

Lethal Precision Without Accountability: Israeli Government "Quadcopter" Use in Gaza

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Summary

In this article, the authors present a multi-faceted analysis of the deployment and impact of small tactical drones, or "quadcopters," equipped with semiautomatic small arms by the Israel Defense Forces (IDF) in Gaza. In any conflict zone, soldiers in the field routinely use a multitude of capabilities to apply lethal force against identified enemy combatants. However, the IDF's Gaza operations have raised serious concerns about civilian casualties.

The Israeli government use these small tactical drones as weapons of precision warfare – which proponents say could, in theory, reduce civilian harm. But rather than doing so in Gaza, the use of these weapons has likely increased civilian harm.

Four factors raise serious concerns about the IDF's use of these small tactical drones in regards to children in Gaza: 1) the high numbers of child casualties;² 2) testimony associating some of these casualties with tactical drone attacks;³ 3) direct observations and experience of medical doctors who have treated patients in Gaza;^{4/5} and 4) numerous social media posts and interviews of IDF soldiers admitting to targeting children.

The interdisciplinary team of authors of this report includes an emergency medical doctor with extensive experience treating patients on the ground in Gaza, a veteran special operations targeting and tactical expert and former Pentagon chief of civilian harm assessments, and the former director of the State Department's Office of Security and Human Rights.

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² UNICEF USA. (2025, May 30). *More than 50,000 children killed or injured in Gaza*.

<https://www.unicefusa.org/stories/more-50000-children-killed-or-injured-gaza>

³ White, M. (2024, November 13). *Gaza surgeon describes drones targeting children*. BBC.

<https://www.bbc.com/news/articles/c7893vpy2gqo>

⁴ Al Jazeera. (2025a, September 14). *Foreign doctors say Israel systematically targeting Gaza's children: Report*.

<https://www.aljazeera.com/news/2025/9/14/foreign-doctors-say-israel-systematically-targeting-gazas-children-report>

⁵ "We [were] operating on children who would say: 'I was lying on the ground after a bomb had dropped and this quadcopter came down and hovered over me and shot me.'" Nizam Mamode British Surgeon (White, 2024).

The analysis incorporates photographic evidence, medical imaging, and eyewitness accounts to provide a comprehensive examination of the subject. The authors will describe their observations of children arriving dead or severely injured in Gaza hospitals with gunshot wounds to the head and chest, and will analyze how this relates to a larger pattern of civilian harm seen in Gaza. They will discuss ballistic analysis showing that these types of projectiles can be fired from IDF/NATO-produced rifles and, through cases of patients treated by a co-author, demonstrate that the injuries are consistent with shots fired from small tactical drones.

The analysis suggests that the way these drones are employed in Gaza has negative strategic and tactical implications and raises serious questions about Israel's compliance with international humanitarian law. The article concludes with policy recommendations from a military perspective—including recommendations for the U.S. as a global leader in drone technology and the largest supplier of arms to Israel.

Introduction

The Israeli government's response to the October 7, 2023 Hamas attacks has consisted of a robust airstrike campaign and numerous ground operations in Gaza and the West Bank. This includes the employment of new battlefield technologies, specifically the use of single-soldier-deployed tactical drones that can identify and shoot individual targets with lethal precision from onboard small caliber weapons.

While drones have long been utilized in Middle Eastern war zones, their use has historically centered on large-scale, long-endurance platforms. In Gaza, while such drones continue to be employed in the air and ground campaign, evidence suggests the IDF has also increasingly fielded smaller, multi-rotor, so-called "quadcopter" drones that are single-soldier operated and equipped to carry rifles,⁶ grenade launchers,⁷ or single-shot ballistic weapons systems. These are unlike more traditional large- or medium-scale drones such as the United States' Predator or Reaper drones, which are expensive, incorporate advanced technologies, require teams of well-trained operators and maintenance crews, and have been available only to developed nations over the past two decades. By contrast, small tactical drones are relatively easily manufactured at extremely low cost and can be deployed by infantry units and launched and operated by a single soldier. This expanded utilization of small tactical drones represents not only an evolution in battlefield technology but also a worrisome shift in the operational norms of lethal targeting.

Medical imaging and forensic analysis of deaths and injuries treated by co-author Dr. Mimi Syed and her colleagues in Gaza between August and September 2024 suggest a

⁶ Shoaiab, A. (2022, January 23). *Israel: Drone that can fire a sniper rifle while flying developed*. Business Insider. <https://www.businessinsider.com/israel-drone-that-can-fire-a-sniper-rifle-while-flying-developed-2022-1?op=1>

⁷ Reiff, B. (2025, July 10). *Israel enforcing Gaza evacuations with grenade-firing drones*. +972 Magazine. <https://www.972mag.com/drones-grenades-gaza-chinese-autel/>

pattern of highly precise and troubling applications of lethal force utilizing small tactical “sniper” drones against children. Wound assessment morphology demonstrates that these shots were made at a particular angle and with a specific type of projectile. Ninety percent of the 18 cases of child death or injury by gunshots documented by Dr. Syed were reported to be fired by quadcopters, per witnesses who brought the injured or killed children into the hospital. Most of the wounds were caused by single small caliber rounds to the head, neck, chest, or abdomen. Given this pattern of single-shot precision, these types of wounds strongly suggest targeting that fails to discriminate civilians from combatants.

There have been longstanding concerns about gunshot wounds to children in Gaza.⁸ Per a 2024 *New York Times* investigation, out of 65 American doctors who worked in Gaza, 44 reported seeing multiple children admitted with gunshot wounds to the head or chest while respectively working at different hospitals and during different periods in the conflict.⁹ The exact number of children killed or injured from gunshot wounds, including by tactical drones, is not possible to know, in part because the Israeli government does not allow foreign journalists and independent investigators to enter Gaza. Additionally, the Israeli government’s destruction of the health care infrastructure has made any accurate documentation of these numbers impossible.¹⁰ Therefore, doctors who have been allowed entry to Gaza, including one of the co-authors, are currently the best available sources of information.

An *Al Jazeera* investigation documented testimony from 20 American physicians who volunteered in Gaza’s hospitals, including a co-author Dr. Mimi Syed, who all reported treating children in the emergency room with gunshot wounds, “often to the head and chest.”¹¹ As Neta Crawford points out in *Accountability for Killing*, “The unintended deaths of civilians in war are too often dismissed as unavoidable, inevitable, and accidental.”¹² Israel’s repeated strikes on schools, hospitals, and refugee camps—despite IDF acknowledgement of civilian presence—align with Crawford’s critique of foreseeability. For example, the IDF’s leaflet warnings are often ineffective in Gaza’s dense urban areas as directions and guidance are often confusing, some civilians are unable or unwilling to evacuate, the short evacuation windows frequently result in civilians being killed while attempting to evacuate, and the IDF often attacks supposed “safe” zones. This indicates a

⁸ Palestinian Centre for Human Rights. (2025, January). *Generation wiped out: Gaza’s children in the crosshairs of genocide*. <https://pchr.org/wp-content/uploads/2025/01/Generation-Wiped-Out.pdf>

⁹ Sidhwa, F. (2024, October). *65 doctors, nurses and paramedics: What we saw in Gaza*. The New York Times. <https://www.nytimes.com/interactive/2024/10/09/opinion/gaza-doctor-interviews.html>

¹⁰ Stamatopoulou-Robbins, S. (2024, October 7). *The human toll: Indirect deaths from war in Gaza and the West Bank, October 7, 2023 forward*. Costs of War, Watson School for International and Public Affairs. Brown University. <https://costsofwar.watson.brown.edu/paper/human-toll-indirect-deaths-war-gaza-and-west-bank-october-7-2023-forward>

¹¹ Al Jazeera. (2025b, March 27). *Kids under fire: Al Jazeera English’s fault lines investigates Israeli military shootings of children in Gaza*. <https://www.aljazeera.com/video/fault-lines/2025/3/27/kids-under-fire-2>

¹² Crawford, N. (2013). *Accountability for killing: Moral responsibility for collateral damage in America’s post-9/11 Wars*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199981724.003.0001>

failure to mitigate foreseeable harm. As Crawford states, "If we can foresee harm, then we have a duty to find ways to mitigate it."¹³

Although there has been media coverage on the use of lethal force by small tactical drones in Gaza, including a 2024 report by *EuroMed Human Rights Monitor*,¹⁴ no reports have yet been published with an interdisciplinary and methodologically rigorous approach such as this one. This report's in-depth analysis of small tactical drone technology, employment and targeting methodologies, medical and forensic analysis, and legal implications of their use in Gaza, sheds new light on this pressing international issue of civilian harm in armed conflict. And because such tactical drones are an emerging military technology, it also serves as an important guide toward employment of tactical drones that conforms to international humanitarian law in conflict worldwide.

This article answers three sets of interrelated questions:

1. Medical and forensic analysis: What can medical, forensic and eyewitness evidence about specific cases of child injuries reveal about how and with what weaponry children in Gaza are being injured and killed? How can we understand these injuries in the context of larger patterns of deaths as well as destroyed healthcare facilities in Gaza?
2. Tactical and operational dynamics: What are the capabilities of small tactical drones and in what context are they used in Gaza?
3. Conclusion and recommendations: How can we understand the operation of lethal tactical drones by small forward units in dense urban environments in the context of international humanitarian law? What steps should the international community, and nations including the U.S., take to manage the use of tactical drones and ensure accountability for their misuse?

To address these questions, we adopt an interdisciplinary methodology. Dr. Mimi Syed, a physician with direct experience in Gaza, provides reports by eyewitnesses who brought in the patients she treated and analyzes clinical records, imaging, and post-mortem exam results to provide a medical account of drone-related injuries. Wes J. Bryant, a former U.S. Air Force special operations targeting expert and Pentagon advisor on precision warfare and civilian harm mitigation, examines the tactical integration of armed drones drawing on his knowledge of command-and-control structures and targeting protocols, and conducts ballistic forensic analysis of cases presented. Charles O. Blaha, a retired former 32-year State Department official, uses his experience to analyze IDF practice in terms of international humanitarian law in the current war in Gaza. Stephanie Savell is Director of Costs of War and provided substantial intellectual contributions to the conceptual framework of the paper and critical revisions. This combined approach moves beyond anecdotal evidence and evaluates the subject within its many technological, operational, medical, and legal dimensions.

¹³ Crawford, N. (2013), 11.

¹⁴ Euro-Med Human Rights Monitor. (2024, February 19). *Gaza: Israel systematically uses quadcopters to kill Palestinians from a close distance*. ReliefWeb. <https://reliefweb.int/report/occupied-palestinian-territory/gaza-israel-systematically-uses-quadcopters-kill-palestinians-close-distance-enar>

The implications of tactical drone utilization in war and conflict are urgent issues in regard to Gaza and beyond. As small tactical drones become increasingly accessible, their use without clear doctrine, systematic training, and robust accountability measures to protect civilians threatens to establish a dangerous international precedent. The IDF's deployment of these systems risks normalizing the concept and practice of individual soldiers and small units wielding lethal precision force against civilians with minimal oversight and complete impunity. This threatens to erode long-standing humanitarian norms in conflicts, lowering the threshold for the military use of lethal force and increasing civilian casualties.

1. Medical and Forensic Analysis

Extreme Civilian Toll with Disproportionate Child Casualties

The humanitarian consequences of Israel's military reaction to the attacks of October 7, 2023 have been cataclysmic. According to the Gaza Ministry of Health (GMH), as of May 2026 over 72,000 Palestinians have been killed,¹⁵ a number collected from hospital records and family reports. GMH casualty figures, which do not distinguish between civilians and combatants, are imperfect due to the breakdown of Gaza's medical and civil registration systems but have nonetheless been recognized as reliable estimates by international organizations, such as the World Health Organization and the United Nations. As well, GMH reporting on casualties has been supported by separate accounts by journalists, foreign aid workers on the ground, UN officials and representatives, and other global organizations.

Further corroborating these figures, after years of public denial, Israel recently acknowledged that at least 70,000 Palestinians have been killed by the Israeli military since the start of the conflict. Israel states that it is reviewing how many of those reported dead have been civilians. However, just before the October ceasefire, the Israeli military claimed that it had killed 22,000 combatants.¹⁶ This means that, by Israel's own count, at least 70% of those killed in Gaza have been civilians. Further, GMH figures likely severely undercount civilian deaths.¹⁷ The destruction in Gaza has left thousands of bodies unaccounted for beneath rubble, and ongoing indirect casualties, such as those resulting from malnutrition, preventable disease, destruction of health care facilities, and poor sanitation have been difficult to quantify.

Former IDF Chief of Staff Herzi Halevi admitted in September 2025 that more than 200,000 Palestinians had been killed or injured since October 2023. And in August 2025,

¹⁵ United Nations Office for the Coordination of Humanitarian Affairs. (2026, May 6). *Reported impact snapshot, Gaza Strip*. <https://www.ochaopt.org/content/reported-impact-snapshot-gaza-strip-6-may-2026>

¹⁶ Fabian, E. (2026, January 29). *IDF believes 70,000 Gazans killed in war, as claimed by Hamas; civilians-combatant ratio unclear*. The Times of Israel. <https://www.timesofisrael.com/idf-believes-70000-gazans-killed-in-war-as-claimed-by-hamas/>

¹⁷ ICRC. (2026). *Proportionality: How does law protect in war?* https://casebook.icrc.org/a_to_z/glossary/proportionality

leaked IDF intelligence data indicated that 83% of the 53,000 deaths recorded by May of that year were civilians. At the current official death toll of over 72,000, this represents nearly 3.3% of Gaza's 2.2 million population at the start of the war.¹⁸ A recent study suggests an even higher death toll, with findings that over 75,000 Palestinians had been killed within the first 16 months of the war alone, likely leading to well over 100,000 casualties to date.¹⁹ Experts assess this would bring the current civilian casualty rate to between 4-5% of Gaza's population.²⁰

These well-corroborated civilian casualty estimates, taken together with the Israeli military's own recent acknowledgement of the civilian death toll in Gaza, suggest a minimum ratio of civilians-to-combatants killed in Gaza of 3-to-1. This severely undermines Prime Minister Netanyahu's own public assertion of an "astoundingly low" civilian casualty ratio and underscores the highly disproportionate burden borne by civilians in Gaza.²¹

The many well-documented, multi-agency investigated incidents in which verified civilian deaths from Israeli attacks have numbered in the dozens, and even hundreds,²² further strengthens the credibility of this intelligence.

As early into the conflict as March 2024, 13,000 children had already been killed in Gaza. This surpassed the number of children killed in conflicts worldwide from 2019 to 2022.²³ As of May 2026, according to the Gaza Ministry of Health, 21,283 of the recorded deaths in Gaza—nearly 30%—have been children.²⁴

¹⁸ Borger, J. (2025, September 12). *We took the gloves off: ex-IDF chief confirms Gaza casualties over 200,000*. The Guardian. <https://www.theguardian.com/world/2025/sep/12/israeli-ex-commander-confirms-palestinian-casualties-are-more-than-200000>; Abraham, Y. (2025, August 21). *IDF database suggests 83% of Gaza dead were civilians*. +972 Magazine. <https://www.972mag.com/israeli-intelligence-database-83-percent-civilians-militants/>; Palestinian Central Bureau of Statistics (PCBS). (2025). *The Palestinian Central Bureau of Statistics (PCBS) presents a brief on the status of the Palestinian people at the end of 2025*. <https://www.pcbs.gov.ps/site/512/default.aspx?lang=en&ItemID=6137>; Penn-Barwell, J. G., et al. (2015). High velocity gunshot injuries to the extremities: management on and off the battlefield. *Current Reviews in Musculoskeletal Medicine*, 8(3), 312–317. <https://doi.org/10.1007/s12178-015-9289-4>

¹⁹ Burke, J. (2026, February 18). *Gaza death toll for first 16 months of war far higher than reported, says peer-reviewed study*. The Guardian. <https://www.theguardian.com/world/2026/feb/19/gaza-death-toll-higher-than-reported-lancet-study>

²⁰ The Economist. (2025, May 8). *How many people have died in Gaza?* <https://www.economist.com/interactive/middle-east-and-africa/2025/05/08/how-many-people-have-died-in-gaza>

²¹ Times of Israel Staff. (2025, September 26). *Full text of Netanyahu's speech: We won't let the world shove a terror state down our throat*. <https://www.timesofisrael.com/full-text-of-netanyahus-speech-we-wont-let-the-world-shove-a-terror-state-down-our-throat/>

²² Bryant, W. J. (2024, January 10). *I led strike cells against ISIS — Israel's strike campaign in Gaza is unacceptable*. The Hill. <https://thehill.com/opinion/national-security/4397982-i-led-strike-cells-against-isis-israels-strike-campaign-in-gaza-is-unacceptable/>

²³ UN News. (2024, March 13). *Gaza: Number of children killed higher than from four years of world conflict*. <https://news.un.org/en/story/2024/03/1147512>

²⁴ United Nations Office for the Coordination of Humanitarian Affairs. (2026, May 6). *Reported impact snapshot, Gaza Strip (06 May 2026)*. <https://www.ochaopt.org/content/reported-impact-snapshot-gaza-strip-6-may-2026>

A New Category of Battlefield Injuries

The use of armed tactical drones in the Gaza Strip since the beginning of the conflict has introduced a new category of battlefield injuries and forensic evidence that warrants dedicated medical scrutiny. While explosive and ballistic trauma has long been a feature of warfare in densely populated areas, the mechanisms of injury associated with small drone-delivered munitions—which are often designed or adapted for close-quarters engagement—have created new diagnostic, surgical, and psychological challenges. This section draws on case-based evidence, surgical reports, and sketches based on actual photographs to analyze the physical and psychological effects of drone strikes on civilians, with an emphasis on pediatric vulnerability and broader public health consequences.

Eyewitness testimony, along with gunshot wound assessment and morphology and medical imaging, suggest a pattern of highly precise and deeply troubling applications of force against children. In 18 documented cases of gunshot wounds to children, all witnessed and treated by a co-author, injuries were sustained to the head, neck, or chest, by single, small caliber rounds. According to the eyewitnesses who brought these children to the hospital, most of the shootings occurred not amid active combat but while children were walking, playing, or doing other benign activities. Furthermore, many child casualties occurred without any associated adult casualties, which undermines the claim they were unintended collateral damage from strikes on lawful combatants.

It is unreasonable to imagine the IDF considered these children to be combatants. While reports suggest that Palestinian children have historically been subjected to militarized forms of indoctrination to support the ideology of Hamas,²⁵ an ideological alignment or even family affiliations do not constitute combatant status. And, while older children (minor teens) have been documented as being used as lookouts, informants, scouts, and sometimes even as fighters, suicide bombers, and human shields,²⁶ these are exceptions rather than the norm and there is no evidence that children as young as those routinely killed and injured in Gaza,²⁷—even toddlers and infants—are being used by Hamas as child soldiers in any capacity.

Further, given the context provided by eyewitnesses, combined with ballistic analysis, the potential that these children are casualties of the “fog of war” or stray battlefield bullets is highly unlikely. The munitions and targeting experts coauthoring this article note that, based on their real-world experience, accidental or stray single gunshot wounds to children at such precision and at such scale is improbable. Medical and forensic

²⁵ Jerusalem Institute of Justice. (2025). *Child soldiers in Gaza – Factsheet*. <https://jij.org/advocacy-materials/child-soldiers-gaza/>

²⁶ The Borgen Project. (2023, July 6). *The use of child soldiers in Palestine*. <https://borgenproject.org/child-soldiers-in-palestine/>

²⁷ The Times of Israel. (2025, July 30). *Washington Post lists names of 18,500 Palestinian children said killed in Gaza war*. https://www.timesofisrael.com/liveblog_entry/washington-post-lists-names-of-18500-palestinian-children-said-killed-in-gaza-war/

evidence strongly suggest that there are multiple cases of well-targeted, single-round shots against children, many by tactical drones, which will be further discussed in the next section.

Other eyewitness accounts bolster concerns about armed drones targeting civilians. In one instance, profiled by *Al Jazeera* in December 2025,²⁸ a 70-year-old woman and her son were chased by a quadcopter drone about one kilometer (roughly a half mile) from the so-called Yellow Line—Israeli's new military demarcation line under the current ceasefire—and were “left there to bleed to death” as the aircraft continued hovering overhead preventing anyone from reaching them. In another account, profiled by *New York Magazine*,²⁹ an armed drone shot a 35-year-old woman to death next to her 4-year-old son as she was drying laundry on her balcony.

Given their technological capabilities, the low altitude and close-in operation of these drones, in theory, should allow for precision strikes against confirmed combatants with minimal collateral damage. However, as will be discussed in further detail, the IDF's use of such drones for targeted lethal strikes appears, at the very least, to consistently fail to discriminate between civilians and combatants and targeting decisions appear often unrelated to the international humanitarian law concept of military necessity. The evidence presented in this report raises legal concerns about targeted use against civilians, especially children.³⁰

Trauma Patterns in Five Case Studies

As highlighted previously, children represent a disproportionate number of casualties in Gaza.³¹ As of December 2025, according to the Gaza Ministry of Health, nearly 30% of casualties in Gaza have been children. While the majority of these casualties have been from air or artillery strikes, single and precisely-placed gunshot wounds in children are unnaturally commonplace in Gaza, as shown in the testimony given by 65 American healthcare workers who served there.³² Witnesses (usually family members or bystanders) who brought these children into the hospital frequently reported hearing and seeing small drones and gunshots being fired from them during the incident. In one video captured by a

²⁸ Ali, F. (2025, December 6). *Israeli drone chases and kills elderly woman as attacks continue in Gaza*. Al Jazeera. <https://www.aljazeera.com/amp/news/2025/12/6/israeli-drone-chases-and-kills-elderly-woman-in-gaza-as-attacks-continue>

²⁹ Mhawish, M. (2025, December 3). *Watched, tracked, and targeted: Life in Gaza under Israel's all-encompassing surveillance regime*. New York Magazine. <https://nymag.com/intelligencer/article/watched-tracked-targeted-israel-surveillance-gaza.html>

³⁰ UN Commission of Inquiry. (2025). *Commission of Inquiry: Israeli authorities and Israeli security forces have committed and are continuing to commit genocide against the Palestinians in the Gaza Strip - Conference room paper (A/HRC/60/CRP.3)*. <https://www.un.org/unispal/document/commission-of-inquiry-report-genocide-in-gaza-a-hrc-60-crp-3/>

³¹ Save The Children. (2025, September 6). *GAZA: 20,000 children killed in 23 months of war - more than one child killed every hour*. <https://www.savethechildren.net/news/gaza-20000-children-killed-23-months-war-more-one-child-killed-every-hour>

³² Sidhwa, F. (2024, October). *65 doctors, nurses and paramedics: What we saw in Gaza*. The New York Times. <https://www.nytimes.com/interactive/2024/10/09/opinion/gaza-doctor-interviews.html>

co-author, bystanders brought a deceased child in with a single through-and-through gunshot wound to the neck. When asked what happened, they stated, “Quadcopter.”³³

As previously discussed, one coauthor documented 18 cases of children with single gunshot wounds suspected to be inflicted by tactical drones in one month alone (August–September 2024). Dozens more similar casualties were seen by this co-author, but due to the urgency of treating critical patients and the chaos of mass casualty incidents, only 18 cases were thoroughly documented. For example, in August 2024, during a mass evacuation in Al-Mawasi Khan Yunis, when the streets were heavily populated with civilians and the IDF did not have a ground presence, there were days when at least seven children were brought into the emergency department with single gunshot wounds to the head within the span of a few hours. These children were brought into the emergency department either along with other children who had similar injuries, or by themselves with no one else around them having been targeted.

The authors analyze five specific cases that occurred from August to September 2024, reported by witnesses and verified through imaging and post-operative reports. The Appendix B at the end of this report contains radiological images or forensic sketches of photographs for each case.

- Case 1: *Mira Al-Dariny*, a 4-year-old girl, was critically injured in Khan Yunis in August 2024 when a bullet penetrated her head and became lodged in her brain. She underwent an emergency craniotomy and survived.
- Case 2: a 14-year-old girl was shot in the neck in August 2024 in Al-Mawasi, with witnesses reporting presence of a quadcopter outside of their tent. The bullet entered through the lateral portion of the neck and remained lodged in the spinal cord. She survived but suffered severe neurological damage due to the proximity of the bullet to the spinal cord.
- Case 3: a 7-year-old boy was shot by a quadcopter in August 2024, in a designated humanitarian zone while no one else in the vicinity was shot. As with the patient in case 2, the bullet remained lodged in the child’s neck but was left in place, as removing it would have posed far too much risk.
- Case 4: a 14-year-old girl was admitted to Nasser Hospital in August 2024. Her family, who brought her in via ambulance, reported that she was shot by a quadcopter while along a road in Khan Yunis. She arrived dead on arrival and thus no CT scan was accomplished.
- Case 5: a 3-year-old boy was brought dead into Nasser Hospital in August 2024 after being shot in the head by a reported quadcopter and subsequently run over by a car

³³ Al Jazeera. (2025b, March 27). *Kids under fire: Al Jazeera English’s fault lines investigates Israeli military shootings of children in Gaza*. <https://www.aljazeera.com/video/fault-lines/2025/3/27/kids-under-fire-2>

after the IDF had issued evacuation orders and the streets were filled with panicked civilians.³⁴ This case also illustrates a common pattern of children arriving alone at hospitals—from supposed "safe zones"—with single gunshot wounds, as routinely witnessed by medical staff including the coauthor, and as reported in media investigations.³⁵

Ballistic analysis of these five cases is useful in investigating how and with what weaponry these children were killed or injured. These cases provide evidence of certain types of trauma patterns that suggest these children were shot by IDF quadcopters. This casualty pattern likely extends beyond these five cases to many other cases of children killed and injured by Israeli military action, as described in the previous section.

Ballistic analyses of projectiles from these cases indicate injury from fully metal jacketed 5.56x45mm NATO rounds. In contrast with the 7.62x39mm rounds used in Hamas' small arms arsenal,³⁶ 5.56mm rounds are commonly used by both American and Israeli forces. These are small caliber, high-velocity rounds—which can be fired from rifles mounted on small tactical drones. These rounds cause devastating tissue damage in children especially, due to their smaller anatomy, as they create a cavitation in their wake.³⁷

5.56mm fully jacketed rounds are designed to remain intact and penetrate a target with little or no deformation to the bullet.³⁸ In the case of impact with soft tissue or even the developing skull of a small child, these bullets can often remain mostly undeformed. Further, as can be seen in the imagery and sketches in several cases, bullets may not always penetrate completely through a target. The type of tissue the bullet is passing through, and the surface area of the bullet presented to the tissue, can lead to more rapid deceleration and loss of kinetic energy and result in the bullet remaining lodged.³⁹ This is evidenced in the images presented in cases 1–3. The risk of lodgment is exacerbated if the shots were fired from a distance near or beyond the maximum effective range of the given weapons system, which can result in a significant loss of velocity before impact. As well, bullet tumbling—or the rapid turning of the bullet upon tissue penetration—is also a

³⁴ This child was treated by one of the co-authors at Nasser Hospital in August 2024 during evacuation orders.

³⁵ Wilkins, B. (2025, September 15). *Volunteer doctors describe how Israeli troops 'deliberately targeted' Gaza children*. Common Dreams. <https://www.commondreams.org/news/doctors-describe-gaza-children-shot-in-head>

³⁶ Associated Press. (2024, January 15). *Hamas fights with patchwork of weapons built by Iran, China, Russia and North Korea*. Politico. <https://www.politico.com/news/2024/01/15/hamas-fights-with-patchwork-of-weapons-built-by-iran-china-russia-and-north-korea-00135641>

³⁷ Penn-Barwell, J. G., et al. (2015). High velocity gunshot injuries to the extremities: Management on and off the battlefield. *Current Reviews in Musculoskeletal Medicine*, 8(3), 312–317. <https://doi.org/10.1007/s12178-015-9289-4>

³⁸ Ditkofsky, N., et al. (2023, January). Understanding ballistic injuries. *Radiologic Clinics of North America*, 61(1), 119–128. <https://doi.org/10.1016/j.rcl.2022.08.005>

³⁹ Penn-Barwell, J. G., et al. (2015).

characteristic of non-deforming fully metal jacketed rounds,⁴⁰ as seen in case 3. This can have an even more devastating impact on surrounding tissue than a bullet simply passing straight through.

In cases 1–3, it is evident that the bullets entered the patients at steeper angles than that which would commonly be observed in gunshot wounds from snipers firing from ground level or even from an elevated position. Given entrance wound pathology and the relationship between the entrance wounds and the final resting point of the bullets, as well as bullet orientation, the bullets in cases 1-3 appear to have entered at between approximately 30- and 60-degree impact angles. This is consistent with the ballistics expected from a bullet fired via a tactical drone that is situated well above and at an angle from its intended target. Gunshots from snipers or other sources of ground fire will typically have trajectories well under 30 degrees, especially in locations such as Gaza where the terrain is generally flat. Notably, higher impact angles may also increase the amount of tissue a bullet must traverse through before exiting, thus boosting the possibility of deceleration and lodgment as seen in the cases presented.⁴¹

The images in the case studies constitute evidence that has not previously been discussed in other research, investigations, or reports. They depict the angle, entry point, and composition of bullets found in children wounded or killed in Gaza. Taken together with the eyewitness testimony surrounding these and similar cases, this forensic evidence suggests injuries caused by quadcopters with single shot capability.

Limited Medical Supplies, Destroyed Healthcare Infrastructure, and Psychological Trauma

The devastating medical impact of these wounds is compounded by the severe scale of damage to Gaza's hospitals and medical infrastructure from air and artillery strikes, as well as the shortage of medical equipment and supplies caused by the IDF's routine blocking of humanitarian assistance. Firsthand testimonies from foreign doctors who worked in Gaza confirm that the lack of equipment and medication needed for surgeries prevented them from delivering lifesaving care. In one testimony, a doctor stated:

I was in the pre-op area when she was wheeled in—a tiny, 7-year-old girl, screaming at the top of her lungs. That's when I saw that she only had half her leg. She was grabbing in desperation at the physician who was standing next to her and asking over and over again for anesthesia drugs. We rushed her into the operating room, despite knowing that the anesthesiologist does not have anesthesia drugs to give her, and he does not have sedation medicines to get her sedated or control her pain. As this little girl screams and writhes on the stretcher, the anesthesiologist just

⁴⁰ Stefanopoulos, P.K., Aloizos, S., Mikros, G. et al. (2024, December 3). Assault rifle injuries in civilians: ballistics of wound patterns, assessment and initial management. *European Journal of Trauma and Emergency Surgery*, 50, 2741–2751. <https://doi.org/10.1007/s00068-024-02537-4>

⁴¹ Phillips, G. (2025, June 12). *Forensic pathology of firearm wounds*. Medscape. <https://emedicine.medscape.com/article/1975428-overview#a15?form=fpf>

starts singing softly to her, like a lullaby. He knows that's all the comfort he can offer her.⁴²

Bahaa Zaqout, director of external relations at PARC, a Palestinian NGO that tracks aid entry, told the *Middle East Eye* after the ceasefire was implemented in October 2025, "You cannot even find paracetamol [acetaminophen]. Even the *simplest* medication is not available in pharmacies and hospitals."⁴³ The Israeli government has denied entry of even basic medical equipment into Gaza. In December 2025, Dr. Hassan Kapasi testified that, while he was attempting to enter Gaza for a medical mission, he was denied entry when arriving at the Israeli checkpoint. He also had his stethoscope taken away and was told by the IDF, "You use your stethoscope to listen to other people's hearts, therefore it is not a personal item, and you cannot bring it in."⁴⁴

Field hospitals have reported increased reliance on manual wound probing and exploratory surgery due to the lack of reliable imaging available. In environments with frequent electricity outages and damaged infrastructure, CT and MRI facilities are often unavailable or inoperable. As a result, bullet detection and damage assessments rely heavily on X-ray films and ultrasonography—modalities which are poorly suited for complex munition mapping. For example, when one of the authors was at Al-Aqsa Hospital in central Gaza, due to the lack of CT scan capability which would otherwise have been indicated, doctors relied on X-rays to detect the bullet lodged in an eight-year-old's abdomen that was reportedly shot from a sniper. The X-ray was not successful, and a high-risk exploratory laparotomy had to be performed to extract the bullet without certainty of its location.

The use of tactical drones against civilians adds another layer of burden to the already cascading series of health system destruction in Gaza. Where hospitals operate under siege conditions and critical medical supplies are restricted, even marginal increases in trauma burden can push facilities beyond their breaking point. By adding to this the prevalence of the use of persistent low-yield-munitions in civilian areas, tactical drone warfare prolongs the duration of combat exposure for civilians and prevents health infrastructure from adequately responding to larger-scale attacks.

Moreover, the psychological dimension of drone warfare—its capacity to instill fear, limit movement, and degrade mental health—compounds the physiological injuries observed in clinical settings. From a humanitarian perspective, the integration of tactical drones into ground operations thus constitutes a multi-layered threat that extends well

⁴² Physicians for Human Rights. (2025). "We could have saved so many more": Anguish and death caused by Israel's restrictions on medical supplies in Gaza. <https://phr.org/our-work/resources/we-could-have-saved-so-many-more-anguish-and-death-caused-by-israels-restrictions-on-medical-supplies-in-gaza/>

⁴³ Hearst K. (October 2025). 'Nothing has changed': Gaza health workers report almost no medical aid entering the strip. *Middle East Eye*. <https://www.middleeasteye.net/news/nothing-has-changed-gaza-health-workers-report-almost-no-medical-aid-entering-strip>

⁴⁴ Humanity Auxillum [@humanityaux]. (2025, December). *Doctors' testimony* [Reel]. Instagram. <https://www.instagram.com/reel/DSU9j5WjUcS/>

beyond their kinetic impact. This is especially the case with children, where the mere sound of a drone can instill fear and lifelong psychological trauma.

2. Tactical and Operational Dynamics

Quadcopters in the Context of Unmanned Aircraft Systems

Unmanned aircraft systems (UAS) are separated under U.S. military classification into five groups by such factors as weight, operating altitude, and airspeed.⁴⁵ Medium and large drones fall within groups 2 through 5.⁴⁶ These drones are typically controlled remotely, from rear command centers or other locations removed from the forward battlefield, their operational use characterized by extensive target development and verification processes and targeting and strike approval that requires specific and often higher authorizations.

“Quadcopter” drones are different, in that they are rapidly deployable, single-soldier-capable systems. These drones fall within UAS Groups 1 and 2—small tactical drones able to operate at very low altitudes and weighing under 55 pounds. NATO has a similar classification system but uses only three categories, within which these systems fall into Class 1.⁴⁷ These drones are further defined as *micro, mini, or small* unmanned aircraft systems, thus differentiating them from the larger unmanned systems that have more sophisticated capabilities and munitions, and which require crews of personnel that are often dispersed across various locations to carry out the necessary functions involved in launch, recovery, operations, and maintenance.

Small tactical drones are operated by individual soldiers, or by designated teams embedded within infantry or special operations forces composed of at most two to three soldiers trained in flight control, payload management, and video-based target identification. These drones are typically launched from rooftops or secured ground positions and can operate within a range of 1-to-5 kilometers (though range can be significantly further dependent on communications and line-of-sight) and return to the

⁴⁵ Federal Aviation Administration (FAA). (2024, June 20). *Large UAS (MGOW 55 pounds or more)*. https://www.faa.gov/air_traffic/publications/atpubs/aim_html/chap11_section_3.html

⁴⁶ Such as the U.S. MQ-9 Reaper or Israel’s equivalent Hermes and Heron systems, and medium tactical platforms such as the U.S. Scan Eagle or RQ-7 Shadow and Israeli equivalents. Elbit Systems. (2026a). *Hermes 450*. <https://www.elbitsystems.com/autonomous/aerial/tactical-uas/hermes-450/>; U.S. Air Force. (2025, January). *MQ-9 Reaper*. <https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104470/mq-9-reaper/>; Stickney, W. (2025, May 30). *The IAI Heron: Israel’s game-changing eye in the sky*. Bolt Flight. <https://boltflight.com/the-iai-heron-israels-game-changing-eye-in-the-sky/>; Boeing. (2025). *Autonomous systems*. <https://www.boeing.com/defense/autonomous-systems/scaneagle#/>

⁴⁷ Haider, J. (2020). A comprehensive approach to countering unmanned aircraft systems: And why current initiatives fall short. *The Journal of the JAPCC*, 29. <https://www.japcc.org/articles/a-comprehensive-approach-to-countering-unmanned-aircraft-systems/>

operator either manually or via automated landing protocols.⁴⁸ Small tactical drones are employed by forward IDF ground forces to directly augment operations and enhance situational awareness. Barring the use of communications relays or repeaters, their tactical range is limited to line-of-sight between the ground controller and the drone. Accordingly, they are not typically operated from rear ground control stations where there would be some level of control and oversight from a higher operations center.

Quadcopters Fielded in Gaza

Various defense technology manufacturers produce a suite of multi-rotor tactical unmanned aerial systems with modular capabilities. Per eyewitness testimony, several models are fielded in Gaza, most of which are produced by Israeli arms manufacturer Elbit Systems.⁴⁹ The Elbit *TerminaTHOR* model is outfitted with a rack of bomblets advertised as being optimized for killing personnel and hitting other “soft” targets.⁵⁰ The *Bird of Prey* model has sniper drone capability and can be outfitted with a range of armaments in multiple calibers including 5.56 NATO and 7.62 NATO rounds as well as 40mm grenades.⁵¹ These capabilities are highlighted in various publicly available promotional and informational videos.⁵²

Retired U.S. Special Forces Lieutenant Colonel Anthony Aguilar, who conducted a tour in Gaza in early 2025 securing aid distribution sites under a contract with the Gaza Humanitarian Foundation and security contractor UG Solutions, reported regularly observing these models in use by the IDF in Gaza.⁵³ The drones would be flown over aid distribution sites and IDF positions in an “overwatch” capacity, including over crowds of civilians while they awaited aid. According to IDF mission needs, the drones were modularly outfitted with either a bomblet rack or a rifle for lethal attack capability, or with nonlethal systems such as overhead speakers or oleoresin capsicum (pepper spray) for crowd dispersion and control.

Other Israeli firms have developed small tactical drones capable of precisely firing small caliber weapons remotely such as the Duke Robotics⁵⁴ TIKAD and the Smartshooter *SMASH Dragon*,⁵⁵ as similarly shown in demonstration videos. Euro-Med Human Rights

⁴⁸ Meegle. (2026, February 9). *Drone autonomous landing algorithms*.

https://www.meegle.com/en_us/topics/autonomous-drones/drone-autonomous-landing-algorithms

⁴⁹ Elbit Systems. (2026b). *About us*. <https://www.elbitsystems.com/about-us>

⁵⁰ Elbit Systems. (2026c). *TerminaTHOR*. <https://www.elbitsystems.com/networked-warfare/autonomy/mini-uas-vtol/terminathor>

⁵¹ Elbit Systems. (2026d). *Bird of Prey*. <https://www.elbitsystems.com/unmanned/aerial/multi-rotor-solutions/bird-prey>

⁵² C14 [@C14news]. (2025, July 22). *Without endangering soldiers: The attack drones that eliminate terrorists “deep in enemy territory”* [Video]. YouTube. https://www.youtube.com/watch?v=F_HBKHFqIyM

⁵³ Per the authors’ collaboration and interview with Anthony Aguilar during the writing of this report.

⁵⁴ Defense and Munitions. (2025, July 7). *Duke Robotics progresses with Elbit Systems on “Birds of Prey” stabilized weapons drone system*. <https://www.defenseandmunitions.com/news/duke-robotics-progresses-with-elbit-systems-birds-of-prey-stabilized-weapons-drone-system/>

⁵⁵ SMARTSHOOTER [@smartshooter_ltd]. (2023, October 29). *Counter-drone capabilities, here and now* [Video]. YouTube. <https://www.youtube.com/watch?v=vFwJ6ixGOVQ>

Monitor⁵⁶ has also identified IDF use of models like the Elbit *LANIUS*,⁵⁷ an even smaller drone that is likewise equipped with small arms or explosives for close-range targeting, as well as commercial drone models retrofitted with weapons systems.

Investigations into the proliferation of small tactical drones in conflict zones reveal the retrofitting of foreign-produced commercial drones such as Chinese-made DJI⁵⁸ and Autel Robotics⁵⁹ models to drop grenades or fire projectiles on civilians, including at hospitals and shelters. DJI, a Chinese company whose drones dominate the global civilian market, produces quadcopters and hexacopters that are widely available at consumer price points. These retrofitted commercial platforms are low cost, mass produced, and quickly fielded.⁶⁰

The Technology: Capable of Precision in Targeting

Regardless of the make or model utilized, small tactical drones have certain characteristics in common. Typically modularizable, multi-rotor systems, these drones are markedly lower in size, profile, and weight in comparison to larger drone weapons systems in use by both the IDF and other comparable military forces. They are nonetheless outfitted with advanced intelligence, surveillance, and reconnaissance (ISR) sensors, which can include electro-optical, infrared, and thermal detection capabilities. They boast weapons system gimbals with advanced stabilization to ensure that a lightweight, multi-rotor drone remains stable enough to fire an on-board rifle or other weapon system with precision and accuracy. They also have capable targeting and fire control systems.

These drones are highly maneuverable and able to maintain close-in reconnaissance and surveillance of an objective area and target. Therefore, they are well-equipped to enable operators to identify targets with little error, similar to the identification capabilities of a sniper that has direct visualization of the target before taking a shot. Further, from a military perspective, they are extremely low-collateral damage weapons systems. Therefore, in theory the ethical use of these systems should lead to *decreased* incidents of target misidentification and collateral damage—not *increased* civilian casualties as we see in Gaza.

This is further evidence that the foundational problem is not the drones or the weapons systems themselves, but the way they are utilized and employed by the IDF in Gaza. If left unaccountable, current practice by IDF in the employment of small tactical drones within dense urban environments that are overwhelmingly populated by civilians

⁵⁶ Euro-Med Human Rights Monitor. (2024, February 19). *Gaza: Israel systematically uses quadcopters to kill Palestinians from a close distance*. <https://euromedmonitor.org/en/article/6166/Gaza:-Israel-systematically-uses-quadcopters-to-kill-Palestinians-from-a-close-distance>

⁵⁷ Elbit Systems. (2026e). *Lanius-X*. <https://www.elbitsystems.com/networked-warfare/robotic-and-autonomous-solutions/tactical-unmanned-aerial-systems/lanius-x>

⁵⁸ DJI. (2025). *Camera drones*. <https://www.dji.com/camera-drones?site=brandsite&from=nav>

⁵⁹ Autel Robotics. (2025). *EVO Lite Enterprise series*. <https://shop.autelrobotics.com>

⁶⁰ Chávez, K., & Swed, O. (2024, August 15). *Small drones for big militaries: The way ahead*. War Room. <https://warroom.armywarcollege.edu/articles/small-drones/>

threatens to metastasize into standard international military practice. Israel's use of small tactical drones in civilian areas thus risks becoming normalized as an unregulated tool of urban warfare. Within such contexts, the military threshold for the use of precise lethal force may be lowered and the incentives to restrain firepower correspondingly diminished.

3. International Humanitarian Law

Under international humanitarian law, primarily codified in the Geneva Conventions and their Additional Protocols, world nations—including Israel—have committed to protecting civilians in armed conflicts. Article 57 of Additional Protocol 1 to the Geneva Conventions requires that militaries take all feasible precautions to avoid loss of civilian life. Furthermore, children are accorded special respect under Article 77.⁶¹ While Israel is not a party to Additional Protocol 1, the Israeli government maintains that it is fully committed to rules and principles that uphold customary international law, which includes many provisions of Article 1.⁶² However, the cases and evidence documented in this report suggest a pattern of consistent violation of the following core principles of international humanitarian law:

Distinction

What appears to be a widespread *de facto* lack of distinction between combatants and civilians, in combination with the above medical and forensic analyses, operational analysis, and eyewitness accounts, raises concerns that tactical drone operations fall into a larger pattern, adding to an already-existing problem and further amplifying civilian harm in Gaza.

Necessity

The IDF often defends its use of tactical drone strikes in urban areas as necessary for force protection or in situations when holding or maintaining ground presence is challenging—i.e., reducing risks to Israeli soldiers. However, in many documented drone strikes—especially those involving first responders, journalists, or civilians attempting to flee—it has been shown that no immediate threat to Israeli forces has been present, as the majority of strikes in Gaza have been conducted via remote targeting without troops in close proximity to the target.⁶³

⁶¹ IHL Databases. (2026). *Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the protection of victims of international armed conflicts (Protocol I)*, 8 June 1977. ICRC. <https://ihl-databases.icrc.org/en/ihl-treaties/api-1977>

⁶² United Nations. (2020, October 20). *Status of Protocols: Additional to the Geneva Conventions of 1949 and relating to the protection of victims of armed conflicts*. Israel Sixth Committee. https://www.un.org/en/ga/sixth/75/pdfs/statements/protocols/12mtg_israel.pdf

⁶³ Andersin, E. (2025, October 24). *Military use of biometrics series – Israel's use of AI-DSS and facial recognition technology: The erosion of civilian protection in Gaza*. Articles of War, Lieber Institute for Law and Warfare. <https://lieber.westpoint.edu/israels-use-ai-dss-facial-recognition-technology-erosion-civilian-protection-gaza/>

The lack of military necessity is even more concerning in cases where children have been injured by tactical drones in non-combat situations, as described in this report. This undermines claims that the attacks were militarily necessary, raising the specter of collective punishment rather than lawful military engagement. Here again, the proliferation of IDF tactical drones equipped with precision lethal capabilities adds to an already-existing problem. In accordance with international humanitarian law, the IDF must also weigh the availability of non-lethal alternatives, the option of capture over kill, and the feasibility of deferring attacks to avoid civilian harm.

Feasible Precautions

As detailed above, the IDF's use of tactical drones by forward units in Gaza appears to lack safeguards that are standard to other nations' military drone operations, including lack of command oversight, lack of pre-strike analysis, ineffective or disregarded characterization of the civilian environment, and inadequate or unenforced procedures for positive target identification.⁶⁴

Conclusion

This analysis has examined the use of small tactical drones by the IDF in Gaza from multiple angles: operational and tactical, medical and forensic, legal and ethical. The evidence from field medicine as evaluated against military doctrine and best practices, legal frameworks, and operational analysis converges on a sobering conclusion: the manner in which the IDF uses small tactical drones in Gaza as instruments of "precision warfare" has not reduced civilian harm but has in fact intensified it.

While there is clear evidence that tactical drones have been used for lethal attacks in Gaza, the extent of such use is still unclear. The IDF may be employing them on an experimental basis, using Gaza as a testing ground for this new technology. If so, this adds urgency to the task of regulating these technologies and their operational use in armed conflict, and for ensuring accountability for misuse. It also points to the need for further research and documentation of small drone use by the IDF. In the current supposed ceasefire in Gaza, the IDF continues to kill Palestinians. And the recrudescence of large-scale violence in the Occupied Territories, and concomitant stepped-up IDF operations in urban areas, remains a real possibility for the foreseeable future.

⁶⁴ From a military perspective. Further, the absence of a consolidated and detailed database of targeting packages and strikes, along with a streamlined and transparent civilian harm assessment and response framework, hinders effective post-strike analysis and investigative processes. These would ensure both internal and public accountability, inform any warranted response or amends to civilian populations, and identify preventable contributors to civilian harm to enable the implementation of lessons learned and necessary institutional and operational changes.

The IDF's use of tactical drones in Gaza is part of a pattern of systemic civilian casualties in this war. The U.S. and the international community would do well to pay attention to quadcopter technology, at the very least to promote measures that incorporate this emerging technology into systems of international humanitarian law that are intended to protect civilians. (Specific policy recommendations from a military perspective are listed in Appendix A). More broadly, as Neta Crawford contends,⁶⁵ attention should be focused on the organizational and political structures that enable widespread civilian harm.

⁶⁵ Crawford, N. (2013). *Accountability for killing: Moral responsibility for collateral damage in America's post-9/11 Wars*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199981724.003.0001>

Appendix A: Policy Recommendations from a Military Perspective Regarding Tactical Drone Technology

From a military perspective, specific policies should be created, adopted and expanded to address the issue of high rates of civilian injury and death due to small tactical drone warfare. The authors recommend the following policy actions:

1. National and international policies that place restrictions on small-scale armed drones. This should include licensing requirements, usage restrictions, transparency standards, and non-proliferation safeguards.
2. Implementation of formal education and training frameworks for professional militaries in the use of lethal force by tactical drones, and established oversight mechanisms including digital audit trails, centralized legal vetting, and battlefield transparency protocols.
3. Independent and transparent investigations, and where appropriate, prosecution and punishment of war crimes, particularly where drone footage, forensic evidence, or survivor testimonies point to cases of harm to civilians.
4. Clear national and international legal doctrine on delegation of lethal authorities for tactical drone strikes, ensuring that remote operators, and their commanders, are consistently held accountable under military and international law.
5. Suspension, including by the U.S., of transfer of tactical drone technology to Israel.
6. Further investigation, research, and analysis of IDF use of tactical drones, including investigations by intelligence and military personnel from the U.S. and other countries in the region.
7. U.S. leadership in the UN, NATO, and other appropriate multilateral institutions to establish international policies and model codes of conduct that further the above recommendations.
8. Bilateral U.S. diplomatic engagement aimed at advancing implementation of the above recommendations, beginning with nations that possess tactical drone technology.

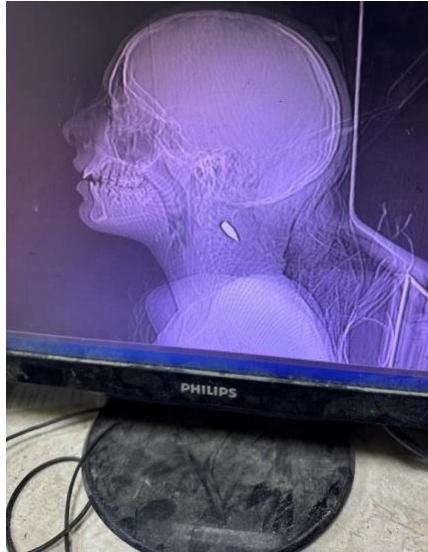
Appendix B: Case Study Images

The following cases show Xray images and accompanying sketches to demonstrate mechanisms of injury and bullet entry points and angles. The sketches provided are AI-derived images (using Venice AI) of actual photos taken of patients by Dr. Mimi Syed. Actual photo images were omitted due to their graphic nature. Readers should be forewarned that these images are nonetheless still disturbing.

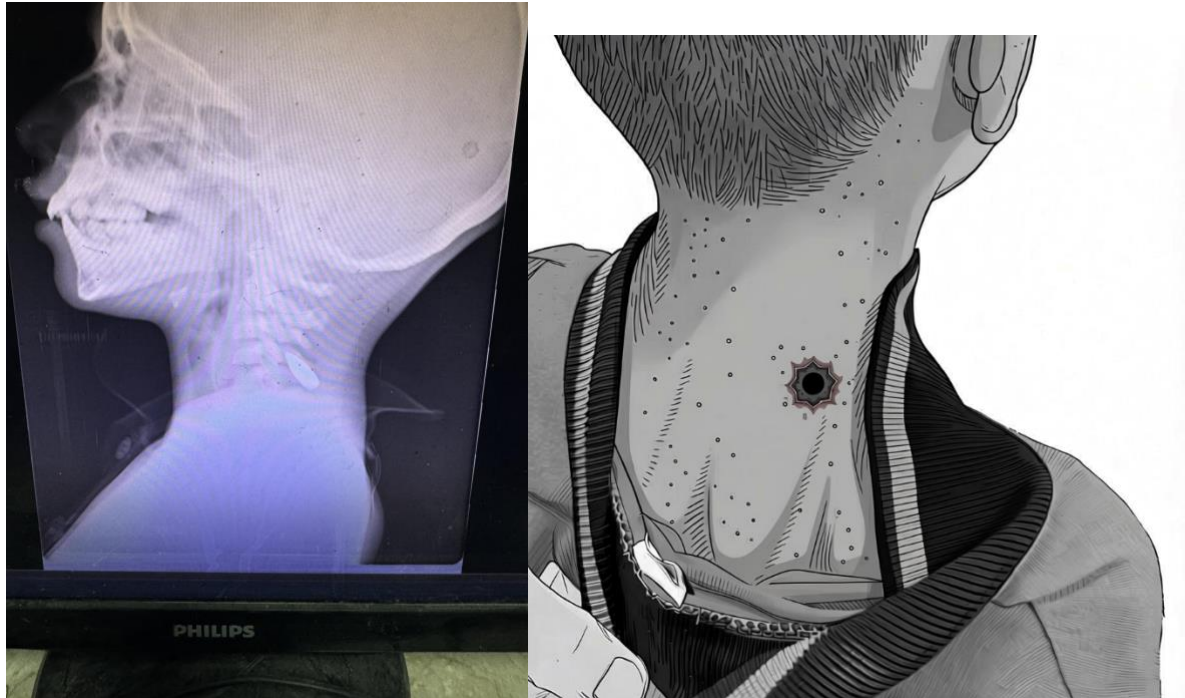
Case 1: Mira Al-Dariny, Nasser Hospital (August 24, 2024). A four-year-old girl admitted with a small wound to her forehead. Eyewitnesses, including her parents, reported quadcopters firing at people around their tents, resulting in multiple casualties with similar wounds. Mira was playing outside of her tent when she was found by her parents on the ground, covered in blood. CT imaging (left) revealed a bullet lodged in her skull. As seen on the image of CT scan and sketch, there is an entry wound on the top of her skull which matches the wound seen in the photo-derived sketch on the right. She underwent emergency craniotomy and recovered. The bullet entry point versus its final resting point, along with its orientation, demonstrates that the round was delivered at a high angle and from above consistent with the trajectory of a bullet delivered from a drone.



Case 2: 14-year-old girl, Nasser Hospital (August 26, 2024). The child was shot in the neck in Al-Mawasi, with witnesses reporting the presence of a quadcopter outside of their tent at the time of the incident. The bullet entered through the lateral portion of the neck and remained lodged, as seen on CT scan on the left, with the entrance wound on the lateral aspect of the neck, as seen in the photo-derived sketch. The child survived but suffered severe neurological damage. The bullet entry point versus its final resting point, along with its orientation, demonstrates that the round was delivered at a high angle and from above consistent with the trajectory of a bullet delivered from a drone.



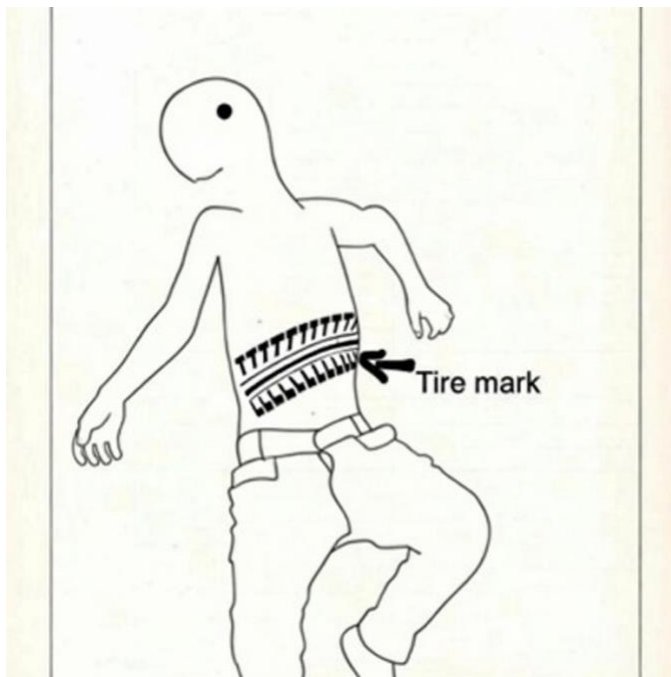
Case 3: 7-year-old boy, Nasser Hospital (August 2024). The child was shot in a humanitarian zone by a reported quadcopter, with no one else shot in the vicinity. He was playing on the street at the time of the incident. As seen in the CT scan on the left, the bullet remained lodged in his neck, similar to the patient in case 2. The child survived, but the bullet was left in place, as removing it would have posed unacceptable risk. The bullet entry point versus its final resting point, along with its orientation, demonstrates that the round was delivered at a high angle and from above consistent with the trajectory of a bullet delivered from a drone. The bullet tumbled upon penetration, accounting for its upward-facing final resting position.



Case 4: 14-year-old girl, Nasser hospital (August 2024). The child was shot by a quadcopter, as reported by her family, who brought her in via ambulance. At the time of the incident, she was walking on a road in Khan Younis. She arrived dead on arrival, therefore, no CT scan was done. A photo-derived sketch depicts where she was shot in the neck.



Case 5: 3-year-old boy, Nasser Hospital (August 14, 2024). The child was brought to the hospital dead on arrival with a single gunshot wound to the head. Witnesses reported quadcopters in the area at the time of the incident. After collapsing from the gunshot, the child was inadvertently run over by a car amidst chaos in the streets following evacuation orders by the IDF. A tire mark can be seen across the patient's collapsed abdomen. There were no reports of active combat in the area.



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

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