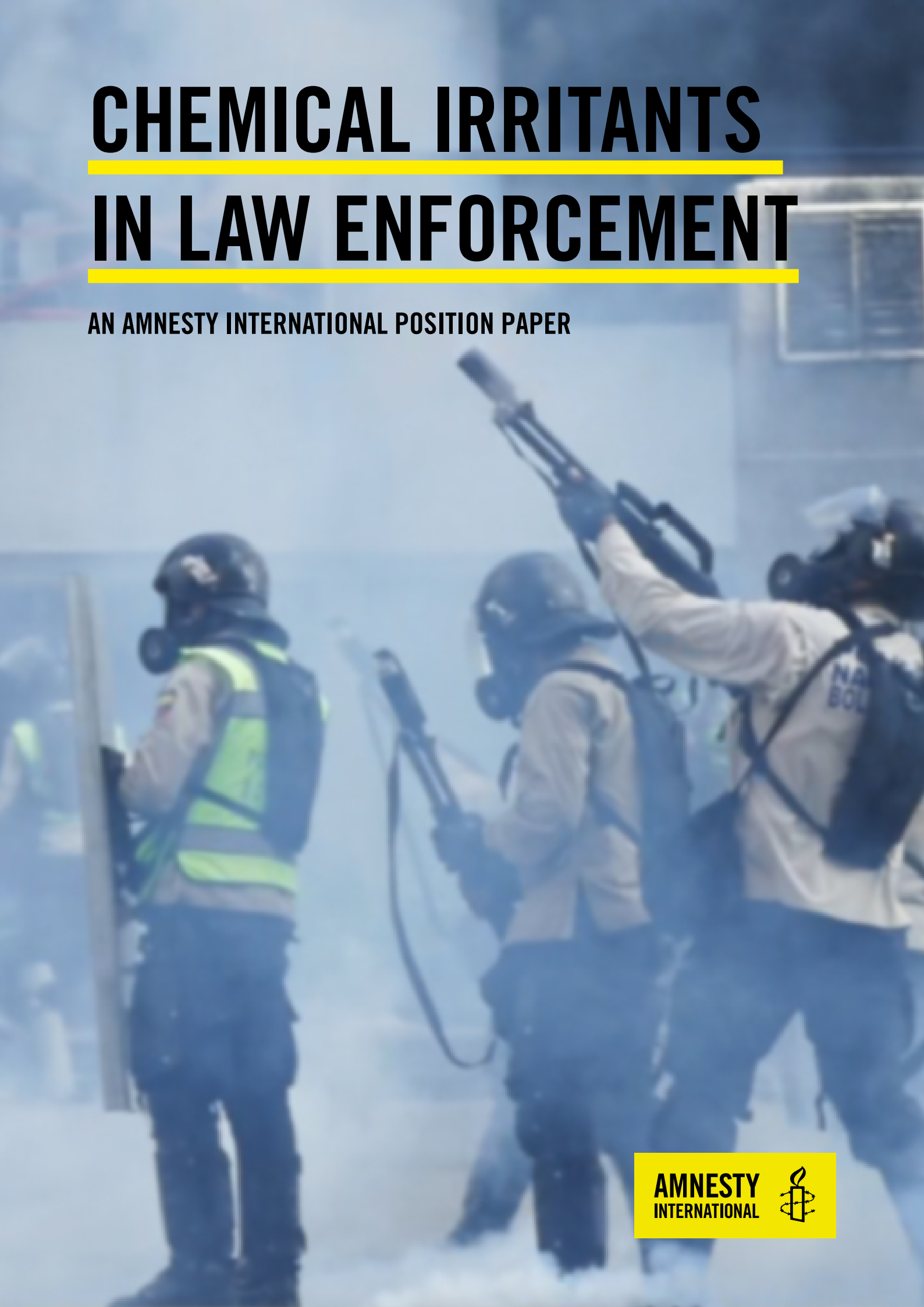
CHEMICAL IRRITANTS IN LAW ENFORCEMENT

AN AMNESTY INTERNATIONAL POSITION PAPER



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Cover page: Security forces fire tear gas canisters at protestors in Venezuela © Laura Rangel

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1. What are chemical irritants and what types of chemical irritants exist?

Chemical irritants are designed to temporarily deter or disable an individual by producing sensory irritation. They are commonly defined as locally acting chemical agents that rapidly produce disabling physical effects through sensory irritation of the eyes and upper respiratory tract. These effects usually disappear within a short time following the termination of exposure. Several chemicals are used, most commonly: CN, CS, OC/pepper and PAVA.[1]

CN gas (2-Chloroacetophenone) has irritant properties designed to disperse crowds who, once exposed, flee to escape from the irritants' effects. CN gas can contaminate rooms, furniture, vehicles and clothing; its effects continue long after it has been released and, in high concentrations, the gas is lethal if the victim is in a confined space. CN is the active ingredient in Mace sprays.

CS gas (o-Chlorobenzylidene malononitrile) is up to five times more of an irritant than CN gas while being less toxic. It has been developed in the USA and UK. Despite considerable evidence of the detrimental effects of CS gas on human health, it remains the "tear gas" most commonly used by security forces. The use of CS gas can have indiscriminate effects.

OC (oleoresin capsicum) is the principal ingredient of pepper spray, which is an irritant but not necessarily a tear gas. The components of pepper spray are of biological origin (from the capsicum species of plant, such as the chilli pepper) and can vary depending on the capsicum used. It can contain many different chemicals, few of which have been adequately studied.

PAVA (pelargonyl vanillylamide) pepper spray is a synthetic formulation of one active OC constituent. It is classified as an inflammatory since, like OC, it causes acute burning of the eyes, severe inflammation of the mucous membranes and upper respiratory tract, and produces coughing and gagging.

Chemical irritants such as those listed above are often referred to as tear gases. This is a generic, non-specific name for such irritants. Under some national and international laws, for example, the Chemical Weapons Convention (CWC),[2] these types of chemical irritants are also known as riot control agents.

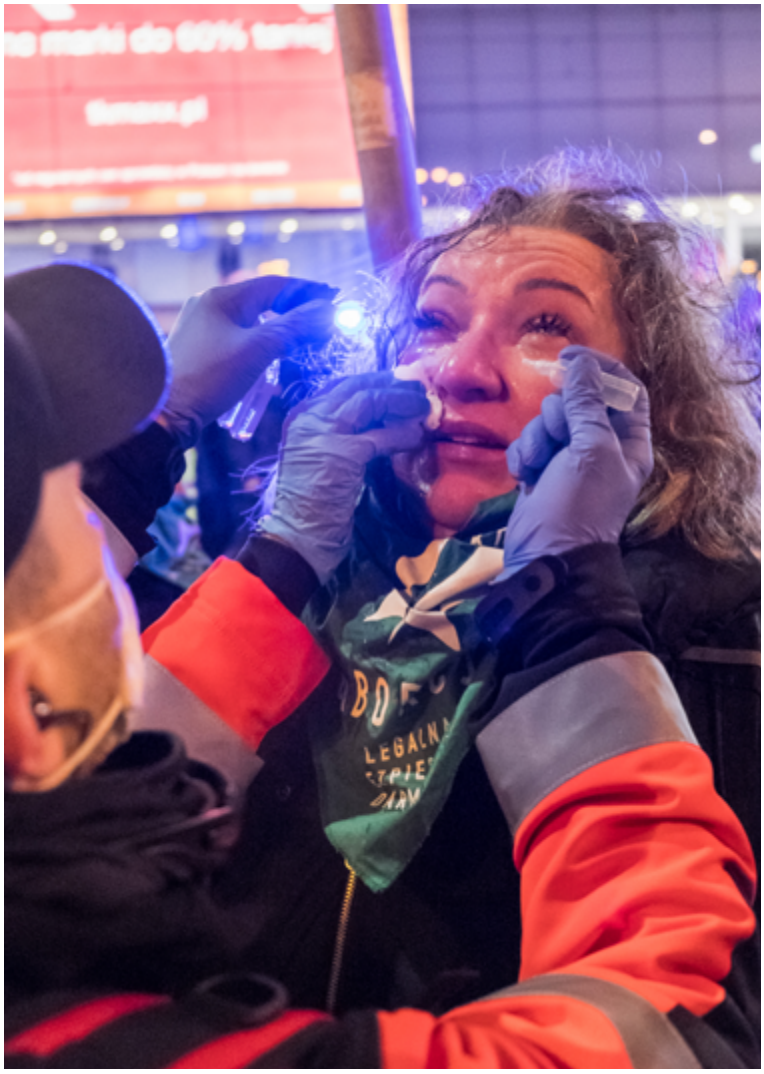
1 For more details on the variety of chemical irritants used see weaponslaw.org/weapons/riot-control-agents as well as ncbi.nlm.nih.gov/pmc/articles/PMC5649076/.

2 Available here: opcw.org/chemical-weapons-convention.

2. What are the effects of chemical irritants, including the potential health risks involved?

2.1 The physical/medical effects of chemical irritants

While in theory chemical irritants are designed to only cause temporary irritation, in practice, the consequences of their use can be considerable.[3] These can include: lacrimal tearing of the eyes, breathing difficulties including coughing and choking sensation, chemical burns, vomiting, and severe allergic reaction, including blistering of the skin. More serious consequences, including in extreme cases death by suffocation or as a result of allergic reactions, can also occur, depending on the composition, length of the exposure, underlying health conditions or specific vulnerabilities:[4]



Marta Lempart, Women's Strike leader, treated by paramedics after being pepper sprayed by the police in Warsaw, Poland. © Grzegorz Żukowski

3 The seriousness of these consequences is regularly recognized. For instance, see European Court of Human Rights (ECtHR), *Tali v. Estonia*, Application 66393/10, para. 78, *Çiloğlu and Others v. Turkey*, Application 73333/01, para. 19.

4 See for more details on the potential harmful effects of chemical irritants: Physicians for Human Rights, *"Lethal in Disguise: The Health Consequences of Crowd-Control Weapons"*, 2016, policehumanrightsresources.org/content/uploads/2017/08/lethal-in-disguise.pdf?x96812 as well as *"Weaponizing Tear Gas: Bahrain's Unprecedented Use of Toxic Chemical Agents Against Civilians"*, August 2012, thenation.com/wp-content/uploads/2015/04/Bahrain-TearGas-Aug2012-small.pdf. More recently, a study found abnormal menstruation as a (sometimes long-lasting) symptom reported after exposure to chemical irritants: B.N. Torgrimson-Ojerio and others, *"Health issues and healthcare utilization among adults who reported exposure to tear gas during 2020 Portland (OR) protests: A cross-sectional survey"*, 26 April 2021, BMC Public Health, bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-10859-w

The US Centers for Disease Control and Prevention lists[5] the following possible symptoms:

Immediately after exposure:

- Eyes: excessive tearing, burning, blurred vision, redness
- Nose: runny nose, burning, swelling
- Mouth: burning, irritation, difficulty swallowing, drooling
- Lungs: chest tightness, coughing, choking sensation, noisy breathing (wheezing), shortness of breath
- Skin: burns, rash
- Other: nausea, vomiting

Long-lasting exposure or exposure to a large dose of riot control agent, especially in a closed setting, may cause severe effects such as the following:

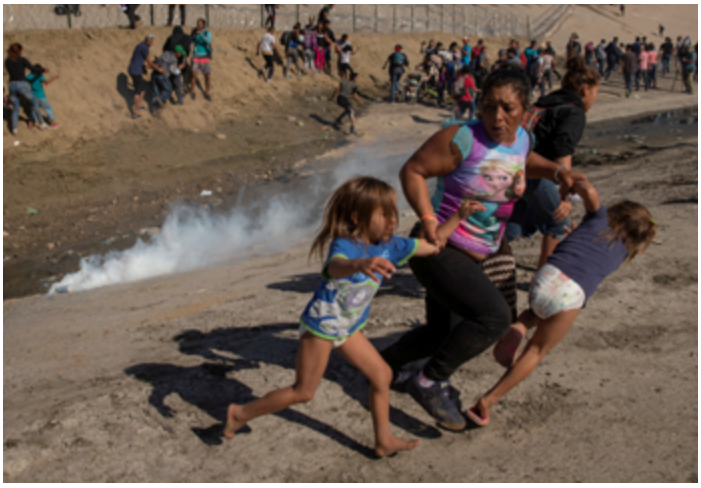
- Blindness
- Glaucoma (a serious eye condition that can lead to blindness)
- Immediate death due to severe chemical burns to the throat and lungs
- Respiratory failure possibly resulting in death

Long-term health effects of exposure to riot control agents:

- Prolonged exposure, especially in an enclosed area, may lead to long-term effects such as eye problems including scarring, glaucoma and cataracts, and may possibly cause breathing problems such as asthma.
- If symptoms go away soon after a person is removed from exposure to riot control agents, long-term health effects are unlikely to occur.

Physicians for Human Rights lists similar and additional effects in relation to the eyes, the respiratory system, the skin and the cardiovascular system as well as psychological consequences and potential effects on pregnancy and the foetus.[6]

Tear gas affects people differently, with children, pregnant women and older persons particularly susceptible to its effects. Toxicity levels can vary according to the product specifications, the quantity used, and the environment in which it is used. Prolonged contact can pose severe health risks. The risk of physical injury and in some cases death (for example, through suffocation) can increase when chemical irritants are used alongside other equipment, such as handcuffs on an already restrained person, or when used against people who are under the influence of drugs or alcohol.



A migrant family run away from tear gas in front of the border wall between the U.S. and Mexico. © Reuters/Kim Kyung-Hoon

5 emergency.cdc.gov/agent/riotcontrol/factsheet.asp

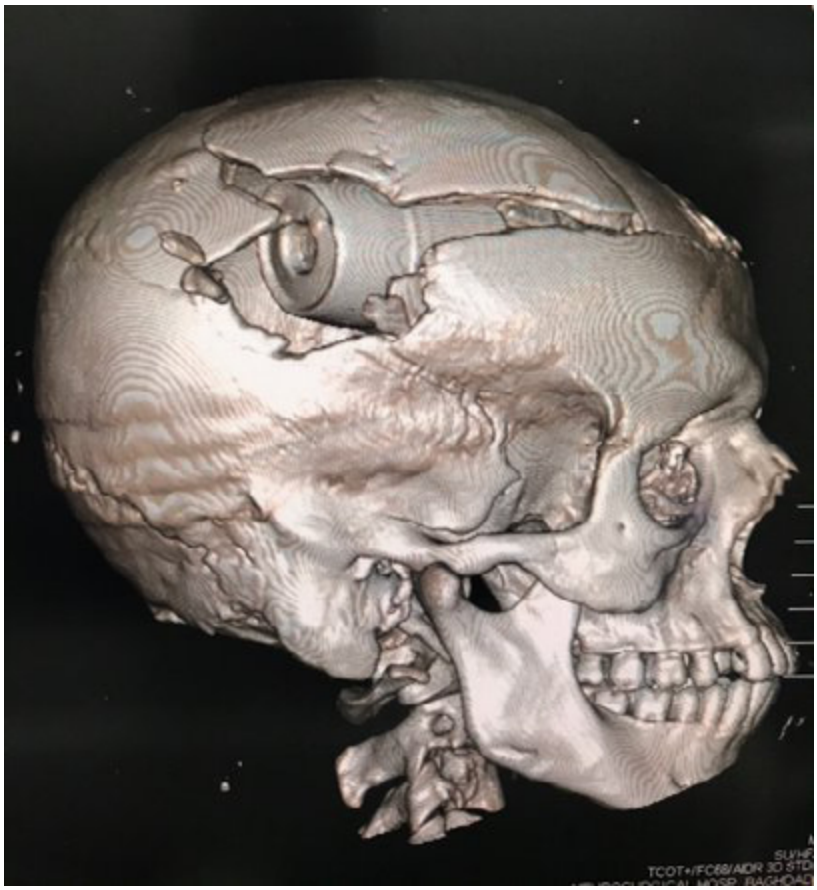
6 https://s3.amazonaws.com/PHR_other/PHR_INCLO_Fact_Sheets_Chemical_Irritants.pdf

Due to limited published research on the effects of these gases, the full scope of their impact remains unclear, and further systematic studies are urgently needed.[7] In any case, law enforcement agencies should only use a given type of chemical irritant when there is sufficient toxicological information available to conclude that it will not cause any unwarranted health problems.[8] They should only use products with the minimum toxicity needed to be effective for legitimate law enforcement purposes.

2.2 Impact-related risks and injuries

In some instances, launched projectiles containing chemical irritants can, if they hit a person directly, cause penetration wounds, concussion, other head injuries and, in severe instances, death.

Handheld pepper spray is designed to cause irritation when sprayed directly at the face of a person. However, it can also cause burns[9] and impact injuries, particularly to the eyes, if the distance is too short compared with the level of pressure of the spray.



CAT scans shared with Amnesty International by medical professionals in Iraq show how tear gas grenades pierced protesters' skulls. © Private

7 A key problem in that regard is that often neither the precise composition of the irritant is known, nor have the effects of this specific composition been thoroughly studied. See, for example, Rohini J. Haar and others, "Health impacts of chemical irritants used for crowd control: A systematic review of the injuries caused by tear gas and pepper spray", 19 October 2017, BMC Public Health, ncbi.nlm.nih.gov/pmc/articles/PMC5649076/, p. 2: "The National Academy of Sciences in the United States does not identify a minimum safe concentration, as even the lowest concentrations can result in 'notable discomfort, irritation, or certain asymptomatic, non-sensory but transient effect' … The volume and concentration of chemical in each spray and aerosol varies considerably among manufactures and countries. Stated concentrations of OC may be misleading, because the potency of OC is dependent not only on the concentration within a solvent but on the strength of the capsicum extracted. Of concern, chemical irritants may contain numerous other toxic chemicals, including alcohols, organic solvents, halogenated hydrocarbons, and propellants such as Freon, tetrachloroethylene, and methylene chloride. The use of solvents such as tetracholoroethylene and methylene chloride may enable deeper skin penetration as well as larger quantities of irritant to be dissolved and dispersed, potentially exacerbating some of the effects attributed to pepper spray.".

8 Office of the UN High Commissioner for Human Rights (OHCHR), *United Nations Human Rights Guidance on Less-Lethal Weapons in Law Enforcement*, 2020, ohchr.org/Documents/HRBodies/CCPR/LLW_Guidance.pdf, para. 7.2.3.

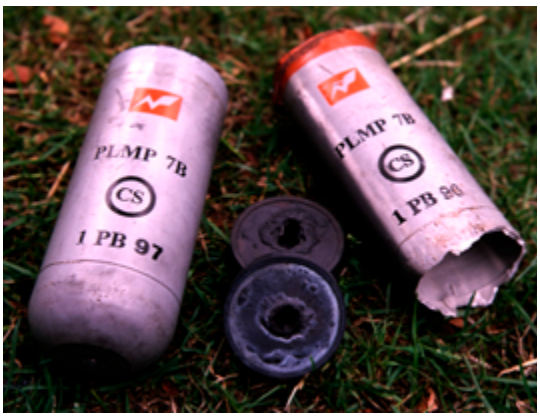
9 See, for instance, *the case of ECtHR, Petruş Iacob v. Roumanie*, Application 13524/05, para. 34.

3. In which forms are chemical irritants being dispensed?

3.1 Wide-area irritants – "tear gas"

Wide-area irritants, commonly known as "tear gas", are dispensed in different ways:

- Canisters or grenades that are hand-thrown or fired from a launcher (placed on the ground or mounted on a vehicle) or fired from a shotgun or rifle. In these cases, there will be some sort of propellant, and some will contain an explosive material that induces the release of the chemical irritant.
- Released as smoke from a mobile device (for example, a specially designed car with openings to release the irritant, or a drone).
- In combination with the liquid of a water cannon.



Markings on French-manufactured tear gas canisters which were used in June, 1999, to break up a demonstration in Nairobi, Kenya.
© Amnesty International

3.2 Short-distance sprays – "pepper spray"[10]

- Small handheld sprays to be used at short distance against a single person.
- Larger spraying devices (similar to fire-extinguishers or insecticide spraying devices) discharging greater volume (compared with handheld sprays).

Military Police officer uses pepper spray against protesters in São Paulo. © Mídia Ninja

10 There are various forms of handheld or "backpack"-style devices. More information can be found at: weaponslaw.org/weapons/riot-control-agents

4. When may chemical irritants be used and when not?

As for any other weapon, the use of chemical irritants must respect the principles of legality, necessity and proportionality.

Therefore, law enforcement officials may only use them for a legitimate law enforcement purpose and not against people who are simply exercising their human rights (principle of legality).

They should not use chemical irritants if there are less harmful means available to achieve a legitimate law enforcement purpose (principle of necessity). If they do use them, chemical irritants should not cause more harm than the harm they are supposed to prevent (principle of proportionality). Hence, as a first rule, they may not be used against persons who are acting peacefully and/or are merely passively resisting an order.[11]

In light of the harm and injury they may cause, their use can only be accepted to prevent harm of at least similar severity.[12] Therefore, they may only be used against persons engaged in violence against persons and when there are no less harmful means available to stop the violence.[13]

➔ **Chemical irritants are not a tool to simply obtain compliance with an order.**

➔ **They may only be used against persons engaged in acts of violence likely to cause more than negligible harm to another person.**

4.1 Wide-area irritants

Wide-area chemical irritants have by nature an indiscriminate effect. It is impossible to control who will be affected by chemical irritants that are dispensed over a wide area. They are as likely to affect people engaged in violence as people acting peacefully, as well as bystanders and people living in the area. Since the harm chemical irritants may cause can be more serious than just the immediate irritation, the effect on bystanders or peaceful protesters can only be accepted in extreme circumstances. As a rule, law enforcement officials must seek to act only on those engaging in violence. Only when violence is so widespread that this is not possible anymore can it be acceptable to use a weapon with an indiscriminate effect by nature.[14]

11 OHCHR, *United Nations Human Rights Guidance on Less-Lethal Weapons in Law Enforcement* (previously cited), para. 7.2.7.

12 For instance, the need to enforce regulations of a purely administrative nature does not justify the use of such a weapon: ECtHR, *Petruş Iacob v. Roumanie*, para. 37. On minor acts of resistance, see ECtHR, *Grămadă v. Romania*, Application 14974/09, para. 70.

13 OHCHR, *United Nations Human Rights Guidance on Less-Lethal Weapons in Law Enforcement* (previously cited), para. 7.2.3.

14 Amnesty International – The Netherlands, *Use of Force: Guidelines for the Implementation of the UN Basic Principles on the Use of Force and Firearms by Law Enforcement Officials*, August 2015, policehumanrightsresources.org/content/uploads/2015/01/ainl_guidelines_use_of_force_0.pdf?x96812, Guideline 7h) and section 7.2.3. OHCHR, *Resource Book on the Use of Force and Firearms in Law Enforcement*, 2017, ohchr.org/Documents/ProfessionalInterest/UseOfForceAndFirearms.pdf, p. 88.

Peaceful protestor exposed to tear gas in Venezuela. © Laura Rangel

- **Wide-area chemical irritants may only be used where violence is so widespread that it is not possible for law enforcement officials to act only upon individuals engaged in violence.**
- **They should never be used to disperse a peaceful assembly.**
- **They should never be used if there are only isolated acts of violence.**

4.2 Short-distance sprays

Short-distance sprays are defensive weapons – they may be used in self-defence or in the defence of others against physical violence.[15] As already stated, law enforcement officials should not use them merely to obtain compliance with an order. Furthermore, it should go without saying that pepper spray should never be used on a person who is already restrained or otherwise under control, as this would amount to torture or other ill-treatment.[16]

15 OHCHR, *United Nations Human Rights Guidance on Less-Lethal Weapons in Law Enforcement* (previously cited), para. 7.2.3; OSCE Office for Democratic Institutions and Human Rights (ODIHR), Human Rights Handbook on Policing Assemblies, 2016, osce.org/files/f/documents/c/5/226981.pdf, p. 79.

16 ECtHR, *Ali Güneş v. Turkey*, Application 9829/07, para. 41,

Otto M.J. Adang and Jos Mensink, "Pepper spray – An unreasonable response to suspect verbal resistance", p. 215-217:[17]
"Each situation should be judged on its own merits and we should expect trained police officers to have the communicative and physical skills to resolve most non-violent conflict situations. Applying the principles of legality, subsidiarity and proportionality is not a matter of statistics, but of situational decision making. **Without analysing interactions and knowing why some result in injuries it seems premature – to say the least – to give a blanket recommendation to use OC in any instance that a suspect does not cooperate**" …

"**Designating pepper spray as the preferred option in situations where suspects are verbally resistive seems unreasonable and could even be seen as a form of abuse**. Applying a very painful stimulus to a non-violent, non-co-operating suspect (by spraying him with pepper spray) will often be disproportionate given the fact that there are less radical techniques available, if applied well. A policy that allows the use of pepper spray in these circumstances may well lead to an all too easy deployment, at the expense of other, less painful techniques and be at odds with Article 5 of the Universal Declaration of Human Rights (which states that: 'No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment'). This is even more true where after-care procedures do not start straight away, but are only implemented after a suspect has been transported to a police station, as is the case in many police forces in the US (Broadstock, 2002). Based on the impact of pepper spray on suspects and the results of the street trials, we recommend a policy where it is stated explicitly that pepper spray is not to be used as a replacement for hands-on physical control techniques. This recommendation is also based on the consideration that an all too easy reliance on pepper spray (at the expense of other options) is potentially dangerous to officers given the fact that OC is not always effective."

While small handheld sprays are designed to be targeted against a single person, short-distance sprays with high pressure and quantity (for example, fire-extinguisher capacity or backpack-style sprayers) can affect a group of people. They should not be used if there is only a single person acting violently, with other people around likely to be affected as well. And they should not be sprayed randomly at a crowd, irrespective of who is or is not engaged in violence.

Riot police spray tear gas at demonstrators gathered outside the parliament building in Budapest. © Peter Kohalmi/AFP

➔ **Handheld sprays may only be used against persons violently resisting or otherwise engaged in violence against another person.**

➔ **Their use on a person who is restrained or otherwise under control amounts to ill-treatment or even torture.**

17 Published in 2004 in Policing: An International Journal of Police Strategies & Management, pp. 206-219.

5. Chemical irritants: how they should and should not be used[18]

5.1 Warning

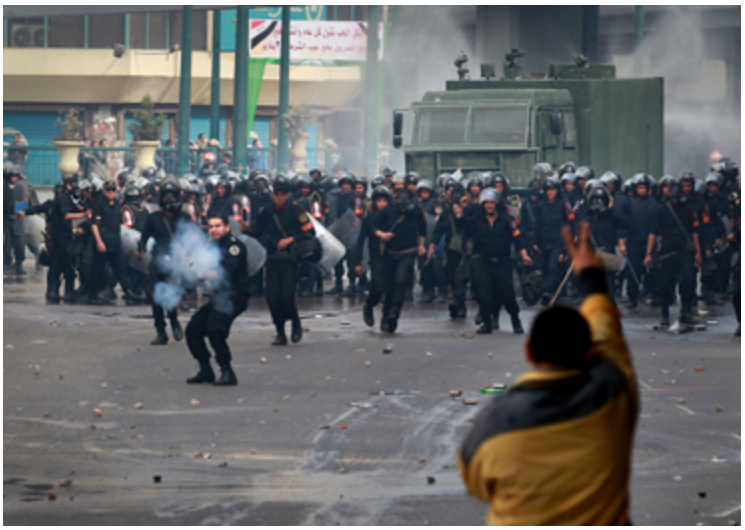
As for any other use of force, the principle of necessity requires law enforcement officials first to attempt non-violent means. Therefore, they must warn that they will use chemical irritants if their order is not complied with and allow sufficient time for people to obey the order. This requirement is inherent to the principle of necessity and the duty to minimize harm. If a person might already stop violent actions due to a warning, then there is no need to resort to the actual use of a weapon. Thus, to minimize harm, a person must be given the opportunity to stop any harmful behaviour before using a chemical irritant can be justified.[19]

➔ **A clear order and a warning must precede the use of chemical irritants.**

5.2 Precautions

The duty to minimize harm and injury[20] requires law enforcement to take a range of precautions when resorting to the use of chemical irritants.

All chemical irritants are supposed to cause irritation only. They are not supposed to cause injury as a result of physical impact, and they must be used in such a way as to avoid any such injuries.



A riot policeman fires tear gas at protestors in front of the I-Istiqama Mosque in Giza, Cairo, Egypt. © Peter Macdiarmid/Getty Images

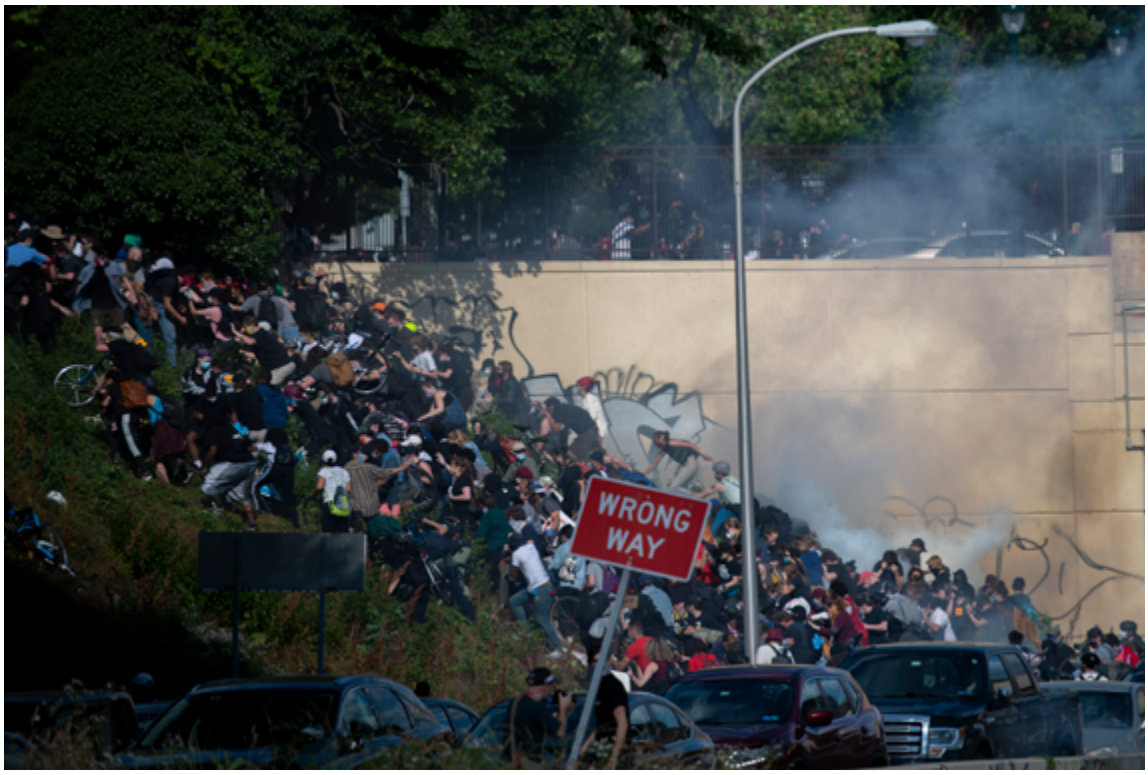
18 See also Physicians for Human Rights, "Chemical irritants", Crowd-Control Weapons Series, s3.amazonaws.com/PHR_other/PHR_INCLO_Fact_Sheets_Chemical_Irritants.pdf

19 See also Adang&Mensing (Fn. 15): "The fact that many officers did not give a warning before spraying OC, even if they were able to do so, may be due in part to considerations of effectiveness. As one reviewer suggested (see also Wright, 1997), by not issuing a verbal warning, an officer ensures that suspects cannot take evasive action (turning away from the spray, cover their faces, fleeing, etc.) and hence the effectiveness of OC will be increased. As true as this is, in our view this is precisely the kind of reasoning that leads to disproportionate police action. If a verbal warning suffices to gain compliance (and our results indicate this is true in half the cases), directly spraying without giving the warning is clearly disproportionate."

20 UN Basic Principles on the Use of Force and Firearms by Law Enforcement Officials (Basic Principles), adopted on 7 September 1990, Principle 5.

- **Grenades (sometimes also referred to as canisters or cartridges) from a launcher should never be fired directly at persons.[21] They should be fired at a certain angle clearly above the heads of people (the precise angle will depend on the distance of the launcher from the crowd).[22] They should not be fired vertically into the air as the falling projectile could hit people, risking serious injury.**
- **Handheld grenades should not be thrown at people; they should be rolled along the ground towards people.**
- **Handheld sprays are supposed to be sprayed at the face of a person. However, in doing this, law enforcement officials must respect the minimum distance indicated by the manufacturer. If spraying from too close a range, the pressure of the spray can directly cause eye injury.**

Contextual factors must always be considered before deciding to deploy indiscriminate chemical irritants. These include: geographical nature of the deployment site, temperature, wind and weather patterns, and the existence of hospitals, schools or dense, uninvolved populations in the vicinity.[23]



Protesters in Philadelphia race up a hill after being targeted with by tear gas. © Mark Makela / Getty Images

21 ECtHR, *Abdullah Yaşa v. Turkey*, Application 44827/08, para. 48; OHCHR, *Resource Book on the Use of Force and Firearms in Law Enforcement* (previously cited), p. 88.
22 OHCHR, United Nations Human Rights Guidance on Less-Lethal Weapons in Law Enforcement (previously cited), para. 7.3.2.
23 International Network of Civil Liberties Organizations (INCLO), Fact sheet: Chemical irritants, inclo.net/pdf/lethal/CIfactsheet.pdf.

➔ **Chemical irritants should only be used by law enforcement officials trained in their use and the required precautions to minimize harm and injury.[24]**

➔ **This training should include the ability to provide assistance, including immediate decontamination of any person who has been exposed to a chemical irritant and who is under their control or otherwise unable to seek assistance themselves.**

The quantity of chemical irritant dispensed should not exceed what is necessary for the circumstances. Repeated or prolonged exposure to chemical irritants should be avoided.[25] This requires a gradual response, with a limited quantity of chemical irritant being dispensed in the first place. Often, entire streets are filled with large clouds of irritants, likely to spread into houses and side streets, but this is in most cases unnecessary and disproportionate.

Lebanon security forces fire tear gas towards protestors in Beirut. © AFP

In any case, the use of multiple batteries mounted on vehicles and simultaneously firing a huge quantity of chemical irritants presents a clearly unnecessary and disproportionate use of this weapon. The development, trade, transfer and use of these devices should be banned.

➔ **Wide-area tear gas should only be used in a carefully coordinated manner,[26] based on clear instructions about the number of grenades/the quantity to be used for a given space or area.**

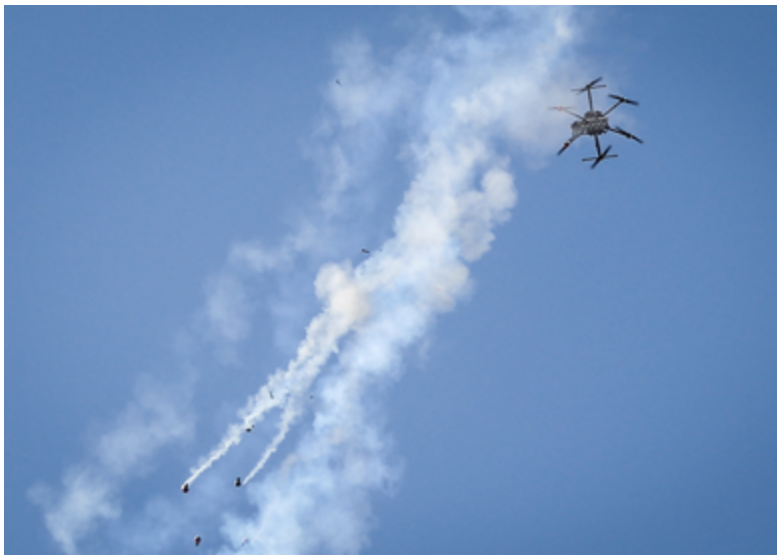
24 OHCHR, *Resource Book on the Use of Force and Firearms in Law Enforcement* (previously cited), p. 88.

25 OHCHR, *United Nations Human Rights Guidance on Less-Lethal Weapons in Law Enforcement* (previously cited), paras 7.2.6 and 7.3.5; OHCHR, *Resource Book on the Use of Force and Firearms in Law Enforcement* (previously cited), p. 88.

26 On the importance of command, control and instructions, see also: ECtHR, *Abdullah Yaşa v. Turkey,* previously cited, para. 49.

Tear gas used in a Hong Kong underground station. © Alamy

Law enforcement officials must use wide-area tear gas in strict accordance with its operational purpose to disperse a violent group of people. It should therefore not be used in confined spaces where people are unable to disperse. The risk of panic and of causing a stampede needs to be avoided through careful assessment of the area, the likely direction people might take when trying to escape, as well as the quantity of tear gas used. Furthermore, they must immediately stop using it when the objective is achieved, and people start to disperse.



An unmanned aerial vehicle belonging to Israeli forces throws tear gas canisters on Palestinian protesters during a protest. © Getty Images

The use of drones to dispense wide-area chemical irritants from above bears considerable risks. Wind and weather conditions make the spread and diffusion of irritants unpredictable, increasing the possibility that people other than those engaged in violence will be affected. This risk might also lead authorities to dispense increased quantities to be sure to have some impact but can then lead to some people being exposed to excessive amounts. Finally, with the chemical irritant coming from above, people have no clear direction in which to disperse. As a result, there is an increased risk of chaos, disorientation, panic and even a stampede. Therefore, chemical irritants should not be dispensed through drones.

- **Chemical irritants must not be used in confined spaces[27] or in an area where people are unable to disperse.[28] Their use should not lead to, or even aim to, corner people;[29] nor should they be used as a means to chase people who are already dispersing.**

- **Chemical irritants should not be dispensed from above (for example, via drones) since their direction and effect are unpredictable. This use bears an increased risk of causing panic and disorientation, given that people will not know in which direction to disperse.**

Chemical irritants (or their propellants) contain flammable materials, and therefore must not be used in situations when there is a risk of fire.

- **Chemical irritants should never be used if there is the intention to use electric-shock weapons, such as "TASERS", since the ignition of the weapon can lead to serious burns.**

- **They should never be used in the surroundings of highly flammable material, such as fuel stations, or when a person is doused with gasoline or similar flammable liquids.**

27 OHCHR, *United Nations Human Rights Guidance on Less-Lethal Weapons in Law Enforcement* (previously cited), paras 7.2.6 and 7.3.7.

28 This was for instance the case in Philadelphia, where protestors on a highway trying to escape from tear gas used upon them, found themselves trapped against a hill: New York Times, June 25, 2020, nytimes.com/video/us/100000007174941/philadelphia-tear-gas-george-floyd-protests.html

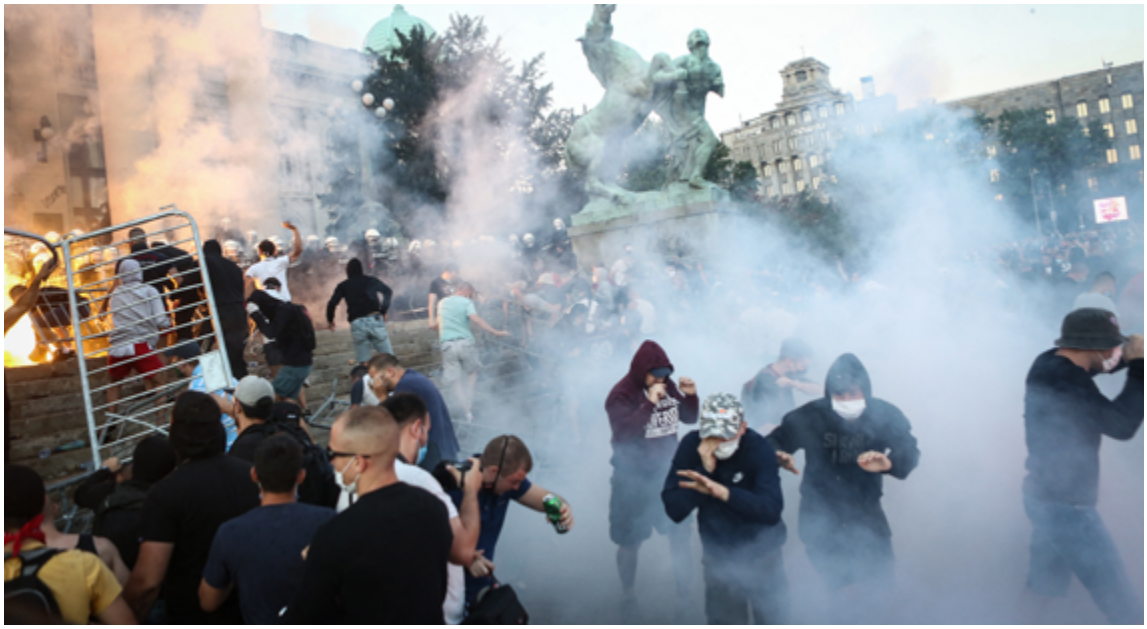
29 See for instance the situation around the Hong Kong CITIC Tower, where police fired tear gas from two sides, trapping protestors: https://youtu.be/leo5TYztv_w.

6. Special considerations

6.1 The use of chemical irritants in times of the COVID-19 pandemic

The use of chemical irritants during a pandemic involving the respiratory system bears considerable additional risks since they could worsen the symptoms of those carrying the COVID-19 virus, as well as increase the risk of infection for others:

- While there have been no systematic large-scale peer-reviewed studies on the risks of using chemical irritants during the COVID-19 pandemic, previous studies on the general effects on the respiratory system are cause for concern. Exposure to a chemical irritant may have a negative impact on how serious an infection with COVID-19 might become. It may have a serious health impact on people already infected but who have yet to develop symptoms. They might have a higher probability to undergo a more serious development of the disease – with potentially lethal consequences for themselves as well as putting an additional strain on the public health system. Such consequences may even occur for people not yet carrying the virus. A study on US soldiers[30] has revealed that those regularly exposed to chemical irritants in training are much more susceptible to developing acute respiratory illnesses (ARIs), with some so severe that they require hospitalization. This can be particularly dangerous when it concerns COVID-19. Another study on workers in a hot pepper factory also revealed long-term problems.[31]



Tear gas use during anti-Corona-lockdown-protests in Belgrade, Serbia. © Oliver Bunic/AFP

30 Joseph J. Hout and others, "O-chlorobenzylidene malononitrile (CS riot control agent) associated acute respiratory illnesses in a U.S. Army Basic Combat Training cohort", *Military Medicine*, Volume 179, Issue 7, July 2014, Pages 793–798, academic.oup.com/milmed/article/179/7/793/4259353 : "Recruits had a significantly higher risk … of being diagnosed with ARI following exposure to CS compared to the period of training preceding exposure, and incidence of ARI after CS exposure was dependent on the CS exposure concentration. There was a significant pre-/postexposure ARI difference across all CS concentration levels.".

31 Paul Blanc, Diane Liu, Carlos Jaurez, Omar A. Boushey, in: Cough, in Hot Pepper Workers, Volume 99, issue 1, p. 27-32, January 1991, journal.chestnet.org/article/S0012-3692(16)30239-2/fulltext.

For instance, concern had already been raised about the effects of chemical irritants on the resistance of people to the virus: cf. Will Stone, Ideastream, **"Tear-gassing protesters during an infectious outbreak called 'a recipe for disaster'**[32] published 6 June 2020, quoting:

- Associate Professor Sven Eric Jordt, researcher at Duke University School of Medicine: "Using it in the current situation with COVID-19 around is completely irresponsible … There are sufficient data proving that tear gas can increase the susceptibility to pathogens, to viruses. … We have a lot of antiviral defenses that can inactivate viruses and prevent them from entering cells, … These are depleted by inhalation of tear gas and also compromised."
- Dr John Balmes, pulmonologist at the University of California, San Francisco: "I actually think we could be promoting COVID-19 by tear-gassing protesters, …It causes injury and inflammation to the lining of the airways." Balmes says this period of inflammation sets back the body's defenses and makes it more likely that someone who already harbors the virus will become sick. "… It's adding fuel to the fire, ... These exposures to tear gas would increase the risk of progression from the asymptomatic infection, to a symptomatic disease."

- Furthermore, the use of chemical irritants on crowds of protesters may increase the risk of spreading the virus between protesters and to those surrounding the protest. When people seek to escape from the chemical irritant, they may do so without physically distancing themselves from other people. They may also take off their masks, cough, sneeze and breathe heavily close to other people due to the irritant. Since this is the primary way of spreading COVID-19,[33] exposure to chemical irritants may increase the risk of contagion.[34]

Considering that COVID-19 already has serious health consequences, including a relatively high lethality rate, it is therefore even more important that law enforcement authorities show utmost restraint in the use of chemical irritants. As in all circumstances, they should handle assemblies in a manner that seeks to avoid problems that would entail the need to resort to force; de-escalation, mediation and peaceful settlements of conflict should be the primary approach for handling assemblies.

→ **Law enforcement officials should never use chemical irritants for the mere purpose of enforcing COVID-19 restrictions when there is no or only limited violence.**

→ **Even in situations that under normal circumstances would justify the use of chemical irritants, law enforcement officials should prioritize other less lethal weapons that do not entail the specific risks for the respiratory system as chemical irritants.**

→ **The quantity of wide-area tear gas should be kept to a minimum to avoid people living in the area being affected.**

32 Available at: *ideastream.org/news/tear-gassing-protesters-during-an-infectious-outbreak-called-a-recipe-for-disaster*.

33 World Health Organization, Coronavirus, who.int/health-topics/coronavirus#tab=tab_1 (accessed on 5 January 2021), "Overview".

34 Omega Research Foundation, "Lowering the risk: Curtailing the use of chemical irritants during the COVID-19 pandemic", 2020, omegaresearchfoundation.org/publications/lowering-risk-curtailing-use-chemical-irritants-during-covid-19-pandemic, p. 3.

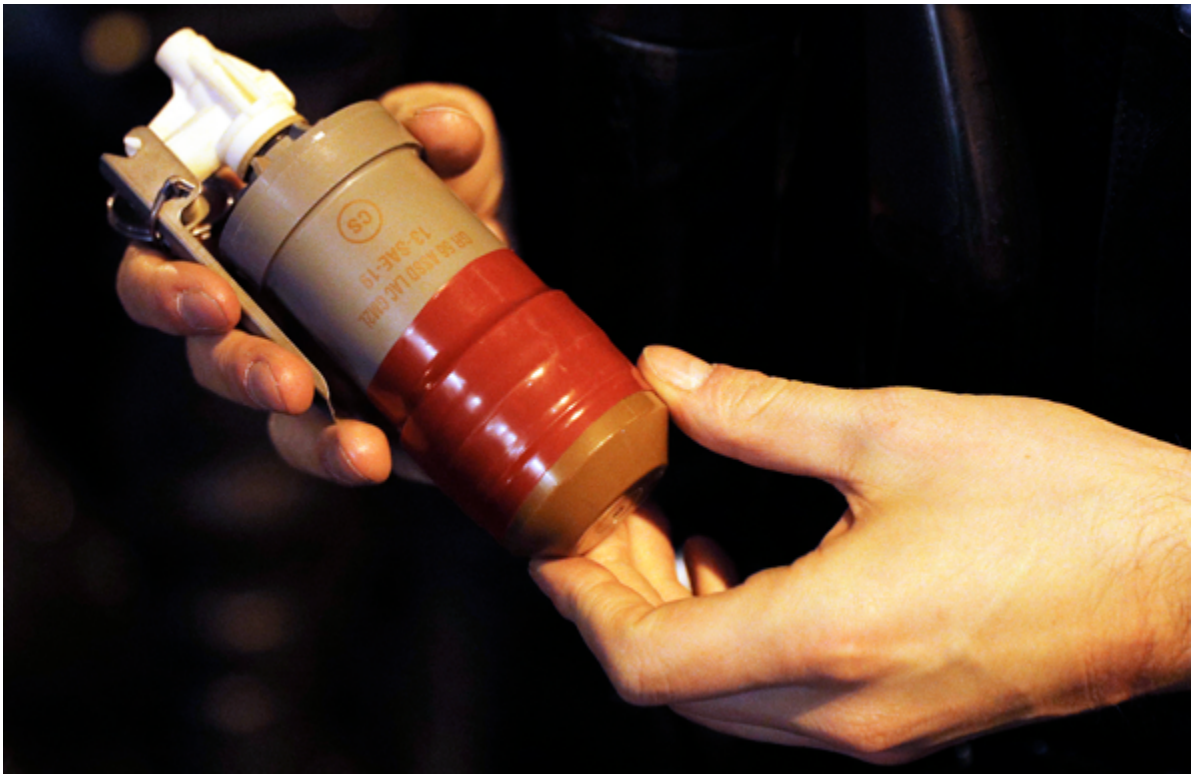
In law enforcement, authorities should never use a weapon with an indiscriminate risk of causing death. Since COVID-19 is still not yet fully understood, it is essential for authorities to monitor the health impact of chemical irritants in relation to this disease, particularly with regard to the lethality rate.

➔ **Should it turn out that the lethality rate among COVID-19 patients is significantly increased for those exposed to chemical irritants, the use of chemical irritants should be immediately stopped for the duration of the pandemic.**

6.2 Chemical irritants combined with other means and devices

More recently, chemical irritants were combined with devices that have other effects:

- Grenades can contain both a chemical irritant and a large quantity of explosive able to cause physical injury through the blast or shrapnel or a loud bang or flash. Such devices should be prohibited. Instead of minimizing harm, they seek to have maximum impact. In France, for instance, five people reportedly have lost their hands due to such weapons.[35] Moreover, the different effects of such multipurpose devices are neutralizing each other – the tear gas should lead people to disperse while the effects of the explosives tend to leave people stunned and unable to react. Exposing people to the effect of tear gas while rendering them unable to promptly escape from it and at the same time possibly causing life-changing injury must be considered excessive use of force. It can also amount to cruel and inhuman treatment. Weapons of such combined effects should therefore be prohibited from use in public order.[36]



A riot-police officer holds a GM2 L grenade during an anti-government protest in Paris. © Geoffroy van der hasselt/AFP

35 Amnesty International, *"France: Call for suspending the use of rubber bullets fired with the LBD40 and for banning grenades GLI-F4 in the context of policing assemblies"*, 3 May 2019,

36 Amnesty International, *"France: Call for suspending the use of rubber bullets fired with the LBD40 and for banning grenades GLI-F4 in the context of policing assemblies"*. This does not preclude their use in hostage-like scenarios where different risk assessments have to be made.

- Another combination is when chemical irritants are added to the liquid used in a water cannon. This is highly problematic for several reasons. This use has never been tested, and there is no information available as to an acceptable concentration of chemical irritants in the water that would stay within a permissible degree of toxicity for law enforcement purposes. This uncertainty presents a significant risk for people's health. Furthermore, wide-area chemical irritants are supposed to make people disperse in the interest of escaping the effects of the tear gas. When their clothing is soaked with the irritant, they cannot escape from it, which means the combination with water defeats the very purpose of using chemical irritants.[37] And finally, when people's clothing is soaked with a chemical irritant, neither the quantity nor the length of exposure can be controlled. Considering that the risks involved for the health of people affected by tear gas increase with higher concentrations and prolonged exposure, the combination of chemical irritants with water violates the duty of law enforcement agencies and their personnel to minimize harm and injury.[38] Resorting to water cannons with a mixture of water and chemical irritants should therefore be prohibited.

➔ **The combined use of chemical irritants with devices that bear a risk of causing excessive harm and would serve contradictory operational purposes should be prohibited.**

Police fire water cannons at pro-democracy protestors outside the government headquarters in Hong Kong.
© Nicolas Asfouri/AFP

37 Similar problems might occur when kinetic-impact projectiles are combined with a chemical irritant, for example, pepper balls: the irritant might stay in the clothing and prolong the exposure. Further risks involved with such devices could include the risk of additional harm by the chemical irritant (for instance, serious burns) in case the bullet is fired from a too close range and penetrates the skin; or reduced accuracy of such bullets as a result of unstable flight trajectory due to their design. These heightened risks would need to be carefully assessed prior to any deployment and use of pepper balls, as well as the question whether the combined effects of physical impact and chemical irritant are operationally complementary or rather contradictory.

38 See also Amnesty International, "Hong Kong: Water cannons pose real danger in hands of trigger-happy police", 9 August 2019, amnesty.org/en/latest/news/2019/08/hong-kong-police-water-cannon-danger/

6.3 The use of chemical irritants in detention and custody settings

As was mentioned previously, wide-area chemical irritants should only be used in an area where people can disperse. If individuals affected by chemical irritants cannot escape the effects, this increases the risk of serious harm beyond the initial irritation caused by the tear gas. And if there is a possible exit route, but it is restricted or not easily accessible, the use of such irritants can create or increase the risk of a stampede.

Therefore their use must be avoided in the confined environment of a detention facility except in the rare and exceptional circumstances, where the level of violence is such that focusing on individual persons engaged in violence is no longer feasible and there is a clear threat of serious injury and even death. However, in such circumstances, a precondition must be that evacuation routes have been opened, inmates have been warned about the use of chemical irritants and are clearly informed about the available escape routes, and adequate medical care is immediately at hand.[39]

Given the exceptional character of such extreme situations, there is no justification for having permanent fixed installations that dispense chemical irritants inside detention facilities. They may too easily be used in less serious circumstances and even for torture or other cruel, inhuman or degrading treatment.[40]

The same risk of such weapons being misused as a means of punishment or merely to obtain compliance with an order applies to handheld devices, such as pepper spray. Furthermore, given the controlled environment in a custody setting, it should be possible to control an inmate engaged in violence with less harmful means. Therefore, custody personnel should not be routinely provided with handheld pepper spray devices.

→ **As a rule, chemical irritants should not be used in the confined environment of custody settings. Exceptions can only be made for serious, large-scale violent disorder that cannot be controlled otherwise, and provided escape routes are open and accessible, and immediate medical care is ensured.**

→ **Fixed installations for dispensing chemical irritants in places of detention must be prohibited.**

39 Amnesty International – The Netherlands, *Use of Force* (previously cited), section 8.4, p. 170.

40 Amnesty International and Omega Research Foundation, *The Human Rights Impact of Less-lethal Weapons and other Law Enforcement Equipment* (Index: ACT 30/1305/2015), 2015, policehumanrightsresources.org/the-human-rights-impact-of-less-lethal-weapons-and-other-law-enforcement-equipment, p. 19.

7. Development and testing, trade and transfer

7.1 Development and testing

All weapons used by law enforcement officials, including chemical irritants, must be subjected to thorough testing as to whether they meet the required operational needs; technical requirements in terms of accuracy, precision, reliability and lifespan; and the degree of possible harm and suffering they may cause as well as possible unwarranted or unintended effects. An independent body should carry out the testing. Furthermore, each device should be subjected to an independent assessment of its compliance with international human rights law and standards, particularly in meeting the requirements of the principle of proportionality.[41]

In relation to chemical irritants, particular attention needs to be given to the degree of toxicity of the irritants, the appropriate quantities and distances when used, and the required medical care to be given to persons affected by them. In that regard, law enforcement agencies should not simply rely on the information provided by the manufacturer that may be inaccurate or imprecise, but make their own assessments – if necessary, with the help of independent scientific and medical experts.

Following the testing, as with any other weapons or devices, chemical irritants should undergo and be subject to a legally constituted and publicly available piloting process that allows for confirmation of whether they meet the operational needs and technical requirements, the adequacy of instructions and training, as well as of the absence of any unexpected, unwarranted risks.[42]

Their use must be subject to thorough and rigorous reporting, supervision and control mechanisms to continually evaluate their effectiveness and effects, including unwarranted harm.

7.2 Trade and transfer

The trade in policing equipment must be strictly controlled against human rights criteria. Trade in equipment that is inherently abusive should be prohibited; licences to export equipment that can have a legitimate law enforcement use should be denied where there are reasonable grounds for believing that the equipment will be used for serious human rights violations. This should also include related training and technical assistance.

41 Amnesty International – The Netherlands, *Use of Force* (previously cited), Guideline 6b) and c) and section 6.2.2.
42 Amnesty International – The Netherlands, *Use of Force* (previously cited), Guideline 6g) and h) and section 6.5.

In practice, chemical irritants and related launchers are often in a regulatory grey zone. Tear gas and some launchers are sometimes on military lists, controlled by arms trade regulations, while pepper spray is often covered by controls on law enforcement goods, such as the EU's Torture Trade Regulation.[43]The UN has begun consulting on international measures to control the trade in goods that could be used for torture and other ill-treatment. Amnesty International advocates for crowd control agents, including tear gas and pepper spray, to be covered by this framework. While states discuss international regulation, they must impose their own restrictions, barring the trade in chemical irritants and related launchers where there are clear human rights risks, and strictly controlling their use domestically.[44]

- **All weapons used by law enforcement officials, including chemical irritants, must be subjected to thorough, independent testing to ensure they are safe and appropriate for human rights compliant use by law enforcement officials.**
- **States must not authorize the export of chemical irritants, such as tear gas or pepper spray, related launchers and technical assistance, when there are reasonable grounds for believing that the equipment will be used for serious human rights violations.**
- **Manufacture and trade in inherently abusive equipment, such as multiple launch systems and launchers, which are intrinsically inaccurate and/or excessively powerful, should be prohibited.**

43 Regulation (EU) 2019/125 of the European Parliament and of The Council of 16 January 2019 concerning trade in certain goods which could be used for capital punishment, torture or other cruel, inhuman or degrading treatment or punishment, 31 January 2019, The Official Journal of the European Union, eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0125&from=en.

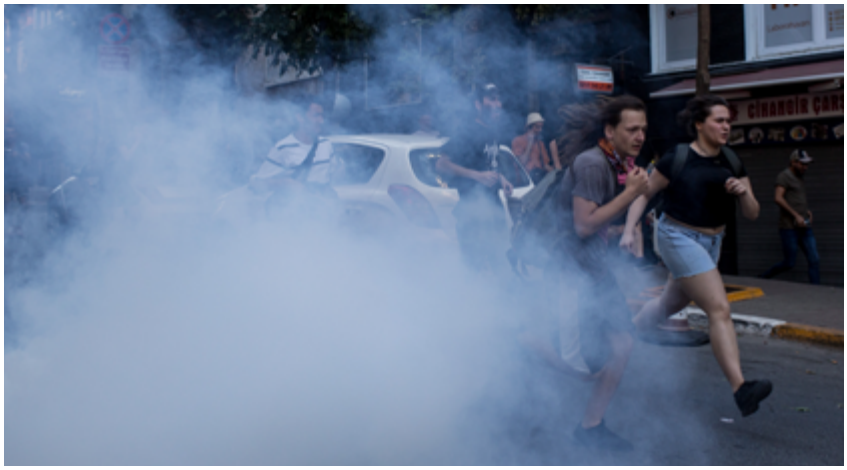
44 See, Amnesty International and the Omega Research Foundation, *Ending the Torture Trade: The Path to Global Controls on the 'Tools of Torture'* (Index: ACT 30/3363/2020), 2020, amnesty.org/download/Documents/ACT3033632020ENGLISH.PDF

8. Instructions and training

Law enforcement agencies must establish clear instructions for the use of chemical irritants, be it wide-area tear gas or handheld sprays, to minimize the risks of unwarranted harm or injury. Instructions must:

- clearly explain the effect of the irritant and mandatory guidelines for safe use (for example, the angle at which a rifle with tear gas canisters should be fired, the minimum distance for using a handheld pepper spray);
- indicate what precautions have to be taken before they are used (for example, regarding distance, direction, weather conditions);
- include explicit prohibitions for the circumstances and manner in which they must not be used (for example, firing tear gas canisters directly at the body of a person, using pepper spray as a means to obtain compliance with an order);
- warn of possible risks involved if used inappropriately (for example, when used in proximity of flammable substances/materials) and unwarranted effects that may occur in exceptional circumstances (for example, severe allergic reactions);
- explain how to provide immediate relief to affected persons (for example, washing the eyes; if the situation warrants handcuffing, this should be done in front of the body and not behind the back, so that the person can wipe their eyes for relief).

Law enforcement officials must be properly and regularly trained on all the above-mentioned points and be proficient in using the weapons. Only duly certified law enforcement officials should be given and allowed to use chemical irritants.



LGBT supporters run from tear gas fired by police after attempting to march to Taksim Square. © Getty Images

➔ **Law enforcement agencies must clearly instruct and train the personnel on the use of chemical irritants, including how they should be used, precautions to be taken to minimize harm and clear prohibitions when and how they may not be used. They should only hand out these weapons to certified law enforcement officials.**

9. Tricky question: Why are chemical irritants allowed in law enforcement but prohibited in armed conflict?

In armed conflict, the use of toxic chemicals, including riot control agents, as a method of warfare is prohibited under the 1925 Geneva Protocols, the Chemical Weapons Convention, and customary international humanitarian law. Hence, why are chemical irritants permitted in law enforcement? The Chemical Weapons Convention states this explicitly, apparently establishing softer legal standards for law enforcement than those applicable in armed conflict.

However, this difference is not a question of applying softer or stricter legal standards; the reason is that the underlying concepts governing law enforcement on the one hand and the conduct of hostilities on the other are considerably different.

In the conduct of hostilities, the maximum force, which is the use of lethal force, is the normal course of action. Combatants may lawfully target each other with such force. The aim is to neutralize – including if necessary by killing – enemy combatants. There are, though, important limitations on the means and methods of warfare. One key limitation is the prohibition of weapons that cause superfluous injury or unnecessary suffering (to combatants).

In the conduct of hostilities, when seeking to neutralize and/or to kill the enemy, combatants must not cause superfluous injury or unnecessary suffering. And in this regard, the risk is particularly high when it comes to chemical weapons. The types of chemical weapons cover the widest range possible: from relatively mild irritants to components that may cause severe suffering and even death. The variety of possible compositions is unlimited. Thus, it would be impossible to establish any rule specifying which chemical composition would or would not be acceptable.[45] Since it is lawful to intentionally kill an enemy combatant, states would likely choose maximum toxicity, which would increase the risk of causing superfluous injury or unnecessary suffering. Therefore, the community of states has decided not to open the door to the use of a weapon that may or may not be fatal, and can also potentially cause long-lasting and severe suffering,[46] since neutralizing or killing enemy combatants can be lawfully accomplished with other types of weapons.

The situation is fundamentally different in law enforcement. In law enforcement, the utmost duty is to protect life. The use of lethal force is the last resort, only allowed to save another life or prevent a life-threatening or life-changing injury; the death of a person must never be the objective of such an action.

45 See for the explanation to Rule 75 of the International Committee of the Red Cross (ICRC) database on customary rules of international human rights law: ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul_rule75

46 See, for instance, the ICRC fact sheet on the use of toxic chemicals as weapons for law enforcement, highlighting the risk of a slippery slope: ICRC, "ICRC fact sheet on the use of toxic chemicals for law enforcement", 6 February 2013, icrc.org/en/doc/resources/documents/legal-fact-sheet/2013-02-06-toxic-chemicals-weapons-law-enforcement.htm

Furthermore, law enforcement officials are obliged when resorting to the use of force to minimize harm and damage. This requires them to make a differentiated use of force depending on the concrete circumstances and level of threat they face. Here, the choice of weapons that are allowed is **the result of a trade-off**. Certain types of weapons capable of causing considerable harm are allowed because they might prevent the use of an even more harmful weapon and, notably as a last resort, the use of lethal force. At the same time, within a certain category of weapons, law enforcement agencies must use those that cause the least possible harm while remaining effective.

To allow the use of chemical irritants under strict criteria is the result of such a trade-off:

- They are allowed to give law enforcement officials another option that will enable them to achieve a legitimate objective **without resourting to a firearm**.
- In addition, law enforcement officials have the **duty to minimize harm**. Consequently, they are prohibited from resorting to using chemical irritants if there is a **less harmful alternative** available to address the concrete situation. And in the choice of the chemical irritant, law enforcement agencies are obliged to choose **the lowest level of toxicity** still likely to be effective in achieving a legitimate law enforcement purpose.[47]

These two considerations – the duty to avoid the use of lethal force and the obligation to apply only the minimum force necessary – are not applicable in armed conflict.

➔ **The general prohibition of chemical weapons in the conduct of hostilities and their admission in law enforcement is not a contradiction (seemingly giving greater protection in the former than in the latter). It is the result of different considerations regarding the purpose and orientation of the use of force and the governing rules and legal framework in either setting.**

47 OHCHR, *United Nations Human Rights Guidance on Less-Lethal Weapons in Law Enforcement* (previously cited), para. 7.3.8.

10. "Dos and Don'ts"

DO: Law enforcement officials should:

- ✓ only use chemical irritants that have been properly assessed regarding the related health risks and are accompanied by clear instructions to avoid any unwarranted risks (for example, as a result of firing at too close range, too great quantity, in inappropriate weather conditions etc.);
- ✓ only use wide-area chemicals in the case of violence that is so widespread that it is impossible to deal with violent individuals alone;
- ✓ always issue a warning before the use of chemical irritants;
- ✓ constantly monitor the effects of chemical irritants' use and stop using them as soon as they achieve the objective;
- ✓ respect the minimum distance for pepper spray and similar handheld devices to prevent any injury due to the physical impact.

DON'T: Law enforcement officials should not:

- ✗ resort to wide-area chemical irritants in an area where people are unable to disperse;
- ✗ use chemical irritants to obtain compliance for an order from persons who are only passively resisting or resisting without violence;
- ✗ launch, fire or throw tear gas canisters in a manner that is likely to cause impact-related injuries;
- ✗ use pepper spray against persons who are already under control.