



Mapping of transportation noise-induced health risks as an alternative tool for risk communication with local residents

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ABSTRACT

Environmental noise can adversely affect human health and well-being. It is typically quantified by sound level; however, local residents are unfamiliar with the relationship between sound level and health risks. Therefore, this study aims to transform noise maps into health risk maps to improve the risk communication with local residents. To this end, we developed a road traffic noise map in Sapporo City, Japan, applied the exposure–response functions established by the WHO Regional Office for Europe to convert the sound levels into health risks and obtained the health risk maps of high annoyance, high sleep disturbance, and ischaemic heart disease. The health risk maps exhibited the distribution of significant risks of noise. In addition, the total number of residents affected by noise exposure was obtained. To our knowledge, this is the first study showing health risks due to the road traffic noise of an entire city in Japan. The health risk maps can help the public realise the impact noise exposure has on health and can be utilised to demonstrate the potential risks reduction in future noise mitigation strategies.