



Measuring the Seepage of Tobacco Smoke Particles Between Apartment Units

We measured fine particulate matter in several multi-unit buildings in Santa Monica California using a real-time monitor that gave minute-by-minute readings. The results of these initial experiments showed that significant seepage of tobacco smoke can take place between units, especially into upstairs units.

For one type of experiment, we carried the monitor to different locations in a building with active smokers. The locations included outdoors, in a lower-level parking garage, in common areas outside of known smoker's apartments, and in an apartment located upstairs from two known smokers. This mobile monitoring showed clearly that seepage of tobacco smoke was occurring out of the smoker's apartments. While the outdoor and parking garage levels were very low, the particulate levels outside the smoker's apartments in the hallway and in an upstairs unit -- where a distinct tobacco odor was present -- were quite elevated in comparison.

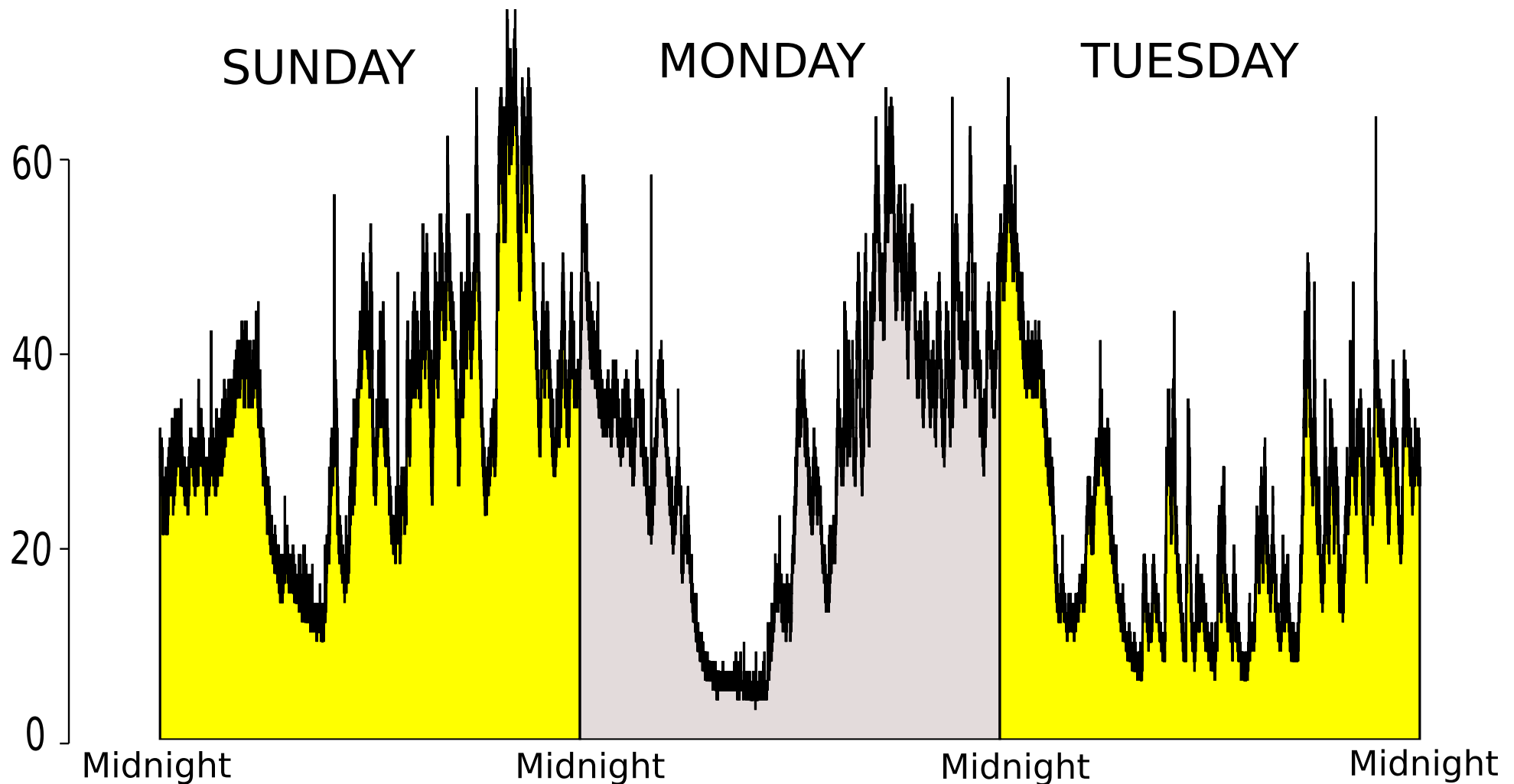
For another type of experiment, we left the particle monitor inside an apartment above known smokers for several days to continuously monitor the levels every minute in one location. The resulting data showed a clear pattern of rising particle levels when the smoking inhabitants in the downstairs apartments woke in the morning to smoke. Another of the inhabitants was known to stay up late, and a clear peak of particles in the early morning hours was evident.

-Neil Klepeis, PhD.

FOR INFORMATION ON MONITORING EQUIPMENT AND PROTOCOL USED PLEASE CONTACT:
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Tobacco Smoke Seeping Out of Smokers' Apartments

The graph below shows the daily pattern of tobacco smoke inside a closed non-smoker's apartment living room (unit #405) measured over a three-day period above two smokers' apartments (units #205 and #305). The smoker on the 3rd floor is known to finish smoking by 11pm and a second smoker on the 2nd floor typically smokes until midnight or later. Smokers' windows may be open during the day but are likely closed in the evening, leading to long periods of seepage and slow decay.

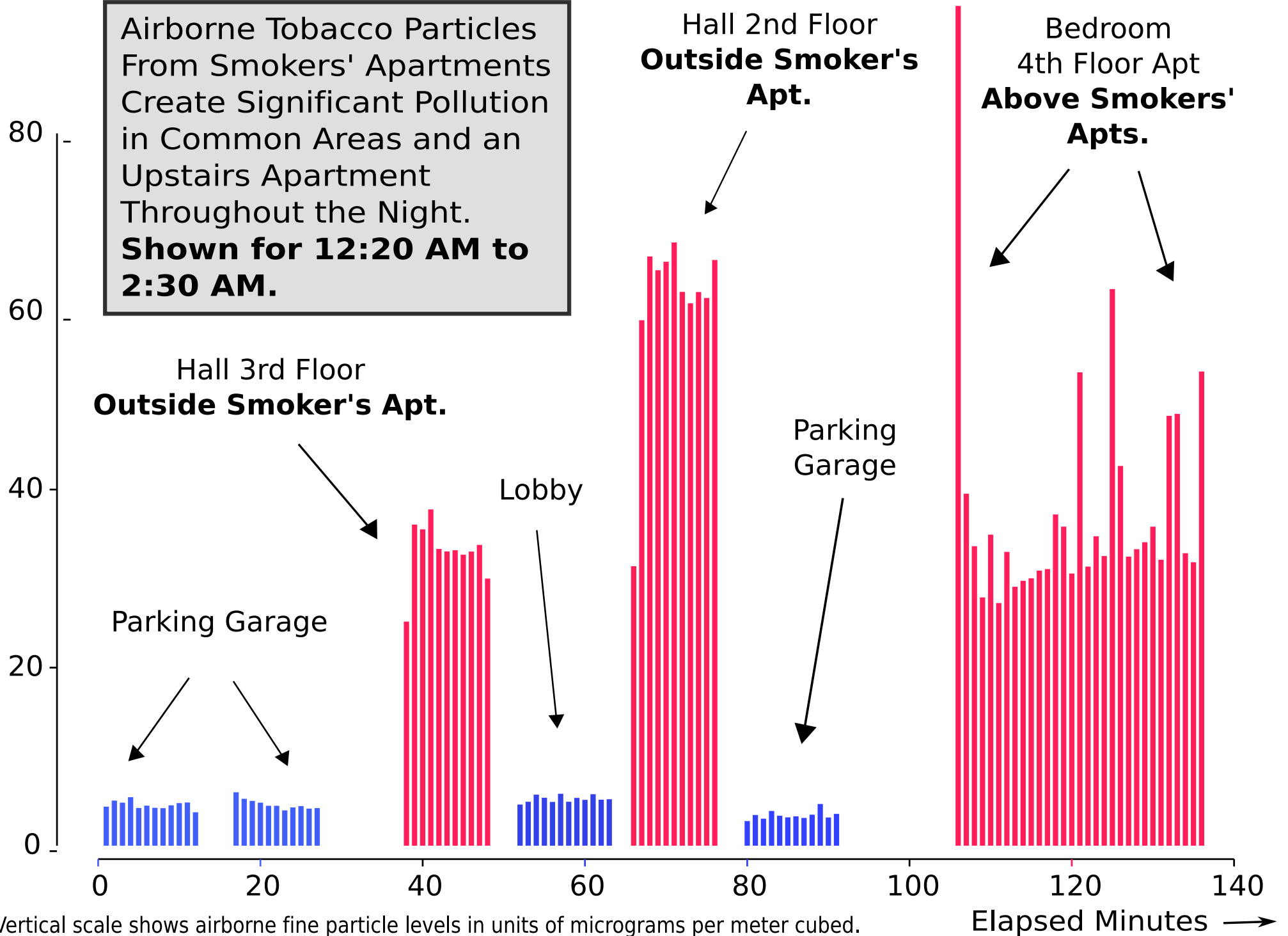


Vertical scale shows airborne fine particle levels in units of micrograms per meter cubed.

Time of Day →

Tobacco Smoke Seeping Out of Smokers' Apartments

Airborne Tobacco Particles From Smokers' Apartments Create Significant Pollution in Common Areas and an Upstairs Apartment Throughout the Night. **Shown for 12:20 AM to 2:30 AM.**



TOBACCO SMOKE SEEPING OUT OF SMOKERS' APARTMENTS

**April 6, 2008
Santa Monica, California**

- **MEASUREMENTS MADE DURING AN EVENING IN A SANTA MONICA APARTMENT BUILDING WITH OBSERVED SMOKERS IN TWO UNITS**
- **MEASUREMENTS CONSIST OF SMALL AIRBORNE PARTICLES THAT CAN PENETRATE THE LUNG**
- **CONTINUOUS MINUTE-BY-MINUTE MEASUREMENTS MADE WITH AN INDUSTRY-STANDARD SENSOR**

- **THE MEASURED POLLUTANT LEVELS IN THE PARKING GARAGE AND LOBBY WERE VERY LOW**
- **THE MEASURED POLLUTANT LEVELS IN COMMON AREAS OUTSIDE BOTH SMOKERS' APARTMENTS WERE HIGH**
- **THE MEASURED POLLUTANT LEVELS IN THE BEDROOM ABOVE THE SMOKERS' APARTMENTS WERE HIGH**

- **PARTICLES CAN SEEP THROUGH CRACKS ALONG JOINTS OF WALLS AND CEILINGS AND DOORWAYS**
- **PARTICLES CAN TRAVEL THROUGH DUCTWORK**
- **PARTICLES CAN TRAVEL THROUGH CRACKS AROUND ELECTRICAL CONDUITS AND PIPING**
- **AIR TRAVELING UPWARDS THROUGH THE BUILDING FINDS ANY OPENING TO FLOW INTO AND CARRIES TOBACCO SMOKE PARTICLES WITH IT**

- **PARTICLE EXPOSURE CAN TRIGGER ASTHMA, IRRITATION, RESPIRATORY INFECTIONS, AND OTHER PROBLEMS**
- **PERSONS LIVING IN APARTMENTS NEAR SMOKERS CAN BE EXPOSED TO ELEVATED POLLUTION LEVELS FOR UP TO 8 - 24 HOURS PER DAY**
- **THE PARTICLE EXPOSURE CAN EXCEED THE U.S. ENVIRONMENTAL PROTECTION AGENCY'S 24-HOUR HEALTH-BASED STANDARD**

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