of the attacks were carried out by multiple assailants, but their share went down to 5% afterwards. Thus, throughout the "Knives Intifada" the lone wolf terrorist became even more solitary.

Chart 13: The Monthly Number of Group Terrorist Attacks



Additionally, over time, the terrorists tended to concentrate their efforts on attacking soldiers and police officers rather than civilian targets. Further examination is needed in order to determine whether these significant correlations stems from a change in the behavior of the assailants, a change in the Israeli terrorism prevention efforts or both.

6.2 Analysis of the "Lone Wolf" Terrorists

Following the analysis of the terrorist attacks' characteristics, I will now turn to examine the personal attributes of the assailants themselves. This section would be divided into three parts: analysis of the terrorists according to their origin residence area, analysis of the terrorists who were stopped before carrying out their planned attack and analysis of

the terrorists according to their origin residence area and the changes in the assailants' traits over time.

6.2.1 Assailants from Different Regions

As was described in Section 4, the great majority of the assailants originated from the regions of Hebron and Jerusalem (55% of the sample) or other areas in the West Bank (37% of the sample), while the remaining few came from Israel or an unknown residence. I used multinomial regressions in order to test the statistical significance of the differences between assailants from these regions and compare terrorists from Jerusalem and Hebron to those who came from the rest of the West Bank. The results are shown in Table 16: Each two columns add more regressors, enriching the analysis but limiting the number of observation due to partial data.

The most notable regressors are the dummy variable for work in Israel and the distance between the assailant's residence and the location of the attack – both are significant in all regressions (see Table 16). That is, assailants from Hebron and Jerusalem travel shorter distances than assailants from other places (less than 10 km in average) and attack "near home".

Table 16: Multinomial Logistic Regressions Comparing Assailants from Different Regions – Relative Odds (Base Outcome: Residence in the West Bank)

	Basic Variables		**Adding Education Variables**		**Adding Poverty, Mental/Personal Problem**	
	Hebron	Jerusalem	Hebron	Jerusalem	Hebron	Jerusalem
	(1)	(2)	(3)	(4)	(5)	(6)
Age	0.989	1.013	0.858	0.939	0.677**	0.863
	(0.0364)	(0.0428)	(0.104)	(0.106)	(0.126)	(0.140)
Male	1.711	1.181	7.367**	1.846	450.6***	0.381

	(0.939)	(0.774)	(7.142)	(1.643)	(1,025)	(0.587)
Married	0.642	0.527	1.436	0.520	0.524	0.007
	(0.404)	(0.408)	(2.987)	(1.637)	(3.520)	(0.029)
Number of Children	1.143	1.131	0.000	0.749	0.000	2.060
	(0.187)	(0.213)	(0.00350)	(0.959)	(0.000)	(3.490)
Attacked Civilian Target	1.328	1.532	0.329	0.533	0.127**	0.355
	(0.511)	(0.732)	(0.227)	(0.398)	(0.133)	(0.360)
Attacked in Companion	1.340	1.023	0.247*	1.308	0.075*	0.107
	(0.541)	(0.529)	(0.205)	(1.050)	(0.109)	(0.190)
Distance from Residence to Attack	0.966***	0.943***	0.936**	0.914**	0.944*	0.920*
	(0.012)	(0.019)	(0.025)	(0.036)	(0.029)	(0.045)
Died in Attack	1.157	1.686	0.487	0.904	1.194	0.455
	(0.490)	(0.900)	(0.398)	(0.774)	(1.269)	(0.589)
Stopped Before Attack	12.73***	3.588	17.68*	1.402	69.74**	0.067
	(10.98)	(4.433)	(26.69)	(2.768)	(130.1)	(0.162)
Blue ID Owner	0.201	36.83***	0.595	31.09***	2.060	213.8**
	(0.261)	(32.11)	(0.959)	(34.96)	(4.899)	(507.7)
Worked in Israel	5.977***	5.216**	248.4***	143.5**	908.7***	245.3**
	(3.984)	(4.271)	(473.3)	(304.7)	(2,347)	(683.1)
Had Criminal Past	0.277**	0.906	0.606	6.133	0.508	12.13*
	(0.157)	(0.554)	(0.717)	(6.784)	(0.774)	(17.88)
Relatives Involved in Terrorism	2.637**	0.701	3.101*	0.715	9.908**	0.744
	(1.097)	(0.419)	(2.074)	(0.596)	(9.705)	(0.834)
Student at time of the Attack			0.715	0.165	0.652	0.043**
			(0.758)	(0.196)	(0.880)	(0.062)
Dropped out of School			0.068**	0.169	0.007***	0.005***
			(0.0787)	(0.213)	(0.0137)	(0.00933)
Academic Background			0.704	1.315	0.512	0.528
			(0.636)	(1.369)	(0.624)	(0.736)
Poor					4.253	90.77**
					(5.363)	(163.9)
Mental/Personal Problem					104.5**	2.979
					(213.4)	(5.679)
Observations	236		116		92	
Pseudo R-squared	26%		37%		53%	

* significant at 10% ** significant at 5%. *** significant at 1%.

Additionally, they are much more likely to work in Israel: when all other factors are constant, the odds that an assailant who worked in Israel would be a resident of Hebron or Jerusalem are at least five times higher in comparison to regions in the West Bank. It appears than that the accessibility and the proximity to Israeli targets are positively correlated with the population's involvement in terrorism.

Several significant results regarding the Hebron assailants are worth mentioning. First, they were the most likely to be stopped in advance. Actually, almost 30% of the assailants from Hebron were caught before carrying out the attack. Presumably, the security measures in the Cave of the Patriarchs, which serves as a common venue for terrorist attacks, assisted in stopping many of them. Also, it's possible that Palestinians who want to get arrested tend to go the Hebron checkpoint with a knife, knowing that the security screening process there is strict and will likely lead to their arrest. Alternatively, this finding could reflect an over-reporting of arrests committed in Hebron in comparison to other regions.

Secondly, all three regressions revealed a significant positive correlation between residence in the Hebron governorate and having relatives who are involved in terrorism. That is, when all other variables are held constant, assailants with familial connections to terrorist activists were more prone to live in Hebron than other areas in the West Bank.

Thirdly, terrorists from Hebron tended to attack alone and not in groups in comparison to assailants from other governorates. When all else was equal, an assailant who attacked in companion was at least 75% less likely to be from Hebron than from the rest of the West Bank.

As for socio-economic and education variables, it is interesting to note that assailants from both Hebron and Jerusalem were less likely to be drop-outs. A terrorist that dropped out of school before completing 12 years of education was about 100% more likely to be from other governorates in the West Bank, all else equals. At the same time, in the case of Jerusalem, the attacker was also much more likely to be poor.

The abovementioned analysis contributes to understanding what factors influence the decision of residents of different regions to perpetrate a terrorist attack. But for decision makers and security forces, another important question is what determines their odds to succeed or fail in their attempts. This subject will be further explored in the next section.

6.2.2 Assailants who were Stopped before the Attack

The summary statistics showed that the assailants' success was negatively correlated with poverty and lack of education and that residents of Israel were more likely to carry out their intended attack. However, when introducing control characteristics and testing the correlation using a logistic probability model, the only significant factors are age and criminal past (see Table 17).

Table 17: Results of a Logit Regression for Assailants who were Stopped before Carrying Out an Attack (Odds Ratio)

	All Assailants in the Sample	Assailants with no Connection to Terrorist Organization
	(1)	(2)
Age	0.581*	0.605
	(0.179)	(0.191)
Distance	1.022	1.020
	(0.022)	(0.022)
Israeli Resident	0.413	0.420

	(0.585)	(0.592)
Criminal Past	33.060*	31.719*
	(60.264)	(57.270)
Relatives connected to terrorism	1.794	1.722
	(2.097)	(1.996)
Poverty	0.192	0.193
	(0.247)	(0.246)
Studied at time of Attack	0.102	0.173
	(0.281)	(0.507)
Academic Background	0.580	0.412
	(1.672)	(1.276)
Completed 12 Years of Education	7.417	5.731
	(16.217)	(12.998)
Week of Attack	0.999	0.998
	(0.019)	(0.018)
Civilian Target	0.444	0.474
	(0.506)	(0.540)
Observations	114	103
Prob > chi-squared	0.46	0.52
Pseudo R-squared	0.26	0.25

* significant at 10% ** significant at 5%. *** significant at 1%.

The results indicate that younger assailants were more likely to be stopped in advance by the security forces – for example, by going through security checks with a knife hidden in the their personal items. The age effect was large in magnitude: each additional year in the assailant's age reduced his or hers chances of being caught by half. In addition, terrorists who were previously engaged in terrorist or violent activities against Israeli security forces were also more likely to get caught – the probability of stopping them was about 30 times the probability of stopping inexperienced assailants.

When focusing only on "lone wolf" terrorist, who operated without the support of terrorist organizations, age becomes insignificant. That is, age was less meaningful in identifying and stopping inexperienced assailants, perhaps due to their heterogeneity. However, "lone wolf" assailants who were involved in previous encounters with security forces were more likely to be stopped in advance, possibly because they were somehow monitored (for example, using their social media activity).

As for socio-economic status and education – the large portion of missing values in the sample reduces the probability of a statistically significant result. At this point, the data does not allow determining their influence on the odds to stop the assailant in advance.

6.2.3 Changes in the Assailants' Traits over Time

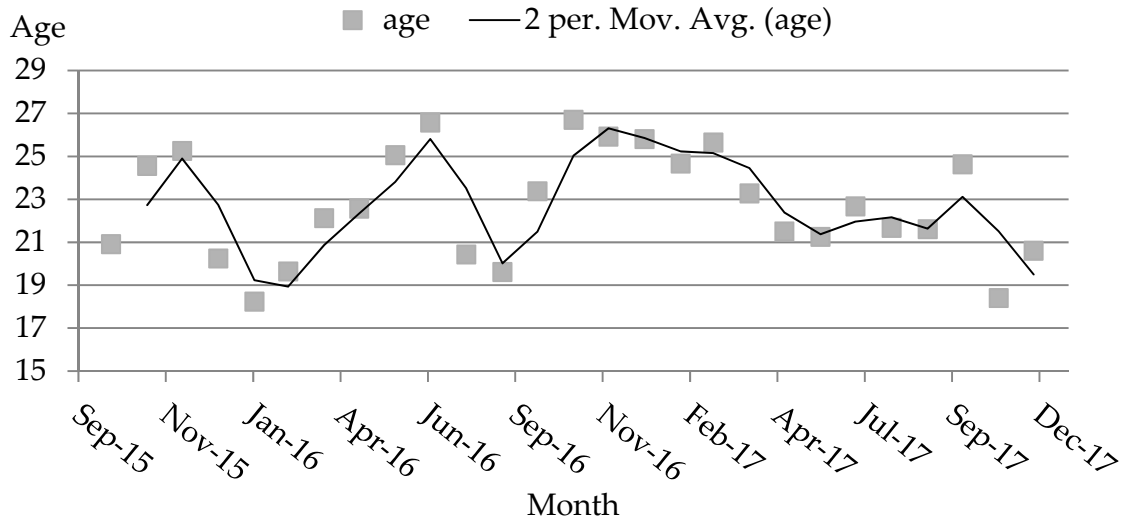
As was described in Section 4.1.3, the terrorism wave went through several phases in terms of intensity and nature. These changes came across in the assailants personal traits as well – they did not remain constant throughout the research period. In order to explore the development of the assailants' personal traits, I conducted a series of OLS regressions, where the dependent variable was the week of the attack and the regressor was a variable that represents one characteristic of the assailant (such as age or nationality). That is, the regressions model was: $reg\ week_i\ \ charactaristic_i$. The results are presented in Table 18.

Table 18: OLS Regression of Different Personal Traits over Time

	Coeff.	Std. Err.	P-val	Obs.	R2
Age over 15	-11.94***	4.40	0.01	420	2%
Male	2.10	4.19	0.62	420	0%
Married	1.45	4.61	0.75	325	0%
Blue ID Owner	-14.55***	4.59	0.00	420	2%
Resident of Jerusalem	-11.61**	4.76	0.02	417	1%

Only few attributes presented a significant correlation with the time of the attack, presumably since the changing pattern was not linear. For instance, the share of minor assailants under the age of 15 rose as time passed, as reflected in the aforementioned significant correlation, but in general the assailants' age changed in a periodical manner, with short-term clusters of young assailants or older assailants (see Chart 14).

Chart 14: The Average Age of the Assailants throughout October 2015-December 2017



This pattern might indicate that despite the "lone wolf" character of the assailants, they are highly influenced by social factors, causing "infectious" outbreaks among specific social circles – as was discussed in the section 4.1.3 of this paper.

The involvement of females in the terrorism wave also varied across time. Out of the 80 female assailants in the sample, almost 50 acted between October 2015 and April 2016, the peak period of the terrorism wave. During these months, on average, 7 female assailants committed attacks each month, in comparison to 1.6 female assailants in the subsequent period. As the volume of the attacks dwindled down, the female involvement almost vanished.

In addition to these changes, the significant decrease in the involvement of blue-ID owners and Jerusalem residents in the terrorism wave is also noteworthy. Ben Avrahami, who works at the department of the Advisor to the Mayor of Jerusalem for Arab and eastern Jerusalem, argues that the education system in Jerusalem had a key role in this decline.[108] According to him, after the violence erupted, many principals and educators made efforts to take control of the situation and turn the schools into islands of stability; and this civilian response helped in soothing the terrorism wave among the Palestinian population of Jerusalem.

7. Comparison to Previous Terrorism

Thus fur, I've analyzed the characteristics of the "Knives Intifada" and the personal traits of the assailants, as they came across in the dataset, in order to gain a more complete picture of the up-to-date terrorism in Israel. However, such analysis does not allow determining whether the new terrorists are fundamentally different than their predecessors. Is the "lone wolf" assailant unsimilar in character to the typical terrorist Israel has come to know in the last few decades?

Following the empirical analysis of the "Knives Intifada" in itself, this section would analyze the similarities and differences between this latest terrorist eruption and the two previous major terrorism waves in Israel, he First Intifada and the Second Intifada, as a part of the attempt to understand whether the "Knives Intifada" represents a new phenomenon. The comparison would address both the characteristics of the terrorist attacks and the characteristics of the assailants, as will be explained henceforth.

7.1 Comparison to Terrorist Attacks in Previous Intifadas

[108] Ben Avrahami (7 March 2018), personal interview.

The terms "Individuals' Intifada", "Jerusalem Intifada" and later "Knives Intifada" surfaced within days from the first attacks of October 2015.[109] Nevertheless, some would argue that this label is misleading, since the recent terrorism wave was not of the same caliber as the First Intifada (1987-1993) and the Second Intifada (2000-2005).[110]

According to Shaul Shay, a military historian and the former deputy head of the Israeli National Security Council, the Israeli definition of the term Intifada reads as follows: a sequence of violent events perpetrated by Palestinians, that occurs over an extended period of time (sometimes years), gains popular support from the Palestinian public and causes multiple casualties on both sides.[111] From this perspective, is seems plausible to label the terrorism wave of 2015-2017 (or at least 2015-2016) as a new Intifada. However, the "Knives Intifada" was considerably different than its predecessors.

Table 19: Comparison of Major Palestinian Terrorism Waves in Israel[112]

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[109] See for example: Avi Issacharoff (2015), "The 'Jerusalem Intifadah' Began: Israel is Fighting the Invisible Terrorists"; Nachman Shai (2015), "The Third Intifada is Already Here", *Globes*, 11 October 2015, retrieved from: https://www.globes.co.il/news/article.aspx?did=1001072738 (Last accessed: 20.09.2018). [*In Hebrew*]

[110] Boaz Ganor (2016), "Six Months into the Violence: the Current Wave of Terror Attacks Isn't and Wasn't an Intifada", *Maariv*, 26 March 2016, retrieved from: https://www.maariv.co.il/journalists/Article-533123 (Last accessed: 20.09.2018). [*In Hebrew*]; Avi Issacharoff (2017), "Intifada 'Light': Hamas and the PA Have Not Yet Decided to Break All the Rules", *Walla! News*, 10 December 2017, retrieved from: https://news.walla.co.il/item/3117995 (Last accessed: 20.09.2018). [*In Hebrew*]

[111] Shaul Shay (2016), "Recurring Motif", *Maariv*, 12 December 2016, retrieved from: https://www.idc.ac.il/he/research/ips/Documents/media/shayMariv12_12_16.pdf (Last accessed: 20.09.2018). [*In Hebrew*]

[112] The information included in this table was assembled using multiple sources: Btselem (No Date), "Statistics", retrieved from: https://www.btselem.org/statistics (Last accessed: 20.09.2018); The Meir Amit Intelligence and Terrorism Information Center (2005), "Five Years of Violent Confrontation between Israel and the Palestinians", retrieved from: https://www.terrorism-info.org.il/en/16/ (Last accessed: 20.09.2018); The Meir Amit Intelligence and Terrorism Information Center (2005), "Jerusalem as a Preferred Target for Palestinian Terrorism in the Five Years of Conflict", retrieved from: https://www.terrorism-info.org.il/he/13/ (Last accessed: 20.09.2018) [*In Hebrew*]; Ephraim Lapid (2017), "An Uprising That Ended in a Controversial Agreement", *Israel Defense*, 14 December 2017, retrieved from www.israeldefense.co.il/he/node/32206 (Last accessed: 20.09.2018) [*In Hebrew*]; The Palestinian Central Bureau of Statistics, *Labor Force Surveys*, retrieved from: http://www.pcbs.gov.ps/default.aspx (Last accessed: 20.09.2018).

	The First Intifada (1987-1993)	The Second Intifada (2000-2005)	The Knives Intifada (2015-2017)*
Length	~5.5 Years	~4.5 Years	~2.5 Years
Peak Period	1987-1991	2001-2004	2015-2016
Primary Organizations	UNLU,[113] Hamas	PLO,[114] Hamas, Islamic Jihad	*No Prominent Organization*
Number of Attacks	30,000+	26,159	363
Attacks Per Year	5,200+	5,915	155
Initial Trigger	Four Palestinians died in a car crash with an army vehicle (December 1987)	Ariel Sharon, then opposition leader, visited the Temple Mount in Jerusalem (September 2000)	Israelis visited the Temple Mount for the holidays, among them one Minister (September 2015)
Palestinian Public Participation	Wide	Limited	Limited
Prominent Pattern	Violent Riots, Throwing Rocks and Petrol Bombs	Suicide Bombing, Shooting Attacks	Stabbings, Ramming Attacks, Throwing Rocks
Israeli Casualties	190 Fatalities 926 Wounded	1084 Fatalities 6089 Wounded	59 Fatalities 439 Wounded
Israeli Casualties per Year	33 Fatalities 161 Wounded	245 Fatalities 1377 Wounded	25 Fatalities 187 Wounded
Terrorism in Jerusalem	*Not Available*	635 Attacks 211 Fatalities (20%) 1643 Wounded (27%)	101 Attacks 22 Fatalities (37%) 154 Wounded (35%)
Israeli Reaction			
Palestinian Fatalities	1162 Palestinians	3333 Palestinians	275 Palestinians

[113] The Unified National Leadership of the Uprising.

[114] The Palestine Liberation Organization (includes the Fatah, the Palestinian Liberation Front, the Popular Front for the Liberation of Palestine and the Democratic Front) for the Liberation of Palestine.

Palestinian Fatalities per Year	202 Palestinians	754 Palestinians	117 Palestinians
Change in Palestinian Workers in Israel	116,000 to less than 50,000 in '95[115]	94,000 to 62,200 Workers	113,200 to 126,600 Workers
Demolition of Houses	432 Houses (~75 per year)	668 Houses (~150 per year)	41 Houses (~15 per year)

** From September 2015 to December 2017. Other studies could choose alternative dates, since the research is not extensive enough yet to form a clear consensus.*

First and foremost, As shown in Table 19, the amount of the attacks in 2015-2017 was smaller by a tenfold and continued for a shorter period of time (though it should be noted that the number of attacks in 2015-2017 does not include snipers' shootings, rocks throwing or petrol bombs attacks, causing an understatement of the actual number). Moreover, these attacks caused significantly less damage than the terrorism in the first two Intifadas, both for Israelis and Palestinians – the number of fatalities from both sides dropped by 70%-75% in comparison to the First Intifada and by 90%-95% in comparison to the Second Intifada**.** Notably, in all three terrorism waves, the number of Palestinian mortalities exceeded the number of Israeli mortalities by a factor of approximately 3-6.

Nonetheless, an annual examination reveals that the "Knives Intifada" was rather similar to the First Intifada in terms of intensity, causing a similar number of casualties per year. Both of them were significantly less harmful than the Second Intifada, which resulted in an unprecedented figure of 245 Israeli Fatalities per year. The terrorism wave in Israel during 2015-2017 did not even come close to these severe consequences, causing some

[115] The exact figures are not available due to the transition of the statistical data collection from the hands of Israeli Central Bureau of Statistics to the Palestinian Central Bureau of Statistics as part of the Oslo Agreements in 1993. The information was instead taken from: Leila Farsakh (1998), "Palestinian Employment in Israel 1967-1997: a Review", *Palestine Economic Policy Research Institute (MAS).*

critics to resolutely dismiss its labeling as in "Intifada", but the above comparison suggests that it stands on an equal footing with the earliest Intifada.

A more conclusive difference, as was extensively explained throughout this paper, is the fact that in the "Knives Intifada" no terror organization stood behind the attacks. Although several terrorist received guidance and support from organizations such as Hamas or the Islamic Jihad, the vast majority of assailants acted independently. In comparison, during the second Intifada, only one suicide bomber tried to perpetrate an attack on his own initiative. [116]

Naturally, this difference was also reflected in the common patterns of terrorism: mostly ramming and stabbing attacks that do not entail elaborate planning or preparations. In contrast, committing a suicide bombing in Israel – which was frequent during the Second Intifada – requires a complex and orchestrated mechanism in order to collect intelligence, obtain materials, build explosive devices, recruit volunteers, maintain confidentiality and fund all of the aforementioned.[117] Carrying out such an attack requires a high level of organization. Therefore, the terrorists' motivation did not translate into bombing attacks.

In this context too, the latest terrorism wave was more similar to the First Intifada, which was also characterized by simple attack methods and the use of cold weapons. However, the limited participation of the Palestinian population in the "Knives Intifada", that without a clear leadership did not stir the masses into action, put the focus on individual perpetrations rather than widespread riots.

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[116] The Meir Amit Intelligence and Terrorism Information Center (2005), "Suicide Terrorism during the Israeli-Palestinian Conflict (September 2000-December 2005)", Retrieved from: https://www.terrorism-info.org.il/he/18891/ (Last accessed: 20.09.2018). [*In Hebrew*]

[117] Ran Baratz (2015), "Two Intifadas and One Defensive Shield", *Mida*, 6 October 2015, retrieved from: https://mida.org.il/2015/10/06/שתי-אינתיפאדות-וחומת-מגן-משפטית-אחת/ (Last accessed: 20.09.2018). [*In Hebrew*]

Correspondingly, the Israeli reaction was less severe than in previous Intifadas. In addition to the relative decrease in the number of Palestinian fatalities, Israeli authorities demolished fewer houses (the annual number shrank by 75%-90% from previous terrorism waves) and did not cut the Palestinian employment in Israel, which actually grew during 2015-2017.

Despite these differences, the comparison also reveals the "Knives Intifada"'s resemblance to past Intifadas. For instance, examining the initial trigger of the terrorism waves points to the political volatility of the Temple Mount in Jerusalem, where two Intifadas erupted following highly publicized Israeli visits to the sacred compound during the Jewish holidays. In the eyes of the Palestinian-Arab-Muslim community, the Temple Mount, known in Arabic as the "al-Aqsa" compound, is not merely a mosque mentioned in the Quran within the context of the Prophet Muhammad's ascension to heaven, but also a unique symbol of identity.[118] For Jews, it is the most sacred of religious sites, since it is regarded as the ancient place of the Holy of Holies, where God's divine presence manifested.[119] These dual claims of both Judaism and Islam turned the compound into a major focal point of conflict.

Furthermore, according to the team of the Advisor to the Mayor of Jerusalem for Arab and eastern Jerusalem, radical Muslim factions deliberately cultivate the political symbolism of the site and promote the plot that "Al Aqsa is in danger" due to Israeli actions.[120] As a result, the situation in the Temple Mount is highly flammable and limited clashes can quickly escalate into widespread violence.

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[118] Yitzhak Reiter (2013), "Narratives of Jerusalem and its Sacred Compound", *Israel Studies* 18 (2): pp. 115-132.

[119] Simon Goldhill (2005), *The Temple of Jerusalem* (Cambridge: Harvard University Press).

[120] Ben Avrahami (7 March 2018), personal interview.

These circumstances also partially explain the main role of Jerusalem in all three terrorism waves. Ever since the establishment of Israel in 1948, its capital city was the most politically or symbolically important target for terrorism, experiencing more attacks than any other city.[121] Exploring the reasons behind this phenomenon is beyond the scope of this paper, but it should be noted that the "Knives Intifada" is no exception to this rule. In fact, it seems that Jerusalem was even more prominent in this terrorism wave than before.

7.2 Comparison to Terrorists in Previous Intifadas

7.2.1 The Knives Intifada vs. the First and Second Intifada

The first dataset, who includes Palestinian terrorists who operated during 1987-2002, allows examining whether the new "lone wolf" assailants are different in comparison to terrorists in previous Intifadas, who are treated as one group, as shown in Table 20. Columns 1 and 2 in the table exhibit the summary statistics for assailants from both generations – 2015-2017 vs. 1987-2002. Columns 3 and 4 show the same statistics, but for a different division between the two samples: organized assailants (the assailants from previous terror waves, plus assailants from 2015-2017 who had links to terrorist organizations) vs. "lone wolves" in 2015-2017 without such known links.

Table 20: Comparison of Personal Traits – 1987-2002 vs. 2015-2017

	Old vs. New		**Organized vs. Lone Wolf**	
	Old	New	Organized	Lone Wolf
	(1)	(2)	(3)	(4)
Age	26.2	22.1	25.9	21.8

[121] Claude Berrebi and Darius Lakdawalla (2007), "How Does Terrorism Risk Vary across Space and Time? An Analysis Based on the Israeli Experience".

Married	32.6%	15.7%	30.6%	14.9%
Rural Residence	32.6%	15.4%	30.1%	14.8%
Refugee Camp Residence	12.6%	6.1%	11.6%	5.9%
Criminal Past	95.9%	12.7%	81.1%	8.9%
Poverty	16%	41.5%	18.3%	43.5%
Dropped Out	32.5%	42.7%	30.8%	44.8%
12 Years of Schooling	64.8%	45.2%	63.5%	44.1%
Academic Background	45.5%	35%	46.1%	33.6%
Studied at Time of Attack	29.3%	39.5%	33.6%	37.1%
Observations	150	420	188	382

The comparison reveals several interesting phenomena. First, the "new" terrorists seem to be younger by 4 years on average. Consequentially, they tended to be single and less educated, with a lower share of academic graduates. However, many of them were still in school at the time of the attack. These finding were even stronger in the "lone wolf" group in comparison to the entire pool of 2015-2017 assailants.

Secondly, the starkest difference between the groups is in the criterion of past criminal past. Only 9%-13% of the new or lone wolf assailants had previous interaction with Israeli security forces, in comparison to 96% of the older generation terrorists or 81% of the "organized" terrorists. This finding corresponds with the perception of the "lone wolf" terrorist as inexperienced and spontaneous – someone who is not necessarily involved in terrorist activity and decides to attack without long preparations.

Thirdly, in comparison to previous terrorists, many of the "new" assailants came from urban areas – almost 80% of them, versus 55%-50% of the assailants in 1987-2002. Even though less of them came from refugee camps or rural villages, their share of poverty was considerably higher: about 40% of the assailants with known socio-economic status, vs. 16%-18% in the older or organized assailants group. As was mentioned before, such a

different could provide empirical support to Bueno de Mesquita's claim that terrorist organization screen potential attackers and choose the most skilled among them, explaining why terrorist are usually more educated and wealthy than the general population.

As explained before, in order to see if the differences between the groups results hold statistically when introducing control characteristics, I used a logistic probability model. The results are shown in Table 21.

The first three columns (1-3) list the estimation results of a logit regression in which the dependent variable equals 1 if the attacker appears on the 2015-2017 dataset and 0 if the attacker appears on the 1987-2002 dataset. Each column adds more regressors, adding information but reducing the number of observation due to partial data. The following three columns (4-6) list the estimation results of a similar regression, in which the assailants are divided to "lone wolves", attackers who acted in 2015-2017 without known links to terrorist organizations, and "organized assailants".

Table 21: Logistic Regressions Comparing Assailants from Different Periods (1987-2002 versus 2015-2017)

	Old vs. New			**Old vs. Lone Wolf**		
	Basic	Poverty	Educ.	Basic	Poverty	Educ.
	(1)	(2)	(3)	(4)	(5)	(6)
Age	0.97 (0.036)	1.00 (0.050)	0.87 (0.085)	0.95 (0.035)	0.98 (0.054)	0.86 (0.09)
Married	0.52 (0.325)	0.47 (0.358)	3.59 (6.832)	0.43 (0.299)	0.37 (0.322)	7.53 (16.84)
Rural Residence	0.26**	0.29**	0.84	0.38	0.32	1.39

	(0.139)	(0.181)	(0.842)	(0.225)	(0.233)	(1.521)
Refugee Camp Resident	0.72	0.88	0.53	1.09	0.94	0.97
	(0.522)	(0.719)	(0.791)	(0.888)	(0.897)	(1.531)
Criminal Past	0.01***	0.02***	0.00***	0.01***	0.01***	0.00***
	(0.007)	(0.013)	(0.005)	(0.004)	(0.009)	(0.004)
Poverty		3.07	5.60		5.02**	5.49
		(2.239)	(5.943)		(4.004)	(5.772)
Education						
Dropped Out			0.00			0.00
			(0)			(0.002)
12 Years of Schooling			0.00			0.00
			(0)			(0.683)
Academic Background			0.03*			0.01*
			(0.062)			(0.033)
Studied at Time of Attack			17.22*			14.22
			(28.29)			(27.20)
Observations	402	337	137	373	311	127
Pseudo R-squared	53%	51%	68%	61%	60%	70%

* significant at 10% ** significant at 5%. *** significant at 1%.

As can be seen in Table 21, many of the seeming differences are actually not statistically significant. Most notably, age has almost no impact on the probability to belong to one group over the other. On the other hand, as could be expected, criminal past is a key factor – significant at the 1% level over all regressions and show a clear distinction between assailants from different generations.

As for socio-economic status and education – the results are more multifaceted. While poverty is insignificant in the old/new regressions, the fifth regression show that the probability of being a "lone wolf" is five times larger if an assailant is poor. However, the variable loses significance when the controls for education are added. Education is significant at the 10% level for both types of regressions: first of all, students were much more prominent in the 2015-2017 terrorist wave – perhaps suggesting that the social circles among young people were more influential in comparison to the previous Intifadas. Secondly, their academic background was significantly weaker, indicating that the organizational involvement does lead to having better educated and skilled terrorists.

7.2.2 The Knives Intifada vs. the Second Intifada (2000-2006)

The second dataset for comparison focuses on more recent terrorism, comparing the current assailants with suicide terrorists who operated during the Second Intifada in the years 2000-2006. The descriptive statistics of comparison are shown in Table 22. Again, columns 1 and 2 exhibit the main summary statistics for assailants from each group – 2015-2017 vs. 2000-2006. Columns 3 and 4 show the same statistics for the organized assailants (the older terrorists, alongside present-day assailants with links to terrorist organizations) vs. the "lone wolf" assailants of 2015-2017.

In contrast with the previous comparison, here all the groups are very similar in terms of age, with an average of 21.2-22.2 years. Nevertheless, they are quite diverse in other turfs: the assailants who operated in 2015-2017 (both the "lone wolves" and the entire group) tended more to be married and live in an urban or rural area (not a refugee camp), and on average traveled a much shorter distance from their residence locality to the place of the attack – only 13 kilometers versus 27-30 kilometers for older terrorist.

Table 22: Comparison of Personal Traits – 2000-2006 vs. 2015-2017

	Old vs. New		**Old vs. Lone Wolf**	

	Old	New	Organized	Lone Wolf
	(1)	(2)	(3)	(4)
Age	21.2	22.1	22.2	21.8
Married	8.1%	15.7%	12.2%	14.9%
Refugee Camp Residence	14%	6.1%	12.6%	5.9%
Distance between Residence and Attack Location	30.3	13.0	26.9	12.8
Education				
Dropped Out	6.9%	42.7%	11.6%	44.8%
12 Years of Schooling	92.6%	45.2%	80.5%	44.1%
Academic Background	19.2%	35%	22.4%	33.6%
Studied at Time of Attack	41.4%	39.5%	48.8%	37.1%
Observations	123	420	161	382

In terms of education, the new generation of terrorists seems to be more polarized. The share of assailants who dropped out of school is 4 times larger for "lone wolves", but the share of assailants with academic training is also higher, by 150%. The share of assailants who completed 12 years of schooling is about 50% smaller in comparison to the terrorists who operated in 2000-2006, despite the similar age distribution.

A possible interpretation of this result is that terrorist organizations eliminate the least-educated candidates, thus explaining the low share of drop-outs among terrorists in the previous Intifada, but that other factors play a part in forming the connection between higher education and terrorism – for example, the exposure to radical ideologies. However, in order to reach more decisive conclusion, it is imperative to examine whether the correlations hold statistically when introducing control variables.

Table 23 presents the results of a logistic probability model. For the first three columns (1-3), the dependent variable equals 1 if the attacker appears on the 2015-2017 dataset

(and 0 otherwise), and for the following three columns the dependent variable equals 1 if the attacker is a "lone wolf" who operated in 2015-2017 (and 0 otherwise).

Table 23: Logistic Regressions Comparing Assailants from Different Periods (2000-2006 versus 2015-2017)

	Old vs. New			**Old vs. Lone Wolf**		
	Basic	Poverty	Educ.	Basic	Poverty	Educ.
	(1)	(2)	(3)	(4)	(5)	(6)
Age	1.00	1.02	1.20	0.98	0.99	1.03
	(0.023)	(0.029)	(0.132)	(0.018)	(0.020)	(0.0692)
Married	2.26	1.73	4.38	1.71	1.48	6.30
	(1.253)	(1.024)	(5.869)	(0.747)	(0.673)	(7.726)
Refugee Camp Resident	0.48*	0.40**	0.67	0.53*	0.47**	0.54
	(0.184)	(0.161)	(0.821)	(0.196)	(0.179)	(0.474)
Distance		0.96***	0.98***		0.97***	0.99***
		(0.006)	(0.007)		(0.006)	(0.006)
Education						
Dropped Out of School			0.00			6.97*
			(0.03)			(7.96)
12 Years of Schooling			0.00			1.91
			(0.000)			(2.185)
Academic Background			0.05***			0.15**
			(0.058)			(0.132)
Studied at Time of Attack			15.74***			3.94**
			(14.11)			(2.70)
Observations	405	402	166	405	402	166
Pseudo R-squared	2%	12%	33%	1%	8%	18%

* significant at 10% ** significant at 5%. *** significant at 1%.

As can be demonstrated by the results in Table 23, most of the aforementioned correlations appear to be statistically significant. The present-day assailants are similar in age to their predecessors, but they are less prone to live in refugee camps and travel shorter distances to the location of their attack.

As for the education variables, it is interesting to note that the "lone wolf" assailants are remarkably different from the "organized" assailants, while the differences between "old" and "new" assailants are more subtle. Attackers who dropped out of school were almost 7 times more likely to be "lone wolves", while attackers with academic background were 85% less likely to be "lone wolves" (both figures are statistically significant). However, the probability of a current student in high school, college or university to be a "lone wolf" was 4 times larger than the probability of being an "organized" terrorist. This result echoes the polarization noticed already in the summary statistics, giving support to the claim that the terrorist organizations screen the potential activists and promote more educated terrorists.

8. Discussion and Conclusions

Questions regarding the "lone wolf" terrorism have been accumulating in the last decade and attracting more attention from scholars and policy makers, as assailants who seemed to be acting alone began to outnumber other terrorists.[122] However, studies on lone wolf terrorism remain scarce and are commonly plagued by methodological and conceptual difficulties.[123]

This thesis focused on the "lone wolf" phenomenon in Israel during the terrorism eruption of 2015-2017. It examined the patterns of the attacks and the personal traits of the assailants – including age, education and socio-economic status – using a unique dataset constructed for the purposes of the paper, consisting of 420 assailants that perpetrated 363 terrorist attacks. Multiple statistical methods – including chi-squared

[122] Jason Burke (2017), "The Myth of the 'Lone Wolf' Terrorist", *The Guardian*, 30 March 2017, retrieved from: https://www.theguardian.com/news/2017/mar/30/myth-lone-wolf-terrorist (Last accessed: 20.09.2018).
[123] Ramón Spaaij and Mark S. Hamm (2015), "Key Issues and Research Agendas in Lone Wolf Terrorism", *Studies in Conflict & Terrorism* 38 (3): pp. 167-178.

tests, hazard estimates and logistic regressions – were employed to gain insight about this recent terrorism upsurge.

Overall, what came to be known as the "Knives Intifada" was comprised of three phases. In the first three months, until the end of 2015, Israelis were hit by terrorist attacks approximately twice a week. Then, between January and April 2016, the pace decreased to an average of about 1.5 attacks per week. Following that period and until the end of 2015, they experienced about one attack each week. Throughout almost the entire research period, the hazard of an attack was lower than 5%, but this risk was enough to cause the newspapers, the general public and the politician to discuss a "new type of Intifada", demonstrating the massive psychological and social impacts of terrorism, even when unorganized and scattered.

Without a steering hand, the terrorist attacks tended to spread in a viral way. In fact, one of the strongest predictors of the volume of attacks in a certain week was the number of attacks on the previous week. Specifically, once an attack happened, the hazard of an additional attack peaked at about 30%-40% for three consecutive days. These results support the portrayal of the "lone wolf" terrorism as an epidemic, following a pattern of contagion, outbreak, containment, and low-grade continuity.

Jerusalem was the main victim of this "plague'. Throughout the research period it experienced over 100 attacks, more than any other locality inside or outside the Green line. Its main role in the terrorism wave was evident from its estimated hazard rate, which was sometimes double the overall hazard. Additionally, the terrorism hazard continually fluctuated following each terrorist attack, creating a constant sense of threat.

Jerusalem stood at the center of attention from the first days of the "Knives Intifada", which erupted against the backdrop of Palestinian uproar regarding the Temple Mount,

one of the most sacred sites to Jews and Muslims alike. The wave of violence began when Palestinian activists gathered on the Temple Mount to prevent Jews from visiting the site on the Eve of the Jewish New Year, throwing firebombs and rocks at Israeli police who attempted to disperse them with tear gas and rubber bullets. The tensions surrounding the visits of about 300 Jews, including the Israeli Agricultural Minister Uri Ariel, quickly sparked into violence.

These events bring to mind the outburst of the Second Intifada, following a visit by then Israeli Opposition Leader, Ariel Sharon, to the Temple Mount for the Jewish New year in 2000. However, the terrorism of 2015-2017 was substantially different than in the early 2000s. The "Knives Intifada" ended within two years and caused significantly less damage, resulting in less fatalities and casualties from both sides. In contrast, it bears similarities to the First Intifada, which was characterized by simple attack methods and the use of knives, stones and petrol bombs. Without guidance and logistical support from terrorist organizations, the assailants were not able to carry out complex attacks and most of them committed stabbings or ramming attacks. In practice, their willingness to risk death for the purpose of killing or wounding Jews was their key weapon.

In light of the above, the main aim of this paper was to shed light on the "lone wolf" terrorists in Israel and describe their typical profile. The data regarding the assailants conveys information on many aspects of their personal backgrounds, as was detailed throughout the paper – their ages, residence locations, criminal experience, education, economics status, social media activity and so on. By combining these aspects, one may construct several typical archetypes, describing the multifaceted profiles of the assailants.

First are the radical young Palestinians, in the ages of 18-25, who act out of a strong drive, either ideological or religious, to fight against Israel. They tend to be educated and many of them were high school or university students at the time of the attack. A second group

consists of Palestinian teenagers from the West Bank (usually from the districts of Hebron or Nablus), who seek revenge after a close relative or friend was killed, wounded or arrested by Israeli security forces. Many of them resided in poor villages or refugee camps and they often had some kind of connections to other terror activists. In addition, their activity on social media websites constantly exposes them to propaganda and inflaming messages.

A third group is comprised of Palestinians and Israeli-Arabs in different ages from various backgrounds, who suffer from difficulties in their private lives– personality disorders, domestic violence, sexual harassment – and turn to terrorism as a way out or as an effective suicide method, which doesn't cause shame but instead brings pride to the assailant and his or hers family.

In comparison to previous terrorists in Israel, despite being very similar in age, the "lone wolf" terrorist turned out to be significantly different in terms of education level. Interestingly, the "lone wolves" were characterized by polarized results: a high share of academic students and graduates, many of whom studied engineering or accounting at the university, but also assailants who dropped out at an early age, usually to help providing for the family.

The terrorism wave of 2015-2017 also saw a substantial increase in the role of female terrorists, who constituted 20% of the sample. They were similar to the male attackers in term of age and lack of criminal past, but were more prone to have a family, with a higher percentage of married and parents among them. In addition, they tended to attack soldiers and police officers rather than civilians, and were much more likely to be stopped in advance.

Furthermore, unlike previous terrorists in Israel, the vast majority of terrorists in 2015-2017 did not have prior criminal-terrorist background. The motivations of the aforementioned groups of assailants may have been varied, but the eruption of the terrorism pushed all of them to action, pointing to the importance of social factors in the spread-out of terrorism. 15% of the assailants have actually posted terrorism-related contents on their personal accounts in social media and after their photos and quotes often became viral following their attacks. The "lone wolf" might be lonely in terms of organizational support, but this paper suggests that he is not lonely at all but acts as a part of a wider social network that communicates through the media's traditional and new channels and the assailant's close environment.

To conclude, there is not one clear figure of the "lone wolf" Palestinian terrorist: the assailants came from all walks of society. To illustrate – Imad Aghbar, who stabbed three Israeli men and one woman on the Tel Aviv beach promenade, was eighteen years old, came from a wealthy and normative family and was enrolled to study Mathematics at al-Najah University in Nablus. He told investigators that he decided "to kill Jews because they are Jews […] to turn into a martyr or hero".[124] Ataya Abu Eisha, a 28 years old resident of Jerusalem's Kfar Aqab, came from a poor family of 14 brothers and sisters. She worked at a military sewing workshop in the Atarot Industrial Area before taking a screwdriver and heading out to Jerusalem to perpetrate an attack. Afterwards, she said that she wanted to die because of a romantic relationship.[125]

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[124] Jacob Magid (2017), "Palestinian Teen, in Israel on Peace Visit, Charged for Tel Aviv Stabbing", *The Times of Israel*, retrieved from: https://www.timesofisrael.com/palestinian-teen-charged-for-tel-aviv-stabbing-attack/ (Last accessed: 20.9.2018).

[125] Criminal File 55653-12-15, *the State of Israel v. Ataya Abu Eisha*, 28 June 2016, retrieved from: https://www.nevo.co.il/psika_html/mechozi/ME-15-12-55653-44.htm (Last accessed: 20.9.2018) [*In Hebrew*].

Nevertheless, is seems that the assailants can be divided into several main archetypes who should be researched more thoroughly. Further research and richer data are required in order to reach a better understanding of these groups and facilitate better policy decisions to deal with them. Their varied personal characteristics demonstrate that there is no single mechanism which generates correlation between social-economic status or education and the tendency to participate in a terrorist activity.

Presumably, terrorist organizations do eliminate the least-educated candidates, as claimed by Bueno De Mesquita and others, but other factors play a part in forming the connection between higher education and terrorism – for instance, the exposure to radical ideologies.

In other words, the organizations' screening process assists in explaining why poor and uneducated individuals were less likely to be involved in terrorist activity in the past, but do not explain why wealthy and well-educated individuals are involved in them. The significant links found in this paper between education and being a "lone wolf" terrorist, in contrary to the ambiguous results regarding poverty, points to one area that should be further researched.

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