Control Banding Method for Respirator Selection against Bioaerosols in Quebec

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Background: Selecting the right respirator to protect workers against occupational exposure to bioaerosols is a complex task complicated by a lack of occupational exposure limit values (OEL), limits of current sampling methods and the diversity of bioaerosols. In this sense, the qualitative nature of control banding (CB) makes it better suited for assessment and management of occupational exposure to bioaerosols than quantitative methods used in occupational hygiene.

Objective: To develop a CB approach for respirator selection against both infectious and non-infectious bioaerosols.

Methods: A committee including occupational hygienists, microbiologists and physicians, as well as experts in the fields of control banding, respiratory protection, ventilation and aerosol behavior was formed to develop and validate the model. A 4 x 5 selection matrix was developed, with the four risk groups used in biosafety along the vertical axis and five exposure level bands along the horizontal axis. Each exposure level band is the sum of a control level band and a generation rate band. An assigned protection factor (APF) is associated with each risk group-exposure level pair, which allows the user to choose an appropriate respirator.

Results: The validation of the model via case studies showed a good correspondence between the CB approach and APF recommendations previously made by experts. The model is simple and user-friendly, yet provides adequate protection to workers by balancing conservative choice with the reality of different workplaces.

Conclusion: Overall, this CB approach is a useful tool for assessing the risk of exposure to infectious and non-infectious bioaerosols, providing recommendations for appropriate respirator selection and identifying activities that present the most risk. It could be easily integrated in the assessment and management of occupational risks wherever workers are exposed to bioaerosols.