

# Occupational second hand smoke exposure in hospitality venues

## Health effects in non-smoking workers and the effects of non-smoking regulations

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Secondhand smoke (SHS) has been identified as an important public health threat with several adverse health effects. Specifically, it has been associated with increased risk of adverse cardiovascular health outcome, lung cancer, various respiratory symptoms and deterioration in pulmonary function<sup>1-3</sup>.

The workplace is an area with a substantial degree of SHS exposure potential, and the adverse health effects associated with workplace SHS have been documented by past studies<sup>4</sup>. Workers in hospitality venues such as bars, restaurants, cafes, music halls, etc., are of special concern in terms of workplace SHS exposure, as smoking tends to be widespread in these types of venues when no smoking regulations are in place. Workers in these venues therefore tend to be exposed to high levels of SHS, with corresponding adverse effects, and it has long been argued that they should be included in any workplace smoking ordinances aimed at protecting workers from SHS<sup>5</sup>.

It has been shown that non-smokers working in hospitality venues where smoking was permitted had higher saliva levels of the nicotine metabolite cotinine than did workers in places where smoking was not allowed and than government employees in non-smoking workplaces<sup>6</sup>. Nicotine fume levels in restaurants in Finland prior to the introduction of public space smoke-free legislation were higher than other public places, and the exposure was considered very high on at least one day of the week. Nicotine fumes in nightclubs were reported to be at even higher levels<sup>7</sup>.

Several other exposure assessment studies have been conducted on the subject, using additional assessment methods. Specifically, air quality measurements made in bars, discos and restaurants in past studies in Europe indicated that the nicotine levels in these types of venues were higher than other public spaces, such as airports, train stations, schools and hospitals<sup>8</sup>. Additionally, using respirable particles as a surrogate for SHS exposure, levels of particulate matter less than 2.5 µm in diameter (PM<sub>2.5</sub>) were also reported to be higher in spaces where smoking was allowed than in smoke-free spaces. While tobacco smoke is not the only

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contributing source to respirable particles, it has been shown that particle concentrations in hospitality venues where smoking is permitted tend to be mostly dependent on tobacco smoke, correlating well with tobacco specific measurements such as nicotine levels and tobacco specific particles<sup>9</sup>. Air quality measurements and other indices of exposure consistently document higher levels of SHS exposure in hospitality venues without any implementation of wide smoke-free ordinances, than in public areas where smoking is not allowed.

The recognition of passive smoking as an important public health hazard, along with the high levels of exposure experienced in various workplaces, including hospitality venues, resulted in the introduction by several countries of smoking related regulations in public places, including the workplace. These reforms were aimed at reducing adverse health effects related to exposure to SHS, and also at reducing smoking in the population, through the changes in social settings and behaviors brought on by the restrictions<sup>10</sup>. Air quality changes associated with smoke-free ordinances indicate that this type of regulation is effective at reducing PM concentrations and improving air quality in public places, including hospitality venues. Such decreases may be of great magnitude, as demonstrated by post-regulation reductions in PM concentrations of the order of 84%, which were reported for hospitality venues in the western state of New York<sup>11</sup>.

As far as the direct health effects on workers in the hospitality industry of the smoke-free regulations are concerned, studies report short term improvement in pulmonary function measurements and decrease in inflammatory marker levels. Introduction of smoke-free ordinances was associated with a significant increase in forced vital capacity (FVC) in non-smoking bartenders in San Francisco 8 weeks after a smoking ban was introduced compared to levels prior to the ban, accompanied by self reported reduction in exposure to passive smoking and decrease in respiratory symptoms<sup>12</sup>.

European studies have also reported beneficial health effects associated with the introduction of smoke-free ordinances in hospitality venues. In a study conducted in Ireland, self-reported exposure and saliva cotinine levels were reduced post-regulation implementation. Improvement in pulmonary function markers, specifically a 5% increase in FVC, was also reported in non-smoking bartenders one year after implementation of a smoking ban in bars<sup>13</sup>. Beneficial effects, including reduction in levels of serum and respiratory system inflammation markers within two months of smoke-free ordinance introduction,

have also been reported in Scotland<sup>14</sup>.

The acute effects of SHS and the changes in these effects after the implementation of a smoke-free ordinance have also been studied by looking at cross-shift differences in lung function parameters in hospitality workers in Norway pre and post smoke-free regulation. Cross shift reductions were reported for FVC, forced expired volume in one second (FEV1) and forced mid-expiratory flow rate (FEF25–75%), before and after the intervention, but the differences were reduced after the ban, and the reductions in the differences were statistically significant for FEF25–75% and borderline significant for FEV1. Nicotine fume and particle concentration measured in this study showed reductions after the ban in the order of 98% and 73%, respectively, denoting an effective SHS exposure intervention<sup>15</sup>.

In conclusion, the current literature concerning the health effects of SHS exposure in hospitality venue workers documents the exposure of this specific occupational group to very high SHS levels in spaces where no smoking ordinances are in place, with evidence of adverse health effects. This particular occupational group and the hospitality workplace should be included in any legislation aiming at protecting workers from SHS exposures. Implementation of a smoking ban in hospitality venues can be expected to lead to an immediate improvement in air quality in these workplaces, with immediate positive effects on the pulmonary function and potentially on the overall health of the workers, as well as a probable reduction in the long-term risks associated with passive smoking.

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