

Thailand's Secondhand Smoke Exposure Levels Compared to Those of Other Countries

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22 Global Air Monitoring Study Locations Including 4 S.E. Asian Countries



The participating countries in the Global Air Monitoring Study

Background

- Though it is widely understood that secondhand smoke (SHS) is dangerous, assessment of exposure levels in low and middle income countries has been limited
- Roswell Park Cancer Center, a Trans-disciplinary Tobacco Use Research Center, launched the Global Air Monitoring Study with Funds from NIH and FAMRI to monitor SHS exposure levels worldwide

Purpose

- To assess secondhand smoke exposure levels using a standard air sampling protocol and a real time air monitor measuring respirable particulate matter of 2.5 microns or less in size (PM 2.5)
- To compare Thai results in restaurants, bars, transportation and other public places with those from other countries and regions and EPA standards for ambient air

Measuring Particulates Indicative of Secondhand Smoke Exposure

- ***PM2.5 is the concentration of particulate matter in the air smaller than 2.5 microns in diameter. Particles of this size are released in significant amounts from burning cigarettes, are easily inhaled deep into the lungs, and are associated with pulmonary and cardiovascular disease and mortality***
- **Unobtrusive sampling in each public place for at least 30 minutes**
- **PM 2.5 Air Monitoring Instrument**

TSI SidePak AM510 Personal Aerosol Monitor

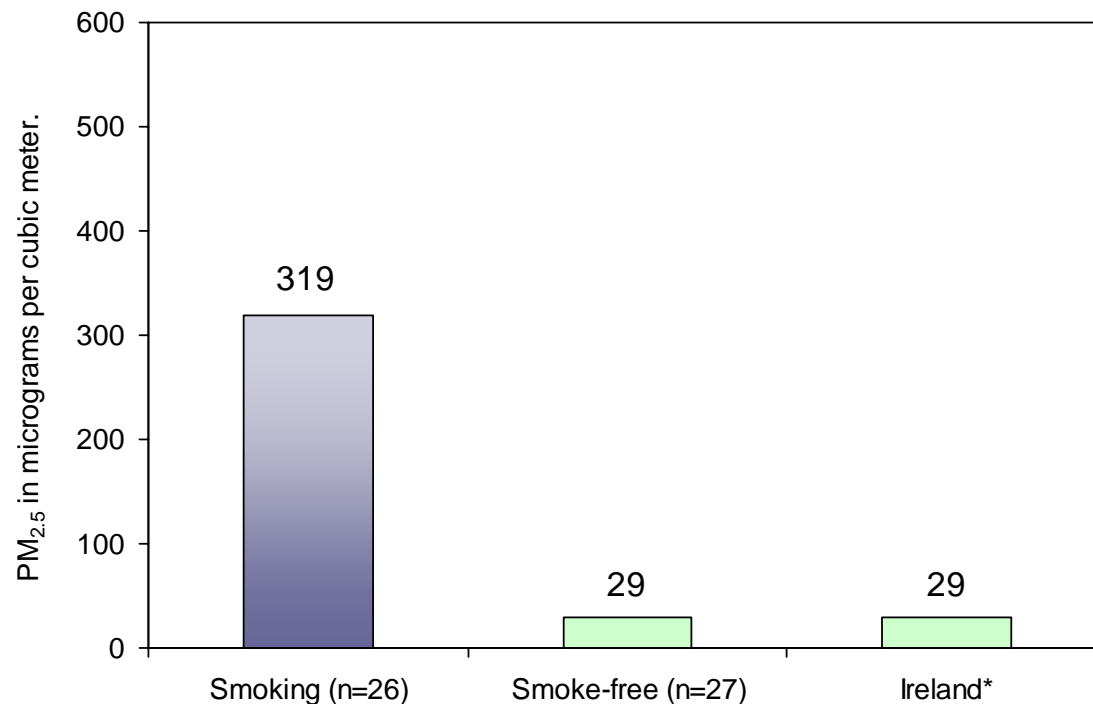


US EPA Air Quality Index

| Air Quality | Air Quality Index | PM _{2.5} (µg/m ³) | Health Advisory |
|---------------------------------------|-------------------|--|--|
| Good | 0-50 | ≤15 | None. |
| Moderate | 51-100 | 16-40 | Unusually sensitive people should consider reducing prolonged or heavy exertion. |
| Unhealthy for Sensitive Groups | 101-150 | 41-65 | People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion. |
| Unhealthy | 151-200 | 66-150 | People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion. |
| Very Unhealthy | 201-300 | 151-250 | People with heart or lung disease, older adults, and children should avoid all physical activity outdoors. Everyone else should avoid prolonged or heavy exertion. |
| Hazardous | ≥301 | ≥251 | People with heart or lung disease, older adults, and children should remain indoors and keep activity levels low. Everyone else should avoid all physical activity outdoors. |

Thai Results: Levels of PM 2.5 in Smoking and Smoke-Free Places

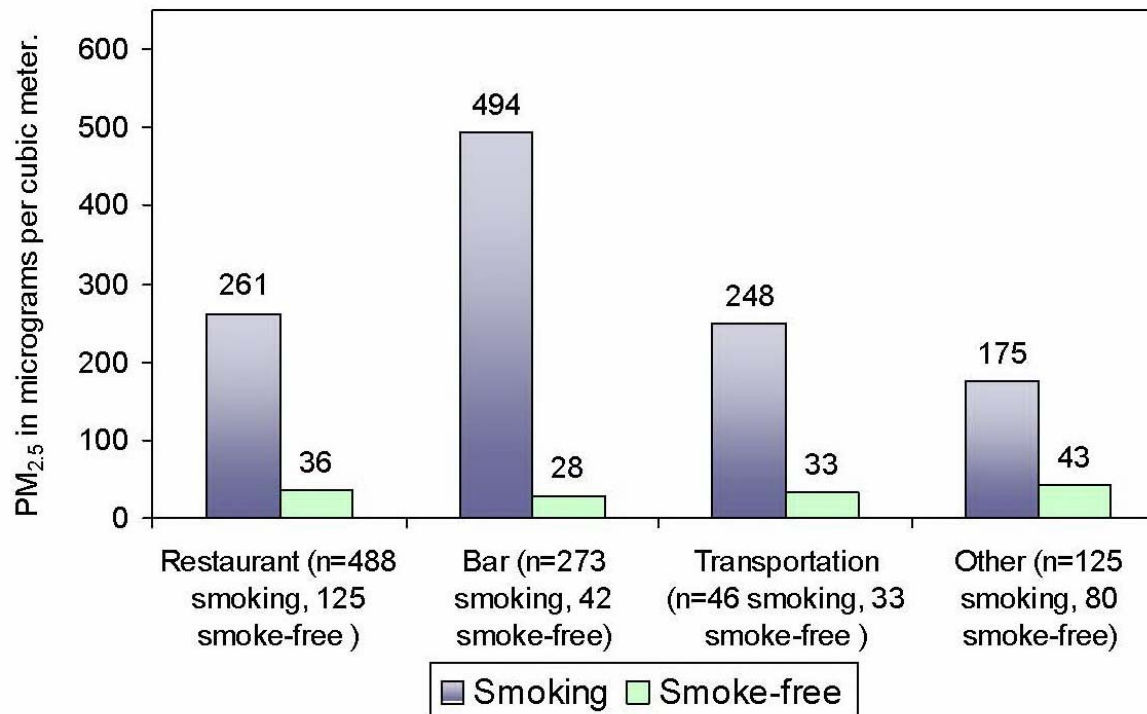
- Levels low in smoke-free public places due to smoking bans in A/C restaurants, for transport stations, hotels, hospitals



Global Results: Type

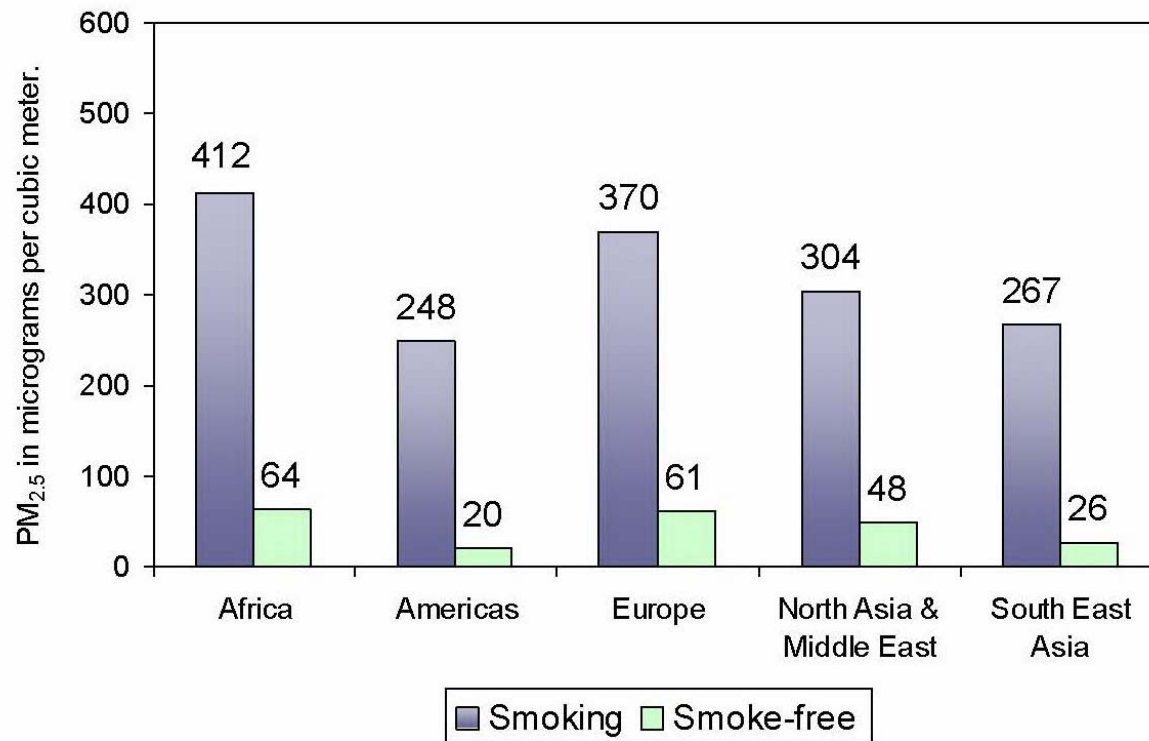
Thailand's Results Lower But Not in Bars

Figure 2. Average Fine Particle Air Pollution by Type of Place



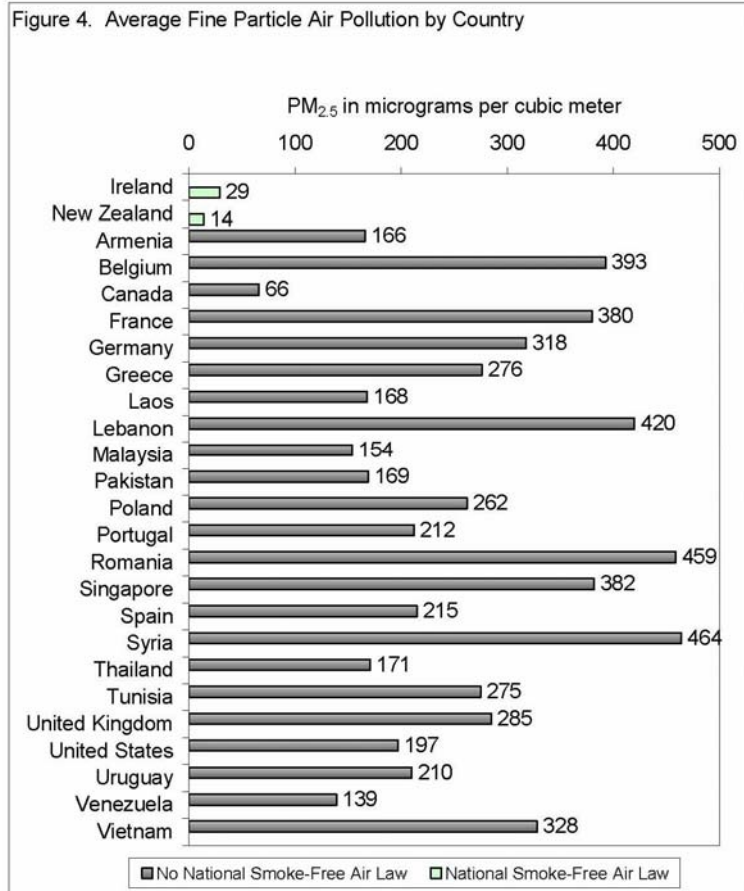
Global Results: Region Thai Avg. of 319 Comparable

Figure 3. Average Fine Particle Air Pollution by World Region



Global Results

Average By Country



- Of the 22 countries with no national smoke-free air law, Thailand's average was 171 µg/cu.m (n= 53) for samples in places with and without smoking, yet 319 µg/cu.m (n=26) for public places where smoking is present
- Bar exposure levels in Thailand were consistent with the average for those in all countries, 488 vs. 494 µg/cu.m

Conclusions

- After comparison, PM 2.5 levels in public places with smoking in Thailand (Avg. 319) are not significantly different than in other regions of the world (Range: 248-412).
- Levels in smoke-filled environments were more than 10 times ($319 \mu\text{g}/\text{cu. m}$) those in smoke-free environments ($29 \mu\text{g}/\text{cu. m}$)
- Levels greatly exceeded the US EPA standards, with bars (N=15) averaging $488 \mu\text{g}/\text{cu. m}$, more than 7 times the present US EPA 24 hr. exposure standard (and 14 times the new proposed EPA standard)

Next Steps

- The Nonsmokers' Health Protection Act now includes bans and restrictions on smoking in over 35 specific locations, yet an easily understood workplace smoking ban still needs to be instituted in Thailand
- Further research is necessary to show how bans work, and to improve enforcement and compliance