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How facial masks against Covid-19 spread affect the speech spectrum

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Introduction: At the aim of counteracting the spread of the infection, the European Center for Disease Prevention and Control has provided indications on the suitability of the use of face masks when the social distancing cannot be implemented. Facial masks can alter verbal communication, causing potential safety problems.
Methods: Eight types of masks (medical, PPE and cloth), one face-shield and four combinations of the same devices were tested, mounted on Head and Torso Simulator with an artificial mouth. For each configuration, tests were carried out in an anechoic chamber with an appropriate measurement chain for signal acquisition and processing.
Results: The results show that medical devices exhibit lower attenuation at high frequencies, even compared to cloth. FFP2 and FFP3 have attenuations greater than 5 dB in the octave bands of 4 and 8 kHz, with negligible influence on acoustic performance due to the presence of valves. Face shield distorts the vocal spectrum, behaving like a low-pass filter with a cut-off frequency around 1 kHz, with a steep slope (with attenuation $>$ 10 dB at 4 and 8 kHz) and an accentuated resonance at 1 kHz (about 6-8 dB), due to the thin PET screen. Clear mask shows low attenuation up to 4 kHz and adds the benefit of lip reading, especially useful for workers with hearing difficulties.
Conclusions: These results show that the devices examined can alter the quality of speech. Further insights will concern the assessment of speech intelligibility in order to provide a contribution to an ergonomic design also linked to the acoustic comfort of these devices, which would be desirable in a post-p

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Occupational Exposure to Airborne Ultrasounds

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Introduction: Ultrasounds (US) are mechanical waves characterized by frequencies above the upper limit of the range of human hearing, which is between 16 kHz and 20 kHz. In the occupational settings they are used in the industrial sectors (e.g. for welding and cleaning of plastics and metals), healthcare (e.g. in diagnostics and therapeutic devices) and aesthetics (e.g. for aesthetic cavitation). US are also used in consumer products such as motion detectors and anti-intrusion devices.
Materials and Methods: Health and safety issues of workers exposed to US are addressed, pointing out the critical issues concerning health effects, preventive and protective measures as well as regulation.
Results: Unlike other physical agents, the EU Regulation does not give specific indications to protect workers from risks arising from US exposure, even if US are explicitly indicated among the physical agents that may pose risks for health and safety of workers, for whom the assessment is mandatory. Moreover, there is currently no national legislation defining exposure limit values and a reference framework at the European level is lacking. It is possible to refer to protection standard/guidelines such as IRPA-INIRC (1984), Health Canada guidelines (1991) and ACGIH (2019), but a shared approach in this regard is not still available at international level.
Conclusions: Given the lack of consolidated national and international references on US occupational risk assessment and management, a special section on the Italian Physical Agents Portal (PAF) (https://www.portaleagentifisici.it/?lg=EN) is under construction and will be available soon.

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Screening and prevalence of hearing loss in professional musicians

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Introduction: The aims of this study were to detect hearing loss in professional musicians and to assess its importance according to the duration of exposure and the intensity of the noise suffered.
Materiel and methods: this cross-sectional epidemiological survey involved 241 musicians aged$>$ 20 years with professional seniority$>$ 2 years. The study included an analysis of working conditions with noise metrology (standard NF EN ISO 9612) and a medical assessment (questionnaire, clinical examination and audiometry).
Results: The average age was 43.6 $\pm$ 10.5 years, the average seniority was 20.1 $\pm$ 6.1 years and the average weekly working time was 33.8 hours. The instruments played were percussion (49.4%), strings (29.4%), winds (14.9%) and brass (5%). Personal and family history of deafness was found in 5% of musicians not playing amplified music at loud levels and 14.5% playing amplified music at loud levels. 24.5% had normal audiometry, 51% sensorineural hearing loss, 14.5% conductive hearing loss and 9.9% mixed hearing loss. Sound exposure measurement showed high values in orchestras not playing loudly amplified music with intensities of around 98 dB (A). LAeq (3h) sound levels ranged from 94 to 106 dB (A). The LAeq (3h) to which musicians from orchestras playing loudly amplified music were exposed were between 98 and 108 dB (A) indoors and exceeded 112 dB (A) during outdoor concerts
Conclusions: There is no information campaign on the preventing hearing impairment amongst musicians in our country. The prevention approach will be more accepted and applied if the representatives of musicians are involved in its elaboration