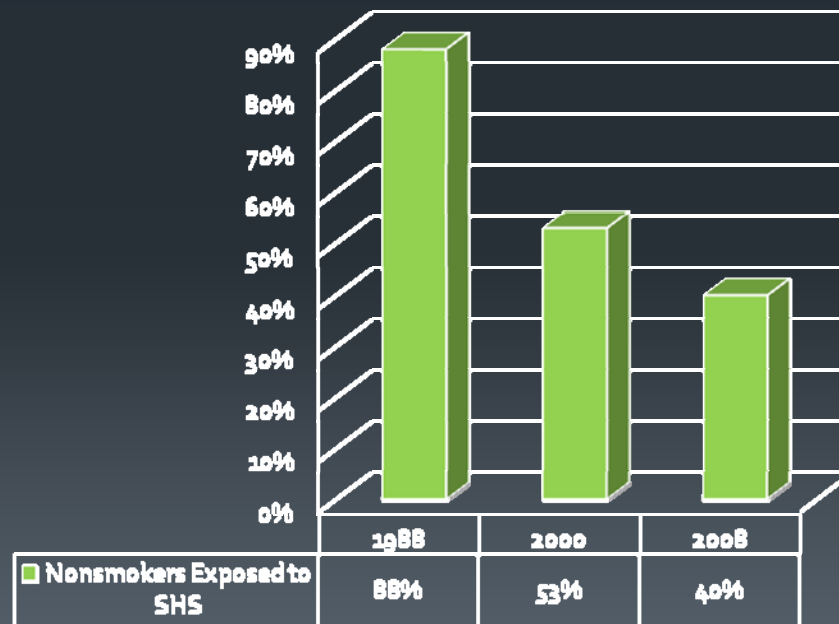


Impact of Secondhand Tobacco Smoke Where People Live

- **Presenter:** Serena Chen, Policy Advocacy Director, American Lung Association in California
- **Coalition for a Tobacco Free Hawaii Annual Meeting"**
 - **Date:** Oct. 26, 2011

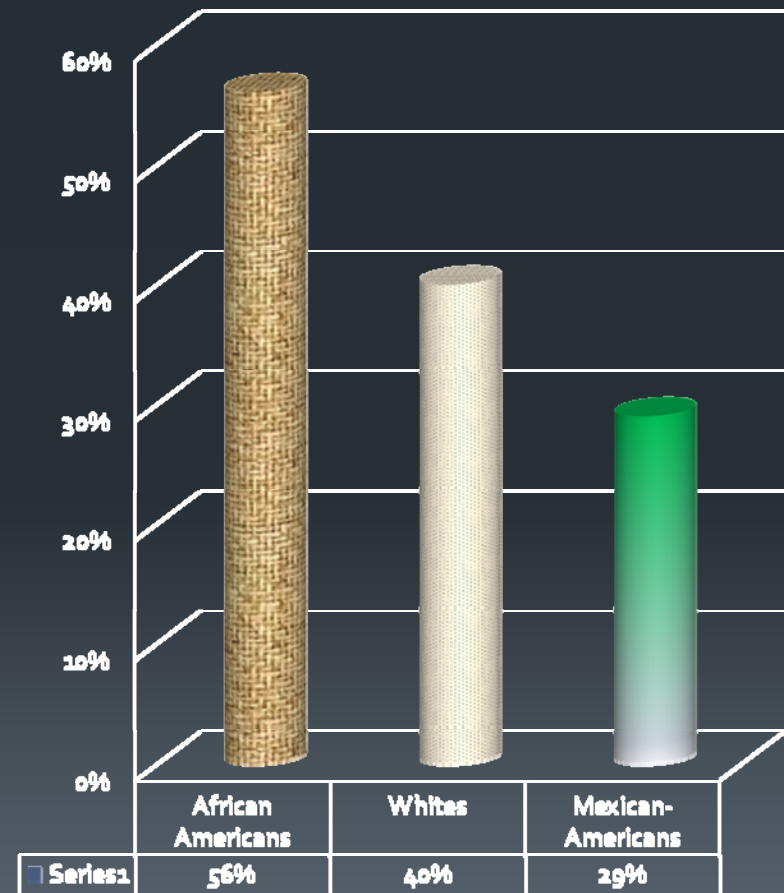
- Fewer and fewer U.S. nonsmokers are being exposed to secondhand smoke

Nonsmokers Exposed to SHS



However, disparities persist

In 2008, 56% of nonsmoking African Americans were exposed to SHS while only 40% of whites and 29% of Mexican-Americans were exposed.



However, disparities persist

Who is exposed most?

- 54% of children (3-11)
- 47% of youth (12-19)
- 60% of those living at or below poverty level



Who is most at risk
at home?

Young children spend 70-100% of their time @ home

- Where there are no legal protections against secondhand smoke.
- And young children are the least able to protect themselves against unwanted smoke



- In general, secondhand smoke harms children more than it does adults.

- SIDS

- Ear infections

- Pneumonia

- Asthma

- Nicotine passes thru the placenta to the baby – nicotine concentrations are **15** times higher in baby's blood than in mother's.



Babies Born to Smoking Households, are born addicted

- And spend the first two weeks of their lives going through withdrawal

- The harm goes beyond the physical

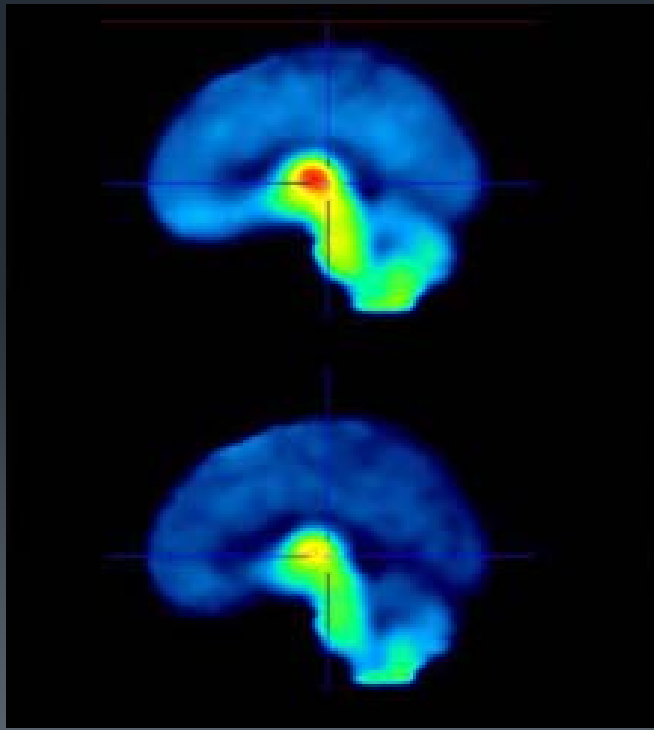
- Ability to learn
 - Lower IQ, math, and reading scores
- Hampers emotional development
 - Depression



- Children exposed to SHS show signs of nicotine dependence:

- Depressed mood
- Anxiety
- Trouble sleeping
- Restlessness
- Irritability
- Trouble concentrating
- Increased appetite

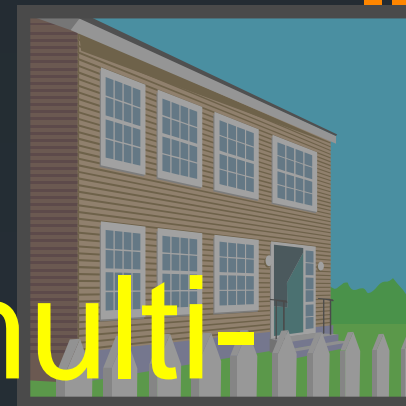
- Even limited secondhand smoke exposure alters brain function, making it more vulnerable to **nicotine addiction**.



When not exposed to smoke, brains show high levels (red and yellow) of a tracer molecule that binds to empty nicotine receptors.

After 1 hour of exposure to secondhand smoke, nicotine displaces and reduces the level of tracer molecules.

Image courtesy of Brody et al., Archives of General Psychiatry.



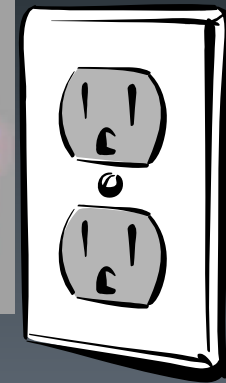
- Children living in multi-family buildings are exposed to SHS even when family members do not smoke.

■ Cotinine levels were highest for children who were

- Under 12
- African American
- Living below poverty level

- As much as 65% of the air in an apartment can be from neighboring units.

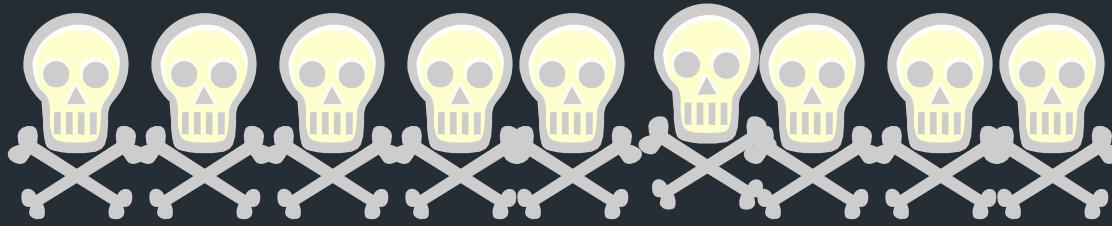
Smoke can seep through vents and outlets.



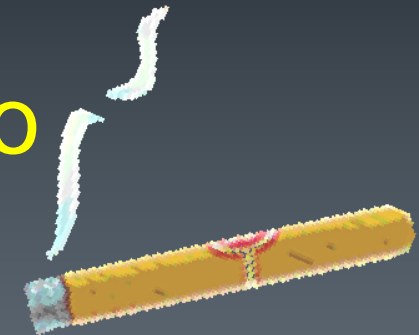


- Within minutes, the smoke is absorbed in walls, floors, furniture, clothes, toys and other household surfaces. These chemicals can be released into the air over hours or months, providing ongoing reservoirs of contamination.





- Levels of toxins in the homes of smokers who regularly smoke indoors are up to **eight times** higher than the homes of smokers who go outside to smoke.



Secondhand Smoke Laws Save Lives

- Places that adopt smoke-free workplace laws show a **17% drop** in heart attack hospitalizations the first year after implementation.



- And the drop in heart attacks increases – after 3 years, there is a **36% drop** in heart attacks in cities with laws.
- Greatest decline seen in non-smokers and people between 40 and 60 years old.



- As little as 30 minutes exposure to SHS alters blood chemistry, causing blood to thicken.
- The blood flow had not returned to normal after 24 hours.
- SHS interferes with the body's ability to repair itself.

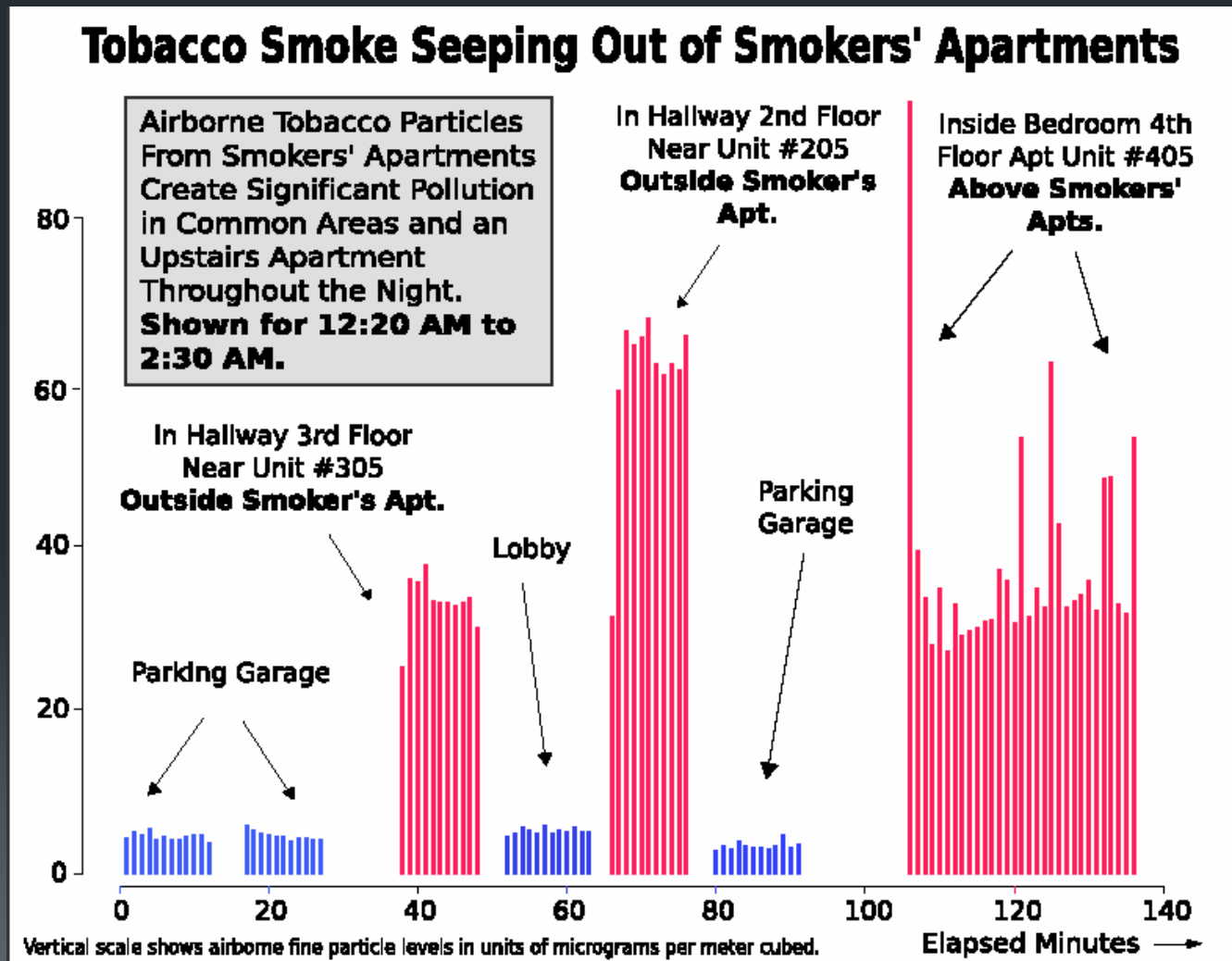
Tobacco Smoke Seeping Out of a Smoked-In Apartment

Study conducted by Jim Levesque with analysis by environmental scientist, Neil E. Klepeis, PhD



Measurements were made during an evening in a Santa Monica Apt. bldg with smokers in the two units directly below the non-smoker's unit. The measurements consist of small airborne particles that can penetrate the lung. Continuous minute by minute measures were made with an industry-standard sensor.

Particle Levels over 140 Minutes



EPA Air Quality Standards

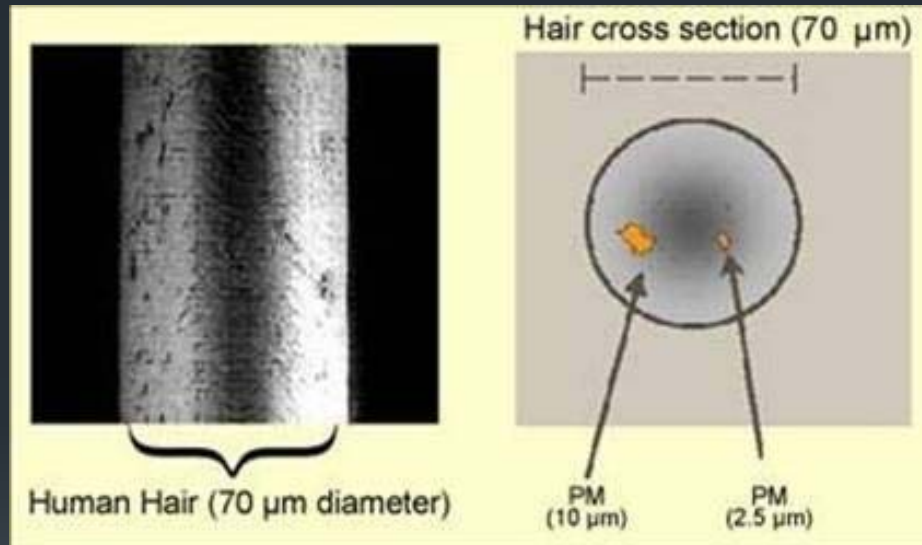
U.S. Environmental Protection Agency Air Quality Index

Level of Health Concern	Numerical Value	Corresponding Particle Level	
Very Hazardous	> 500	> 500	$\mu\text{g}/\text{m}^3$
Hazardous	301 - 500	250 - 500	$\mu\text{g}/\text{m}^3$
Very Unhealthy	201 - 300	150 - 250	$\mu\text{g}/\text{m}^3$
Unhealthy	151 - 200	65 - 150	$\mu\text{g}/\text{m}^3$
Unhealthy for Sensitive Groups	101 - 150	40 - 65	$\mu\text{g}/\text{m}^3$
Moderate	51 - 100	15 - 40	$\mu\text{g}/\text{m}^3$
Good	0 - 50	0 - 15	$\mu\text{g}/\text{m}^3$

Level of particle matter in non-smoker's apartment reached **unhealthy levels** for **OUTDOOR** air.

How SMALL Are Those Particles?

Secondhand tobacco smoke is PM_{2.5} & smaller.



- These particles go directly into lung tissue and into the blood stream.
- 28-80 particles can fit across the width of a human hair

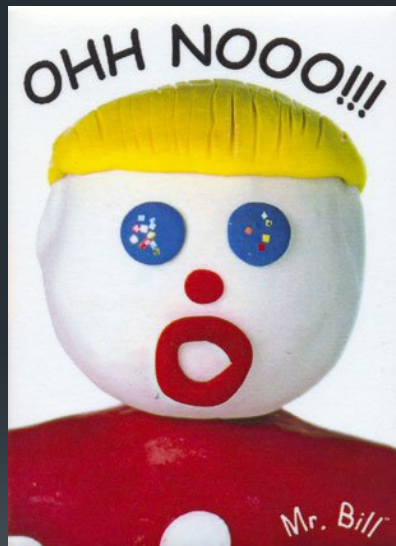


Effects of Particle Exposure

Can trigger asthma, lung infections +
Elevated pollution levels in neighboring
units for up to 8-24 hrs/day

Exposure can exceed EPA health-
based 24 hour standards

H-O-N=O Thirdhand Smoke





Thirdhand Smoke

Between 1983 and 1987, Philip Morris funded residual tobacco smoke research to determine toxicity over time

The research, unpublished, but recently uncovered by public health researchers, showed that aged residual tobacco smoke is more toxic than fresh.

A 30-minute exposure was found to be 4 times more toxic after 21 days and still twice as toxic after 90 days.



Thirdhand Smoke + Ozone = Cancer

August 2010 – Berkeley Lab Research

Nicotine combines with ozone to
form tiny cancer-causing particles
easily ingested by young children

Ironically, ozone generators are used eliminate the
smell of tobacco in cars and hotel rooms



Thirdhand Smoke + Ozone = Cancer

Ironically, ozone generators are used eliminate the *smell* of tobacco in cars and hotel rooms

"In general, we would not recommend ozone as cleaning anything in indoor air," said Peggy Jenkins, manger of the California Air Resources Board's indoor air research division. "It is not really very effective, and it can cause health problems, including respiratory tract irritation and breathing difficulty."



Thirdhand Smoke

Clearly more research needs to be done on the health effects of chronic exposure to thirdhand smoke but the recent findings raise many questions and suggest that there is definitely a harm to human health.