

Steve Morgan on: Adverse Effects of Noise on Quality of Life

The Relationship between Noise and Wellbeing

The cornerstone of the concept of 'Quality of Life' is wellbeing. Wellbeing encompasses all aspects of life, from happiness, comfort, and security, to safety and health. For those living or working in close proximity to an industrial facility, noise pollution can pose a unique problem for their wellbeing.



The consequences of noise are extremely broad^[4], ranging from relatively minor but still harmful concerns (e.g., interference with communication, sleeplessness, and reduced efficiency) to the most serious risk of all: irreversible hearing damage^[8]. Noise can adversely affect human health even at low levels. The relationship between health-related quality of life and acoustic environment has been widely recognised^[7].

Complicating matters is the fact that individuals perceive and experience noise differently. Some people may be more

sensitive to noise than others, both physiologically and psychologically^[7]. As such, the effects of noise are difficult to quantify because tolerance levels among different individuals for different types of noise vary considerably^[8]. For example, people in quiet areas can be more adversely affected by the introduction of noise to their environment due to the drastic contrast of shifting from a quiet environment to a noisy environment^[7].

The problem of noise pollution is a widespread, world-encompassing issue, not limited by geographic or social factors^[8]. In America alone, an estimated 11 million workers are regularly exposed to potentially hazardous noise in the workplace^[1]. As such, it is imperative for Industry to take into consideration the entire spectrum of physiological, social, and ecological concerns presented by noise pollution. Doing so early on with industrial applications is the best way to mitigate and prevent these issues^[5]. And with a comprehensive understanding of the impact of noise pollution ensures a safe workplace for employees, environmentally-friendly standards of operation, and a harmonious relationship between Industry and community.

Health and Other Considerations

Exposure to noise is an internationally-recognized health hazard that presents a range of acute and chronic health impacts^[6]. Noise pollution stemming from oil exploration, drilling, and extraction, as well as other industrial applications, has been repeatedly

THOUGHT LEADERSHIP

shown to have detrimental effects on the health of those exposed to it. In contrast, quiet environments have actually been shown to have positive—not merely neutral—impacts on health-related quality of life by both facilitating the restoration of health, as well as impeding the insult of noise to health^[7].



Hearing loss has been shown to worsen with repeated exposure to noise^[1], and this hazard increases with intensity of noise and length of each exposure^[8]. Excessive exposure to loud noise, such as that encountered in an industrial work environment, causes cells in the inner ear to degenerate and eventually can lead to permanent hearing loss^[1].



In fact, noise-induced hearing loss resulting from too much noise is the “most common type of permanent hearing loss” (Bahadori & Bohne, 1993). This form of hearing loss has a

gradual onset and the damage it causes is irreversible. Compared to presbycusis (hearing loss associated with age) which is natural and not preventable, noise-induced hearing loss is unnatural and can therefore be prevented.

Noise affects the human body in a wide variety of ways. Noise-induced hearing loss—or even deafness, in its most extreme form—is generally the most pressing concern to take into consideration. Not only is the irreversible hearing damage obviously detrimental to the wellbeing of an individual worker, but it is also destructive for the workplace in general. Difficulty hearing in an industrial workplace can pose serious safety hazards for everyone, and also result in costly yet avoidable lawsuits and worker’s compensation claims, not to mention loss of time and productivity.

However, hearing loss isn’t the only health concern posed by noise pollution. Even while sleeping (as in the case of neighbours living in proximity to an industrial facility, which may run at any hour of the day), noise can be interpreted by the body as a danger signal, prompting the release of stress hormones^[3]. In this manner, exposure to noise for those living nearby as well as those on site can lead to both acute and chronic changes to physiological stress hormone regulation. This can result in short-term and long-term health consequences, including hypertension, stress, high blood pressure, higher incidence of circulatory problems, cardiac diseases, peptic ulcers, and neurosensory and motor impairment, among other concerns^[8].

Though noise-related health problems are the most significant and direct concern arising from excessive or continuous noise in a community or workplace, such exposure can also cause a more general, frequently indirect, reduction in quality of life^[8].

THOUGHT LEADERSHIP

Annoyance is one of many consequences of noise for those exposed to it, but it can also have far-reaching psychosocial effects^[4], including social isolation due to impaired speech reception, disruption of work productivity, diminished cognitive function, and sleep disturbance^[1]. Even property values can be adversely affected by the presence of industrial noise nearby, causing tension between local homeowners and Industry.

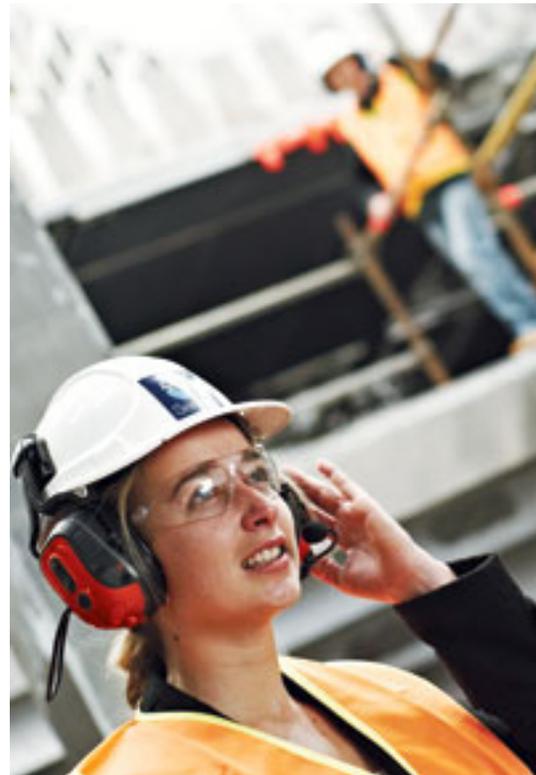
Local environmental impacts from oil and gas facilities or other industrial applications causing noise pollution are also an important—though usually overlooked—concern^[6]. In fact, noise has been shown to reduce nesting species richness and lead to different avian communities as a result of noise disrupting natural predator-prey and reproductive interactions^[2]. Sometimes this has unexpected consequences by facilitating the reproduction of some well-adapted species, such as the all-too-common pigeon, resulting in problematic overpopulation while inhibiting the reproduction of others species. As such, noise can have significant impact on the ecology and evolution of many animals, producing a subtle yet cascading effect on the environment and local ecosystems.

Prevention

The best way to preserve hearing and avoid noise-induced hearing loss specifically is to limit cumulative exposure to noise^[1]. More generally, the preservation of quiet areas, as well as proper noise abatement in noisy areas, is imperative to ensuring the highest possible quality of life for the local environment and those exposed to the industrial noise^[7]. However, it is also important to ensure public education on the consequences of noise pollution, and encourage the creation of effective noise-control legislation to ensure that noise pollution is comprehensively addressed and regulated^[8].

Noise pollution is a complicated and multifaceted issue. Luckily, we know a lot about the risks involved in noise pollution and therefore have an opportunity to address the problem effectively, before permanent damage can occur. For example, it is estimated that exposure to “[...] noise pollution exceeding 75 decibels for more than eight hours daily for a long period of time can cause loss of hearing [...]” for those in an industrial workplace (Singh & Davar, 2004).

Providing workers with the best possible personal safety equipment, such as high-noise communication headsets, and limiting the quantity and quality of noise they are exposed to in the workplace can go a long way toward ensuring their short-term and long-term auditory health.



THOUGHT LEADERSHIP

Similarly, the use of high-quality noise control equipment on industrial facilities can prevent noise from escaping into the surrounding environment and reaching the neighbours. Ultimately, it is the responsibility of Industry to consider the effect of a facility's noise

contribution on those working on site or living nearby, and with today's technological advancements in the areas of noise abatement, this has never been easier to address efficiently and effectively. 

~ ~ ~

RESOURCES AND CITATIONS

- [1] Bahadori, R., Bohne, B. (1993). Adverse Effects of Noise on Hearing. *American Family Physician*, 47(5), 1219-1226.
- [2] Francis, C., Ortega, C., Cruz, A. (2009). Noise Pollution Changes Avian Communities and Species Interactions. *Current Biology*, 19(August 25 2009), 1415-1419. doi: 10.1016/j.cub.2009.06.052
- [3] Ising, H., Kruppa, B. (2004). Health Effects Caused by Noise: Evidence in the Literature from the Past 25 Years. *Noise and Health*, 6(22), 5-13.
- [4] Kluizenaar, Y., Passchier-Vermeer, W., Miedema, H. (2001). Adverse Effects of Noise Exposure on Health: A State of the Art Summary. TNO Report, 2001.171(41046), 1-22. Division Public Health: The Netherlands.
- [5] Lercher, P. (1996). Environmental Noise and Health: An Integrated Research Perspective. *Environment International*, 22(1), 117-129. doi: 0160-4120(95)00109-3
- [6] O'Rourke, D., Connolly, S. (2003). Just Oil? The Distribution of Environmental and Social Impacts of Oil Production and Consumption. *Annual Review of Environment and Resources* 2003, 28, 587-617. doi: 10.1146/annurev.energy.28.050302.105617
- [7] Shepard, D., Welch, D., Dirks, K., McBride, D. (2013). Do Quiet Areas Afford Greater Health-Related Quality of Life than Noisy Areas? *International Journal of Environmental Research and Public Health*, 10, 1284-1303. doi: 10.3390/ijerph10041284
- [8] Singh, N., Davar, S. (2004). Noise Pollution: Sources, Effects and Control. *Journal of Human Ecology*, 16(3), 181-187.

ABOUT STEVE MORGAN



Steve Morgan is Executive Vice President at Noise Solutions, after serving as the company's Vice President Business Development since 2004. Steve has been part of the speaker rotation at Olds College in Alberta since 2012, specializing in business development and social media. He has written and facilitated a variety of leadership-training courses, and has been a keynote speaker at events for the Canadian Institute of Management and the Lone Star College's Continuing Education of Engineers Program. Steve lives in Alberta, Canada with his wife of 17 years. Article written by Taija Morgan.