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# Successful for whom?: an examination of the general deterrent impact of the targeted killing of terrorist leaders on global terrorist fatalities

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## ABSTRACT

Targeted killings are a prominent strategy for combatting terrorism and are regularly claimed to deter political violence. Employed against terrorist leaders like Osama bin Laden and others who are argued to be prominent terrorist threats, a growing body of evidence suggests that targeted killings do not achieve their desired general deterrent impacts. Yet, this strategy still enjoys great political support and targeted killings continue to be touted as examples of previous counterterrorism success even before their impacts could be observed. Aiming to disentangle whether there is an empirical basis for these divergent claims regarding the impacts of targeted killings, this study examines the impact of the killing of bin Laden on global patterns of terrorist fatalities. Employing group-based and dual trajectory models, our findings indicate that regardless of whether an explicit cut-point is included in the analysis, the killing of bin Laden coincided with a global increase in terrorist fatalities in many but not all countries, some of which had previously declining trajectories of fatalities from terrorism. The potential impacts of future targeted killings and general deterrence are discussed along with the need to consider terrorism consequences beyond national borders.

## ARTICLE HISTORY

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## KEYWORDS

Targeted killing; general deterrence; Osama bin Laden; trajectory analysis; terrorism; Soleimani

## Introduction

Deterrence is one of the most widely used theoretical perspectives for justifying counterterrorism measures (Dugan & Chenoweth, 2012; Harvey & Wilner, 2020; Stein & Levi, 2020). This theoretical tradition aims to either advertise the negative consequences or costs for committing terrorism<sup>1</sup> through general deterrence, or to prevent terrorism recidivism through the experience of punishment from the perspective of specific deterrence (Apel & Nagin, 2011; LaFree et al., 2009; Stafford & Warr, 1993). Deterrence operates by demonstrating that the likely costs for crime or terrorism outweigh the expected benefits, via the perception of certain, swift, and proportionate punishment (Beccaria, 1986). This criminological approach has been expanded to counterterrorism and has been particularly popular within the general public and political spheres (Brenan, 2021;

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McCarthy, 2017), primarily due to the pressure for decisive counterterrorism responses and the desire for retribution (Anker, 2005). This in turn has been observed to have led to the expanded use of targeted killings United States (US) as a method to eliminate terrorist leaders and deter future terrorism (Carvin, 2012; Walsh, 2018). Exemplified by the most prominent and widely publicized targeted killing of Osama bin Laden on 2 May 2011, recent research has called into question the deterrent benefits of targeted killings (Carson, 2017; Fisher & Becker, 2021).

The use of targeted killings as a response to terrorism has not abated however, with former President Trump and President Biden continuing to employ technique frequently (Bureau of Investigative Journalism, 2021; Carpenter, 2021; Crawford & Liebermann, 2021; Hjelmggaard, 2021; Plummer & Murphy, 2022). Particularly given the potential for escalations in violence and terrorist backlash from repressive counterterrorism strategies including targeted killings (Argomaniz & Vidal-Diez, 2015; Dugan & Chenoweth, 2012; LaFree et al., 2009), one might expect the use of targeted killings to have instead reduced in frequency or for there to be more hesitancy in claiming counterterrorism success in their aftermath. While the extant evidence suggests that the use of this tactic is not an effective deterrent and should be reduced, the actual frequency and scope of such strikes appears to have expanded in recent years (Bureau of Investigative Journalism, 2021; Walsh, 2018).

Demonstrating the persistence of targeted killings as a tactic, on 31 July 2022 the United States military killed Al Qaeda leader Ayman al-Zawahiri in a targeted drone strike where a drone pilot operating an unmanned aerial vehicle (UAV) launched a Hellfire missile into a safe-house balcony (Plummer & Murphy, 2022). Despite taking the mantle as the leader of Al Qaeda following bin Laden's death, al-Zawahiri existed as 'an increasingly marginali[z]ed figurehead of rickety terrorist franchise organization' (Gohel, 2017, p. 54). He was born an Egyptian Aristocrat and trained as a surgeon (Raphaeli, 2002), and while he lacked the more charismatic leadership style of bin Laden, he was the strategic mind behind many of Al Qaeda's terrorist attacks including the September 11th attacks when he was the 'the number-two man in Al Qaida' (Bush, 2006a, p. 3). For these acts and for his more than 40 years of involvement in committing acts of terrorism (Gohel, 2017), al-Zawahiri was among the FBI's 'Most Wanted' terrorists (Martinez & Gittleston, 2022). As can be seen in the quote from President Biden's public address below, his connection to bin Laden and his involvement in major terrorist attacks were the central reasons behind this targeted killing:

*My fellow Americans, on Saturday, at my direction, the United States successfully concluded an airstrike in Kabul, Afghanistan, that killed the emir of al Qaeda, Ayman al-Zawahiri. You know, al-Zawahiri was bin Laden's leader. He was with him all the – the whole time. He was his number-two man, his deputy at the time of the terrorist attack of 9/11. He was deeply involved in the planning of 9/11, one of the most responsible for the attacks that murdered 2,977 people on American soil. For decades, he was a mastermind behind attacks against Americans, including the bombing of the USS Cole in 2000, which killed 17 American sailors and wounded dozens more. He played a key role – a key role in the bombing of U.S. embassies in Kenya and Tanzania, killing 224 and wounding over 4,500 others ... This mission was carefully planned and rigorously minimized the risk of harm to other civilians. And one week ago, after being advised that the conditions were optimal, I gave the final approval to go get him, and the mission was a success. None of his family members were hurt, and there were no civilian casualties. I'm sharing this news with the American people now, after confirming the mission's total success*

*through the painstaking work of our counterterrorism community and key allies and partners.*  
(Biden, 2022, pp. 1–2)

This quote also demonstrates the branding of this counterterrorism action as an operational success. Admiral John Kirby, President Biden's National Security Council coordinator for strategic communications, went further and claimed that the strike was a 'significant blow to Al Qaeda and their plans, operations, and even resourcing' in the region (Kirby, 2022). Described as 'justice' by President Biden, he echoed former Presidents George W. Bush and Barack Obama by stating 'that no matter how long it takes, no matter where you hide, if you are a threat to our people, the United States will find you and take you out' (Biden, 2022, p. 3). While appealing to the central deterrence tenet of certainty of punishment (see Beccaria, 1764), President Biden's claims of success refer to the operation rather than the likely impacts for terrorism, whereas Admiral Kirby highlighted some of the other goals of targeted killings. Indeed, beyond deterrence, targeted killings have also been justified as being part of warfare (Bachmann & Haeussler, 2011), decapitation strategies (Morehouse, 2014), retribution (Braun, 2021), or to diminish the strategic capacity of terrorist organizations (Wilner, 2010), each with their own underlying theory and outcome goals that should be considered. This explicit framing stands in contrast to the framing of previous targeted killings where the primary motivation for the targeted killing was to deter future terrorism by other entities (Braun, 2019; Carson, 2017; Jordan, 2014; Mitchell, 2012; Shire, 2020), raising important questions regarding what the likely impacts for terrorism will be following the killing of al-Zawahiri.

Understanding that it is premature to assess the long-term consequences of the strike on al-Zawahiri and other more recent targeted killings including the 29 August 2021 drone strike on the individuals said to be behind the 26 August 2021 Islamic State – Khorasan bombing of the Hamid Karzai International Airport in Kabul, Afghanistan (Ali, 2021), it is valuable to revisit how targeted killings have been used by the United States against prominent terrorist leaders in the recent past (Carvin, 2012). Al-Zawahiri is inextricably linked to bin Laden both in their position as leader of Al Qaeda at the time of their death and their co-involvement in numerous terrorist attacks (Martinez & Gittleson, 2022; Raphaeli, 2002). Given the parallels between bin Laden and al-Zawahiri, the killing of bin Laden in 2012 provides the most similar case example for deriving evidence regarding the likely impacts of this recent targeted killing. Although there is some variation in the impacts following the killing of the leaders of terrorist organizations (Carson, 2017), as it will take years before the impacts from the killing of al-Zawahiri are observable, examining the consequences for terrorism that stemmed from this previously targeted killing could provide important insights into the likely consequences for terrorism stemming from these counterterrorism actions.

Leveraging a series of group-based and dual trajectory models to investigate whether any deterrent benefits from targeted killings are dependent on the geographic frame of reference, this paper examines the impacts of the killing of bin Laden. Replicating the analytic approach conducted by Fisher and Becker (2021), this study examines whether the trajectories of global terrorism fatalities deviate from the trajectories of the frequency of terrorist attacks following the killing of bin Laden. Taking advantage of the features of trajectory modeling techniques, this study then examines whether global findings are also echoed by the United States and other nations that were involved in the

Global War on Terror (i.e. NATO, OAS, and ANZUS members, and other global partners) (United States Department Of State Bureau of Public Affairs, 2009). This study finds that deterrent impacts of the killing of bin Laden on terrorist fatalities depends on the geographic frame of reference and discusses the implications of this for national governments and their selection of counterterrorism options.

## Evolution of US Counterterrorism goals and priorities

When selecting from a range of counterterrorism policy options however, national governments may not be concerned with the net general deterrence impacts of a counterterrorism policy. Rather than considering global counterterrorism interests, governments may instead be more concerned with domestic political, economic, and security priorities (Bougen & O'Malley, 2009; Hunt, 2007; Richardson, 2000). Concordantly, the geographic focus of the impacts on terrorism may drive divergent counterterrorism decisions. A rhetoric and policy shift for a government from focusing on global interests to domestic priorities raises the potential that policies would have been considered detrimental to counterterrorism goals in the global sense could be considered successful if the geographic frame of reference is changed. As such, although a counterterrorism policy may be empirically dismissed as it does not meet the requirements for global general deterrence, restricting the focus to only prioritize the impacts for a single nation may lead to different conclusions regarding general deterrent impacts.

This difference in geographic prioritization is one of the points of departure from transitioning from the *Global War on Terror* (GWOt) under the Presidency of George W. Bush compared to the *America First* dictum used by President Trump. Shortly after the 11 September 2001 attacks, former President George W. Bush (2001) outlined the diplomatic and policy premise of the GWOt. This was described as a globally collaborative effort with the focus being on reducing terrorism worldwide;

*The message to every country is, there will be a campaign against terrorist activity, a worldwide campaign. And there is an outpouring of support for such a campaign. Freedom-loving people understand that terrorism knows no borders, that terrorists will strike in order to bring fear, to try to change the behavior of countries that love liberty. And we will not let them do that.*

In the period that followed, the United States secured operational and logistic support from dozens of individual countries and multilateral bodies, pursuing the goal of achieving the broad (and indeed elusively operationalized) aims of ending terrorism (George, 2021). The evolving philosophy of the Global War on Terror across the Bush and Obama Administrations contrasts sharply with the more recent policy shift expressed by President Donald Trump. In a speech on 27 April 2016 this new doctrine, referred to as the *America First* approach, was described by former President Trump as a mission to 'put the interests of the American people and American security above all else.' This doctrine prioritized bilateral relationships with a premium placed on potential domestic costs or risks. Ultimately, while the implementation of this policy was characterized by institutional friction in many domains, the rhetorical framing of foreign policy goals, metrics for success, and achievements of the Trump presidency were articulated within this lens (Trump, 2016). This domestic prioritization of the domestic over the international was stated explicitly by former President Trump in a speech he delivered to the United

Nations General Assembly in 2017 where he solicited support for other nations in protecting national sovereignty from ‘chaos, turmoil, and terror;’

*Our Government's first duty is to its people, to our citizens: to serve their needs, to ensure their safety, to preserve their rights, and to defend their values. As President of the United States, I will always put America first, just like you, as the leaders of your countries, will always, and should always, put your countries first.*

Adopting elements from previous presidential administrations and in response to the US withdrawal of military personnel from Afghanistan, the Biden administration proposed its alternative ‘over-the-horizon’ counterterrorism. Instead of boots on the ground, counterterrorism would now ‘strike terrorists and targets’ from afar (Martinez & Gittleston, 2022). This policy places a greater reliance on drone strikes and similar counterterrorism methods, making it even more important to examine the consequences of targeted killings. The Biden administration’s recent claims of operational successes – focusing not on the deterrent impacts of killing al-Zawahiri, but rather the avoidance of civilian casualties – marks a shift in stated goals. Regardless, this indicates the need to assess the most similar historical case in order to understand possible outcomes (particularly when they are not the focus of the administration).

Consequently, the objectives of these three counterterrorism frameworks are distinct in approach and geographic prioritization. By contrasting the rhetorical policy aims of these approaches, the disparity in deterrence outcomes comes into sharp focus. Moreover, if both strategies are aimed at achieving general deterrence goals, understanding the differing scope of who is reaping those general deterrence ‘benefits’ is important for both domestic and international policymakers and partnerships and for more firmly interrogating what general deterrence means within the context of counterterrorism.

## The theory of deterrence

The theory of deterrence has a long and influential history within criminology (Beccaria, 1764; Loughran et al., 2012; Nagin & Pogarsky, 2001; Paternoster, 2010; Paternoster & Fisher, 2017), and it has influenced other social science disciplines and numerous policy domains (D’Arcy & Herath, 2011; Huth, 1988; Kilgour & Zagare, 1991). The interpretations and meaning of this theory however have changed considerably since it was described by Cesare Beccaria in 1764 in *On Crimes and Punishments*. Although former US Presidents have explicitly drawn upon notions of deterrence to justify the use of targeted killings in the name of counterterrorism, the version presented above is incongruent with the more than 250 years of theoretical development of deterrence and more than 50 years of empirical study (Argomaniz & Vidal-Diez, 2015; Beccaria, 1764; Becker, 1968; Dugan & Chenoweth, 2012; Nagin & Pogarsky, 2001; Paternoster, 1987). More accurately, deterrence theory states that individuals will be less likely to break laws or act against a state if there is a high perceived certainty of punishment, there is the minimum necessary severity of punishment to outweigh the potential benefits of the crime, and the punishment is swift (Beccaria, 1764).<sup>2</sup> Importantly in the case of targeted killings, the theory of deterrence emphasizes that for a punishment to be just and effective (and thus avoid backlash or perceptions of state illegitimacy), it should not exceed the minimum necessary severity to deter an undesirable act (Kydd & Walter, 2006; Toros, 2008). Deterrence is also either

general or specific based upon the audience of the deterrent message. In general deterrence, the audience of the punishment is the general public rather than those who are targeted as they are incapacitated by the strike (Nagin & Pogarsky, 2001). Specific deterrence on the other hand focuses on impacting the future decision making of an individual who has previously received punishment. As those who have been killed are incapacitated and are unable to make future decisions, specific deterrence and policy options that aim to present costs that exceed the perceived gains from terrorism are concordantly inapplicable as justifications for targeted killings.

This does not however eliminate the deterrence perspective as a justification for targeted killings and instead raises important questions that are vital to unpack regarding the varying priorities and goals of both governments seeking to reduce terrorism and those committing terrorism. While Ross and Gurr (1989) argued that the impacts of intervention aiming to deter terrorism operate primarily through vicarious exposure and perceptions, the question remains how broad should the sphere of influence be? General deterrence could extend to a terrorist organization (Wenger & Wilner, 2020), a region of a country (Fisher & Dugan, 2021; Fisher & Lee, 2019; Python et al., 2019), a nation (Argomaniz & Vidal-Diez, 2015; LaFree et al., 2009), or the global experience of terrorism (Piazza, 2008; Sandler, 2003). Previous research has demonstrated that the impact on terrorism can be heterogeneous and divergent (Fisher & Becker, 2021), and the geographic frame of reference could determine whether any counterterrorism action yields general deterrence benefits. While this discussion has been prominent within the situational crime prevention literature regarding where different interventions displaced crime or displayed a diffusion of benefits (Hsu et al., 2018; Johnson et al., 2014), this issue is also central for general deterrence. Unlike previously explored situational crime prevention however, the impacts of many counterterrorism policies are less likely to stop at national borders (Andreeva, 2021; Foot, 2005). Furthering this avenue of inquiry, it is vital to examine whether the influence of the geographic frame of reference is theoretical in nature or whether it also yields important empirical differences as well. Beyond more firmly defining the geographic frame of general deterrence conceptually, this discussion is necessary for governments as they seek to balance and prioritize a host of different practical and political considerations.

### Testing the deterrent impact of targeted killings

Despite this theoretical dissonance, the rhetorical framing of targeted killings as deterrence has persisted in the United States. For the past two decades and across presidential administrations, the United States federal government has justified the use of targeted killings as a deterrent force (Bush, 2006b; Mangan, 2020; Obama, 2011). Most notably perhaps, this was the case presented to the American public in the wake of the targeted killing of Osama bin Laden on 2 May 2011, the most prominent and widely publicized targeted killing (Carson, 2017). As deterrence is based on perception (Nagin, 2013; Roche et al., 2020), knowledge of the law and of the consequences of breaking the law are needed for it to impact behavior (Beccaria, 1764). Consequently, the killing of bin Laden provides an opportunity to observe the greatest extent to which targeted killings can impact the lethality of global terrorism due to its global media exposure (Fisher & Becker, 2021). As all other targeted killings have received less social and media attention,

if the killing of bin Laden was unable to impact terrorist fatalities, then it is unlikely that other targeted killings will be able to either. Notably, these responsibilities resemble those of Osama bin Laden, who up to his death had been the strategist, financier, and ideological figurehead of al 'Qaeda (Post, 2002). Though the circumstances of the two individuals, bin Laden al-Zawahiri, diverge in a variety of other facets, elements of their roles and the perceived threat posed by each to US national security remain. Consequently, examining the impacts of the bin Laden targeted killing of 2011 can help frame the counterterrorism impacts that the July, 2022 killing and other targeted killings may have on the lethality of terrorism.

Examining a range of terrorism outcomes is vital for counterterrorism research and focusing exclusively on one dependent variable may miss important consequences that stem from terrorism. Indeed, terrorism has many important elements that previous research has examined ranging from the number of attacks (Fisher & Becker, 2021; LaFree, Dugan, et al., 2009), to the number of fatalities (Frisch, 2006; Hewitt, 2000), to wide-spread health and trauma outcomes (Alfa-Wali et al., 2015; Chrisman & Dougherty, 2014; Fremont, 2004). Taken together, these studies have produced a more complete understanding of the impacts of terrorism and have allowed policymakers to have a better evidence base to select policy options from. Particularly given the previous focus on the number of terrorist attacks rather than the lethality of terrorist attacks, examining the impact of targeted killings on terrorist killings should enable a more nuanced appreciation of whether targeted killings deter terrorism, incite increased terrorism as a backlash, and/or escalate terrorist conflicts and result in increased fatalities (Dugan & Chenoweth, 2012; Fisher & Becker, 2021; Mannes, 2008).

Deterrence has been applied repeatedly in the prior empirical work on political violence and asymmetric conflict, typically demonstrating mixed counterterrorism impacts of deterrence tactics and the high human and opportunity costs (Argomaniz & Vidal-Diez, 2015; Dugan & Chenoweth, 2012; Fisher and Dugan, 2019; Forst, 2017). This is perhaps due to the inherent difficulty in anticipating the utility structures and reactions of terrorists and other heterogeneous organizations (Victoroff, 2005). This is most poignant in the empirical literature on the use of targeted killings (Carson, 2017; Fisher & Becker, 2021; Wilner, 2010). Research focusing on the empirical study of targeted killings research has also found null, mixed, or heterogeneous evidence of its deterrent capacity (Gruenewald, 2017). As a part of a broader study on the impact of targeted killings against political and military leadership targets within al 'Qaeda and the global jihadist movement, Carson (2017) found evidence of null or backlash effects on subsequent violence by Salafi-Jihadist groups. Most recently focusing on the May 2011 death of Osama bin Laden, Fisher and Becker (2021) found divergent impacts on terrorism incidents using dual trajectory models. Notably they found that while the US observed a drop in terrorism following the death of bin Laden, regional counter-terrorism partners Iraq and Yemen experienced a substantially higher incidence of terrorism following the strike. Despite these recent insights, there remains many important unanswered questions regarding the impacts of targeted killings on terrorism. Specifically, while Fisher and Becker (2021) provide some value for identifying divergent impacts of targeted killings on the incidence of terrorism and why the previous studies have provided inconsistent findings, it is unfortunately silent on understanding the counterterrorism impacts in terms of fatalities. To this end, the present study aims to extend the methods employed in Fisher and Becker

(2021) by exploring if and to what extent the killing of bin Laden had on country-level terrorism-related fatalities. Specifically, this study examines whether terrorist fatalities decreased in nations following the killing of bin Laden in line with general deterrence, increased as a backlash to this killing, or had divergent impacts within different nations.

## Data and methods

Data for this study were obtained from the Global Terrorism Database (GTD), an event-based database comprised of global terrorist attacks (LaFree et al., 2014). The definition of terrorism within the GTD is: 'the threatened or actual use of illegal force and violence to attain political, economic, religious, or social goals through fear, coercion, or intimidation' (LaFree & Dugan, 2007). An incident must contain the following three elements to be deemed an act of terrorism and to be included in the GTD dataset:

- i. The incident was intentional (the result of a conscious calculation on the part of the perpetrator);
- ii. The incident included some observable level of violence or the threat of violence;
- iii. The perpetrator of the incident was a sub-national actor.

In addition, two of the three following conditions must also be met in order for an event to be included in the GTD:

- i. The violent act was aimed at attaining a political, economic, religious, or social goal;
- ii. The violent act included evidence of an intention to coerce, intimidate, or convey some other message to a larger audience (or audiences) other than the immediate victims;
- iii. The violent act was outside the precepts of International Humanitarian Law (START, 2021).

For the present study, data concerning the number of fatalities were collected from each of the nations represented in the GTD. The number of fatalities was selected for the outcome variable of this study as the number of deaths presents one of the key aspects of terrorism that governments seek to minimize. Beyond the deaths themselves, the loss of life leaves broader social and economic impacts on a nation and are among the biggest costs that stem from terrorism (Frey & Luechinger, 2004). Particularly given the heterogeneity of terrorist attacks, measuring the number of terrorist fatalities can provide a key indication of the changing nature and consequences that stem from terrorist attacks (Danzell & Zidek, 2013). Fatalities resulting from a terrorist attack in many cases are not immediate, and more accurate information on deaths may not be available until a period after these events. As such, it is important to note that the number of fatalities from any given terrorist attack may change over time. To account for these issues, the GTD usually records the number given by the most recent source (LaFree et al., 2014). In cases where this source is of questionable validity, for example if the estimate stems from the claims of the group that perpetrated the attack, the GTD triangulates the estimates given by all sources to arrive at a figure that is agreed upon by a majority of sources (LaFree et al., 2014). In cases where an estimate cannot be triangulated using

independent sources, the lowest estimate provided from a valid source is recorded (LaFree et al., 2014).

Replicating the method employed in Fisher and Becker (2021) which previously examined the killing of bin Laden on the number of terrorist attacks, this study analyzes fatalities from terrorist attacks that were perpetrated between 2 November 2007 and 2 May 2014. This provides a symmetric three-and-a-half-year window (seven years in total) before and after the killing of bin Laden for comparison within this study, and the findings from this study will be more directly comparable to Fisher and Becker (2021). Following this approach, the periods before and after the killing of bin Laden were broken up into seven six-month periods for analysis. One of the key assumptions made in the analysis in Fisher and Becker (2021) and in this analysis is that the killing of bin Laden was viewed globally and influenced subsequent terrorism decision-making. This is evidenced by the volume of government and journalistic descriptions of the targeted killing in regional and international press at the time of the raid and shortly thereafter (Carson, 2017; Fisher & Becker, 2021). Moreover, the global salience of the targeted killing has led to widespread examination of the press reaction as emblematic of state relations, journalistic morality, and critical frameworks in security studies (Bowman et al., 2014; Marwan et al., 2017; Onyebadi, 2016).

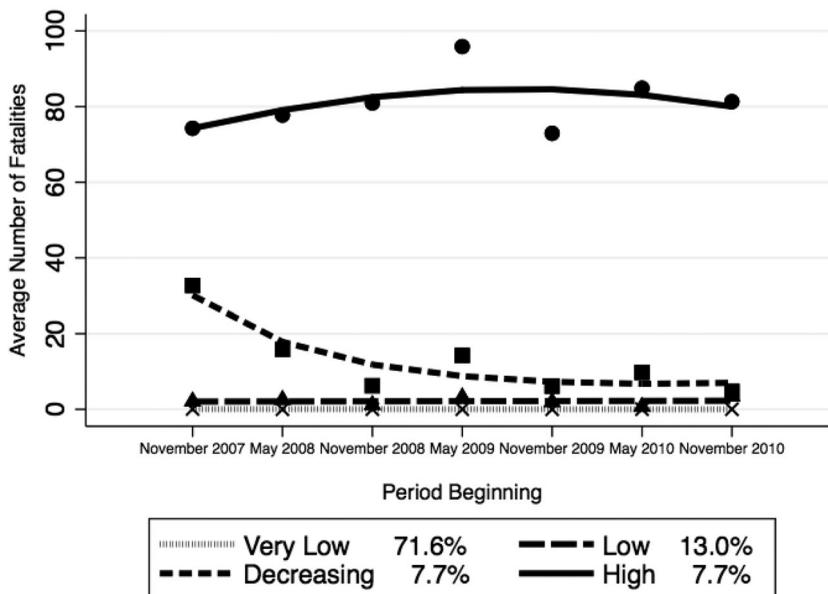
The present study also employs Group-based trajectory models (GBTM) to examine patterns of terrorist fatalities over time and allow for divergent trends across countries (Fisher & Becker, 2021). Introduced to the study of terrorism by LaFree et al. (2010), GBTM identifies clusters of nations that follow similar progressions of terrorist violence (trajectory groups). Stemming from this statistical approach, dual-trajectory models were also used for the following analysis as they also produce measures for the change and continuity in group-membership across these two time-periods by producing the probability for membership in each group after the death of bin Laden conditioned on group membership prior to May 2011. These two outputs are able to provide evidence of stability or change within global terrorism trends after the killing of Osama bin Laden. The output from these models can also be used to ascertain whether this targeted killing changed the terrorism fatality trajectory of specific nations such as the United States and other countries of interest. It is important to note however that consistent with previous applications of GBTM to terrorism, zero-inflated Poisson (ZIP) models with cubic functions were used to estimate country-level trajectories (Dugan & Yang, 2012; Fisher & Becker, 2021; LaFree et al., 2009; LaFree et al., 2010; Morris & Slocum, 2012; Nagin, 2005). In addition to replicating the dual-trajectory method used in Fisher and Becker (2021) that artificially breaks the data into two distinct periods, this study also examines the full seven-year period simultaneously in a single GBTM to examine whether any changes in terrorism fatality trends are an artefact of the cut point used to divide the observation period. If the killing of bin Laden was however influential for terrorist fatalities across nations, this study expects there to be changes in the trajectory of some groups in both the dual-trajectory models and the single GBTM.

## Findings

Focusing firstly on the period prior to the killing of bin Laden, the Bayesian Information Criterion (BIC) optimized analysis suggested that there were four distinguishable

groups for terrorist fatalities (see [Figure 1](#)) compared to the five that were detected for terrorist incidents (Fisher & Becker, 2021). Unsurprising given the low number of attacks in the majority of nations, it was also evident that the majority of countries (84.6%) fall in either the Very Low or Low trajectory groups for terrorist fatalities. It was also evident that there was a group of 16 countries that had a declining average number of terrorist fatalities during the initial time period (Burundi, Cameroon, Central African Republic, Chad, China, Ethiopia, Israel, Kenya, Lebanon, Mali, Myanmar, Nepal, Niger, Turkey, Uganda, West Bank and Gaza Strip). A full list of these countries can be found in [Table 1](#). A group of 16 countries was also detected as being part of the High terrorism fatalities group, with nine of these countries also being observed within the highest terrorism incidence group during this period according to Fisher and Becker (2021) (Afghanistan, Colombia, India, Iraq, Pakistan, Philippines, Russia, Somalia, and Thailand). Particularly of note, the Democratic Republic of the Congo, Iran, and Sudan were in the highest terrorist fatality group despite being in the Moderate terrorism incidence group in Fisher and Becker (2021).

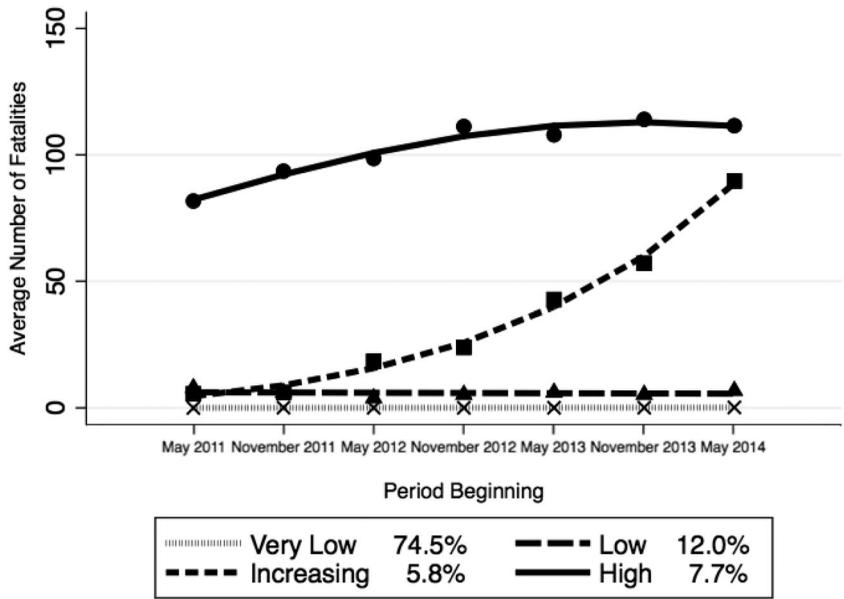
Four distinguishable groups were also detected following the death of bin Laden for terrorist fatalities. As displayed in [Figure 2](#) below however, the decreasing group observed in [Figure 1](#) was no longer evident and was instead replaced by an increasing group of 12 nations. Eight countries (Cameroon, Central African Republic, China, Lebanon, Mali, Turkey, Uganda, and the West Bank and Gaza Strip) were observed in both the Decreasing ([Figure 1](#)) and Increasing groups ([Figure 2](#)). For these specific countries, the period surrounding bin Laden’s death in May 2011 appears to have been the nadir in terrorist fatalities. The High group containing nations including Yemen and Pakistan also increases in terrorist fatalities following the killing of bin Laden. For the majority of nations contained



**Figure 1.** Group based trajectory model output for terrorist fatalities 2 November 2007–2 May 2011.

**Table 1.** Group Membership for Dual Trajectory Models (\* Indicates that group membership was higher and # indicates that group membership was lower after the targeted killing of Osama bin Laden).

Group 1 (Very Low)			Group 2 (Low)	Group 3 (Decreasing/ Increasing)	Group 4 (High)
Albania	Gambia	North Korea	Angola <sup>#</sup>	Burundi <sup>#</sup>	Afghanistan
Andorra	Germany	Norway*	Bangladesh	Cameroon	Algeria <sup>#</sup>
Antigua and Barbuda	Ghana	Panama	Belarus <sup>#</sup>	Central African Republic	Colombia
Argentina	Gibraltar	Papua New Guinea	Bhutan <sup>#</sup>	Chad <sup>#</sup>	Democratic Republic of Congo
Armenia	Grenada	Paraguay*	Egypt*	China	India
Australia	Guadeloupe	People's Republic of China	Eritrea	Ethiopia <sup>#</sup>	Iran <sup>#</sup>
Austria	Guatemala	Poland	Finland <sup>#</sup>	Israel <sup>#</sup>	Iraq
Azerbaijan	Guinea	Portugal	Georgia <sup>#</sup>	Kenya*	Nigeria
Bahamas	Guinea-Bissau	Qatar	Greece <sup>#</sup>	Lebanon	Pakistan
Bahrain*	Haiti	Republic of the Congo	Guyana <sup>#</sup>	Mali	Philippines
Barbados	Honduras	Romania	Indonesia	Myanmar <sup>#</sup>	Russia
Belgium	Hong Kong	Serbia	Ivory Coast	Nepal <sup>#</sup>	Somalia
Belize	Hungary	Seychelles	Liberia <sup>#</sup>	Niger <sup>#</sup>	Sri Lanka <sup>#</sup>
Benin	Iceland	Sierra Leone	Mauritania <sup>#</sup>	Turkey	Sudan
Bolivia	Ireland	Singapore	Mexico	Uganda	Thailand
Bosnia-Herzegovina	Italy	Slovak Republic	Morocco <sup>#</sup>	West Bank and Gaza Strip	Yemen
Botswana	Jamaica	Slovenia	Netherlands <sup>#</sup>		
Brazil	Japan	Solomon Islands	Peru		
Brunei	Jordan	South Africa*	Rwanda		
Bulgaria	Kazakhstan*	South Korea	Saudi Arabia		
Burkina Faso	Kosovo	South Sudan*	Senegal		
Cambodia	Kuwait	St. Kitts and Nevis	Spain <sup>#</sup>		
Canada	Kyrgyzstan	St. Lucia	Tajikistan <sup>#</sup>		
Cayman Islands	Laos	Suriname	United Kingdom <sup>#</sup>		
Chile	Latvia	Swaziland	United States		
Comoros	Lesotho	Sweden	Venezuela <sup>#</sup>		
Costa Rica	Libya*	Switzerland	Zimbabwe <sup>#</sup>		
Croatia	Lithuania	Syria*			
Cuba	Luxembourg	Taiwan			
Cyprus	Macau	Tanzania*			
Czech Republic	Macedonia	Togo			
Denmark	Madagascar	Trinidad and Tobago			
Djibouti	Malawi	Tunisia*			
Dominica	Malaysia	Turkmenistan			
Dominican Republic	Maldives	Ukraine*			
East Timor	Malta	United Arab Emirates			
Ecuador	Martinique	Uruguay			
El Salvador	Mauritius	Uzbekistan			
Equatorial Guinea	Moldova	Vanuatu			
Estonia	Montenegro	Vatican City			
Falkland Islands	Mozambique*	Vietnam			
Fiji	Namibia	Wallis and Futuna			
France	New Caledonia	Western Sahara			
French Guiana	New Hebrides	Zaire			
French Polynesia	New Zealand	Zambia			
Gabon	Nicaragua				



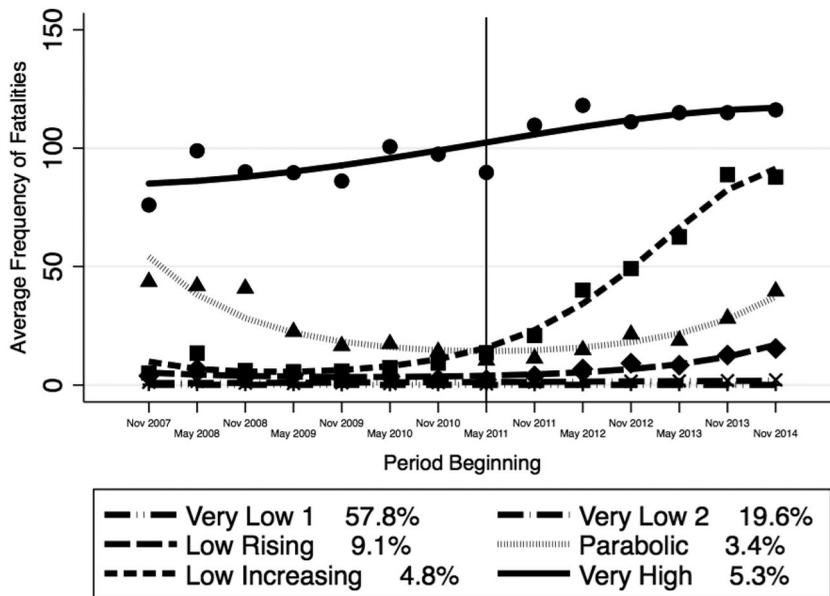
**Figure 2.** Group based trajectory model output for terrorist fatalities for 2 May 2011–November 2014.

in the Very Low and Low group once again it was evident that terrorist fatalities remained low and consistent through the entire observed seven-year period.

In order to see whether the transition from a Decreasing group to an Increasing group between these two models was artefact of the temporal cut point, and final group-based trajectory model was also run for the entire seven-year period. As evidenced by Figure 3 below, the post bin Laden increase in terrorist fatalities was still evident as exemplified by the Parabolic and Low Increasing groups. Particularly given that every group with the exception of the two Very Low groups saw increases in the average number of fatalities following May 2011 (marked by the vertical black line), this should be taken as further evidence that the trajectories of terrorist fatalities saw important changes at this point regardless of the estimation procedure. While it should be emphasized that many of the increasing trends for the High and Low Rising groups began before the killing of bin Laden, the actual average values for the Very High group indicate that terrorist fatalities had been decreasing for the 18 months prior to this event and then markedly increased afterward. Combined with these increasing trends emerging for other groups also beginning in the period beginning in May 2011, this is further evidence that the killing of Osama bin Laden may have been the catalyst for increased terrorist lethality for nations including the United States that was found to be in the Low Rising group.

### Group based trajectory analysis group membership

Notable changes in group membership following the targeted killing of Osama Bin Laden emerged. Following the killing, 7.14% (14) of the countries shifted trajectories upward – consistent with an increase in the number of fatalities in terrorist attacks per six-month



**Figure 3.** Group based trajectory model output for terrorist fatalities for 2 November 2007–November 2014.

period following the breakpoint. Notably, Egypt, Libya, South Sudan, and Syria were included in this escalating subset. Almost all of the countries in this subset (12) exhibited a shift from the ostensibly very-low incidence group to higher rate (Very Low group to the Low, Increasing, or High Groups). Further, Egypt moved up from the Low to the Decreasing group, whereas Kenya moved up from group the Decreasing to the High group. While most countries shifting upward only did so by one group (71.43%), similar to in the primary analysis, changes in trajectory group membership ranged from a 1 to 3 group upward shift following the breakpoint. Table 2 below presents group membership for each nation included in the primary analysis for terrorist fatalities. Due to the number of countries falling into the Very Low trajectory group in each dual trajectory model, the first three columns in each table reflect this group. For parsimony, each nation was only marked if it was observed to transition up (marked by \*) or transition down (marked by #) in both versions of this table.

Conversely, 13.27% (26) of the countries shifted trajectories downward, suggesting a decreased number of individuals killed in terrorist attacks per six-month period following the killing of Osama Bin Laden. Included in this subset of decreasing fatality countries were Iran, Israel, Spain and the United Kingdom. Important for claims of the deterrent value of targeted killings, the United States is missing from this subset. Most countries that shifted downward following the targeted killing were from group two (low; 61.54%), however another seven (26.92%) shifted down from group three (Decreasing) and three countries shifted downward from group 4 (High). Among those that switched to a lower group following the intervention, all but three of the countries in this subset shifted down by one group, with Chad and Iran shifting down by two groups and Sri Lanka shifting downward by three following the breakpoint.

The remaining 79.59% (156) countries experienced no discernible effect in the trajectory of fatalities from terrorist attacks per six-month period following the death of Osama Bin Laden. Among this stable subset are again Afghanistan, France, Germany, Iraq, Pakistan, and the United Arab Emirates. Importantly for assessing whether deterrent impacts may have been evidenced only for the nation carrying out the targeted killing, the United States was among these stable trajectory countries, remaining in group two (low) for both the pre and post-intervention periods.

## Discussion and conclusions

Echoing the previous empirical literature on targeted killings this study contributes to the evidence base that indicates that it is inaccurate to assume that targeted killings deter terrorist fatalities. Unlike previous studies however, the findings from this study display that targeted killings may have the potential to reverse existing decreasing fatality trends. Indeed, regardless of whether a cut point is statistically included in the model or not, the death of bin Laden coincided with increases in the number of terrorist fatalities for numerous countries which is more in line with previous observations of terrorist backlash (Argomaniz & Vidal-Diez, 2015; Dugan & Chenoweth, 2012; Fisher & Becker, 2021). Concordantly, while the United States was not observed to see any meaningful reductions in terrorist fatalities nor any direct deterrent benefits, this analysis suggests that this may have come at the cost of the escalation of terrorist violence in other nations. While it is important not to over interpret null findings in any statistical analysis, and particularly in both GBTM and DTM which do not allow for testing of hypotheses (Jones & Nagin, 2007), these findings failed to provide evidence consistent with general deterrence regardless of whether the geographic frame of reference was global or specific to the United States.

Cautiously extending these observations to the more contemporary case of the targeted killing of Ayman al-Zawahiri, these findings do not indicate that the July 2022 strike would likely serve as a general deterrent against terrorist violence either by the al Qaeda or other adversaries to the United States. Moreover, like in Fisher and Becker (2021) the present study portends possible negative repercussions for regional adversaries to al Qaeda. Indeed, recent political turmoil and humanitarian circumstances in Afghanistan, coupled with recent violence by the Islamic State provide initial indications that the July 2022 strike may have escalated violence rather than serving as a general deterrent (Faiez & Noroozi, 2022; Martinez & Gittleson, 2022). Returning to the theoretical backbone of this study, the potential for general deterrence stemming from the killing of al-Zawahiri via an over the horizon drone strike may be less than that of the killing of bin Laden. Insofar as general deterrence places importance on the swiftness of sanctions (Nagin, 2013), the additional ten-year delay in punishment meted out against al-Zawahiri serves as a weaker signal of deterrence than the already limited potential impact of killing bin Laden. While this is an empirical question deserving greater examination in the years to come, the fundamental similarities between bin Laden and his successor al-Zawahiri suggest that any deterrent impacts would be similar in magnitude and this study fails to provide evidence that expanding the scope of targeted killings would yield reductions in terrorist fatalities.

These findings further call into question the consistent claims made that targeted killing are able to reduce the frequency and lethality of global terrorism. Further,

**Table 2.** Group Based Trajectory Model Group Membership For Full Time Period (2007–2014).

	Group 1 (Very Low 1)	Group 2 (Very Low 2)	Group 3 (Low Rising)	Group 4 (Parabolic)	Group 5 (Low Increasing)	Group 6 (Very High)
Albania	Guinea	Serbia-Montenegro	Argentina	Bahrain	Algeria	Afghanistan
Andorra	Guinea-Bissau	Seychelles	Australia	Burundi	Democratic Republic of Congo	Colombia
Angola	Guyana	Sierra Leone	Austria	Cameroon	Greece	India
Antigua and Barbuda	Haiti	Singapore	Belarus	Central African Republic	Nepal	Iraq
Armenia	Hong Kong	Slovak Republic	Bosnia-Herzegovina	Chile	Sri Lanka	Nigeria
Azerbaijan	Hungary	Slovenia	Brazil	China	Libya	Pakistan
Bahamas	Iceland	Solomon Islands	Bulgaria	France	Sudan	Philippines
Barbados	International	South Vietnam	Canada	Georgia	Syria	Russia
Belgium	Jamaica	South Yemen	Chad	Indonesia	Turkey	Somalia
Belize	Kuwait	Soviet Union	Cyprus	Iran	Ukraine	Thailand
Benin	Kyrgyzstan	St. Kitts and Nevis	Czech Republic	Ireland	United Kingdom	Yemen
Bhutan	Laos	St. Lucia	Ecuador	Mali	West Bank and Gaza Strip	
Bolivia	Latvia	Suriname	Ethiopia	Mozambique		
Botswana	Lesotho	Swaziland	Germany	Myanmar		
Brunei	Liberia	Switzerland	Guatemala	South Africa		
Burkina Faso	Lithuania	Taiwan	Honduras	South Sudan		
Cambodia	Luxembourg	Togo	Italy	Spain		
Cayman Islands	Macau	Trinidad and Tobago	Ivory Coast	Tunisia		
Comoros	Madagascar	Turkmenistan	Japan	United States		
Costa Rica	Malawi	United Arab Emirates	Jordan			
Croatia	Malta	Uruguay	Kazakhstan			
Cuba	Martinique	Uzbekistan	Kosovo			
Czechoslovakia	Mauritius	Vanuatu	Macedonia			
Denmark	Moldova	Vatican City	Malaysia			
Djibouti	Montenegro	Vietnam	Maldives			
Dominica	Morocco	Wallis and Futuna	Mauritania			
Dominican Republic	Namibia	West Germany (FRG)	Mexico			
East Germany	Netherlands	Western Sahara	Niger			

(Continued)

**Table 2.** Continued.

	Group 1 (Very Low 1)		Group 2 (Very Low 2)	Group 3 (Low Rising)	Group 4 (Parabolic)	Group 5 (Low Increasing)	Group 6 (Very High)
East Timor	New Caledonia	Yugoslavia	Paraguay				
El Salvador	New Hebrides	Zaire	Peru				
Equatorial Guinea	New Zealand	Zambia	Rwanda				
Eritrea	Nicaragua		Saudi Arabia				
Estonia	North Korea		Senegal				
Falkland Islands	North Yemen		Serbia				
Fiji	Norway		Sweden				
Finland	Panama		Tajikistan				
French Guiana	Papua New Guinea		Tanzania				
French Polynesia	People's Republic of China		Uganda				
Gabon	Poland		Venezuela				
Gambia	Portugal		Zimbabwe				
Ghana	Qatar						
Gibraltar	Republic of the Congo						
Grenada	Rhodesia						
Guadeloupe	Romania						

the findings from this study do not indicate that there are potential empirical reasons to claim that general deterrence success is contingent upon the geographic frame of reference for terrorism stemming from the killing of bin Laden and targeted killings generally. Instead, this study highlights that many important terrorism impacts are not limited to specific national borders. These findings raise additional questions about how heterogeneous general deterrence impacts of counterterrorism policies may be distributed. Literature on general deterrence is rarely precise as to where and how deterrence benefits (or backlash) will be felt; this study suggests that similar uncertainty with respect to targeted killings needs to be explored. Evaluating these findings under the divergent counterterrorism goals of the GWoT and America First strategies, we would interpret this case as a failure and inconclusive respectively. While the targeted killing of Bin Laden yielded null or backlash impacts in most countries, the United States did not detect an observable change in terrorism fatalities. Thus, this paper highlights the need for careful consideration of what constitutes success for counterterrorism tactics and moreover, who may experience that success.

From a policy perspective, the increases in terrorism fatalities observed among strategic partners of the United States calls into question the bipartisan use of (and support for) this tactic under the guise of general deterrence. Though justifications may be conjured and deployed by leaders and supporters of the policy, and targeted killings have been justified for purposes other than deterrence (Bachmann & Haeussler, 2011; Braun, 2021; Wilner, 2010), this should not substitute an acknowledgement of the potential human impacts of the tactic. Moreover, given the available evidence of potential geographically heterogeneous escalation of fatalities, this tactic should be used sparingly if at all for the purposes of deterrence.

This study also had a number of notable limitations that necessitate the continued examination of the impacts of targeted killings on terrorism. Firstly, while GBMTs are able to observe diverging and dynamic patterns in global terrorism they are unable to directly test hypotheses. As such, while this study is able to observe that there was no evidence of deterrence in the United States and other important countries due to the flat or increasing number of terrorist fatalities, it is unable to make other firm conclusions or to isolate the causal impact of any independent variable. Specifically, future studies employing regression-based analyses should consider variables pertaining to governance changes (Chenoweth, 2013; Schmid, 1992), government counterterrorism actions (Bejan & Parkin, 2015; Dugan & Chenoweth, 2012), law and policy changes (Carson, 2014), economic conditions (Abadie, 2006; Benmelech et al., 2012), weapons availability (Carson et al., 2022), natural disasters and climate change (Agnew, 2010; Berrebi & Ostwald, 2011; Fisher & Dugan, 2021), and political representation (Ash, 2016) amongst others to better isolate the specific impact of targeted killings. Consequently, the findings from this study have more value in concert with the approach employed by Carson (2017), and other regression based analyses that are able to control for other important factors including other counterterrorism methods; geo-political changes; economic changes; military spending; and a host of other factors. However, given the consistency of the findings in this study with Carson (2017) and Fisher and Becker (2021), and across both GBTM methods that were employed, this study reaffirms that the killing of prominent terrorist leaders may only serve to escalate violence within these conflicts.

Looking forward, this study has further developed the groundwork for research examining the heterogeneous impacts of counterterrorism policy on subsequent terrorism. Further, critical considerations of the geopolitical and counterterrorism repercussions of 31 July 2022, killing of al-Zawahiri abound. The 18 August 2022 bombing of a prominent Kabul mosque by the Islamic State resulting in over 33 deaths demonstrates the human cost of the failures of general deterrence under the new 'over the horizon' counterterrorism regime (Faiez & Noroozi, 2022). Indeed, despite the oft-echoed justifications and declared successes, to date the empirical evidence remains in stark contrast to the heralded deterrent benefits of targeted killings.

## Notes

1. For the purposes of this study, terrorism is defined 'as the threatened or actual use of illegal force and violence by a nonstate actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation' (National Consortium for the Study of Terrorism and Responses to Terrorism, 2017). A more complete definition and its operationalization can also be found in the data and methods section.
2. It should be noted that the theory of deterrence also exists in other social science disciplines including political science, economics, and sociology. There are key differences in these theories regarding the nature of deterrence, however they are centered around the idea that if governments are able to demonstrate punishment or other threats that people will be less likely to engage in a sanctioned action (see Huth, 1999). This study highlights the importance of examining these disciplinary differences across deterrence theories, as well as the consequences this has had for counterterrorism itself, as this would help to extend and clarify the existing deterrence literatures in each discipline.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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