Media Coverage: Ipsos Survey of Public Views on Killer Robots
January – February 2019

The 22 January 2019 release of a new Ipsos public opinion poll garnered significant media coverage around the world in the days and weeks that followed, as shown by this compilation of articles.

More than a dozen outlets published articles in English, including BBC, POLITICO, The Independent, and Reuters. The Times highlighted the need for the United Kingdom to re-consider its position the call to ban fully autonomous weapons, while the Globe and Mail took a critical look at Canadian government lack of policy.

There were also at least 16 news articles in Spanish, 7 in Japanese, 6 in Italian, 4 in Dutch and one each in Filipino and German.

Several campaign members issued press releases to draw attention to the poll findings, including Amnesty International and PAX. Human Rights Watch translated its press release into Arabic, Chinese, French, German, Russian, Spanish. Some campaigner used the poll findings to draw attention to the need for strong government positions that support the ban call, such as Erin Hunt at Mines Action Canada in Open Canada.

Selected Media Coverage

"Red Cross sounds alarm over use of 'killer robots' in future wars," *Reuters*, **22 January 2019. https://www.reuters.com/article/us-global-war-rights/red-cross-sounds-alarm-over-use-of-killer-robots-in-future-wars-idUSKCN1PG0AK**
NAIROBI (Thomson Reuters Foundation) - Countries must agree strict rules on "killer robots" - autonomous weapons which can assassinate without human involvement, a top Red Cross official has said, amid growing ethical concerns over their use in future wars.
Semi-autonomous weapons systems from drones to tanks have for decades been used to eliminate targets in modern day warfare - but they all have human control behind them.
With rapid advancements in artificial intelligence, there are fears among humanitarians over its use to develop machines which can independently make the decision about who to kill.
Yves Daccord, director-general of the International Committee of the Red Cross (ICRC), said this would be a critical issue in the coming years as it raised ethical questions on delegating lethal decisions to machines and accountability.
"We will have weapons which fly without being remotely managed by a human and have enough intelligence to locate a target and decide whether it is the right person to take out," Daccord told the Thomson Reuters Foundation in an interview.
"There will be no human making that decision, it will be the machine deciding - the world will essentially be delegating responsibility to an algorithm to decide who is the enemy and who is not, and who gets to live and who gets to die."
The ICRC initiated the international adoption of the four Geneva Conventions that lie at the core of international humanitarian law in 1949.
Since then, it has urged governments to adapt international humanitarian law to changing circumstances, in particular to modern developments in warfare, so as to provide more effective protection and assistance for conflict victims.
TO BAN OR NOT TO BAN
A global survey published by Human Rights Watch and the Campaign to Stop Killer Robots, a global coalition of NGOs, on Tuesday found six out of ten people polled across 26 countries oppose the development of fully autonomous lethal weapons.
The study, conducted by Ipsos, surveyed 18,795 people in 26 countries including Brazil, India, the United States, Britain, China, South Africa, Japan and Israel.

Daccord said autonomous weapons crossed a moral threshold as machines did not have the human characteristics such as compassion necessary to make complex ethical decisions.

They lacked human judgment to evaluate whether an attack was a proportional response; distinguish civilians from combatants, and abide by core principles of international humanitarian law, he added.

The issue of "killer robots" has divided humanitarians.

The United Nations Secretary-General Antonio Guterres has called for a complete ban, while other organizations such as the ICRC are advocating for strict regulation.

"We should not go for banning, but I am of the opinion that we have to keep a level of human control over such weapons. This means that, at any time of the operation, a human can intervene," said Daccord.

"There are no guidelines regarding their use and they have not even been defined yet, so we have to create a common grammar between states and develop guidelines, or treaty law."

The rules would address issues such as the definition of autonomous weapons, the level of human supervision over these weapons such as ability to intervene and deactivate, as well as the operational conditions for their use, says the ICRC.

Supporters of autonomous weapons argue they will make war more humane. They will be more precise in determining and eliminating targets, not fall prey to human emotions such as fear or vengeance and will minimize civilian deaths, they say.

But Daccord said such machines could malfunction, and this raised questions over who would be held responsible.

"You can hold people accountable under international humanitarian law with remotely managed weapons such as drones. With autonomous weapons, we are moving into new territory," he said.

"There is a process under way, but we have to get countries together to agree on a common text which is not easy. It's better they start to negotiate now and find an agreement than wait for a major disaster."

"How killer robots overran the UN," *POLITICO*, 18 February 2019.
https://www.politico.eu/article/killer-robots-overran-united-nations-lethal-autonomous-weapons-systems/

BERLIN — The killer robots are coming, and it won't be the United Nations that'll stop them.

That's the reluctant conclusion some activists are coming to, as an effort to ban "lethal autonomous weapons systems" under the U.N.'s Convention on Certain Conventional Weapons seems set to fall apart.

"We'd still like to see the CCW succeed," said Mary Wareham, the global coordinator of the Campaign to Stop Killer Robots, an initiative representing 93 NGOs in 53 countries, which has gathered support from 28 governments for a ban. "But what happened … is forcing us, and I think others, to explore any other avenue — because the CCW is not going to produce."

The effort — which would have outlawed killer robots alongside blinding lasers and the use of napalm against civilians — has been unable to overcome resistance from military powers such as Russia, the United States, South Korea, Israel and Australia.

The last straw was a meeting in November, when Moscow insisted on limiting the amount of time during which the proposal could be discussed in 2019, said Frank Sauer, a political scientist at the Universität der Bundeswehr in Munich.

"This was perceived as an outright affront by those representing the civil society," Sauer said.

Negotiations on a ban, which would require a consensus of all the signatories of the treaty, are expected to continue in two meetings this year. But few expect they will result in progress that could lead to a binding decision.

"The talks are going to hobble on, but to us it showed that other avenues now need to be pursued," Wareham said.

Rise of the robots

A failure of the talks would mean there will be no barriers to countries wishing to develop autonomous systems that can decide on their own when and whom to kill.

Though the technology is still in its infancy, militaries and manufacturers are working to develop and test weapons that could one day be deployed to fight on their own.

Russia is testing autonomous tanks on the battlefields of Syria, the U.S. has released swarms of drones into the California sky, the U.K. wants to use drone squadrons in combat by the end of this year, and China is building unmanned submarines that would be capable of carrying out kamikaze attacks on enemy vessels.

Weapons with a certain degree of autonomy are no new phenomenon; militaries have been working on them for several decades. At least 30 countries today use them, primarily to defend ships, airbases or ground vehicles against missile attacks. But although some of these systems could technically complete a mission entirely on their own, soldiers still supervise the operations in real-time and can intervene if things go wrong.

Only in isolated cases have truly autonomous weapon systems been deployed on battlefields, said Paul Scharre, the author of "Army of None," a 2018 book that has become a standard reference text on the topic.

Israel's "IAI Harpy" drones, for example, which have been around since the 1990s, are designed to circle battlefields for hours before autonomously attacking an enemy's radar.

The use of similarly self-acting weapons could soon multiply, as artificial intelligence technology gallops ahead.

Arms manufacturers have already begun developing autonomous systems that can be deployed in areas where adversaries seek to jam communications between the robots and their human controllers.

Militaries will soon have to decide what rules they will code into the software that powers those systems: If communication breaks down, will the weapons be allowed to strike targets on their own without human approval? If an enemy shoots at them, will they be allowed to fire back? If the system launches an attack against civilians, who will be responsible for that decision?

"Those are all very, very real questions that militaries will have to address within the next 10 to 15 years," Scharre said.

First, do no 'overall harm'

Concerns about autonomous systems have grown with the technology, egged on by activists like Wareham, who worry that robots will soon decide who lives and dies.

Wareham's "Campaign to Ban Killer Robots," which was founded in 2012 by a dozen activists in a New York hotel, has produced a post-apocalyptic video in which two children, one of them holding a teddy bear, stand by a window and look out into a blood-red sky filled with swarming drones.

Some of the group's members also endorsed an open pledge spearheaded by another initiative, in which hundreds of scientists, CEOs and other celebrities spoke out for a ban. And some of its member organizations published a legal analysis arguing that lethal autonomous weapons violate a century-old clause in international law that guarantees broad protection to individuals.

The effort seems to be slowly bearing fruit. A 2019 poll commissioned by the campaign and conducted by research company Ipsos suggested that opposition to the weapons rose from 56 to 61 percent over the past two years.

The campaign has caught the attention of politicians and business leaders as well.

In September, German Foreign Minister Heiko Maas told other countries at the U.N.'s General Assembly to "please support, both here in New York and in Geneva, our initiative to ban fully autonomous weapons, before it is too late."

And last summer, Google decided not to renew its contact for the U.S. government's Project Maven program, which uses some of Google's AI technology to analyze drone footage. At the same time, Google pledged not to use its AI for technologies "that cause or are likely to cause overall harm."

Alternative avenues

Where the activists haven't been able to get traction, however, is in the legal arena.

As the effort to push through a ban falters in the Convention on Certain Conventional Weapons, Wareham and others have looked for other avenues with which to restrict the use of autonomous systems.

One possibility would be to go back to the U.N. and ask the General Assembly to vote for a ban — a move that would likely have the backing of U.N. Secretary-General António Guterres, who has publicly urged countries to outlaw the weapons.

While this would require only a simple majority of votes in the assembly, there's little reason to believe it would have much effect. Similar efforts led to the 2017 Treaty on the Prohibition of Nuclear Weapons, which in theory bans nuclear weapons but in practice does not have a single nuclear power among its signatories.

A second possibility the activists are exploring would be to work outside of the U.N. framework, using the 1997 Ottawa Treaty that banned anti-personal mines as a model. There too, however, the treaty is most notable for who has declined to adopt it. Neither Russia, the U.S. nor China are among the signatories.

If history is anything to go by, those efforts are unlikely to have much bite. There have been a few notable weapons bans, most notably the 1997 Chemical Weapons Convention. But there have been far more times — dating back to the 1st millennium BC when leaders tried to ban barbed or poisoned arrows — when attempts to introduce prohibitions have failed.

Between World War I and World War II, debate raged between military powers over whether countries should be allowed to engage in unrestricted submarine warfare, a fairly new technology at the time.

When, in December 1941, a Japanese bomber attacked Pearl Harbor, it took the U.S. little more than four hours to issue an order to all its ship and submarine commanders, telling them to "execute against Japan unrestricted air and submarine warfare."

"My suspicion is that initially there will be some cautioning," said Scharre, the author of "Army of None." "But when the strategic environment changes in a significant way, or countries feel major pressure to intervene in a certain direction, they can change their approach very, very quickly."

"If the goal is to sign a piece of paper, it's possible to find a handful of countries that will sign a document that says 'We don't want lethal autonomous weapon systems,'" he added. "But the impact of those countries saying that is probably very minimal in shaping how the technology goes forward."

"World calls for international treaty to stop killer robots before rogue states acquire them," *The Independent***, 14 February 2019. https://www.independent.co.uk/life-style/gadgets-and-tech/killer-robots-ban-treaty-weapons-ai-rogue-states-military-research-development-human-rights-watch-a8778576.html**

There is widespread public support for a ban on so-called "killer robots", which campaigners say would "cross a moral line" after which it would be difficult to return.

Polling across 26 countries found over 60 per cent of the thousands asked opposed lethal autonomous weapons that can kill with no human input, and only around a fifth backed them.

The figures showed public support was growing for a treaty to regulate these controversial new technologies - a treaty which is already being pushed by campaigners, scientists and many world leaders.

However, a meeting in Geneva at the close of last year ended in a stalemate after nations including the US and Russia indicated they would not support the creation of such a global agreement.

Mary Wareham of Human Rights Watch, who coordinates the Campaign to Stop Killer Robots, compared the movement to successful efforts to eradicate landmines from battlefields.

However, this time she said the aim was to achieve victory before autonomous weapons get out of control and into the wrong hands.

"The efforts to deal with landmines were reactive after the carnage had occurred. We are calling for a pre-emptive ban," she said.

She added that unless kept in check these technologies could end up being employed not just by the military but by police forces and border guards as well.

Ms Wareham discussed these ideas with other experts in the field at the American Association for the Advancement of Science meeting in Washington DC.

She said scientists and tech companies such as Google had already been incredibly proactive in demonstrating their support for the cause.

UN Secretary-General Antonio Guterres added his voice in November, calling lethal autonomous weapons systems "politically unacceptable and morally repugnant" and urging states to prohibit them.

Ms Wareham said critics of these developments recognised killer robots as AI at its very worst.

"The AI experts have said that even if 'responsible' militaries like the US and UK say we will use these things responsibly, once they are out where you cannot control it they will proliferate to all sorts of governments as well as non-state groups," she said.

One rationale often given for the development of these machines is that they could be more precise than existing weapons and therefore cause less human suffering. However, as these weapons systems have not been developed this remains untested.

Russia, Israel, South Korea and the US indicated at the annual meeting of the Convention on Conventional Weapons they would not support negotiations for a new treaty.

Even the UK is allegedly dabbling with more autonomous weapons, with the planned development of a "drone swarm" capable of flying and locating targets by itself.

Ms Wareham said ministers should carefully consider the implications of such actions before hurrying to keep up with nations like the US.

"By permitting fully autonomous weapons to be developed, we are crossing a moral line," she concluded "We are not just concerned about use in warfare, but use in other circumstances, policing, law enforcement, border control, there are many other ways in which a fully autonomous weapons could be used in the future."

"Why 'killer robots' are neither feminist nor ethical," Open Canada, 22 January 2019.
https://www.opencanada.org/features/why-killer-robots-are-neither-feminist-nor-ethical/
Six out of 10 Canadians responding to a recent poll opposed the development of weapons systems that would select and attack targets without human intervention (commonly known as autonomous weapons systems or killer robots). The poll results, released Tuesday, show that only 15 percent of Canadian respondents supported the use of such weapons, while 25 percent were not sure. These types of weapons might sound like something from a sci-fi movie but the survey and the context it was prompted by are very real, and the Canadian government should being paying attention. The survey was commissioned by the Campaign to Stop Killer Robots and was conducted by market research company Ipsos in December across 26 countries: Argentina, Australia, Belgium, Brazil, Canada, China, Colombia, France, Germany, Great Britain, Hungary, India, Israel, Italy, Japan, Mexico, Netherlands, Peru, Poland, Russia, South Africa, South Korea, Spain, Sweden, Turkey and the United States. The Canadian results were close to the global results where 61 percent of respondents said they oppose the use of lethal autonomous weapons systems, while 22 percent support such use and 17 percent said they were not sure. Such opposition appears to be on the rise. In a near-identical survey by IPSOS in January 2017, 55 percent of Canadian respondents were opposed to autonomous weapons. The increase in Canadian opposition from 55 percent to 60 percent over the past two years mirrors a worldwide increase in opposition from 56 percent to 61 percent.

While public opposition to autonomous weapons has been growing, so has international attention. This month, 4,000 Google employees were named Arms Control Person of the Year for urging the company to not be "in the business of war." The Campaign to Stop Killer Robots, which was co-founded by Mines Action Canada, where I work, was launched in 2012 in the face of growing concerns among tech experts and humanitarian actors about ongoing efforts to develop autonomous weapons. It has grown to include 88 non-governmental organizations in 50 countries advocating for a pre-emptive ban on autonomous weapons systems. In November,

UN Secretary-General Antonio Guterres called lethal autonomous weapons systems "politically unacceptable and morally repugnant" and urged states to prohibit them. Also in November, at the annual meeting of the UN's Convention on Conventional Weapons in Geneva, the states parties to the convention decided to continue diplomatic talks on killer robots, but that process has no clear objective or timetable for negotiating new international instruments to address these concerns.

Outside the disarmament community, roboticists, artificial intelligence (AI) experts and scientific leaders have also been voicing their concerns. In November 2017, over 200 leaders in AI from across Canada signed an open letter to Prime Minister Justin Trudeau urging the government to "take a strong and leading position against Autonomous Weapon Systems on the international stage. "But in light of this most recent public opinion data and the ongoing international work, where is the Canadian government on autonomous weapons? The short answer is nowhere special. I hope the longer answer is continuing internal discussions between Global Affairs Canada, the Department of National Defence, and Innovation, Science and Economic Development Canada. Canada has participated in the Convention on Conventional Weapons meetings since they began in 2014 and this government's defence policy, Strong, Secure, Engaged, states that "The Canadian Armed Forces is committed to maintaining appropriate human involvement in the use of military capabilities that can exert lethal force." Canada's statements at the UN have often focused on international humanitarian law and the requirement to test all new weapons systems for compliance with international humanitarian law. Can autonomous weapons use be considered feminist or ethical?

The lack of a comprehensive policy raises some questions about the government's priorities. There seems to be a disconnect between the slow pace of action on a national autonomous weapons policy and two other government policies — its unofficial feminist foreign policy and the Pan-Canadian Artificial Intelligence Strategy.

Achieving a pre-emptive ban on autonomous weapons is a feminist issue. Remember, artificial intelligence is not neutral — human biases are baked into algorithms, and the data we use to train a machine learning program often reflects our own patriarchal and racist society. Experiences of people of colour and women are often not included in the development of artificial intelligence programs. A recent estimate done by WIRED with Element AI found that only 12 percent of leading machine learning researchers were women. In many cases AI has been found to magnify biases about race and gender.

So what happens when we combine bias in AI with weapons?

In short — scary things. Most obviously, when you have biased AI which can't identify people of colour, especially dark-skinned women, or misidentifies people of colour involved in targeting decisions without meaningful human control, we're going to see people who shouldn't be targeted being targeted. Furthermore, we already see examples of men being targeted during armed conflict based on their gender, age and location, so it stands to reason those errors will be compounded if human judgment is taken out of the targeting process. Canada should be taking steps to ensure that no one develops weapons which will magnify the power imbalances and biases our feminist foreign policy is trying to dismantle.

Autonomous weapons are also a concern from the perspective of the ethical use of AI, something Canada is hoping to promote. In 2017, the government announced a $125 million Pan-Canadian Artificial Intelligence Strategy as part of over $1.3 billion in funding for AI research and development in 2016-2017. The Pan-Canadian AI Strategy aims to strengthen Canada's economy by "increasing the number of highly-skilled researchers and graduates, enhancing

research capabilities and discoveries through collaboration across three centres of excellence, and demonstrating global leadership around the economic, ethical, policy and legal implications around advancement in AI technologies."

"Canadians' opposition to autonomous weapons is now undeniable."

Autonomous weapons systems are a major concern for the Pan-Canadian AI Strategy in a few ways. First of all, the strategy itself strives to demonstrate global leadership on "ethical, policy and legal implications" around AI. Much of the debate around autonomous weapons systems has focused on their ethical and legal implications. Of the Canadians who were opposed to autonomous weapons in the Ipsos survey, 67 percent indicated their opposition was in part because autonomous weapons "cross a moral line because machines should not be allowed to kill."

Second, leaders from the three centres of excellence participating in the strategy were among the co-writers of the November 2017 letter to Trudeau asking for national legislation prohibiting autonomous weapons systems and the weaponization of AI.

Third, and possibly most importantly, autonomous weapons pose a serious risk to the public's trust in AI more broadly. In addition to the Ipsos poll, a 2017 Canadian trust survey by Proof(formerly Environics) found that that only 39 percent of Canadians trust that artificial intelligence will contribute positively to the Canadian economy, and even fewer women believe this to be true (36 percent). Only 25 percent of those surveyed by Proof trusted AI companies to do what is right for Canada, Canadians and our society. These levels of public trust will present a problem for the commercial success of AI in the future, even without images on the news of AI powered autonomous weapons in use. Public trust in the technology is absolutely crucial to the transition from "cool techy thing" to an integral part of our lives. If the technology is weaponized, that transition will be so much harder. The Canadian government has made huge investments in AI — it cannot afford to damage people's trust in the technology.

Canadians' opposition to autonomous weapons is now undeniable. Canada has a history of leadership on peace and disarmament, coupled with a strong AI sector which has been quite outspoken on this issue. The Trudeau government should be listening to Canadian experts and to public opinion and begin to develop national legislation to prohibit the development and use of autonomous weapons systems.

A national ban on the use and production of autonomous weapons systems by any Canadian actor and leadership internationally are in line with both a feminist foreign policy and the emphasis the government has put on AI as a future driver of the Canadian economy. The UN talks on the topic resume in March and as the technology is rapidly evolving, it's time for Canada to get serious about banning autonomous weapons systems.

"It's time to terminate killer robots, world leaders are told," *The Times***, 15 February 2019.**
https://www.thetimes.co.uk/article/it-s-time-to-terminate-killer-robots-world-leaders-are-told-lqqqbswrn

Killer robots are a threat to humanity, scientists were told yesterday, and polling suggests that opposition to autonomous weapons systems is rising.

Mary Wareham, co-ordinator of the Campaign to Stop Killer Robots, told the annual convention of the American Association for the Advancement of Science: "Bold political leadership is needed for a new treaty to pre-emptively ban these weapons systems."

This week Gavin Williamson, the defence secretary, said that "swarm squadrons" of drones could be used to counter enemy air defences.

Computer scientists are developing clusters of robots, in which individual machines would have some autonomy.

Ms. Wareham, who works for Human Rights Watch, said: "Swarm technology is still in its infancy and there's little evidence that, if weaponized, such systems could comply with key principles of international humanitarian and human rights law. The UK should be considering the many risks raised by such technology before wholeheartedly embracing it."

In November, Antonio Gutteres, the UN secretary-general, called lethal autonomous weapons systems "politically unacceptable and morally repugnant" and urged states to prohibit them. However, Russia has maneuvered to limit the time that the UN will devote to negotiations on the issue this year.

An Ipsos poll of people in 26 countries suggested that 61 percent were opposed to lethal autonomous weapons systems. The survey suggests that support for fully autonomous weapons was strongest in India, where 50 percent were in favour, and Israel, where 41 percent supported the technology. Men were more likely than women to favour such weapons and people aged between 50 and 64 were most likely to oppose it.

The UN has held debates on the development of "weapons systems that, once activated, can select and engage targets without further intervention." Christof Heyns, a former UN special rapporteur, has called for a ban.

"Survey: More than 60% of people want robot soldiers banned," Big News Network, No date.
https://www.bignewsnetwork.com/news/259167278/survey-more-than-60-of-people-want-robot-soldiers-banned

More than 60% of people around the world oppose the development of autonomous weapons that could select and kill targets without human intervention, according to a new poll commissioned by the Campaign to Stop Killer Robots.

The poll, which was carried out by Ipsos MORI, found that:

In 26 countries surveyed in 2018, more than three in every five people (61%) oppose the development of lethal autonomous weapons systems.

Two-thirds (66%) of those opposed to lethal autonomous weapons systems were most concerned that they would "cross a moral line because machines should not be allowed to kill."

More than half (54%) of those who opposed said they were concerned that the weapons would be "unaccountable."

A near-identical survey in 23 countries in January 2017 found that 56% of respondents were opposed to lethal autonomous weapons systems – opposition growing.

More than half of respondents opposed killer robots in China (60%); Russia (59%); the UK (54%); France (59%), and the USA (52%).

The Campaign to Stop Killer Robots is a growing global coalition of NGOs, including Amnesty International, that is working to ban fully autonomous weapons.

"This poll shows that the states blocking a ban on killer robots are totally out of step with public opinion. Governments should be protecting people from the myriad risks that killer robots pose, not rushing into a new arms race which could have terrifying consequences," Rasha Abdul Rahim, Acting Deputy Director of Amnesty Tech said Thursday.

"We still have time to halt the development and proliferation of fully autonomous weapons, but we won't have that luxury for long. Governments should take note of this poll and urgently begin negotiating a new treaty to prohibit these horrifying weapons. Only this can help ensure respect for international law and address ethical and security concerns regarding delegating the power to make life-and-death decisions to machines."

Amnesty International is calling for a total ban on the development, production and use of fully autonomous weapon systems, in light of what they say are the serious human rights, humanitarian and security risks they pose. The use of autonomous weapons without meaningful and effective human control, Amnesty says, would undermine the right to life and other human rights - and create an accountability gap if, once deployed, they are able to make their own determinations about the use of lethal force.

However, a minority of states at the 2018 November annual meeting of the Convention on Conventional Weapons, used consensus rules to thwart meaningful diplomatic progress. Russia, Israel, South Korea, and the USA indicated at the meeting that they would not support negotiations for a new treaty, but the poll results show that more than half of respondents in Russia (59%) and the USA (52%) oppose autonomous weapons.

More than half of respondents opposed autonomous weapons in China (60%), South Korea (74%) and the UK (54%), which are among the leading states developing the technology.

The survey by Ipsos MORI was commissioned by the Campaign to Stop Killer Robots and conducted last month. The sample size was 500 to 1,000 people in each country

"Countries must agree strict rules on 'killer robots' in future wars," Political Economist, 22 January 2019. http://www.politicaleconomistng.com/countries-must-agree-strict-rules-on-killer-robots-in-future-wars/

Countries must agree strict rules on "killer robots" – autonomous weapons which can assassinate without human involvement, a top Red Cross official has said, amid growing ethical concerns over their use in future wars.

Semi-autonomous weapons systems from drones to tanks have for decades been used to eliminate targets in modern day warfare – but they all have human control behind them.

With rapid advancements in artificial intelligence, there are fears among humanitarians over its use to develop machines which can independently make the decision about who to kill.

Yves Daccord, director-general of the International Committee of the Red Cross (ICRC), said this would be a critical issue in the coming years as it raised ethical questions on delegating lethal decisions to machines and accountability.

"We will have weapons which fly without being remotely managed by a human and have enough intelligence to locate a target and decide whether it is the right person to take out," Daccord told the Thomson Reuters Foundation in an interview.

"There will be no human making that decision, it will be the machine deciding – the world will essentially be delegating responsibility to an algorithm to decide who is the enemy and who is not, and who gets to live and who gets to die."

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