

# LETHAL IN DISGUISE 2

How Crowd-Control Weapons Impact  
Health and Human Rights

Kinetic Impact Projectiles



# KINETIC IMPACT PROJECTILES

BERKUT RIOT POLICE SHOOT RUBBER BULLETS TOWARD ANTI-GOVERNMENT PROTESTERS ON INDEPENDENCE SQUARE ON FEBRUARY 19, 2014 IN KIEV, UKRAINE. BRENDAN HOFFMAN | GETTY IMAGES

## Weapon profile

Kinetic impact projectiles (KIPs) are bullet-like missiles used in various law enforcement contexts as a deterrent through the pain of impact. Shot from firearms, these weapons were developed to offer the deterrent power of handheld baton strikes from greater physical distances. The staggering variety of KIPs has led to an abundance of common and trade names for what are often referred to as “baton rounds.” KIPs are most commonly dubbed “rubber bullets” regardless of their composition: modern KIPs are most commonly made of plastic (“foam-tipped plastic bullets,” “plastic baton rounds,” “sponge grenades,” “Flashball rounds”), metal (“rubber-coated metal bullets,” “pellets,” “birdshot,” “flexible baton rounds,” “bean bag rounds,” “Super-sock”), or other materials such as wood or rock salt.

The development of KIPs for crowd control is linked to the colonial policing of the British Empire. Early forms of KIPs used in protests were sawed-off pieces of wooden broom handles that were shot at rioters in Singapore in the 1880s. In the 1960s, slightly more advanced wooden bullets were developed in the United Kingdom and used against protesters in Hong Kong, Malaysia, and Singapore. The British Army initially developed wooden and then plastic polyvinyl chloride (PVC) and rubber bullets for use during the conflict in Northern Ireland. In parallel, the United States introduced rubber bullets to quell Vietnam War protests but temporarily halted their use in protests after a fatality in 1971. Over the past 40 years, the production of KIPs has spread from a few manufacturers in the United States and the United Kingdom to dozens of producers throughout the world. Manufacturers now produce more than 75 different types of

bullets and launchers.<sup>17</sup> Today, KIPs have found widespread use both in everyday policing and in crowd control as an addition to an arsenal that includes firearms, batons, chemical irritants, and more. The global CCW market was estimated at \$867.4 million in 2019 and is expected to continue to grow well into this decade.<sup>18</sup>

Some bullets are designed to be fired as a single missile, while others are fired as a group of small projectiles. The latter are sometimes known as “pellets,” “scatter shot”, or “multiple projectile rounds”, where many small- to medium-sized spheres are fired at a broad target. “Bean bag rounds” also consist of small metal pellets that are stitched into a synthetic cloth bag designed to expand on impact and therefore behave as a single projectile. Newer weapons include projectiles with a hard outer shell encasing chemical irritants that explode upon impact, or “attenuated energy projectiles,” where a hollow tip can limit the risk of ricochet or penetration by crushing into itself on impact.

Of special concern are metallic rounds used for crowd control. Due to their density and typically high velocities of impact, these pose greater inherent risks than rounds made of any other material. Rubber-coated metal

bullets designed as KIPs have been used for crowd control, and LiD1 highlighted the extreme danger posed by these weapons. This report highlights the impact of metal hunting bullets that have been arbitrarily designated “less-lethal” by virtue of protocols intended to reduce their lethality. While both types of weapons are used for crowd control in a similar manner to other KIPs, their inherent killing power has left a huge number of injuries, disabilities, and deaths in the wake of their use, as detailed further below.

KIP weapons exemplify the “elephant in the room” problem of less-lethal weapons: To date, no organisation, study, or report has clearly and objectively defined what makes a weapon lethal, less-lethal, or non-lethal—much less acceptably “safe.” The decision is typically left to the very organisations tasked with procuring CCWs—or the government entities demonstrators often protest against—to determine whether said weapons achieve a level of acceptable lethality. There are heterogeneous rules across countries and jurisdictions, ranging from allout bans to free use of all KIPs and many permutations in between.

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17 Omega Research Foundation, “Crowd Control Technologies: An Appraisal of Technologies for Political Control” (Manchester, UK: European Parliament, Directorate General for Research, The STOA Programme, (June 2000), accessible at: [http://www.omegaresearchfoundation.org/assets/downloads/publications/19991401a\\_en.pdf](http://www.omegaresearchfoundation.org/assets/downloads/publications/19991401a_en.pdf). See, also, Global Non-Lethal Weapons Market Report 2013-2018. Manufacturing of KIPs takes place in locations as diverse as Brazil, China, Israel, South Africa, South Korea, and the United States.

18 Grand View Research, “Less Lethal Ammunition Market Size, Share & Trends Analysis Report By Weapon Type (Shotguns, Launchers), By End Use (Law Enforcement, Military), By Product, By Region, And Segment Forecasts, 2020 - 2027,” accessible at: <https://www.grandviewresearch.com/industry-analysis/less-lethal-ammunition-market>.

## Sidebar

## Defining “lethal” versus “non-lethal”

Clearly defining “lethal” versus “non-lethal” projectiles has proven difficult. Most physical based guidelines for defining less-lethal impact projectiles stem from a 1977 pilot study by the United States Army’s Human Engineering Laboratory, which established an “extensive damage” threshold of 90 foot-pounds (approximately 120 joules) of kinetic energy of impact, beyond which severe damage to the human body was highly likely.<sup>19</sup> However, this threshold was arrived at through tests with approximately 1-inch diameter rubber spheres; while kinetic energy considers only mass and velocity, the form of a projectile strongly also affects its terminal behaviour.

For instance, a pellet of U.S. #6 birdshot (a common size used by Indian police, approximately 3mm in diameter) has an approximate mass of 0.126g and a muzzle velocity of 365 m s<sup>-1</sup>, yielding a kinetic energy at the muzzle of ~8 joules, well below the so-called lethal threshold. However, metal birdshot is universally accepted to be lethal at close range and hazardous to the eyes at

longer distances, due in large part to its ability to penetrate tissues even at extreme ranges. “Energy density”—or how much kinetic energy is distributed over impact area—is a more relevant metric for evaluating penetration. Birdshot’s energy of impact is focused on a very small area (birdshot ranges in diameter from <1 to 6 mm), which accounts for its high risk of penetration and accordingly high potential for injury.

The ambiguous physical principles behind projectile lethality must be kept in mind when authorities claim a particular CCW is “non-lethal.” This uncertainty can, in some circumstances, allow for exceptionally hazardous weapons to be utilised in crowd control contexts. A more nuanced approach to evaluating lethality would rigorously test factors beyond impact energy, such as energy density, projectile precision, and human factors of use,<sup>20</sup> although to date testing that is both comprehensive and publicly available has not proven forthcoming.

19 DO Egnor, “Evaluation of Less-Lethal Weapons,” *U.S. Army Human Engineering Laboratory Technical Memorandum*, 37-77, (December 1977) at p 194, accessible at: <https://www.ojp.gov/ncjrs/virtual-library/abstracts/evaluation-less-lethal-weapons>.

20 The “SWAPDEC” testing protocol considering speed, weight, accuracy, precision, density of impact energy, effective range, and consistency comes closest to a standard of testing that could effectively anticipate health risks of an impact munition under consideration for use. See RT Wyant and T Burns, *Risk management of less lethal options: evaluation, deployment, aftermath, and forensics*, CRC Press, (2014).

## Mechanism of action

Kinetic Impact Projectile	Rubber or plastic bullets
Alternative Name(s)	Baton rounds, Riot rounds, "Flash-Ball" rounds
Composition/Description	<ul style="list-style-type: none"> <li>• Solid, spherical or cylindrical projectiles of variable sizes made solely of hard rubber, plastic, or polyvinylchloride (PVC)</li> <li>• May be fired as single shots or in groups of multiple projectiles within a cartridge</li> </ul>
Mechanism of Action	Less dense than metal bullets to limit force on impact
Range and Usage	<ul style="list-style-type: none"> <li>• Many guidelines suggest they are designed to fire at the target's legs or at the torso (to avoid hitting the head, face or genitalia)</li> <li>• Muzzle velocity and force on impact are dependent on variable shapes and fills within cartridges that can affect flight patterns</li> </ul>



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Kinetic Impact Projectile	Scattershot or multiple projectile rounds
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Alternative Name(s)	Multi-projectile, Sting ball, Rubber pellet rounds
Composition/Description	Similar to baton rounds (above) but are fired in groups of multiple projectiles within one cartridge. Can range from 2 to dozens of projectiles ejected at once
Mechanism of Action	<ul style="list-style-type: none"> <li>• Similar to above in striking with force.</li> <li>• Multiple projectiles splay out over distance so farther distances will result in more spread of the shot and less discrimination in target. Closer ranges may result in multiple projectiles hitting a single individual</li> </ul>
Range and Usage	Muzzle velocity and force on impact are dependent on variable shapes and fills within cartridges that can affect flight patterns



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Kinetic Impact Projectile    Attenuated Energy Projectile (AEP)

Alternative Name(s)    AEP

Composition/Description    Hard plastic body and a hollow nose

Mechanism of Action    Hollow tip is designed to collapse on impact, limiting penetrative injury

Range and Usage    

- Intended to only fire at target's legs
- Specific weapon used primarily in the UK



Kinetic Impact Projectile    Rubber- coated metal bullets

Alternative Name(s)    (misleadingly called) plastic or rubber bullets

Composition/Description    

- Spherical or cylindrical projectiles with solid lead or metal core surrounded by a 2 mm coating of plastic or rubber
- (Core weight: about 16 g; diameter: 15.75 mm)
- May be fired as single shot or in groups up to 15

Mechanism of Action    Outer coating made of rubber to limit penetrating trauma but dense metal core augments operational range and force on impact.

Range and Usage    

- Intended to only fire at target's legs
- Similar to solid baton rounds, although metal core allows for greater retained velocity and impact force
- Primarily used in the Occupied Palestinian Territory by Israeli security forces



**Kinetic Impact Projectile**    **Flexible baton round**

**Alternative Name(s)**    Bean bag rounds, "Super-Sock"

**Composition/Description**

- Synthetic cloth bag filled with about 45 g of small metal pellets (100 pellets of #9 lead shot is most common)
- Greatest diameter for the bag is usually 6 cm

**Mechanism of Action**    A cartridge has wadding meant to expand and drop the wadding as it travels, creating a wider surface area blow

**Range and Usage**

- Intended to only be fired at target's legs
- Expansion of the bag is problematic at short distances leading to injuries



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**Kinetic Impact Projectile**    **Sponge rounds**

**Alternative Name(s)**    Foam-tipped plastic bullet, Sponge grenade

**Composition/Description**

- Projectile with a high-density plastic body and a hard foam nose designed to collapse upon impact
- Fired from 37- or 40-mm grenade launchers

**Mechanism of Action**    Large surface area and relatively soft tip intended to limit penetrative injury

**Range and Usage**

- Minimum engagement range is 10 – 15 m, and maximum effective range is 50 m
- Designed as "direct fire" at target's less vulnerable anatomy (legs)



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**Kinetic Impact Projectile    Pellet rounds**

**Alternative Name(s)**    Birdshot, buckshot

**Composition/Description**    Cartridges filled with plastic, rubber, steel or lead balls that spread out when fired.

**Mechanism of Action**    Smaller than scattershot (multiple projectile rounds), these smaller pellets have a wider dispersal pattern and less acute aim. Metal pellets are dense and have a higher kinetic energy.

**Range and Usage**    Causes an indiscriminate spray of munitions that spreads widely and cannot be aimed. Lead and steel pellets in particular cause significant injuries, especially if they hit the eyes.



**Kinetic Impact Projectile    Plastic-metal composite bullets**

**Alternative Name(s)**    (misleadingly called) plastic or rubber bullets

**Composition/Description**    A composite of plastic and silica, metal fragments, or small shards of metal (lead or steel) within a rubber, plastic, or PVC base

**Mechanism of Action**    Have higher density than solid plastic but less than metal bullets designed to extend firing range or force on impact from traditional baton rounds

**Range and Usage**

- Intended to only fire at target's legs
- Similar to solid baton rounds with higher speed and force on impact possible
- Variable shapes can affect flight patterns and force on impact





Kinetic Impact Projectile	Pepper-spray projectiles
Alternative Name(s)	“Pepperballs”, FN 303
Composition/Description	Plastic capsules fired from a compressed air gun similar to recreational paintballs, filled with PAVA/OC (“pepper” agent) or marking dye
Mechanism of Action	Combines kinetic impact from a projectile with a secondary chemical irritant
Range and Usage	<ul style="list-style-type: none"> <li>• Up to 50 meters advertised</li> <li>• Questions about accuracy</li> </ul>

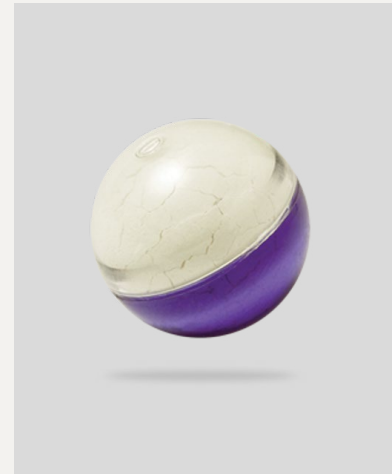


Figure 1: Selected types of Kinetic Impact Projectiles\*

\*Note: this table only includes some common types of KIPs and information gleaned from accessible sources

KIP weapons exemplify the “elephant in the room” problem of less-lethal weapons: To date, no organisation, study, or report has clearly and objectively defined what makes a weapon lethal, less-lethal, or non-lethal—much less acceptably “safe.”

A projectile weapon works by transferring kinetic energy (i.e., energy from movement) from an object in flight to a person. While lethal projectiles are constructed to maximise the likelihood of death by penetrating the skin to compromise vital organs, KIPs are ostensibly constructed to minimise penetration while delivering sufficient kinetic energy to produce significant pain and/or incapacitate an individual.

A projectile's impact force and propensity to penetrate depend on a number of factors, foremost among them their cross-sectional area and speed. Small, fast projectiles are more likely to penetrate the skin than large, slow projectiles. Many KIPs are designed to maximise the surface area of presentation to distribute impact force and reduce the probability of skin penetration or to minimise weight so that the projectile will quickly lose speed while in flight. The plasticity of a round, the number of projectiles fired at once, and protocols governing their use will all also affect how a projectile functions. In spite of design efforts to reduce lethality, KIPs can cause serious injury, permanent disability, and death if they hit critical parts of the body with significant force. To avoid potentially lethal uses of KIPs, manufacturers often establish protocols to avoid circumstances in which KIPs could prove fatal. First, as projectile velocity is greatest as soon as it enters ballistic flight (i.e. immediately after a bullet is fired), manufacturers often establish minimum use distances to reduce the impact velocity of KIPs.

Complexity arises when considering distance: older projectiles had a reputation for inaccuracy (especially when "bounce-fired" off the ground). While ballistic testing of newer designs has shown them to be capable of sufficient precision to keep rounds within the lower third of the body at operational distances, these operational distances can differ between weapons, be unclear in practical terms, and are frequently not maintained.<sup>21</sup> Second, manufacturers sometimes issue warnings that KIPs should never be shot at vital parts of the body, such as the head. However, guidelines on targeting parts of the body tend to be contradictory, some saying that the bullets should be aimed in the torso "box" between the clavicles and the hips, others noting that the upper torso should be avoided, and bullets should be aimed towards the lower legs. Given that police departments purchase multiple weapons for use in the same protests, and each weapon can have vastly different instructions, there is frequent confusion and misuse.

Use protocols help to mitigate the human hazard of KIPs, although they are by nature imperfect and do not eliminate the objective hazard inherent in ballistic weapons such as KIPs. Minimum engagement distances are often difficult to follow in dynamic, high-stress situations, such as crowd control, which can lead to inadvertent deployment at dangerous ranges. Directives to target specific body parts are heavily contingent upon the training and stress response of users, with the latter having been demonstrated to add

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21 I Ndindabahizi et al., "Error Budget of Non-lethal Projectiles Using Stochastic Simulations," *Human Factors and Mechanical Engineering for Defense and Safety* 3, (August 2019), a p 10, doi:10.1007/s41314-019-0029-1.

significantly to the inaccuracy of KIPs.<sup>22</sup> These human factors are exacerbated by the minimum operational ranges imposed to limit the damage caused by KIPs—longer engagement distances make it more difficult to accurately target specific body parts and more likely that projectiles may fly astray.

### Multiple projectile KIPs

Multiple projectile KIPs, which fire more than one projectile per shot, best illustrate the irreconcilable nature of protocols demanding pinpoint accuracy at extended ranges. When fired, these projectiles spread out in a cone from the muzzle of the weapon, resulting in progressively greater imprecision with distance. At longer distances, projectile dispersion renders these projectiles impossible to place precisely, increasing the likelihood that projectiles may accidentally impact other parts of a target's body or other individuals entirely. This risk is greatly exacerbated by the large number of projectiles in flight with the use of these weapons, which is tens to hundreds of times greater than that of single projectile rounds.

The metal pellets described earlier in this section illustrate the danger posed by a failure to understand the interaction among these risk factors. Colloquially known as "birdshot," these are hunting rounds fired as a single group of tens to hundreds of high-velocity metal spheres. While indisputably lethal at close range, the minimum distance of use (e.g., 50 metres in India)<sup>23</sup> is designed to be far enough to ensure that pellets have lost sufficient velocity so as to render them non-lethal. However, even beyond 50 metres, pellet guns have the ballistic capacity to penetrate some organs, such as the eyes, causing blindness.<sup>24</sup> The vast number of individuals gravely injured by birdshot used as a CCW is a testament to the regrettable ignorance of the danger posed by any use of these potentially lethal rounds.

The use of potentially lethal weapons as KIPs is perhaps unsurprising given that there is little published research on the safety of KIPs. There is an overall lack of transparency by manufacturers and policing organisations regarding the type of safety testing KIPs have undergone and under what conditions. The dozens of weapon types on the market

**Multiple projectile KIPs, which fire more than one projectile per shot, best illustrate the irreconcilable nature of protocols demanding pinpoint accuracy at extended ranges.**

22 J Taverniers and J Suss, "A user-centred assessment of a less-lethal launcher: the case of the FN 303 in a high-pressure setting," *Ergonomics* 62, no. 9, (2019), at pp 1162-1174, doi:10.1080/00140139.2019.1626916.

23 ScSaaliq, "Pellets: Lethal or not?" Hindustan Times, (July 28, 2016), accessible at: <https://www.hindustantimes.com/static/lethal-pellets/>.

24 B. Perrigo, "Faces in the Darkness: The Victims of 'Non-Lethal' Weapons in Kachmir," Times, 6 September 2018. Accessible at: <https://time.com/longform/pellet-gun-victims-kashmir/>.

can generate considerable confusion about their proper use, as protocols developed for some KIPs may not apply to others. Lack of transparency on the part of manufacturers also limits the information that health care providers can use in assessing injuries.

KIPs are marketed to military, police, and private security forces in nearly every country, with little or no regulatory oversight or accountability. Protocols on the use of KIPs by police and military or by manufacturers are not usually publicly available. Available use-of-force guidelines generally recommend that KIPs be used only for individual force-control rather than on groups of people. Nonetheless, evidence from photographs, video cameras, and testimonials in many countries identifies the frequent violation of these guidelines. There are examples of KIPs being aimed at the upper body or face, being fired from very short distances, being used against non-threatening individuals, and being fired indiscriminately at crowds as a means of collective punishment.<sup>25</sup> Even when used according to protocol, slight errors in distance estimation or aim can instantaneously make a supposedly “less-lethal” weapon lethal. Worldwide reports of KIP injuries to critical areas of the body—as well as injuries to innocent bystanders—are testaments to this unacceptable risk.

## Health effects

### Overview

The health impacts of KIPs depend on a number of factors, including the type of projectile, the characteristics of the weapon it is shot from, the distance from which the shot is fired, the user’s skill, and the inherent imprecision of the weapon itself. Although KIPs are designed to minimise penetration and limit the force of blunt trauma, injuries from both mechanisms have been documented.

Most KIPs are propelled by a powder charge and are best considered a subcategory of firearm. KIP injuries, like all trauma and specifically firearm injuries, can be non-penetrating, where the pellet does not enter the skin or tissue (such as blunt force trauma) or penetrating (where the pellet does enter and in the case of perforating injuries, also exits the tissue). KIPs can cause both types of injury. The severity of injury from bullets is dependent on the missile energy on impact (related to projectile mass, distance, and muzzle velocity), missile design (including the calibre and shape), and the characteristics of the target tissue.<sup>26</sup>

KIPs can cause severe injuries through both blunt and penetrating trauma. Blunt trauma directly damages tissue by crushing but can also lead to potentially life-threatening injuries from organ rupture, bone fracture, and internal haemorrhage. Blunt impacts to

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25 S Reynhout, RJ Haar, and M Heisler, “Shot in the Head,” *Physicians for Human Rights* (14 September 2020), accessible at: <https://phr.org/our-work/resources/shot-in-the-head/>.

26 Z Gugala and R Lindsey, “Classification of Gunshot Injuries in Civilians,” *Clinical Orthopaedics and Related Research* 408, (March 2003), at pp 65-81, accessible at: [https://journals.lww.com/clinorthop/fulltext/2003/03000/classification\\_of\\_gunshot\\_injuries\\_in\\_civilians.7.aspx](https://journals.lww.com/clinorthop/fulltext/2003/03000/classification_of_gunshot_injuries_in_civilians.7.aspx).

the head pose a very high risk of traumatic brain injury. Tissue damage from penetrating and perforating wounds can cause laceration of skin and solid organs, stretching of tissue in the track of the projectile and shockwaves of pressure in the tissue. Penetrating trauma to the brain causes traumatic brain injury, such as skull fractures and intracranial haemorrhage and is often instantly fatal. Piercing the heart or lungs directly compromises the circulation system and the body's oxygen exchange system, which can result in death within minutes. Severed arteries can also lead to rapid death through exsanguination (bleeding out). Spinal cord or nerve injuries can be permanently debilitating, causing motor and/or sensory deficits. Injuries to other organs may require rapid emergency surgery to avoid fatality, given the risks of internal bleeding, organ damage, and secondary infection (particularly from bowel perforation). Furthermore, the risk of permanent disfigurement or disability is high from both blunt and penetrating trauma, either through compromise of non-vital organs (such as the eyes) or damage to the skin or musculoskeletal system.

### Results of the updated systematic review

We updated the systematic review of medical literature conducted in the previous version of this study with literature published from 2016 to 2021, following the same search and selection process that was followed in the first report.<sup>27</sup> Collectively, the systematic reviews identified 4,174 individuals injured by KIPs and 65 fatalities as a result of KIP impact. At

least 1,245 individuals have likely sustained permanent injuries as a result of KIPs.

Nineteen new studies were identified that met the inclusion criteria. (See the list of reviewed studies in the Appendix.) These

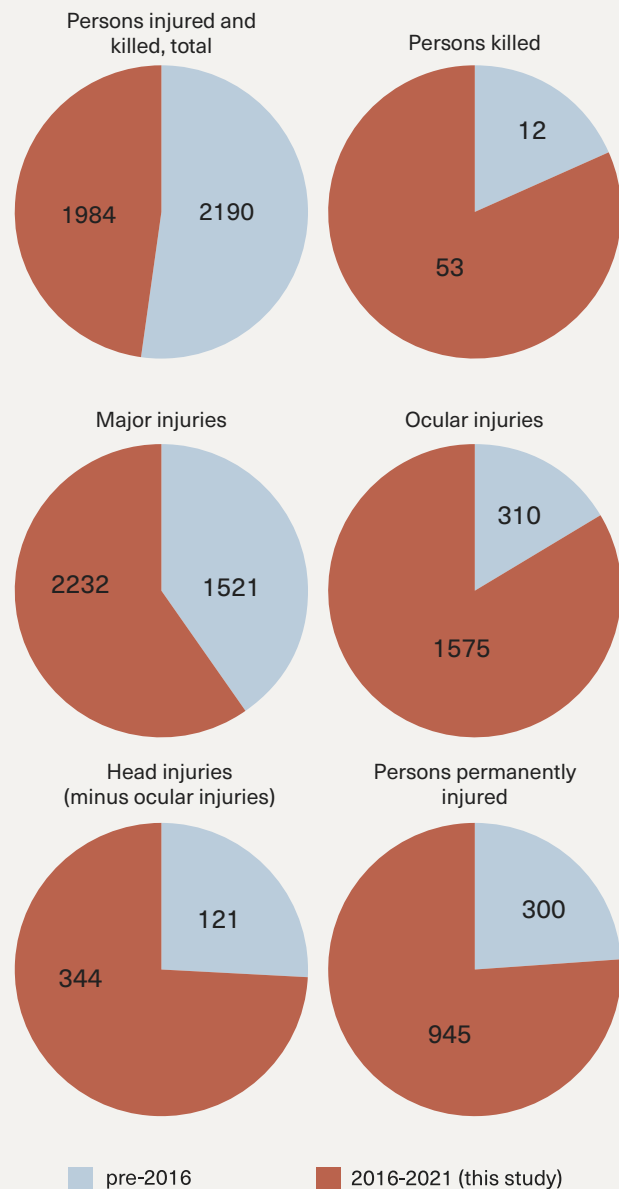


Figure 2: Comparison of selected statistics from *Lethal in Disguise* (2016) and this study (2016-2021).

27 The updated review identified scientific and medical literature pertaining to KIPs injuries published since the printing of the last version of *Lethal in Disguise* (2016-2021). Nineteen articles met inclusion criteria, had clear causation by KIPs, contained health impact data, and were of sufficient quality to include.

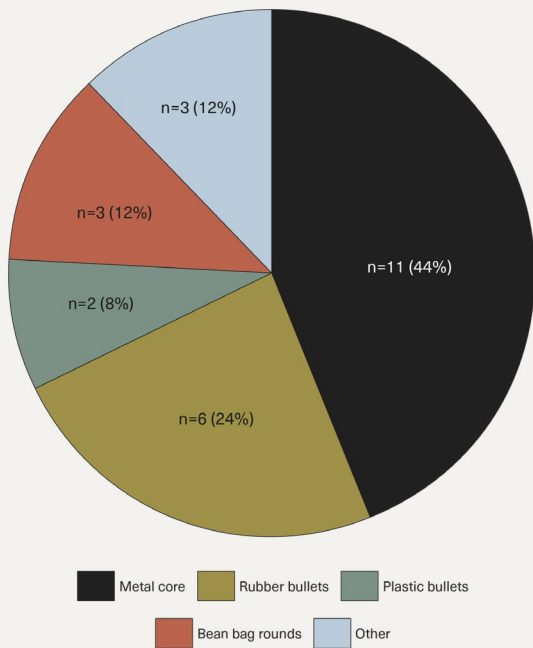


Figure 3. Types of weapons represented in the literature review. Several publications referenced multiple types of KIPs.

detailed 2,190 individuals injured by KIPs, compared to 1,984 found in the last report. Of these 2,190, 12 perished as a direct result of being shot with impact projectiles. All deaths occurred secondary to injuries inflicted by metallic projectiles. Compared to the previous report, over the last five years, the medical and scientific literature identified higher numbers of total individuals affected, major injuries, permanent injuries, head injuries, and ocular injuries (Figure 2). Deaths, on the other hand, declined. This does not necessarily indicate a relative increase in the use of less lethal weapons; rather, the high number of injuries over the past five years could represent an increasing awareness of and interest in documenting the health hazards posed by impact projectiles. These numbers should be considered a minimum estimate of the true health impacts of KIPs. Our review is limited in scope to solely the medical and scientific literature. Literature reviews are subject to selection

bias guided by research priorities, resources, geographic bias, and many other issues. Many individuals will not seek medical attention for their injuries due to economic constraints or fear for their personal safety and will, therefore, not be counted per our methodology.

### KIPs of special concern

Our report revealed injuries from metallic rounds (including “bean-bag” rounds), rubber rounds, plastic rounds, as well as hybrid rounds (such as “pepper-ball” guns, classified as “other”). In the previous report, so-called “pellet guns” firing metal pellets used for crowd control were not included in the literature review of KIPs. Since then, a host of literature regarding these weapons has been published, illustrating the highly indiscriminate and dangerous nature of metallic birdshot. The vast majority of the casualties from multi-projectile rounds come from the use of metal birdshot in Indian-

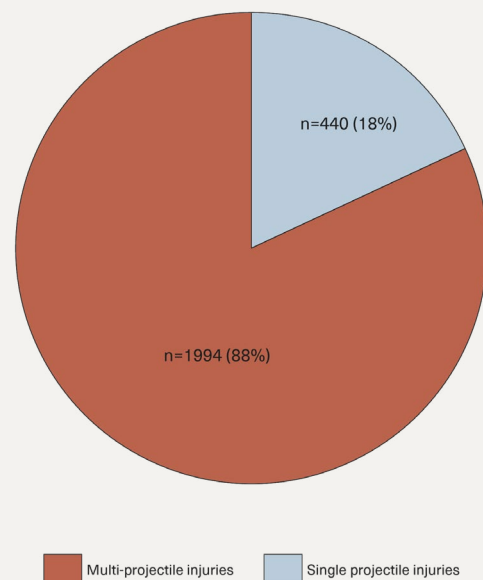


Figure 4. Total injuries (major and minor) from single and multi-projectile KIPs, this report.

controlled Kashmir. Their deleterious effect on public health is far out of proportion relative to any other kind of KIP. Birdshot is also unique as an unmodified lethal munition made non-lethal only on a technicality by protocols of use and laws in a given country. While fewer than half (n=9) of the studies identified pertain to these weapons, they are responsible for 82% of the injured and killed in this review (Figure 4).

Two countries are almost wholly responsible for this tally: India and Chile, where different kinds of multi-projectile KIPs are widely used for crowd control.

Shotgun shells carrying hundreds of metal pellets have been used for over a decade for crowd control in the Indian Union Territory of Jammu and Kashmir. Often referred to as “birdshot” or, locally, “pellets,” these lethal rounds historically were used for hunting small game. Local police have arbitrarily labelled them “less-lethal” when fired from distances of over 50 metres; however, beyond this distance, the expanding cloud of dense, high-velocity pellets still have ample capacity to penetrate the skin and inflict grievous injuries. Metal birdshot from Kashmir alone accounts for 76% (n=1,669) of all dead and injured individuals captured in our review of the medical literature and 85% (n=1,323) of all ocular injuries. This tally is certainly an undercounting of the true prevalence of birdshot injuries in the region, which by independent accounting, is likely in the thousands.<sup>28</sup> In many cases, surgical

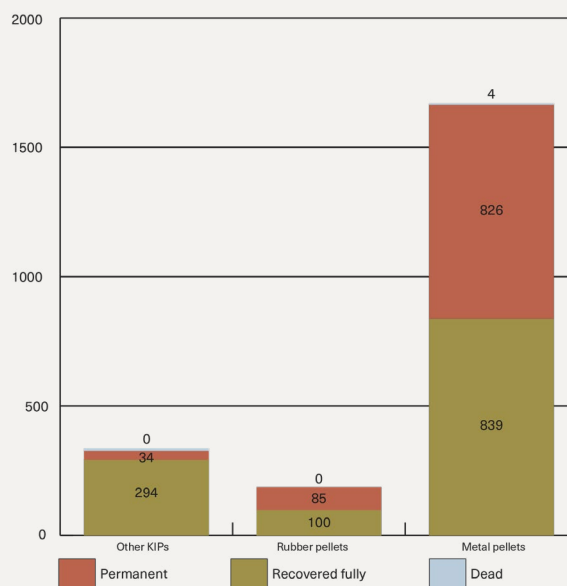


Figure 5. Deaths, permanent injuries, and recoverable injuries are sorted by single-projectile and multi-projectile KIPs

removal of birdshot is not feasible, and the social and economic cost of the longterm effects provoked by Kashmir’s “epidemic of dead eyes” will persist for decades.<sup>29</sup>

In Kashmir and elsewhere, the metal birdshot is primarily composed of lead, which, even in small doses, is known to cause physical and mental developmental and behavioural harm that can be devastating. Lead pellets, having once penetrated the skin, are difficult to remove. Moreover, due to their indiscriminate nature, children may be struck. Thus, the longer-term effects of lead poisoning from pellets must be better studied.

Multi-projectile KIPs are also responsible for the upsurge in ocular injuries reported in the literature in countries where they are being

28 Human Rights Watch, “India: Stop Using Pellet-Firing Shotguns in Kashmir,” *Human Rights Watch*, (4 September 2020), accessible at: <https://www.hrw.org/news/2020/09/04/india-stop-using-pellet-firing-shotguns-kashmir>.

29 E Barry, “An Epidemic of ‘Dead Eyes’ in Kashmir as India Uses Pellet Guns on Protesters,” *The New York Times*, (29 August 2016), accessible at: <https://www.nytimes.com/2016/08/29/world/asia/pellet-guns-used-in-kashmir-protests-cause-dead-eyes-epidemic.html>

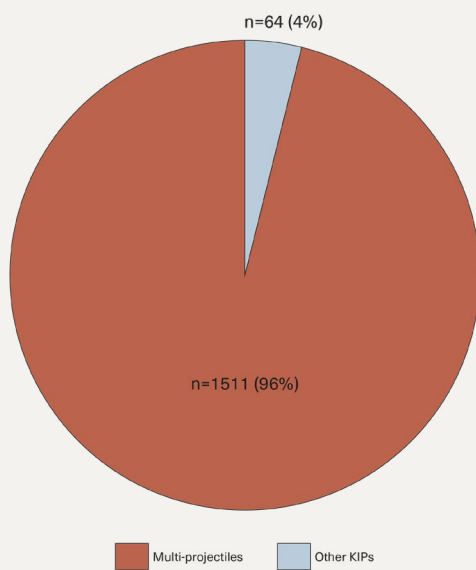


Figure 6. Ocular injuries caused by single projectile vs multi-projectile KIPs, this report.

used. These injuries are severe and consist of both closed- and open-globe injuries, which often require surgical intervention and, in almost all cases, leave the victim with reduced visual acuity or permanent vision loss in the affected eye(s).

Another example of the harms of multi-projectile KIPs comes from Chile. Chilean security forces used a kind of multiple projectile KIP known as “rubberized buckshot” during the nationwide protests starting in October of 2019, resulting in over 400 ocular injuries as a result of these KIPs.<sup>30</sup>

These projectiles, fired as a group of 12, are made of a composite material far denser than pure rubber. Although less hazardous than birdshot, “rubberized buckshot” shares the characteristic of uncontrollable dispersion at a distance with its metal counterpart. Perhaps unsurprisingly, the pattern of injuries in our literature review is similar, with a high number of ocular injuries occurring (n=182) over a period of less than two months.

The number of injuries from metal birdshot found in our literature review dwarfs those from other KIPs. Metal birdshot is also responsible for all deaths not attributable to rubber-coated metal bullets. The disproportionate health impacts of metal birdshot demonstrate that these weapons should be considered lethal and must never be used for crowd control. Furthermore, the alarming similarities in ocular injury prevalence between metal birdshot and rubberized buckshot strongly suggest multiple projectile KIPs, in particular, pose a grave risk of disability. They likewise should be banned for crowd control.

**The disproportionate health impacts of metal birdshot demonstrate that these weapons should be considered lethal and must never be used for crowd control.**

30 N Larsson, “He saw white: Why the eye became a symbol of Chile’s unrest,” *Al Jazeera*, (16 March 2020), <https://www.aljazeera.com/features/2020/3/16/he-saw-white-why-the-eye-became-a-symbol-of-chiles-unrest>.



## Sidebar

## Pellets, buckshot, and birdshot

Historically, police have used shotguns to fire loads of metal pellets as an extreme method of crowd control. These weapons were used during the Attica Prison riot in 1971 and “Bloody Thursday” at People’s Park in 1969 in the United States, as well as throughout pre- and post-apartheid South Africa. While lethal rounds have been replaced by a host of kinetic impact projectiles in most parts of the world, birdshot—shotgun loads of small (<6 mm diameter) pellets—are still frequently deployed across the Middle East and South Asia as a crowd management strategy. Over the past decade, birdshot use in crowd control has been documented in Bahrain, Egypt, Iran, Iraq, Lebanon, Tunisia, and, most notably, India.

Birdshot is frequently deadly at close to medium ranges. The 2011 Bahraini uprising saw at least seven deaths directly attributed to police birdshot, with the majority of victims

being shot from a range no greater than five metres, often in the back.<sup>31</sup> Despite these deaths and hundreds of injuries attributed to these weapons, birdshot is still extensively deployed by Bahraini security officials, causing high numbers of deaths in 2012,<sup>32</sup> 2014,<sup>33</sup> 2015, and 2017.<sup>34</sup> In Egypt, Shaimaa al-Sabbagh, an Egyptian poet and activist, was killed after being shot in the back from close range with birdshot. More recently, birdshot from security forces killed protesters in Iraq in 2020<sup>35</sup> and in Sudan in 2022.<sup>36</sup>

By far the most sustained use of birdshot has been in the Indian Union Territory of Jammu and Kashmir, where police birdshot—fired from what are often mislabelled “non-lethal pellet guns” —has claimed the lives of at least 24 and injured thousands.<sup>37</sup> Our review of the scientific and medical literature regarding KIPs also identified eight studies about pellet injuries in Kashmir, which

31 “Report of the Bahrain Independent Commission of Inquiry,” (23 November 2011) accessible at: <http://files.bici.org.bh/BICReportEN.pdf>.

32 W Al-Jawahiry and H Mohammed, “Bahrain protester died of birdshot wounds: relative,” *Reuters*, (23 April 2012), accessible at: <https://www.reuters.com/article/us-bahrain-protester/bahrain-protester-died-of-birdshot-wounds-relative-idUSBRE83M1BS20120423>.

33 Human Rights Watch, “Bahrain: Gunshot Deaths Require Swift Investigation,” *Human Rights Watch*, (11 June 2014), accessible at <https://www.hrw.org/news/2014/06/11/bahrain-gunshot-deaths-require-swift-investigation>.

34 Amnesty International, “Bahrain: At least one dead and hundreds injured as government violently cracks down on opposition,” *Amnesty International*, (23 May 2017), accessible at: <https://www.amnesty.org/en/latest/news/2017/05/bahrain-at-least-one-dead-and-hundreds-injured-as-government-violently-cracks-down-on-opposition/>.

35 Reuters Staff, “Iraqi security forces kill protester in Baghdad – police sources,” *Reuters*, (25 February 2020), accessible at: <https://www.reuters.com/article/uk-iraq-protests-violence-idINKBN20J2LR>.

36 AFP, “Sudanese protester killed as thousands march against coup,” *France 24*, (28 February 2022), accessible at: <https://www.france24.com/en/live-news/20220228-sudanese-protester-killed-as-thousands-march-against-coup>.

37 Business Standard, “Pellet guns have killed 24, blinded 139 in Kashmir since 2010: Report,” *Business Standard*, (2 August 2019), accessible at: [https://www.business-standard.com/article/current-affairs/pellet-guns-have-killed-24-blinded-139-in-kashmir-since-2010-report-119080200151\\_1.html](https://www.business-standard.com/article/current-affairs/pellet-guns-have-killed-24-blinded-139-in-kashmir-since-2010-report-119080200151_1.html).

recorded 1,669 individuals killed or injured by pellets—almost three times the number of KIP injuries previously recorded in literature published from 2017-2021. These injuries disproportionately resulted in permanent injury relative to other KIPs (see Figure 4).

Birdshot use is associated with a very high incidence of ocular injuries. In Kashmir, hundreds of civilians have suffered severe eye injuries as a result of the small-diameter, high-velocity shot, which disperses uncontrollably with increasing distance from the shooter.<sup>38</sup> This phenomenon is not unique to India; in one week of November 2012, Tunisian police's use of birdshot led to at least 20 cases of severe ocular trauma.<sup>39</sup> Ocular trauma stands out due to the often-permanent nature of the disability created, generating additional physical, mental, and

economic burdens for those maimed by these weapons.

Lead poisoning has also been reported due to the use of lead pellets, especially when they are embedded in the tissues of children and young people and not removed. Chronic exposure to even small doses of lead can lead to devastating physical and mental injuries. Lead is now known to produce a spectrum of injury across multiple body systems, affecting children's brain development and resulting in reduced intelligence quotient (IQ), behavioural changes such as reduced attention span and increased antisocial behaviour, and reduced educational attainment. Lead exposure also causes anaemia, hypertension, renal impairment, immunotoxicity, and toxicity to the reproductive organs. The neurological and behavioural effects of lead are irreversible.

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38 See the case of Farzan Nazir Sheikh in INCLO, "Unhealed Wounds," accessible at: <https://www.inclo.net/projects/unhealed-wounds/>.

39 CL Belhadj, "A Decade After Cops Took Their Eyes, Siliana Victims Still Seek Justice," *Meshkal*, (30 December 2021), accessible at: <https://meshkal.org/a-decade-after-cops-took-their-eyes-siliana-victims-still-seek-justice/>.

## What has changed?

- › Increase in injuries: Since the publication of LiD1, the use of KIPs to suppress mass dissent has rapidly accelerated, with a corresponding increase in documentation of the resulting injuries. Of the 2,434 total injuries reported in the medical literature from 2016-2021, 2,232 were severe (92 per cent), a ratio higher than that found earlier (70 per cent). We note, however, that this proportion may be skewed by the under-reporting of less-severe injuries. At least 945 individuals (43 per cent) suffered permanent disability as a result of KIP injury, a ratio of maiming greater than that of the previous report (15 per cent). Ocular injuries also made up a much larger share of total reported injuries, with 1,575 cases (73 per cent) versus 310 cases (16 per cent) from the earlier literature. This total is due almost wholly to multi-projectile KIPs (1,511 cases, or 96 per cent).
- › Increase in use: Novel weapons have come to the fore over the last five years. In France, impact projectiles—notably a variety of KIPs commonly known as “flash-balls” —were widely used during the *gilets jaunes* protests of 2018-2020, resulting in life-threatening injuries to the face and eyes.<sup>40</sup> The Chilean

protests of October 2019 resulted in a wave of ocular injuries from “rubber buckshot.”<sup>41</sup> In the United States, the police response to protests in the wake of George Floyd’s murder saw extensive use of a wide variety of impact projectiles, resulting in a surge in potentially life-threatening injuries. In Colombia, the use of impact projectiles during the protests of the spring of 2021 resulted in more than one hundred ocular injuries.<sup>42</sup>

- › Multiple-projectiles: The widespread use of multi-projectiles (where multiple projectiles are fired at once) has allowed for a more in-depth analysis of these weapons in this report that demonstrates their particular harms. 82% (n=1994) of all injuries and deaths recorded in our updated literature review of KIPs were a result of multiple projectile rounds—KIPs that consist of more than a single missile fired at the same time (Figure 4). Furthermore, multiple projectile rounds were involved in a staggering 96% (n=1,511) of all ocular injuries from KIPs. Multiple projectiles are inherently indiscriminate: they cannot target a single individual or a single body part, resulting in excessive injury to targeted individuals (when they impact sensitive body parts) and to bystanders (when the projectiles spread to those not

40 R Lartzien et al., “Yellow vests protests: facial injuries from rubber bullets,” *The Lancet* 394, no. 10197 (2019): 469-470, doi:10.1016/S0140-6736(19)31764-7 and A Chauvin, et al., “Ocular injuries caused by less-lethal weapons in France,” *The Lancet* 394, no. 10209 (2019): 1616-1617, doi:10.1016/S0140-6736(19)31807-0.

41 A Rodríguez et al., “Ocular trauma by kinetic impact projectiles during civil unrest in Chile,” *Eye* 35 (2021): 1666-1672, doi:10.1038/s41433-020-01146-w.

42 O Griffin, “Over 100 Colombian protesters suffered eye damage by police in 2021 marches - report,” Reuters, 26 November 2021. Accessible at: <https://www.reuters.com/world/americas/over-100-colombia-protesters-suffered-eye-damage-by-police-2021-marches-report-2021-11-26/>

targeted. The results of our analysis suggest that these weapons are more dangerous than single projectiles, and restrictions on their use must be one of the first steps in limiting harm from KIPs.

- › 'Hybrid' weapons: The development and proliferation of novel 'hybrid' weapons that combine characteristics of KIPs with other less-lethal weapons add complexity to the assessment and treatment of injury from these weapons. Foremost among these are KIPs laced with chemical agents designed to deter through impact and chemical irritation concomitantly, most notably compressed-air weapons such as the "Pepperball" gun or the FN 303, which shoot irritant-filled spherical gelatine capsules. Stun grenades, also known as distraction devices, with a kinetic component—such as grenades designed to project rubber balls across their blast radii ("Sting-ball" grenades) along with a flash and report—are increasingly seen in protest settings, where they act in effect as indiscriminate KIPs.
- › Canisters misused as KIPs: Weapons not designed to function as impact projectiles are increasingly being pressed into service as improvised KIPs. Tear gas canisters, when fired directly at protesters, act as KIPs; however, they can be extraordinarily hazardous when used in this manner as they are dense, metallic, large and often heated or mid-explosion. These devices and their resultant injuries are reviewed in the chemical irritants section. Projectile-launched distraction devices, such as the Airborne Warning/Signalling Munition (AW/SM),<sup>43</sup> are designed to deflagrate 6 metres above the heads of crowds but have been directly fired towards individuals or crowds, risking serious injury and death.

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43 Defense Technology, "40MM WARNING / SIGNALLING MUNITIONS; OC, CN, CS AND INERT MARKING; 50, 100, 200 AND 300 METERS," accessible at: [https://www.defense-technology.com/wp-content/uploads/2020/06/40mm-Warning\\_Signaling-Munition-w-Payload.pdf](https://www.defense-technology.com/wp-content/uploads/2020/06/40mm-Warning_Signaling-Munition-w-Payload.pdf).

## Case study

# Inherently inaccurate ‘double-ball rounds’ cause deaths and injuries of demonstrators and bystanders

## South Africa

Among the “less-lethal” weapons that the South African Police Service (SAPS) possess are the “double-ball rounds”, more commonly known by the generic name “rubber bullets”. They consist of double-ball rounds containing two hard rubber balls fired from a shotgun. Manufactured by a number of companies, around the world and in South Africa, the use of these inherently inaccurate weapons in policing protests and public gatherings have changed the lives of many people in South Africa, both through tragic deaths and injuries.

On 19 March 2018, Thembekile Fana, a 61-year-old man, died during a protest in the Eastern Cape after being shot by police.<sup>44</sup> According to a witness on the scene, Fana, who had been running for cover from police, stopped and raised his arms in surrender

before being lethally wounded by double-ball rounds fired from a police shotgun.<sup>45</sup> Fana’s son, Andile, noted that he saw 16 shell casings lying around his father’s lifeless body.<sup>46</sup> He further noted that Fana was shot under the arm—further evidence of his surrender<sup>47</sup> in the wake of impending death by CCW. Significantly, Fana was the only breadwinner in his family and was described as a community leader.<sup>48</sup> Research conducted in the wake of this tragedy found that the death of Thembekile Fana appears to have been linked to the use of double-ball rounds at close range.<sup>49</sup>

On 10 March 2021, Mthikozisi Ntumba, a 35-year-old civil servant, was shot and killed by police using double-ball rounds as he was leaving a medical clinic in Johannesburg city centre during protests.<sup>50</sup> Ntumba was leaving

44 D Bruce, “Rubber bullets well past their sell-by date”, Mail & Guardian. (6 December 2019), accessible at: <https://mg.co.za/article/2019-12-06-00-rubber-bullets-well-past-their-sell-by-date/>.

45 DispatchLive, “Protester ‘killed by cops’”, (20 March 2018) at: <https://www.dispatchlive.co.za/news/2018-03-20-protester-killed-by-cops/>.

46 *Id.*

47 Another prominent case of an individual shot while raising their arms and surrendering to law enforcement was the case of actor Patrick Shai who was shot eleven times in 2019, including in the neck, back, and arms by police using rubber bullets. Mr Shai had been seeking to intervene between police and protesters. See: <https://www.timeslive.co.za/news/south-africa/2019-11-11-actor-patrick-shai-shot-11-times-by-cops-during-soweto-protest-over-disconnected-electricity/>.

48 *Id.*

49 D Bruce, “Rubber bullets are high risk when used at close range”, Polity, (2019).

50 U Nkanjeni, “Mthokozisi Ntumba: Know the man who was killed in the Wits protest crossfire”, Times Live, (12 March 2021), available at: <https://www.timeslive.co.za/news/south-africa/2021-03-12-mthokozisi-ntumba-know-the-man-who-was-killed-in-the-wits-protest-crossfire/>.



STUDENT SPEAKS DURING THE DEMONSTRATION. SOUTH AFRICAN POLICE MOVED TO DISPERSE STUDENTS PROTESTING AGAINST REFUSAL BY WITS UNIVERSITY TO REGISTER THOSE STUDENTS IN ARREARS WITH TUITION FEES. POLICE CLASHED WITH PROTESTERS WHO WERE BLOCKING THE ROADS WITH RUBBLE AND DISRUPTING TRAFFIC IN JOHANNESBURG. POLICE VIOLENTLY REPPRESSED THIS STUDENT PROTEST AT WITS UNIVERSITY IN JOHANNESBURG WITH DOUBLE BALL ROUNDS, FATALLY SHOOTING PASSERBY MTHOKOZISI NTUMBA. THABO JAIYESIMI | SOPA IMAGES/SIPA USA/AP IMAGES

his doctor's rooms, when he caught himself in the crossfire of running protests over historical debt between police and students.<sup>51</sup> It was also reported that three students, who were waiting outside the Johannesburg Institute of Engineering and Technology College, were also shot and injured by police using double-ball rounds that day.<sup>52</sup> According to a CCTV video of the alleged incident, police violently pursued a group of people standing on a

sidewalk and can be clearly seen firing their shotguns indiscriminately as people flee for safety.<sup>53</sup> Four Johannesburg Metropolitan Police Department (JMPD) officers were subsequently arrested and charged with one count of murder and three counts of attempted murder.<sup>54</sup> An investigating officer with the Independent Police Investigative Directorate reported that she found "Ntumba's body with wounds on the left side of his chest, under

51 B Wicks, "SERI wants answers after acquittal of cops accused of Mthokozisi Ntumba's murder" Eyewitness News, (8 July 2022), accessible at: <https://ewn.co.za/0001/01/01/seri-wants-answers-after-acquittal-of-cops-accused-of-mthokozisi-ntumba-s-murder>.

52 J Chabalala, "Cops accused of killing Mthokozisi Ntumba amid student protest want case thrown out", News24. (4 July 2022), accessible at: <https://www.news24.com/news24/southafrica/news/cops-accused-of-killing-mthokozisi-ntumba-amid-student-protest-want-case-thrown-out-20220704>.

53 SERI, "The excessive use of force: We demand accountability for Mthokozisi Ntumba", (7 July 2022), accessible at: <http://www.seri-sa.org/index.php/latest-news/1235-press-statement-the-excessive-use-of-force-we-demand-accountability-for-mthokozisi-ntumba-7-july-2022>.

54 See above 50.

his armpit and under his left eye”.<sup>55</sup> During Ntumba’s postmortem, a ballistics expert “confirmed that the deceased was shot by a rubber bullet at close range”.<sup>56</sup> Ntumba’s case is not the only recent case of the tragic death of a bystander: In 2017, in Bela-Bela, Karabo Kuhmalo, an 11-year old boy, died after being hit in the head by rubber bullets fired by the South African police.<sup>57</sup>

Siphesihle Mtsweni, 21, then a student at the Johannesburg Institute of Engineering and Technology was also shot by police using double-ball rounds during the protest that day. Mtsweni, who sustained injuries from the double-bullet rounds to the face, said he dropped out of college later that year due to trauma following the shooting incident.<sup>58</sup> “When I would go back to the college, I was reminded of what happened when I was shot. I am reminded of the dead body I saw,” said Mtsweni.<sup>59</sup>

Double-ball rounds are a particularly dangerous type of kinetic impact projectile.

Owing to their design, cartridges that contain multiple projectiles are inaccurate. Once fired, the projectiles separate, and can rapidly disperse, resulting in unpredictable impacts. This inaccuracy only increases over longer distances. As a result of this design, projectiles from double-ball rounds may impact unintended parts of the body, including the head, face or neck, which could cause serious injury. Despite their inherently inaccurate nature, the use of different types of rubber bullets continues to be a key part of police responses to protests and other public gatherings in South Africa. This tendency to rely on less-lethal weapons and equipment for public order policing was addressed in the Panel of Experts Report on Crowd Management, published following the Marikana Commission of Inquiry<sup>60</sup> (a case included in LiD1) although the recommendations of that Report have not been prioritised.

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55 C Mahamba, “Mthokozisi Ntumba shot at close range with rubber bullets, court told”, The Star. (25 March 2021), accessible at: <https://www.iol.co.za/the-star/news/mthokozisi-ntumba-shot-at-close-range-with-rubber-bullets-court-told-cd1ba027-d380-4707-b0f0-2d90561cbb7a>.

56 *Id.*

57 See above n 43 and J Bornman, “Family angry over death of 10-year-old boy allegedly shot by police in BelaBela”, Times Live, 9 February 2017, accessible: <https://www.timeslive.co.za/news/south-africa/2017-02-09-family-angry-over-death-of-10-year-old-boy-allegedly-shot-by-police-in-bela-bela/>.

58 M Koka, “Former student testifies about being shot on day Mthokozisi Ntumba was killed”, Sowetan Live. (10 February 2022), accessible at: <https://www.sowetanlive.co.za/news/south-africa/2022-02-10-former-student-testifies-about-being-shot-on-day-mthokozisi-ntumba-was-killed/>.

59 *Id.*

60 Panel of Experts Report on Policing and Crowd Management, Established by the Minister of Police in Terms of the Recommendations of the Marikana Commission of Inquiry, Final Report, (27 May 2018).

## Sidebar

## Manufacture and procurement of double-ball rounds

Double- and triple ball rounds are manufactured and procured by a wide range of companies. Many of the double-ball rounds used in South Africa are manufactured in South Africa, but there are companies manufacturing double- and triple-ball rounds across the world. Among these are believed to be: the Spanish company, Trust Eibarres SA, manufactures both double- and tripleball rounds for law enforcement;<sup>61</sup> the Turkish company, ZSR;<sup>62</sup> the Czech company, Sellier & Bellot;<sup>63</sup> the Brazilian company, Condor;<sup>64</sup> and the US-based company, Defense Technology, makes a 'Multiple Rubber Baton Round' with three projectiles.<sup>65</sup>

Several companies within South Africa manufacture a range of kinetic impact projectiles – including the double-ball round. The most notable historical South African manufacturer of kinetic impact projectiles

was Swartklip Products, which became a Denel (now Rheinmetall Denel) subsidiary during the 1990s. In 2014, the then-Chief Executive of Rheinmetall Denel Munition, Norbert Schulze, was confident that “locally produced rubber bullets, flash-bangs and tear gas [would soon be] used by police”.<sup>66</sup> Another manufacturer is Industrial Cartridge, that currently markets ‘2 ball baton’ and ‘3 ball baton’ 12-gauge ammunition among its ‘Law Enforcement Shotshells’ range<sup>67</sup> and that reported to have seen “high demand for less lethal ammunition for crowd control, with orders from South African entities taking up much of its production capacity” in 2019.<sup>68</sup> That same year, the South African Police Service published a tender to supply “shotgun, 12 gauge/bore baton double ball, soft silicone, smokeless propellant, orange to the South African Police Service: nationally for a period of three (3) years.”<sup>69</sup> In July 2020,

61 Trust Eibarres SA, “Law Enforcement”, available at: <https://www.cartuchostrust.com/en/cartridges/law-enforcement/>.

62 ZSR Patlayıcı Sanayi A.Ş., “Traumatic”, accessed at <https://zsrpatlayici.com/traumatic-en>.

63 Sellier & Bellot, “Law enforcement products: 12/67.5 rubber ball”, accessible at: <https://www.sellier-bellot.cz/en/products/law-enforcement-products/12-67-5-rubber-ball/list/>.

64 Condor Tecnologias Nãa-Letais, “AM-403/A TRIMPACT – TRÊS PROJÉTIS DE BORRACHA”, accessible at: <https://www.condornaletal.com.br/am-403-a/?lang=en>.

65 Defense Technology, “Multiple Rubber Baton Round 40mm”, accessible at: <https://www.defense-technology.com/product/multiple-rubber-baton-round-40mm/>.

66 K Helfrich, “Exports essential for Rheinmetall Denel Munition”, (4 February 2014), accessible at: <https://www.defenceweb.co.za/industry/industry-industry/exports-essential-for-rheinmetall-denel-munition/>

67 Industrial Cartridge SA, Less Lethal Ammunition – 12 Gauge. Law Enforcement Shotshells, accessible at: <https://industrialcartridgesa.com/less-lethal-ammunition/>.

68 defenceWeb, “High demand for less lethal rounds”, (6 December 2019), accessible at: <https://www.defenceweb.co.za/featured/high-demand-for-less-lethal-rounds/>.

69 Awarded Bid. Bid Number 19/1/9/1/03TT(19), accessible at: <https://www.saps.gov.za/services/bidthumbnail.php?id=2679>.





BANGKOK, THAILAND - MARCH 20, 2021: RIOT POLICE FIRE RUBBER BULLETS TO PRO-DEMOCRACY PROTESTERS DURING A CRACKDOWN AT SANAM LUANG AND RATCHADAMNOEN NAI RD. DIRACH TOUMLAMOON | SHUTTERSTOCK

the successful bidder, IT Empowerment Technologies, was awarded a three-year R30.5 million contract. Although the contract between the SAPS and IT Empowerment Technologies was cancelled later in 2020,<sup>70</sup> it is unclear if the tender was re-issued or if a previous supplier has been contracted instead of IT Empowerment Technologies.

Civil society actors in South Africa have repeatedly criticised the nature of the use of these kinetic impact projectiles within South Africa.<sup>71</sup> Despite this, police forces continue to procure new stocks of double-ball rounds. The lack of transparency and clear global

standards regarding the manufacture of these weapons around the world, their testing before purchase by governments and their procurement<sup>72</sup> creates immense challenges for organizations seeking to monitor abuses related to these weapons and the fight for justice by victims and their families.

70 defenceWeb, "Inflated' SAPS rubber bullet tender cancelled", (23 September 2020), accessible at: <https://www.defenceweb.co.za/land/land-land/inflated-saps-rubber-bullet-tender-cancelled/>.

71 See, for example, M Rayner, L Baldwin-Ragaven, with S Naidoo, "A Double Harm: Police misuse of force and barriers to necessary Health Care Services", Socio-Economic Rights Institute of South Africa and D Bruce, "Rubber bullets are high risk when used at close range", ISS Today (28 November 2018), accessible at: <https://issafrica.org/iss-today/rubber-bullets-are-high-risk-when-used-at-close-range>.

72 In the case of the IT Empowerment Technologies' successful bid, it was alleged that the SAPS "paid five times what they should have for less lethal ammunition" and a whistleblower, Colonel (ret.) David Peddle, alleged that "the ammunition was not tested to the latest SAPS specifications before the bid was approved". See defenceWeb, "Concern over 'inflated' SAPS rubber bullet tender", (2 September 2020), accessible at: <https://www.defenceweb.co.za/industry/industry-industry/concern-over-inflated-saps-rubber-bullet-tender/>.

## Case study

## Man killed by ESMAD with bean bag shot

### Colombia

On 21 November 2019, a series of social demonstrations in Colombia was called by unions, students, pensioners' associations, and other groups in response to several factors, including proposed modifications to the pension, labour, and tax regime; non-compliance with the peace agreements; the murders of human rights defenders; and socioeconomic inequalities.

On 23 November 2019, Dilan Cruz, an 18-year-old, was participating in demonstrations in the centre of Bogota, the country's capital. ESMAD (*Escuadrón Móvil Antidisturbios*), the police unit responsible for crowd and riot management, began to throw tear gas and stun grenades to disperse the demonstrators. In videos, Cruz can be seen picking up a grenade, throwing it back at the agents and, within seconds, being hit in the back of the head by a flying object. The projectile that hit him was a bean bag, fired by Captain Manuel Cubillos Rodríguez from a 12-gauge shotgun, which is one of the less lethal weapons authorised for police use under Colombian law.

Dilan Cruz died two days after the incident, while in intensive care.<sup>73</sup> The National

Institute of Legal Medicine and Forensic Sciences confirmed in his autopsy that the cause of death was "secondary to penetrating cranioencephalic trauma, caused by low impact ammunition, which causes severe and irreversible damage to the brain."<sup>74</sup> That is to say, he was killed by the impact of the bean bag ammunition, which complied with the manufacturer's technical data sheet and had not been modified. His death fuelled further protests, including demands for the end of police violence and the end of impunity for deadly police conduct.

Cruz's death was followed by almost two years of disagreement regarding whether the ordinary justice system or the military criminal justice system had the authority to investigate and criminally prosecute the ESMAD agent. The Constitutional Court, the highest court in Colombia on constitutional matters, ruled that the investigation should continue in the ordinary justice system. In December 2021, the agent was required to attend a disciplinary trial by the *Procuraduría General de la Nación* (the national prosecutor's office), which is in charge of investigating and sanctioning public officials for actions taken in their official capacity.<sup>75</sup> According

73 D Cruz, Colombian teenager injured by police projectile, dies, BBC News, (26 November 2019), accessible at: <https://www.bbc.co.uk/news/world-latin-america-50557496>.

74 Medicina Legal confirmó que Dylan murió por disparo del ESMAD. El Tiempo, (28 November 2019), accessible at <https://www.eltiempo.com/justicia/investigacion/dylan-cruz-medicina-legal-confirio-que-el-joven-murio-por-el-disparo-del-esmad-438524>.

75 Capitán del ESMAD fue citado a juicio disciplinario por muerte de Dylan Cruz, Revista Semana, (10 December 2021), accessible at: <https://www.semana.com/nacion/articulo/capitan-del-esmad-fue-citado-a-juicio-disciplinario-por-muerte-de-dylan-cruz/202115/>.



THE MOTHER OF DILAN CRUZ WHO WAS KILLED BY THE POLICE IN A BOGOTÁ PROTEST SHOWS A PICTURE OF HIM IN DURING THE COLOMBIAN NATIONAL STRIKE AGAINST THE IVAN DUQUE GOVERNMENT. BOGOTÁ, COLOMBIA. 19 MAY, 2021. SEBASTIAN DELGADO C. | SHUTTERSTOCK

to the prosecutor's office, "The investigated officer did not take the necessary care when activating the shotgun he was carrying, since regardless of whether the weapon is listed among the least lethal weapons, it will always affect the integrity of the people."<sup>76</sup> Despite this finding, to date there has been no decision on the merits of the case.

In December 2019, days after Cruz's death, civil society organisations and concerned individuals filed a legal action seeking protection of the fundamental right to protest. In September 2020, the Supreme Court of Justice finally issued a ruling<sup>77</sup> protecting the right of all persons to protest and clarifying the duty of authorities to "avoid, prevent and sanction the systematic, violent and

arbitrary intervention of the public forces in demonstrations and protests." The court's ruling suspended the use of 12-gauge shotguns, the weapon used to shoot the bean bags, by ESMAD. The suspension continues to this day, and the Ombudsman's Office of Colombia is obliged to monitor compliance with this order.

76 Procuraduría General de la Nación, Procuraduría formuló cargos a capitán de la Policía Nacional por la muerte de Dilan Cruz, (10 December 2021), accessible at: <https://www.procuraduria.gov.co/portal/PROCURADURIA-FORMULO-CARGOS-A-CAPITAN-DE-LA-POLICIA-NACIONAL-POR-LA-MUERTE-DE-DILAN-CRUZ.news>

77 See <https://www.dejusticia.org/en/supreme-court-of-justice-protects-the-right-to-protest-against-police-violence/>.

## Case study

## Expanding bullets among multiple CCWs used in Minsk demonstrations

### Belarus

On 9 August 2020,<sup>78</sup> after the results of Belarus's presidential election were announced, mass protests broke out to denounce what many Belarusians - and international observers - saw as an unfair, rigged election. Aliaksandr,<sup>79</sup> a 37-year-old driver, joined other protesters seeking to gather in the centre of Minsk. He was among approximately 20 people who, trying to make their way to the main protest site, approached a police van and a group of policemen. When Aliaksandr's group was approximately 15 metres from the police van, at least three rounds of ammunition were fired, and Aliaksandr was struck in the abdomen. He tried to run away but managed to stumble only 150 metres before being picked up by strangers and taken to a hospital by car.

Aliaksandr was operated on, and the surgeon later told him that a rubber bullet had been extracted from his body. According to the surgeon, the bullet was made of plastic, but its core was made of small metal balls, which expanded on impact and were easily visible in an X-ray image. Aliaksandr was in

severe pain for many days. He spent 15 days in intensive care and had to undergo further operations abroad, as the treatment available in Belarus was limited and expensive. It took him five months to recover.

Hundreds of thousands of Belarusians protested over several weeks after the elections, and these demonstrations were regularly dispersed violently, using CCWs such as rubber bullets, tear gas, and stun grenades. It is estimated that hundreds of protesters were severely injured, and at least 15 protesters died during the 2020 protests.<sup>80</sup> *Mediazona*, an independent media outlet, reported the number of arrests at over 33,000<sup>81</sup> and *Viasna*, a major human rights group, counts over 1,300 of those as political prisoners. Hundreds have been reportedly beaten and tortured in custody.<sup>82</sup>

A report by the UN Office of the High Commissioner for Human Rights (OHCHR), published on 5 March 2022, detailed excessive and inappropriate uses by Belarusian security forces of batons, water cannons, tear

78 This is a summary of the incident reported at <https://august2020.info/ru/detail-page/292>.

79 Republic of Belarus has two official languages, Belarusian and Russian. For the sake of consistency, the transliterations follow the Belarusian versions of names, even where sources are in Russian.

80 FIDH, "Supplying the means for repression in Belarus," December 2021. Accessible at: [https://www.fidh.org/IMG/pdf/548344402-supplying-the-means-for-repression-in-belarus\\_1\\_.pdf](https://www.fidh.org/IMG/pdf/548344402-supplying-the-means-for-repression-in-belarus_1_.pdf).

81 See <http://mediazona.by/number/2022/08/22/detained>.

82 Human Rights Watch, "Belarus: Systematic Beatings, Torture of Protesters," *Human Rights Watch* (15 September 2020), <https://www.hrw.org/news/2020/09/15/belarus-systematic-beatings-torture-protesters>.



A WOMAN ON HER KNEES STANDS IN FRONT OF THE RIOT POLICE IN A PUBLIC UNREST STARTED IN THE STREETS OF MINSK, BELARUS, ON AUGUST 9, 2020 AT THE END OF THE VOTING DAY WITH PEOPLE CLAIMING FOR A GOVERNMENT CHANGE AND PROTESTING BECAUSE FRAUD ELECTIONS FOR THE PRESIDENCY OF BELARUS. CELESTINO ARCE | NURPHOTO VIA GETTY IMAGES

gas, and kinetic impact projectiles, including rubber-coated steel bullets. The UN report stated, “On the basis of an analysis of 26 first-hand witness accounts, their medical records and photographic material, in conjunction with a review of the injuries of more than 1,000 individuals treated by the Minsk medical emergency services during the protests, along with open source material, OHCHR found that injuries resulting from the use of force in several cities across Belarus between 9-12 August included tramline bruises and hematomas on the torso, buttocks, and back of the legs, head injuries (such as brain contusion), concussion, traumatic wounds, fractures and burns, ear drum perforations as a result of acoustic trauma, and eye injuries. More severe injuries included multiple organ injuries sustained from rubber-coated steel bullets and internal organ damage caused by shrapnel from stun grenade fragments and burns caused by explosions.”<sup>83</sup>

Not only has Belarus failed to investigate these actions of security forces, but some of the civilians who complained were themselves prosecuted. According to authorities, a complaint about police brutality was an admission of “participation in mass disorder.” A report from the human rights group FIDH<sup>84</sup> highlighted the issue of the unregulated transfer of CCWs from the European Union (EU) to Belarus. After the crackdown on the protests in Minsk and other cities, journalists found KIP ammunition produced in Turkey (STERLING 12 gauge less lethal cartridge with rubber bullet), Latvia (D Dupleks 12/70 cartridge with rubber bullet), and Poland (Fam-Pionki 12/70 light and sound cartridge ONS 2000).<sup>85</sup> Multiple testimonies were collected by human rights activists and journalists about police use of CCWs. It is a striking commonality in many of these testimonies that the police used CCWs not when the protests were at their largest, but at times when the demonstrators barely started gathering or were dispersing. It may reasonably be inferred that CCWs were used not in self-defence, but to frighten and punish the protesters.

83 OHCHR, “High Commissioner’s report on the situation of human rights in Belarus in the run-up to the 2020 presidential election and in its aftermath, A/HRC/49/71, paras 25-30” 4 March 2022. Accessible at: <https://www.ohchr.org/en/hr-bodies/hrc/ohchr-belarus/index>

84 FIDH, “Supplying the means for repression in Belarus,” December 2021. Accessible at: [https://www.fidh.org/IMG/pdf/548344402-supplying-the-means-for-repression-in-belarus\\_1\\_.pdf](https://www.fidh.org/IMG/pdf/548344402-supplying-the-means-for-repression-in-belarus_1_.pdf).

85 *Id* at p 18