The effect of cleaning agents on occupational health diseases for workers in the hospitality industry

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1. Introduction – Historically, cleaning agents have been identified as a trigger for work-related diseases, producing dermatitis or asthma symptoms among workers [1]. Over time, this problem has not been yet successfully concluded, despite the advances in environmental and epidemiological studies focused on understanding the effects of chemical compounds for human health [2]. In turn, this study is aimed to analyse from an occupational point of view, applied to the hospitality industry, how cleaning agents are affecting workers in order to identify main risk groups, based on workers´ different occupations, clinical characteristics and socio-demographic factors.

2. Experimental – A total of 33,925 medical checks obtained from occupational health surveillance programmes performed to workers in the hospitality industry during the period 2012-2016 in Spain were used to analyse through machine learning techniques the existing patterns between the variables medically assessed. For that, several supervised Bayesian models were built with different target variables, trying to emulate a multi target regression approach from a machine learning perspective where there exist manifold dependent variables. Each Bayesian model learnt allows to infer particular scenarios that unveil valuable insights, offering also the possibility to exploit the informative content of the target node by using information theory parameters that compute the reduction of uncertainty brought by every variable in the model.

3. Results and Discussion – The Bayesian models built shed light on the negative effects that cleaning agents constitute for the development of occupational health diseases, based on the analysis of multiple key variables. As an example, women (Image 1) are more prone than men to suffer skin problems. This result has a double conception supported by the inherent risk brought by the higher number of women exposed to cleaning agents and to their job positions, which are more dependent on the use of these products to execute their job task. Conversely, when it comes to nervous system diseases men are exposed to a higher risk conditioned by their worse feeding and low sport practice. Apart from this, the results obtained for workers who were subjected to specific medical protocols (dermatosis, biological agents, heavy loads, etc.) due to their job exposure to certain health risks were benchmarked with the rest of the population. Not relevant differences could be found on the findings obtained for each subset, which suggests the inaccuracy of the current protocol policies.

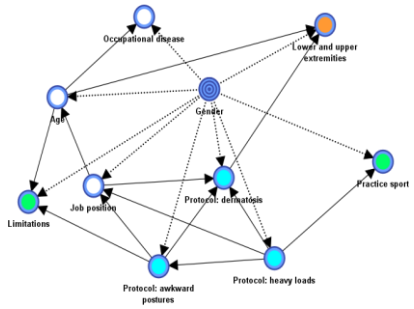

Image 1. Supervised Bayesian model with gender as target node of the network.

4. Conclusions - The results obtained show the existence of common patterns triggering occupational diseases among workers exposed to cleaning agents in certain job groups (housekeepers, waiters or cooks) within the hospitality industry. This study promotes the implementation of machine learning techniques that contribute to design more accurate health surveillance policies across different regions.

5. References

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