



Why hearing loss in Law Enforcement cannot and should not be ignored

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Introduction

The world of law enforcement is littered with risk, from day-to-day danger to less obvious, ongoing threats to the mental and physical health of those who work in it.

Among those 'unseen' risks is noise-induced hearing loss - a prevalent issue in sectors including the military and law enforcement, where personnel often experience loud or constant noise. The environments they operate in can have far-reaching, potentially permanent effects on hearing, with potentially catastrophic results on individuals and on a wider scale.

In the defense sector, work has been underway to ensure frontline operatives are provided with equipment that not only offers hearing protection, but does so without affecting their situational awareness in the field. Protecting hearing from damage is vital, but so is ensuring situational awareness is maintained in environments where it can mean the difference between life and death or serious injury. Yet despite similar risks, while consideration and investment is made in hearing protection in the defense sector, the issue receives less attention in the world of law enforcement¹.

Research in various sectors, including law enforcement and the military, shows that hearing impairment or hearing loss has a significant impact on the daily lives of those affected by it, both physically and mentally. It also causes a financial impact on individual and the wider sector, either through lost earnings or loss of revenue or through the impact of lawsuits brought as a result of a lack of attention for this issue.

This white paper will outline the risks of hearing loss in law enforcement and its impact, building up a picture of why it cannot be ignored, as well as presenting potential solutions to the issue.

Background

Noise-induced hearing loss is considered a significant preventable disease, ranking 13th globally as the cause of years lived with disability (YLD²)³.

Injury from noise can occur in two main ways⁴:

- **High level, short duration exposure exceeding more than 140 dB** can cause the delicate inner ear tissues to stretch beyond their elastic limits, causing direct damage to supporting and sensory cells. This can result in immediate and permanent hearing loss.
- **Long term exposure to low-level noise** damages the cochlea metabolically rather than mechanically, leading to the death of hair cells in the inner ear that enable hearing.

According to the U.S. Department of Veterans Affairs, hearing loss - including tinnitus - is the most prevalent service-connected disability among veterans, due to frequent exposure to loud noises from weaponry and aircraft. In 2018, 1,228,936 US veterans suffered from hearing loss⁵, while another 1,971,201 veterans suffer from tinnitus, giving some idea of the scale of the issue. Veterans are also 30% more likely than non-veterans to have a severe hearing impairment.

Research into Noise-Induced Hearing Loss (NIHL) in the police force⁶, carried out in 2015, showed that NIHL was prevalent in 34.2% of the people involved in the study, with increasing age, hypertension and longer duration of service considered significant factors associated with NIHL. In addition, a French study⁷ into the effects of occupational exposure for law enforcement, found that officers are 1.4 times more likely to have a selective 4,000-hertz hearing loss - the level accepted as indicating early or moderate NIHL - than other civil servants.

In Europe, EU 'Noise at Work' regulations⁸ put the responsibility on employers to assess the levels of noise employees are working with and to take appropriate action to protect them. Whether the workplace is a factory, battlefield, or within law enforcement, organizations whose employees are at risk of hearing loss are required to protect them and, therefore, should invest in adequate equipment.

Research into NIHL in law enforcement may be less expansive than the military equivalent, but there are parallels between environments in which military personnel operate and those in law enforcement.

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One such area is the use of firearms. Research from the US Occupational Safety and Health Administration (OSHA)⁹ shows that muzzle blast levels for most firearms, can range from 140 to more than 170 decibels - potentially causing instant, permanent hearing damage. On top of this, bystanders to gun or weapons fire can suffer similar auditory injuries - potentially worse given that they may not anticipate the gunshot or be equipped with ear protection.

Alongside the more obvious risks associated with gunfire, research into NIHL in the police force pointed out that police officers are potentially exposed to multiple sources of noise, including traffic noise, vehicle horns, gunfire, and barking from police dogs. Specifically for police motorcyclists, the noise exposure can range from 63 dBA to 90 dBA, and up to 105 dBA in open roads.



Other situations include riots and football matches, where noise can include firecrackers that detonate around 170 dB. Anecdotal evidence suggests that large-scale crowd control situations deliver much greater noise levels than previously, both due to volume of people as well as the regular use of firecrackers or fireworks by agitators. This increase in noise levels means it is imperative that crowd control officers use hearing protection that protects them but also allows high levels of situational awareness in volatile situations.

What are the effects of Noise-Induced Hearing Loss?

The effects of NIHL can be significant, both physically and mentally. Patients who develop NIHL may exhibit difficulty in listening to high frequency noise such as whistles or buzzers and may also struggle to differentiate some speech consonants, especially in situations where there is significant background noise. In a tactical environment - whether in the military or law enforcement, this can be catastrophic, affecting communications and detracting from situational awareness.

A NATO technical report into hearing loss refers to data showing that around 50 – 60 percent of one’s situational awareness comes from hearing. This means someone with poor hearing will take approximately 90 seconds to identify a target that takes 40 seconds to acquire with good hearing - with that 50-second difference potentially meaning the difference between life or death or mission success or failure¹⁰.

The effect of poor hearing on an individual’s situational awareness affects their safety and that of their colleagues and the public they are protecting. The same NATO report refers to the fact that a unit’s ability to accomplish its mission is directly proportional to its ability to communicate effectively. The effects of hearing loss on situational awareness mean that it can interfere with a frontline operative’s ability to recognize threats, exchange mission-critical information and give and receive commands - potentially endangering his/her own life as well as the safety and mission accomplishment of his/her unit.

“Hearing loss means much more than simply asking people to repeat themselves. It can cause mental and social problems including depression, anxiety, low self-esteem, isolation and withdrawal, reduced social activity, and problems at work.”

Scott Hogenson, former deputy assistant secretary for public affairs at the US Department of Veterans Affairs in the George W. Bush administration

Whilst arguably less serious than potential life or death, hearing loss within law enforcement and the military can take its toll on individuals and in a wider sense.

In a 2019 article on Veterans and hearing loss¹¹, Scott Hogenson, a former deputy assistant secretary for public affairs at the US Department of Veterans Affairs, observes: “Hearing loss means much more than simply asking people to repeat themselves. It can cause mental and social problems including

depression, anxiety, low self-esteem, isolation and withdrawal, reduced social activity, and problems at work.” Hogenson cites a study, estimating that profound hearing loss in the US could cost a sufferer \$297,000 during their lifetime.

The financial impact doesn’t stop there. Alongside the personal financial effects on individuals, the impact through absence and sickness and

compensation connected to hearing loss is well documented in the defense sector and likely to be reflected within law enforcement. One report on the economic burden for hearing loss in the US military¹² cited estimates of up to \$1.2 billion of entitlement for compensation and care of hearing loss and auditory system injuries in over 1.8 million veterans in 2012 alone. According to the Veterans Benefits Administration compensation report in the US¹³, tinnitus and hearing loss were the top two most prevalent service-connected disabilities of all compensation recipients, with more than 1.3 million veterans receiving disability compensation for hearing loss, and more than 2.3 million for tinnitus, in the 2020 fiscal year.

Similarly, data from the Swedish Police Union¹⁴ shows that the number of noise-induced hearing damages almost doubled between 2013 and 2016, leading to a decision to sign framework agreements in 2019 for comms equipment with active hearing protection to enable their police officers to work safely and effectively.

In addition, occupational hearing loss can lead to legal action if employers and governments are found to have not taken adequate steps to mitigate the risk. One example is the \$3 million lawsuit joined by hundreds of veterans¹⁵ after a US defense contractor settled a case around faulty earplugs that allowed dangerous levels of noise to come through, putting thousands of soldiers at risk of hearing damage. Such lawsuits are not unique to the military, with lawsuits brought by individual law enforcement officers against their police departments due to hearing loss. One example was Delores Facey, who filed a lawsuit against the Boston Police Department after being forced into retirement due to cumulative hearing loss sustained during her 19 years on the force. In 2015, NYPD paid out hundreds of thousands of dollars in compensation to two officers who had to retire due to hearing impairments sustained through their work as patrolmen.

How do we prevent hearing loss in law enforcement?

The best way to tackle NIHL is summarised in a 2015 article from Military Medical Research: "Prevention is still the mainstay of treatment". The \$3 million lawsuit in the US proves that it is far from acceptable for governments and employers not to consider the risk to frontline operatives' hearing, and if they fail in their obligations, they will be held to account.

Although actions are slow to pick up, some measures have come up to surface. In March 2022, efforts were underway to put \$500,000 towards a hearing protection procurement program for the Florida Department of Law Enforcement (FDLE), allowing it to find the best hearing protection for its law enforcement officers.

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While hearing protection is an obvious answer, the need for law enforcement or military operatives to maintain situational awareness means any protection has to be geared to that. A 2014 study found that military personnel supplied with hearing protection devices admitted not wearing them as they felt they reduced their situational awareness and made it difficult to communicate and hear commands.



Providing feedback to INVISIO, police officer from Seattle Police Department Tyler Verhaar said: “Hearing protection has always been a struggle during crowd management and riot control settings. It is well documented that officers need to have hearing protection while engaged in these activities, however wearing standard ear plugs presents a tactical and officer safety problem. Simply cutting out external noise reduces an officer’s ability to listen to their surroundings making them far less aware of the situation around them. Additionally, by decreasing the decibels at the ear without using an active listening system it reduces the ability of the officer to hear their radio.”

Why hearing loss in Law Enforcement cannot and should not be ignored

The creation of state-of-the-art systems, that offer hearing protection in a range of dynamic, dangerous environments while also allowing clear communication and situational awareness, has been key to address the issue of Noise-Induced Hearing Loss (NIHL) in both law enforcement and the military. INVISIO's headsets and control units offer hearing protection with hear-thru and communication. The combination of its in-ear headset and the T7 over-the-ear headset can also offer double protection for particularly noisy environments.

Such systems have been proven effective in the field for law enforcement officers across the world.



In Northern Nevada, SWAT Operator Timothy Braginton used an INVISIO control unit and an in-ear headset during a SWAT call-out in 2019.

“I was positioned approximately 75 yards from a residence in which a subject was shooting at our personnel. I was utilizing a V20 control unit and the X5 headset with the situational awareness hear-through at the highest setting. From my position I was able to hear and understand the subject yelling inside the residence.”

This contrasted with other systems, which did not allow teams to hear the subject at all. In his feedback, Braginton praised the ability of the INVISIO systems to increase situational awareness and operator capability.

Police forces in both Europe and Asia have also turned to INVISIO's systems to ensure hearing protection and clear communication in environments including the 2016 UEFA European Football Championship, INVISIO won the contracts for communication and hearing protection systems from the French police force to ensure readiness to cope with the major event.

The Japanese police force made a similar move to allow safe, effective policing of large grounds and spectators during the 2020 Olympic Games. In 2019 the Swedish Police signed two framework agreements with INVISIO for comms equipment with active hearing protection to enable their police officers to work safely and effectively.

While some large events may allow for planning, the vast majority of policing involves unplanned situations, requiring readiness at all times. The importance of hearing protection that does not affect the ability to communicate in a constantly shifting situation has been proven in various situations where law enforcement officers have used systems such as INVISIO's.

Summarising the effectiveness of the systems during policing riots in Seattle, Tyler Verhaar, from Seattle Police Department, said: “Multiple times during the riots very specific use of force information was broadcast over the radio detailing the commander’s intent. Officers on the line were unable to hear the information due to the overwhelming noise from the crowd. Utilising the INVISIO systems officers were able to clearly hear the commander’s intent and follow the orders. Without these systems it would have been very difficult to hear what was expected and to follow the move command.”

“Additionally, the INVISIO systems provided significant hearing protection for officers from noise and explosions coming from the crowd. Also, when blast balls were deployed officers were able to immediately go back to standard hearing without ringing or other dangerous hearing deficits.”

Verhaar also praised the ruggedness of the systems, and their ability to fit seamlessly with issued helmets, adding to their effectiveness in providing hearing protection and quality communication in dynamic situations for those on the frontline of law enforcement. In his view, officers’ safety would have been “greatly compromised” without such systems.

Conclusion

Noise-Induced Hearing Loss (NIHL) is as much of a threat to the health, wellbeing and effectiveness of law enforcement officers as it is to those in the military. Police forces and law enforcement agencies worldwide are not only losing experienced, highly capable individuals earlier than necessary due to this issue, but are also losing out financially due to compensation payments and lawsuits that are potentially avoidable.

The best solution to the problem of NIHL is prevention - a measure already invested in and taken seriously in defense. While some steps are being taken in law enforcement, more could be done to ensure those on the frontline are given hearing protection systems that not only reduce the risk of NIHL, but also ensure high quality communication and minimal reduction in situational awareness. The tools are out there, and proven to work in some of the most dangerous and dynamic situations faced by law enforcement officers. All it needs is for the organizations that employ them to invest time and money in ensuring those systems are part of their core equipment.

Related Links and Resources

1. Win, Kyaw N et al. Noise-Induced Hearing Loss in the Police Force. *Safety and health at work* vol. 6,2 (2015): 134-8. doi:10.1016/j.shaw.2015.01.002
2. YLD is estimated by multiplying the number of incident cases in that period with the duration of disease and the weight factor which measures disease severity.
3. Yong, Jenica Su-ern & De-Yun Wang, Impact of noise on hearing in the military, published in *Military Medical Research*, National Library of Medicine <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4455974/>
4. Yong, Jenica Su-ern & De-Yun Wang, Impact of noise on hearing in the military, published in *Military Medical Research*, National Library of Medicine <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4455974/>
5. VA's Office of Research & Development <https://www.research.va.gov/topics/hearing.cfm>
6. Win, Kyaw N et al. "Noise-Induced Hearing Loss in the Police Force." *Safety and health at work* vol. 6,2 (2015): 134-8. doi:10.1016/j.shaw.2015.01.002
7. Lesage, F., Jovenin, N., Deschamps1, F., & Vincent, S. (2009). Noise-induced hearing loss in French police officers. *Occupational Medicine*, 59.7, 483-486
8. Directive 2003/10/EC of the European Parliament and of the Council of 6 February 2003 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise) (Seventeenth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC)
9. <https://drgo.us/wp-content/uploads/2017/03/DRGO-HPA-White-Paper-03-27-17.pdf>, p2
10. NATO Science & Technology Organisation, Optimizing Hearing Loss Prevention and Treatment, Rehabilitation and Re-Integration of Soldiers with Hearing Impairment, <https://apps.dtic.mil/sti/pdfs/AD1022224.pdf>, p110
11. https://www.americanthinker.com/blog/2019/12/veterans_and_hearing_loss.html
12. <https://academic.oup.com/milmed/article/181/4/301/4158503>
13. https://www.benefits.va.gov/REPORTS/abr/docs/2020_compensation.pdf
14. <https://www.svt.se/nyheter/lokalt/helsingborg/arbetsmiljoverket>
15. <https://www.foxbusiness.com/politics/veterans-file-lawsuit-against-3m-over-defective-military-earplugs>

About INVISIO

INVISIO offers cutting-edge personal communication and hearing protection systems. The systems enable users to operate and communicate safely and clearly in all environments, even under extreme conditions, such as loud noise, heat, and underwater. INVISIO systems consist of headsets and advanced control units that interface to a wide range of communication devices. The systems provide hearing protection while maintaining the natural level of situational awareness. Sales are made via the headquarter in Copenhagen and sales offices in the USA, France, Italy as well as a global network of partners. INVISIO is listed on Nasdaq Stockholm (IVSO).

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