Environmental tobacco smoke exposure in public places of European cities


Background: Exposure to environmental tobacco smoke (ETS) has important public health implications. The results of the first European multi-centre study that measured ETS exposure in a range of public places (transport, educational settings, and leisure facilities such as bars and restaurants) are presented.

Method: Nicotine vapour phase was measured using ETS passive samplers containing a filter treated with sodium bisulphate.

Results: Bars and discos are the places with the highest concentrations of nicotine from ETS, median ranging from 19 to 122 µg/m³. Restaurants had the next highest values. Concentrations of nicotine generally range from 0.1–5 µg/m³ in airports, and from 0.5–10 µg/m³ in train stations. Nicotine was also found in schools and universities, yet schools tended to have the lowest concentrations compared to all the other public places sampled. In hospitals levels were generally below 5 µg/m³.

Conclusions: Although there is some variability between cities, this study shows that tobacco smoke is present in most of the studied public places. The study also showed that in areas where smoking is prohibited, concentrations of nicotine are lower than in areas where smoking is allowed but they are not zero. The results of this study indicate that policies should be implemented that would effectively reduce levels of tobacco smoke in public areas.

Nicotine vapour phase was measured using ETS passive samplers, which comprise a plastic cassette (with a windscreen in one side), containing a filter treated with sodium bisulphate that has a diameter of 37 mm. The samplers were placed for a period ranging from four hours to two weeks in the following public places: airports, train stations, schools, universities, hospitals, restaurants, and discos. As a rule, settings were sampled at random when a sampling universe list was available and no other selection criteria prevailed. In Vienna some places known to have high exposure were included. One airport and one train station were sampled in

<table>
<thead>
<tr>
<th>Public places sampled</th>
<th>Location</th>
<th>Smoking policy</th>
<th>Sampling time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airport Luggage claim</td>
<td>Prohibited</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td>Main Hall</td>
<td>Prohibited</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waiting room</td>
<td>Prohibited</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cafeteria</td>
<td>Allowed (except in Italy and Sweden)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Train station Waiting room</td>
<td>Prohibited</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td>Platform</td>
<td>Prohibited</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cafeteria</td>
<td>Allowed (except in Italy and Sweden)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital Waiting room</td>
<td>Prohibited</td>
<td>7 days</td>
<td></td>
</tr>
<tr>
<td>Cafeteria</td>
<td>Allowed (except in Italy and Sweden)</td>
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<td></td>
</tr>
<tr>
<td>Restaurant Dining area</td>
<td>Separate</td>
<td>2 days</td>
<td></td>
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<tr>
<td>Schools Corridor</td>
<td>Prohibited</td>
<td>7 days</td>
<td></td>
</tr>
<tr>
<td>Teacher room</td>
<td>Allowed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University Corridor</td>
<td>Prohibited</td>
<td>7 days</td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>Prohibited</td>
<td></td>
<td></td>
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<tr>
<td>Leisure room</td>
<td>Allowed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cafeteria</td>
<td>Allowed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disco Personal sample</td>
<td>Allowed</td>
<td>4 hours</td>
<td></td>
</tr>
</tbody>
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every country (except in Spain where two train stations were sampled), and a minimum of two settings were sampled in the rest of the public places. The samplers were placed in areas of common use. In places with areas where smoking was prohibited and areas where smoking was allowed, samples were placed in both smoking and non-smoking areas. Table 1 lists the places sampled, approximate sampling time, and smoking policy.

Placement of samplers was done according to the following instructions: samplers had to hang freely in the air, not to be placed within 1 m of an area where someone regularly smokes, where air does not circulate such as a corner, or

Figure 1  Concentrations of nicotine by setting and city (ETS measurement in a sample of European cities project). Solid circles: places where smoking is allowed (or there are no specified policies); solid squares represent the median concentration. Open circles: places where smoking is prohibited; open squares represent the median concentration.
What this paper adds

Environmental tobacco smoke (ETS) has been shown to have important health effects. However, there are not many studies showing objective data about the exposure in public places in Europe. The results found in this study provide objective data about the levels of ETS exposure in public places from seven European cities.

REFERENCES
1. International Agency for Research on Cancer. Tobacco smoke and involuntary smoking. IARC Monographs, June, 2002;83.
ETS exposure in Europe

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