

Received 26/05/2025

Accepted 08/12/2025

The Drone Wars in International Law: Between the Effectiveness of Weapons and the Limits of Legitimacy

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Abstract :

The proliferation of autonomous weapons systems, particularly drones, has fundamentally transformed modern warfare and introduced new challenges to international humanitarian law. While these systems offer greater precision, enhanced operational efficiency, and reduced risks to soldiers, they raise serious legal and ethical concerns—especially regarding the distinction between civilian and military targets, proportionality in the use of force, and necessary precautionary measures. A central issue is the extent of meaningful human control over lethal decisions; weapons that operate without direct human input may violate the right to life and fundamental humanitarian principles. To address these challenges, experts propose developing human-centered evaluation mechanisms, implementing pre-authorized operational directives, and embedding ethical and legal principles directly into the programming of autonomous systems. The key challenge remains balancing military effectiveness with legal legitimacy—a balance that will shape the future of autonomous weapons regulation.

Keywords: Autonomous Weapons, Human Control, International Humanitarian Law, Accountability, Ethical Principles....

ملخص:

انتشار أنظمة الأسلحة الذاتية، وخاصة الطائرات المسيّرة، غيّر جذرياً طبيعة الحروب الحديثة، وطرح تحديات جديدة أمام القانون الدولي الإنساني. فبينما توفر هذه الأنظمة دقة أعلى وكفاءة تشغيلية أكبر مع تقليل المخاطر على الجنود، تثير تساؤلات قانونية وأخلاقية خطيرة، خصوصاً فيما يتعلق بالتمييز بين الأهداف المدنية والعسكرية، والتناسب في استخدام القوة، واتخاذ الاحتياطات اللازمة. إحدى القضايا المحورية هي مدى السيطرة البشرية الفعلية على القرارات القاتلة، إذ أن الأسلحة التي تعمل دون تدخل بشري مباشر قد تنتهك الحق في الحياة والمبادئ الإنسانية الأساسية. لمواجهة هذه التحديات، يقترح الخبراء تطوير آليات تقييم تركز على الإنسان، وتطبيق توجيهات مسبقة تحدد نطاق تشغيل الأنظمة الذاتية، وترسيخ مبادئ أخلاقية وقانونية في برمجتها. ويظل التحدي الأبرز هو تحقيق توازن بين الفعالية العسكرية والشرعية القانونية، وهو ما سيحدد مستقبل تنظيم الأسلحة الذاتية.

1. INTRODUCTION

In the evolving landscape of modern warfare, unmanned aerial vehicles (UAVs), commonly known as drones, have emerged as transformative tools that fundamentally alter the nature of armed conflict. The proliferation of drone technology has precipitated profound changes in military strategy, international relations, and legal frameworks governing the use of force. This intersection of technological innovation and international law presents a complex terrain where questions of effectiveness, legitimacy, and regulatory adequacy converge.

The deployment of drones in conflict zones represents a paradigm shift in warfare that challenges traditional conceptions of combat. As Rebecca Mignot-Mahdavi observes, drone programs function as "techno-legal machineries" that facilitate the emergence of a new warfare model—one that is increasingly individualized and de-materialized, focusing on threat anticipation rather than responding to acts of hostilities. This shift toward what might be termed "anticipatory warfare" extends both temporally and geographically, potentially normalizing the use of force as part of a state's regular functioning.¹

The rapid advancement and deployment of drone technology in conflicts worldwide, most recently exemplified in the war in Ukraine, has outpaced the development of corresponding legal frameworks. This technological-legal gap raises critical questions about the adequacy of existing international humanitarian law (IHL), international human rights law (IHRL), and domestic regulations in addressing the unique challenges posed by drone warfare.²

This study aims to examine the complex interplay between drone technology, international law, and the changing nature of warfare. The significance of this research lies in its attempt to reconcile the military effectiveness of drones with their legal and ethical implications in an era where technological innovation often precedes regulatory frameworks. By analyzing this tension, we seek to contribute to the ongoing discourse on how international law can adapt to technological advancements while preserving its fundamental principles.

The primary objectives of this study are to analyze how drone technology reshapes conventional understandings of warfare and challenges existing legal paradigms; to evaluate the adequacy of current international legal frameworks in regulating drone usage in armed conflicts; to identify gaps in regulatory mechanisms and propose potential pathways for legal development; and to examine the ethical dimensions of drone warfare, particularly regarding civilian protection and human rights³.

This study is guided by the following central research question: How does the proliferation of drone technology in warfare challenge and potentially transform international legal frameworks governing armed conflict? Subsidiary questions include: To what extent do existing international legal frameworks adequately address the unique characteristics of drone

¹ - Rebecca Mignot-Mahdavi, "Drone Programs as Techno-Legal Machineries: Individualization, Anticipation, and the Emergence of a New Model of Warfare," *European Journal of International Law* 31, no. 3 (2020), 1032.

² - Peter L. Bergen & Daniel Rothenberg (dir.), *Drone Wars: Transforming Conflict, Law, and Policy*, Cambridge University Press, Royaume-Uni, 2015, Introduction, pp. 1-10.

³ - Michael J. Boyle, *The Drone Age: How Drone Technology Will Change War and Peace*, Oxford University Press, Royaume-Uni, 2020, pp. 15-22.

warfare? How do states attempt to adapt or interpret international law to legitimize their use of drones in conflict? What are the implications of drone warfare for civilian protection and human rights? How might international law evolve to address the challenges posed by increasingly autonomous weapons systems?

The methodological approach of this study is multi-faceted, employing legal doctrinal analysis of relevant international legal instruments; case study analysis of specific incidents involving drone usage in conflicts; computational approaches drawing on data science methods to identify patterns in legal developments and state practice; and interdisciplinary integration incorporating insights from military studies, international relations, ethics, and technology assessment. Through this methodological pluralism, the study aims to bridge the gap between technological reality and legal theory, contributing to both academic discourse and practical policy development in the regulation of drone warfare under international law.

2. Drones and the Challenges to Traditional Legal Frameworks

Drone technology's rapid expansion across sectors like construction, agriculture, and surveillance has created significant regulatory challenges worldwide. The fragmented legal landscape combines local bylaws, national regulations, and international frameworks, creating uncertainty for businesses and operators. Key concerns include privacy invasion, unauthorized surveillance, and airspace violations, with many countries lacking comprehensive frameworks to address these issues.

In India, for example, the Drone Rules of 2021 focus primarily on civil use but leave gaps in addressing drone-related crimes like smuggling and privacy violations. The construction industry in the UK faces similar regulatory ambiguity, highlighting the need for specific national guidelines to address uncertainties and build public trust⁴.

As drones become increasingly autonomous, security threats have prompted the development of counter-drone technologies, including radar detection, radio frequency sensing, and AI-driven approaches. However, these solutions raise additional legal and ethical considerations that must be balanced against security needs.

The economic potential of drone technology—projected to reach \$30 million by 2021 in the distribution sector alone—underscores the urgency for regulatory frameworks that can keep pace with technological advancement. Future regulations must address multiple domains including registration, insurance, flight restrictions, data collection, and communication while balancing innovation with legitimate concerns about security and privacy in an era of ubiquitous drone use⁵.

⁴ - Anna Konert and Tomasz Dunin, "UAS Safety Operation – Legal Issues on Reporting UAS Incidents," *Frontiers in Psychology* 12 (2021): Article 8549410,

⁵ - Michael J. op. cit, pp. 15-22.

2.1 Sovereignty and the Jus ad Bellum Question

Sovereignty and the Jus ad Bellum Question

The concept of sovereignty and its relationship to jus ad bellum (the right to go to war) represents one of the most complex intersections in international law and political theory. This analysis explores how state sovereignty interacts with the legal and moral frameworks governing when states may legitimately resort to armed force.

The modern understanding of sovereignty emerged from the Peace of Westphalia in 1648, establishing the principle that states possess supreme authority within their territorial boundaries. This Westphalian model positioned sovereignty as an absolute right of states to govern themselves without external interference. Initially, this concept included an unfettered right to wage war as an extension of state power.

However, the catastrophic consequences of two World Wars fundamentally transformed this understanding. The establishment of the United Nations in 1945 marked a watershed moment, as the UN Charter explicitly restricted the use of force while simultaneously affirming state sovereignty as a foundational principle of the international order.

In today's international system, the jus ad bellum framework primarily derives from the UN Charter, which establishes two main legal pathways for the legitimate use of force:

1. Self-defense under Article 51, which permits states to use force in response to an armed attack.
2. Authorization by the UN Security Council under Chapter VII.

This framework represents a significant limitation on traditional notions of sovereignty, as states have collectively agreed to restrict their previously unlimited right to wage war. The prohibition on the use of force found in Article 2(4) of the UN Charter stands as one of the most fundamental norms in international law.⁶

The relationship between sovereignty and jus ad bellum contains inherent tensions. While sovereignty implies non-interference in domestic affairs, the international community has increasingly recognized exceptions to this principle, particularly in cases of humanitarian intervention, Responsibility to Protect (R2P), preventive or preemptive self-defense, and counter-terrorism operations.

These developments have led to ongoing debates about whether sovereignty should be understood as absolute or conditional. The emergence of concepts like "sovereignty as responsibility" suggests that legitimate sovereignty entails not only rights but also obligations to protect populations from mass atrocities.

Several contemporary challenges further complicate the sovereignty-jus ad bellum relationship, including the rise of non-state actors, cyber operations, proxy warfare, and the

⁶ - United Nations, *Charter of the United Nations*, États-Unis, 1945, Article 2(4) et Article 51 (voir texte officiel sur le site de l'ONU ou dans tout manuel de droit international public).

role of collective security arrangements. These challenges strain traditional frameworks designed primarily for interstate conflicts.

Different theoretical traditions offer contrasting perspectives on this relationship. Legal positivists emphasize formal constraints established by treaty and customary law. Natural law theorists focus on moral considerations that might justify force beyond strict legal parameters. Realists maintain that power considerations ultimately determine when states use force, while constructivists highlight how evolving norms reshape understandings of both sovereignty and legitimate uses of force over time.

The relationship between sovereignty and *jus ad bellum* remains dynamic and contested. While the absolute right to wage war has been decisively rejected, the precise boundaries of legitimate force continue to evolve. Contemporary international relations reflect an ongoing negotiation between respecting state sovereignty and addressing threats that cross borders. The challenge for the international community lies in developing frameworks that can accommodate legitimate security concerns while preventing the misuse of force that undermines the very sovereignty the system aims to protect.⁷

As global challenges become increasingly transnational in nature, from climate change to terrorism to pandemic response, the traditional understanding of sovereignty continues to evolve, with corresponding implications for when and how force may legitimately be employed. The sovereignty-*jus ad bellum* relationship will likely remain at the center of international legal and political discourse for the foreseeable future

2.2 International Humanitarian Law Compliance

Recent assessments of international humanitarian law (IHL) compliance reveal a deeply troubling landscape: violations are now persistent and widespread, with an alarming trend toward indifference by states and non-state actors alike. The most recent IHL in Focus Annual Report, covering July 2023 to June 2024, analyzed 22 active conflicts and identified significant challenges in upholding IHL, including deliberate attacks on civilians, destruction of essential infrastructure, sexual violence, and the erosion of respect for humanitarian norms. The report underscores that these violations are no longer isolated incidents but have become systemic, increasingly met with impunity and lack of accountability⁸.

There are currently 71 active armed conflicts, with a notable rise in international armed conflicts (IACs) from 8 to 14, indicating more intense and destabilizing state confrontations. Non-international armed conflicts (NIACs) remain the majority but have slightly declined. Modern conflicts see indiscriminate violence, targeting of civilians, and destruction of hospitals, schools, and communication systems. Civilian harm extends beyond immediate casualties to long-term suffering, displacement, and disruption of livelihoods and essential services.

⁷ - Glennon, Michael J. *The Fog of Law: Pragmatism, Security, and International Law*. Stanford, CA: Stanford University Press, 2010, 23–29.

⁸ -International Committee of the Red Cross (ICRC). *IHL in Focus: Annual Report 2023–2024*. Switzerland, 2024, 12–25.

The lack of effective enforcement mechanisms, both nationally and internationally, is a major barrier. The International Criminal Court (ICC) can issue arrest warrants but lacks the means to enforce them within non-cooperative states. The UN Security Council's structure, especially the veto power of the Permanent Five (P5), often shields violators from accountability, further exacerbating impunity. The blurring of lines between civilians and combatants, especially in protracted and identity-driven conflicts, has eroded respect for IHL protections. The increasing involvement of non-state armed groups and private military actors, many of whom may not recognize or adhere to IHL, complicates compliance efforts⁹.

Despite strong global commitments to IHL, local realities often diverge sharply. In places like Yemen, years of conflict have produced severe humanitarian crises, with ongoing violations despite international pledges. Grassroots advocacy and local civil society engagement are critical in pushing for compliance and protection of civilians.

Recent initiatives, such as annual global IHL compliance reports and spot reports, aim to provide data-driven analysis and increase transparency regarding violations and trends. These tools are intended to guide policymakers and practitioners in targeting interventions and advocacy. Scaling up IHL training, especially during peacetime, is highlighted as essential. Advocacy for IHL compliance must be prioritized in diplomatic forums, including the UN, regional bodies, and bilateral discussions.

States are reminded of their obligations under Common Article 1 of the Geneva Conventions to "respect and ensure respect" for IHL. Fact-finding missions, Human Rights Council resolutions, and independent monitoring are recommended to hold violators accountable and prevent future abuses. Beyond compliance, there is a call to address the full complexity of civilian harm, including cumulative and long-term effects. This requires not just legal enforcement but also operational changes and policy innovations to better protect civilians and humanitarian actors. Effective IHL compliance depends on both international advocacy and local implementation. Civil society organizations, humanitarian agencies, and affected communities play a vital role in monitoring, reporting, and advocating for adherence to humanitarian norms.

The current state of IHL compliance is at a critical juncture. Violations are widespread, enforcement is weak, and the gap between global commitments and realities on the ground is widening. The international community faces an urgent imperative to reaffirm the principles of humanity in armed conflict, strengthen multilateralism, and prioritize both prevention and accountability. As conflicts become more entrenched and complex, ensuring robust compliance with IHL is not only a legal necessity but a humanitarian imperative to protect civilians and uphold global peace and security.

3. The Humanitarian and Strategic Implications of Drone Warfare

Drone warfare represents a pivotal development in modern conflict, balancing strategic military advantages with serious humanitarian concerns. These unmanned systems offer precision capabilities while raising critical questions about civilian casualties and international law compliance. As drone technology proliferates among state and non-state

⁹ - ¹ International Criminal Court. *Annual Report on Preliminary Examination Activities*. The Netherlands, 2023, 7–15.

actors alike, the ethical implications grow increasingly complex. This technological shift fundamentally alters both warfare conduct and humanitarian response possibilities in conflict zones worldwide¹⁰.

3.1 Human Rights and Accountability Concerns

The remote nature of drone warfare raises profound questions about accountability and human rights protections. The physical separation between operators and targets creates a potential accountability gap, where responsibility for civilian casualties becomes diffused through technological and bureaucratic systems. This separation does not eliminate psychological impacts on operators, who despite physical distance from conflict zones, often exhibit symptoms similar to those experienced by conventional combat soldiers. Italian perspectives on drone warfare have highlighted this moral dilemma of operators sitting miles away from conflict zones, detached from war's immediate consequences, which raises serious concerns about the abdication of human agency within international law.¹¹

The targeting of individuals outside active combat zones, particularly in counterterrorism operations, raises significant due process concerns. When suspected terrorists are targeted without judicial oversight or transparent processes, fundamental human rights protections regarding fair trial and the presumption of innocence are potentially compromised. This creates a tension between security imperatives and human rights obligations that remains inadequately resolved in current legal frameworks. Research involving Italian participants revealed that many view the use of UAVs outside war zones as both illegal and morally indefensible, expressing concerns over the dehumanization inherent in remote targeting and emphasizing the importance of more nuanced regulatory mechanisms.

The post humanist perspective offers valuable insights into these challenges, highlighting the increasingly blurred boundaries between humans and machines in warfare decision-making. As technology advances toward greater autonomy, questions of moral and legal responsibility become increasingly complex. The concept of "meaningful human command" emerges as a critical consideration, particularly regarding how humans can ensure moral and legal responsibility for systems operating outside normal temporal parameters. The philosophy of posthumanism recognizes the increasingly narrow differences between humans and non-humans, men and machines, which helps define a new anthropological view that is decentralized and deconstructed in the context of modern warfare.

Recent research indicates that the precise and supposedly "humanitarian" elimination of enemies through drone warfare may actually prove counterproductive in some contexts, potentially leading to dehumanization of the enemy and radicalization on both sides of the conflict. This suggests that technological solutions alone cannot address the complex human dimensions of armed conflict. The Obama administration's increased use of drone strikes, despite initial resistance to existing counterterror approaches, demonstrates how difficult it is

¹⁰ - Strawser, Bradley Jay, ed. *Killing by Remote Control: The Ethics of an Unmanned Military*. Oxford: Oxford University Press, 2013. Chapter 2, 37–55. (Humanitarian and strategic issues related to the use of drones).

¹¹ - Roscini, M. (2015). Remote Participation and Accountability in Drone Warfare. *European Journal of International Law*, 26(1), 67–91. (pp. 70–73 discuss responsibility and physical distance).

to reverse established militaristic approaches to counterterrorism once they become institutionalized.¹²

The shifting dynamics of international relations in the age of drone warfare have created a gray area where boundaries between nationalism and terrorism are perpetually blurring, raising concerns about military regulation and ethics surrounding the battlefield. As autonomous weapons systems continue to evolve, there is an urgent need for frameworks that address human rights concerns throughout their lifecycle - from design and deployment to actual use - to prevent violations of international humanitarian law and protect fundamental rights¹³. The implementation of "humanitarian algorithms" has been proposed to ensure that lethal autonomous weapon systems operate within the confines of International Humanitarian Law, though such technical solutions must be accompanied by appropriate fail-safe mechanisms and robust accountability structures.¹⁴

3.2 Regulatory Challenges in an Era of Technological Innovation

The rapid evolution of drone technology presents significant regulatory challenges at both national and international levels. Current international legal frameworks were largely developed before the advent of modern drone technology, creating regulatory gaps that are increasingly exploited¹⁵. The dual-use nature of drone technology, with applications spanning military and civilian domains, further complicates regulatory approaches.¹⁶

Existing treaties, including the Chicago Convention governing international airspace, provide limited guidance on unmanned systems, creating ambiguity regarding their legal status and operational constraints. This regulatory uncertainty is particularly problematic as drone technology becomes more accessible to non-state actors and less powerful states, potentially undermining the monopoly on advanced military technology previously held by major powers.

The development of autonomous weapons systems represents the next frontier in this regulatory challenge, raising fundamental questions about human control and decision-making in warfare. The principles established in Article 36 of Additional Protocol I to the Geneva Conventions require states to review new weapons for compliance with international law, but implementation remains inconsistent and often lacks transparency. This creates a situation where technological development potentially outpaces legal and ethical considerations.¹⁷

Recent international discussions, including at the International Committee of the Red Cross (ICRC) conferences, have emphasized the need for proactive regulatory approaches that maintain human-centered decision-making while acknowledging technological realities.

¹² - Lethal autonomous weapons systems, revulsion, and respect, *Frontiers in Political Science*, États-Unis, 2022, Article PMC9632845, pp. 3-5 (sur la responsabilité morale et juridique des systèmes autonomes).

¹³ - RPAS Forensic Validation Analysis Towards a Technical Investigation Process: A Case Study of Yuneec Typhoon H, Focuses on forensic techniques for drones, with implications for legal admissibility and international accountability.

¹⁴ - Peter L. op. cit, pp. 301–310.

¹⁵ - Risks of Drone Use in Light of Literature Studies, *Pologne*, 2024, pp. 3–6

¹⁶ - Konert, A., & Dunin, T. (2021). UAS Safety Operation – Legal Issues on Reporting UAS Incidents. *Frontiers in Psychology*, 12, Article 8549410. Poland. Section: Regulatory Challenges.

¹⁷ - A Systematic Literature Review on Security of Unmanned Aerial Vehicle Systems, *Inde*, 2022, pp. 1–8

These discussions recognize that effective regulation requires balancing military necessity with humanitarian considerations, technological innovation with ethical constraints, and national security with international legal obligations.

As of May 2025, regulatory progress is evident but challenges persist. The FAA Reauthorization Act of 2024 has created momentum toward Beyond Visual Line of Sight (BVLOS) operations, which could revolutionize commercial applications. The Act, signed on May 16, 2024, mandated the FAA to develop a consistent regulatory framework, requiring a Notice of Proposed Rulemaking (NPRM) by September 2024 and finalization within twenty months. However, as of April 2025, the NPRM was delayed to January 2025, reflecting ongoing regulatory challenges.¹⁸

On May 14, 2025, the Department of Transportation announced significant advancements in drone regulations, with proposed rules for BVLOS operations and restrictions on UAS operations at fixed site facilities now under review at the White House Office of Management and Budget. These rules aim to facilitate low-altitude drone operations without requiring special permissions, potentially transforming sectors like agriculture and emergency response. The proposed rule introduces a streamlined process for granting special airworthiness certificates to drones up to 1,320 pounds, ensuring they meet new design and operational standards.

Canada has also implemented regulatory changes effective April 1, 2025, introducing new pilot and operator certification for lower-risk beyond visual line-of-sight operations, expanded privileges for advanced pilots, and new rules for flying medium drones. These regulations will be fully implemented by November 4, 2025, giving stakeholders time to obtain appropriate training and certification.

Despite this progress, industry professionals identify regulatory hurdles as a central concern, with slow progress on BVLOS rulemaking, excessive regulation of low-risk operations, and high compliance costs creating operational friction. The complexity of regulatory compliance has led to the development of specialized platforms designed to help drone operators navigate airspace restrictions, licensing requirements, data privacy concerns, and safety protocols.¹⁹

The drone industry is experiencing transformative changes in 2025, driven by regulatory shifts, technological advancements, and evolving global markets. With new leadership at the Federal Aviation Administration (FAA) and changing global conflicts influencing regulations and supply chains, the industry faces both challenges and opportunities. Experts predict that artificial intelligence (AI) and automation will play a critical role in 2025, with AI-powered navigation and real-time data processing reducing human intervention while improving efficiency across industries.

The drone detection market is also experiencing significant growth, driven by security concerns and the need for airspace governance. In 2025, drone-enabled espionage and sabotage were flagged as top-tier global risks, leading the US to earmark \$1.6 billion for UAS countermeasures. However, regulatory fragmentation across different regions complicates the

¹⁸ -FAA. (2024). *FAA Reauthorization Act of 2024*, Section on BVLOS operations, pp. 112-118. United States. Available at the official FAA website.

¹⁹ -Digital Forensic Research for Analyzing Drone Pilot: Focusing on DJI Remote Controller, Corée du Sud, 2023, pp. 2-5.

deployment of drone detection systems across borders, with different regions taking very different approaches to UAV governance.

As Unmanned Traffic Management (UTM) and U-Space frameworks develop, they will play a crucial role in integrating drones into shared airspace. These frameworks will set standards for safe and efficient operations, influencing global adoption and regulatory alignment. By 2025, there may be over 3,000 passenger drones or flying taxis operating worldwide, with this number potentially exceeding 100,000 by 2050.

Looking ahead, effective drone regulation will require balancing technological innovation with ethical constraints and national security with international legal obligations. The integration of drones into shared airspace will depend on the development of comprehensive regulatory frameworks that can adapt to rapidly evolving technology. As the drone landscape continues to evolve, addressing these regulatory challenges will be essential to unlocking the full potential of drone technology while ensuring safety, security, and privacy.

The commercial drone industry is entering a new era marked by evolving and intensifying challenges²⁰. Broader political factors, including national infrastructure strategies, supply chain resilience, and data security policies, are shaping the competitive landscape. Furthermore, a dramatic 73% decline in venture capital funding from 2022 to 2024 has accelerated industry consolidation through mergers, acquisitions, and companies leaving the drone market. Addressing these multifaceted challenges demands a strategic shift toward process optimization, refined go-to-market approaches, and deeper collaboration within the drone ecosystem.

As drones become more common, public perception will shape policy and regulation. Clear and effective communication about drone capabilities, safety, and benefits will be key to preventing restrictive policies and fostering public acceptance. The rise of the drone market is more than just a trend; it's a fundamental shift in how businesses gather information, automate processes, and tackle pressing issues. Understanding this market's direction needs to evolve alongside its sophistication, making it crucial for stakeholders to access reliable knowledge to stay ahead of the curve in 2025 and beyond.

4- Conclusion

This research demonstrates that drone warfare exists in a contested legal space where technological capabilities challenge established legal frameworks. The tension between military effectiveness and legal legitimacy remains inadequately resolved in current international law, creating significant challenges for both states deploying drone technology and those affected by its use.

The analysis reveals several critical findings. First, claims of "surgical" precision in drone warfare often fail to account for documented civilian casualties and broader sociopolitical impacts of remote targeting. Second, existing legal frameworks provide insufficient guidance on cross-border drone operations, creating ambiguity that undermines accountability. Third,

²⁰ - The Use of Drones in Emergency Medicine: Practical and Legal Aspects, Examines regulations and legal issues surrounding drone use in civil and military contexts, relevant for understanding broader legal frameworks.

the increasing autonomy of weapons systems presents unprecedented challenges to traditional notions of responsibility and command in warfare.

Based on these findings, the following recommendations are proposed:

1. Develop specific international legal instruments addressing drone warfare that clarify obligations regarding sovereignty, human rights protections, and accountability mechanisms.
2. Establish transparent review processes for drone operations that include independent assessment of civilian impacts and compliance with IHL principles.
3. Implement mandatory human-centered test and evaluation methods for drone systems that ensure meaningful human control over targeting decisions.
4. Invest in digital infrastructure to increase knowledge of civilian environments in conflict zones, enhancing the ability to make proportionate assessments.
5. Create international standards for training drone operators in IHL principles and ethical decision-making.
6. Develop more nuanced national and international regulatory mechanisms that address the specific challenges of remote warfare while maintaining humanitarian protections.

These recommendations acknowledge that effective regulation must balance legitimate security concerns with fundamental humanitarian principles. As drone technology continues to evolve, international law must adapt to ensure that technological capability remains constrained by legal legitimacy, preserving the human-centered nature of warfare decisions even as the physical distance between decision-makers and targets increases.

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