

# 1Editorial

## 2Personal music players and hearing loss: Are we deaf to the risks?

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Research suggests that the ear bud generation might one day be the hearing loss generation. The European Union has taken action to reduce the risk; Health Canada should follow suit.

The European Union's Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) has estimated that 5%–10% of personal music player (PMP) users could develop permanent hearing loss if they listen to their devices at high volume for more than an hour a day.[1] They calculate that this could affect between 2.5 and 10 million people in the European Union alone. Given the massive worldwide sales of PMPs and of mobile phones that play music, the global impact will likely be much greater.

US and international standard-setting bodies require workers' ears to be protected from sound levels starting at 85 decibels.[4] Yet some player/headphone combinations can produce sound levels reaching 120 or 130 decibels: as loud as a thunderclap, a jackhammer, or a jet taking off 30 metres away. PMP users do tend to stay below these volume levels in quiet environments, but the use of headphones in noisy environments in particular encourages listeners to turn up the volume, putting their hearing at risk.

In a study conducted in three cities in England, the UK Royal Institute for the Deaf found that 72 out of 110 PMP users were listening at volumes above 85 decibels.[3] Australian research measuring the PMP levels of users passing by found that 25% were listening at levels above the same threshold.[2]

Potential hearing damage from noise exposure includes permanent ringing in the ears, hypersensitivity to loud sounds, lost ability to hear certain sounds, and difficulties understanding speech in noisy environments. Experts also worry that younger ears may be particularly susceptible to loud noise and more vulnerable to subsequent hearing loss later in life.[5]

The European Union is moving to protect listeners who may not realize they risk damaging their hearing, but there are few signs that other countries plan to do the same. In early 2011, Europe passed standards requiring PMPs to have a default maximum volume of 85 decibels (80 decibels for products marketed for children). Users will still have the option of setting the volume higher, but will be reminded intermittently that their player is above recommended limits. Manufacturers have two years to meet these standards.

Unfortunately, loudness is a product of both the player's output and the headphones used, so a PMP volume limit will not perfectly predict the sound pressure perceived by the listener. Ear bud headphones, for instance, may produce a sound output up to 10 decibels greater than standard headphones.

Why have an option of overriding the default setting? One can guess at manufacturers' reasons for not setting a fixed maximum. The determined user will surely find ways to boost volumes anyway, such as with amplified headphones. People with already reduced hearing may need higher levels. And it allows regulators not to be over-prescriptive in limiting users' listening enjoyment. Risking hearing damage would at least be done with the knowledge that the volumes chosen are higher than levels considered protective of hearing.

Research in behavioural psychology suggests that, despite the ability to ignore the preset volume limit, a lower default level should have a positive impact through what is known as the status quo effect: that is, asking listeners to override the default level in order to put their hearing at risk should be more effective than expecting them to reduce the volume to protect their hearing.[6] The default will also guide parents in helping their children to use PMPs safely.

Users can protect their hearing in other ways, such as by using noise-cancelling headphones and avoiding the use of players in noisy environments, limiting the number of hours of listening per week and taking breaks during continuous use. But this new technological nudge is an important aid in protecting hearing and helping consumers know when they are at risk. A second part of the European mandate includes the development of new ear-saving technology, which they are calling "smart" hearing protection.[7] The goal is to create ways to protect listeners from excessive sound pressure with PMPs that actively monitor the levels they are experiencing.

Health Canada should follow the European lead and use the new *Canada Consumer Product Safety Act* to require similar changes to personal music players sold in Canada. Other jurisdictions should take action as well. Harmonizing with the new European Union standards would create consistent expectations of manufacturers and allow them to create one set of products globally. In doing so, larger numbers of consumers would be protected and the worldwide risk of hearing damage reduced.

Past experience with European chemicals regulation suggests that standards protecting the European Union do not necessarily drive companies to meet the same protective levels elsewhere.[8] In the absence of legislative mandates in those areas, consumer demand for higher-volume devices and the cost of transitioning to new technology would likely leave PMPs in other parts of the world unchanged.

Health Canada and others could also go a step further. Some headphones now have maximum volume limits, ensuring that the listener is never exposed to more than 85 decibels. This could be made mandatory for all headphones marketed in Canada.

Research is needed to monitor the effectiveness of these measures. Perhaps the default volume limit will turn out to be of little influence in keeping users from turning their devices up higher. Given the design of ear buds and patterns of heavy use, a default of 85 decibels might not be low enough to protect hearing. On the other hand, research could show that those who routinely override the default volume develop no extra hearing damage. Although it may take years for much of the damage to occur, it is important that we monitor for PMP-related hearing changes. The significant negative impact that hearing damage has on people's lives is worth preventing.

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