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An Empirical Study of Factors Influencing Drone Terrorist Attack Casualties

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ABSTRACT

Recognizing the pivotal role of casualties as a metric for assessing the success of terrorist acts, this study endeavors to unravel the underlying factors shaping the casualty count in drone terrorist attacks across the globe. By applying Zero Negative Binomial Regression Analysis on data sourced from the Global Terrorism Database, we discern significant factors influencing the number of terrorist casualties. Our findings reveal the paramount importance of the target facility's significance, the attack type, the utilization of remote-controlled drones, the deployment of suicide drones equipped with explosive payloads, and the audacious strategy of swarming drone attacks.

KEYWORDS

National Security, Drone Terrorism Attacks, Situational Crime Prevention, Target Factors, Weapons Factors

INTRODUCTION

Drones, which are formally referred to as unmanned aircraft systems (UASs) or unmanned aerial vehicles (UAVs), have instigated a technological revolution with sweeping implications for public safety (Patel & Rizer, 2019). Despite their initial acclaim for their diverse potential applications, the rapid integration of artificial intelligence (AI) has paradoxically positioned drones as a substantial menace to public safety, giving rise to instances of terrorism, criminal activities, and warfare on a global scale (Wang et al., 2021). In his seminal work *Drones and Terrorism: Asymmetric Warfare and the Threat to Global Security* published in 2018, N. Grossman coined the phrase democratizing smart bombs to underscore the cost-effective empowerment of nonstate actors in the Third World, including terrorist organizations and irregular forces (Grossman, 2018).

Recent developments have underscored the pressing nature of this issue. In 2022, the UN Security Council Counter-Terrorism Committee officially recognized drones as a significant, new terrorist threat to Western nations (UNOCT, 2022). Moreover, the 2023 "Terrorism Outlook" from the Counterterrorism Institute at the U.S. Military Academy at West Point highlighted the transformative role of Russian suicide drones, typified by the Iranian-manufactured Shahed-136 and the Turkish-produced Ukrainian TB-2, in the Ukraine–Russia conflict, colloquially known as "drone warfare" (Hoffman & Ware, 2022). According to the Global Terrorism Index (GTI) for

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2023, as analyzed by the Institute for Economics and Peace (IEP), a staggering 113 countries and 65 terrorist organizations, including Houthi rebels, ISIS, and Boko Haram, have incorporated drones weighing between 200 g to 50 kg into their arsenals as illicit tools for antiterrorism endeavors (IEP, 2023). In 2023, the world witnessed a notable surge in terrorism, with incidents increasing by 22% compared to the previous year, reaching levels not seen since 2017. Among these incidents, drone attacks played a significant role, resulting in casualties and drawing attention to the evolving threat landscape (IEP, 2024).

Drones have transcended their conventional roles encompassing search, surveillance, and filming, morphing into highly precise lethal instruments (Gaines & Kappeler, 2019; Enemark, 2019). Striking instances include a swarm drone assault in Colombia in August 2018, which claimed the lives of seven soldiers during an assassination attempt on President Maduro. Similarly, in November 2021, a drone-borne explosive device targeted Iraqi Prime Minister Haider al-Abadi, leading to the unfortunate demise of six security guards. The Ukraine–Russia conflict of 2022 witnessed a multitude of drone strikes, with casualty figures remaining undisclosed. Particularly noteworthy is the employment of a suicide drone in Ukraine in May 2023 intended to target the Russian Kremlin and assassinate President Putin. This event, triggering significant geopolitical tensions, exemplifies the capacity of drone-related incidents to instill fear and shock, thereby enhancing the effectiveness of terrorist organizations in advancing their political objectives (IEP, 2023). Despite the escalating global menace posed by lethal drone terrorism, empirical research on this subject remains limited. The primary challenge lies in deciphering terrorism patterns in affected regions and devising effective counterterrorism strategies.

As a response to this profound knowledge gap, this study seeks to empirically analyze global drone terrorism trends and forecast the factors influencing the number of terrorist casualties by adopting the framework of situational crime prevention (SCP), a well-established theory within the realm of criminology (Gill et al., 2020). In this study, we aimed to analyze the rational decision-making process of terrorists for drone terrorist attacks against the theoretical background of SCP. In particular, we analyzed what physical factors are considered in the decision-making process of drone terrorism in terms of human casualties. In the end, the research question was *What are the factors that influence the number of casualties in drone attacks?*

Through this empirical exploration, the study can provide invaluable insights for cultivating a deeper comprehension of the evolving global security predicament posed by drone terrorism. In pursuit of the study's objectives and to ascertain the factors influencing drone terrorism attacks from the vantage point of SCP, we conducted a comprehensive literature review. This section begins by scrutinizing existing studies to elucidate the concept of drone terrorism attacks and subsequently expounds on the tenets of SCP with a specific emphasis on the rational choice theory.

UNDERSTANDING THE CONCEPT OF DRONE TERRORISM ATTACKS

The expansion of drone threats from primarily military security to nonmilitary domains like terrorism and crime can be attributed to the unique attributes of drones, distinguishing them from traditional modes of attack (USCISA, 2020). Several contemporary instances of terrorism perpetrated using drones are outlined in Table 1.

The threat posed by Iran's drone capabilities at the global level has increased significantly in recent years, posing a major security challenge to the United States and its allies. The urgency of this threat was dramatically demonstrated by the 14 September 2019 attack on Saudi Arabia's Abqaiq oil processing facility and Quraysh oil field, and the 2023 Hamas terrorist attack. In particular, Saudi Arabia and Israel have been exposed as vulnerable to drone terrorist attacks despite the deployment of sophisticated air defense systems (JINSA, 2023).

Now we will discuss some notable drone-related incidents in 2023. In 2023, there was an increase in deadly drone terrorist attacks. On May 3, two suicide drones were shot down over the Kremlin in Russia. This incident was believed to be an attempt to assassinate President Putin. Additionally, on