

Gas and Propane Stoves and Indoor Air Quality: Summary of Recent Findings

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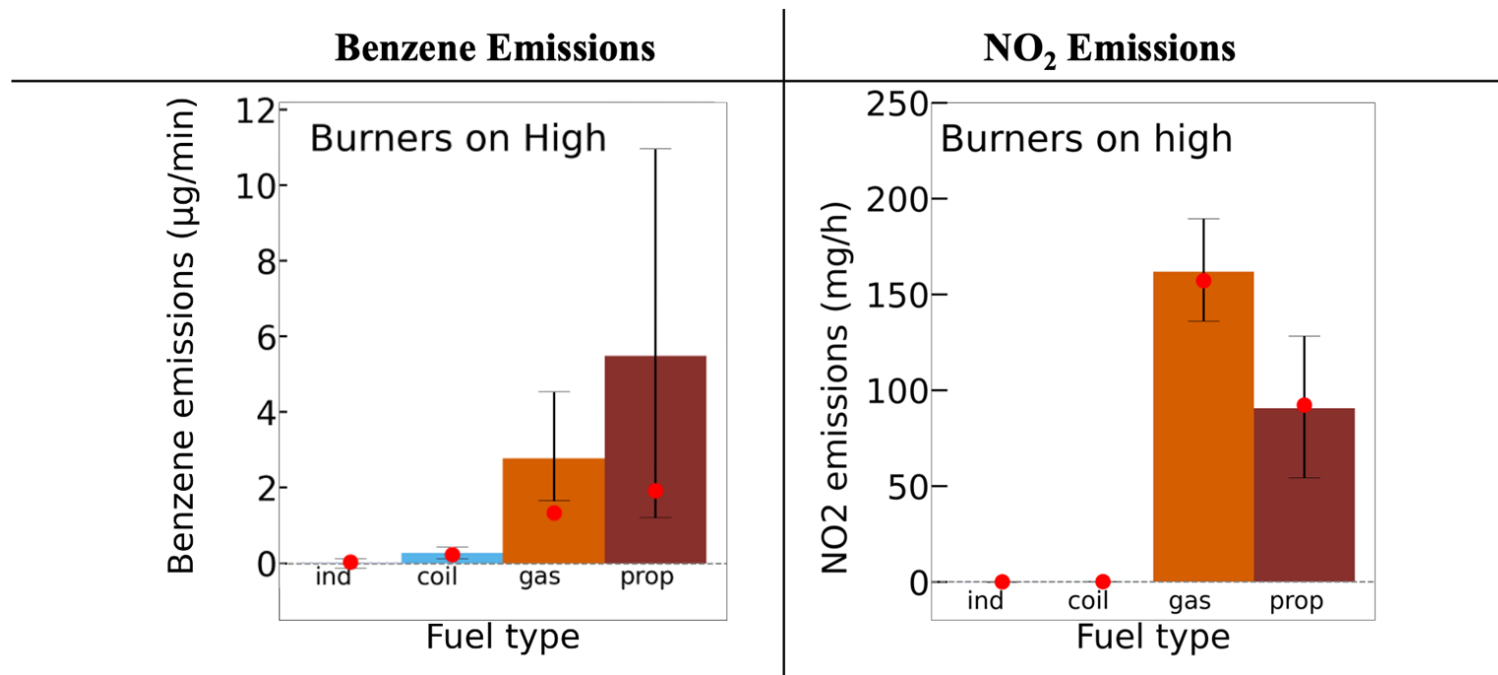
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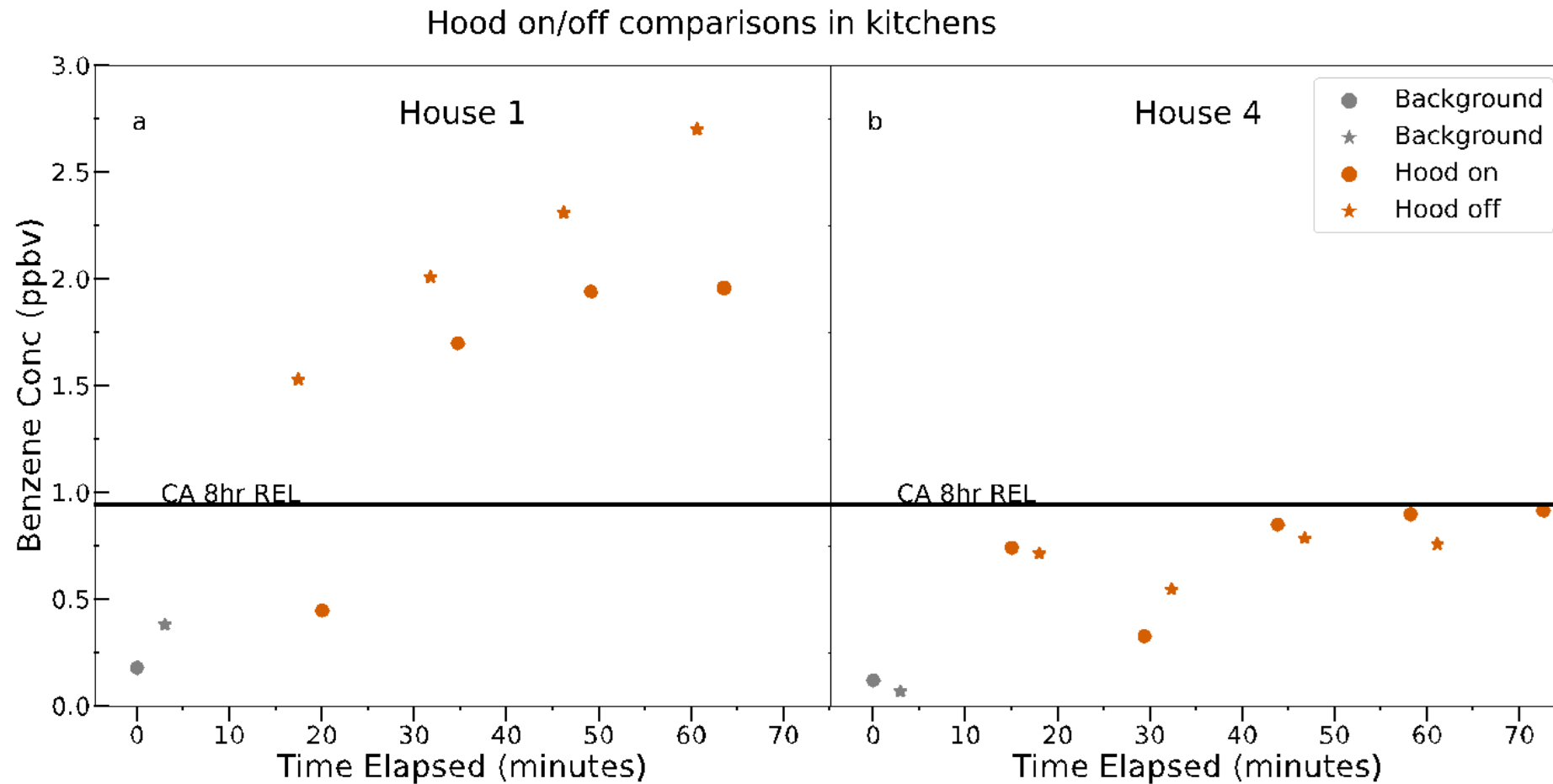
Fuel choice dictates indoor air pollution

Stoves that burn gas and propane produce substantial benzene, nitrogen dioxide, and carbon monoxide. Electric and induction stoves produce none.



You can reduce risk through ventilation and behavioral changes, but you can't eliminate it.

Two-thirds of Californians don't use their hoods (Zhao et al. 2020).
When they do, many hoods only help modestly (Singer et al. 2011).

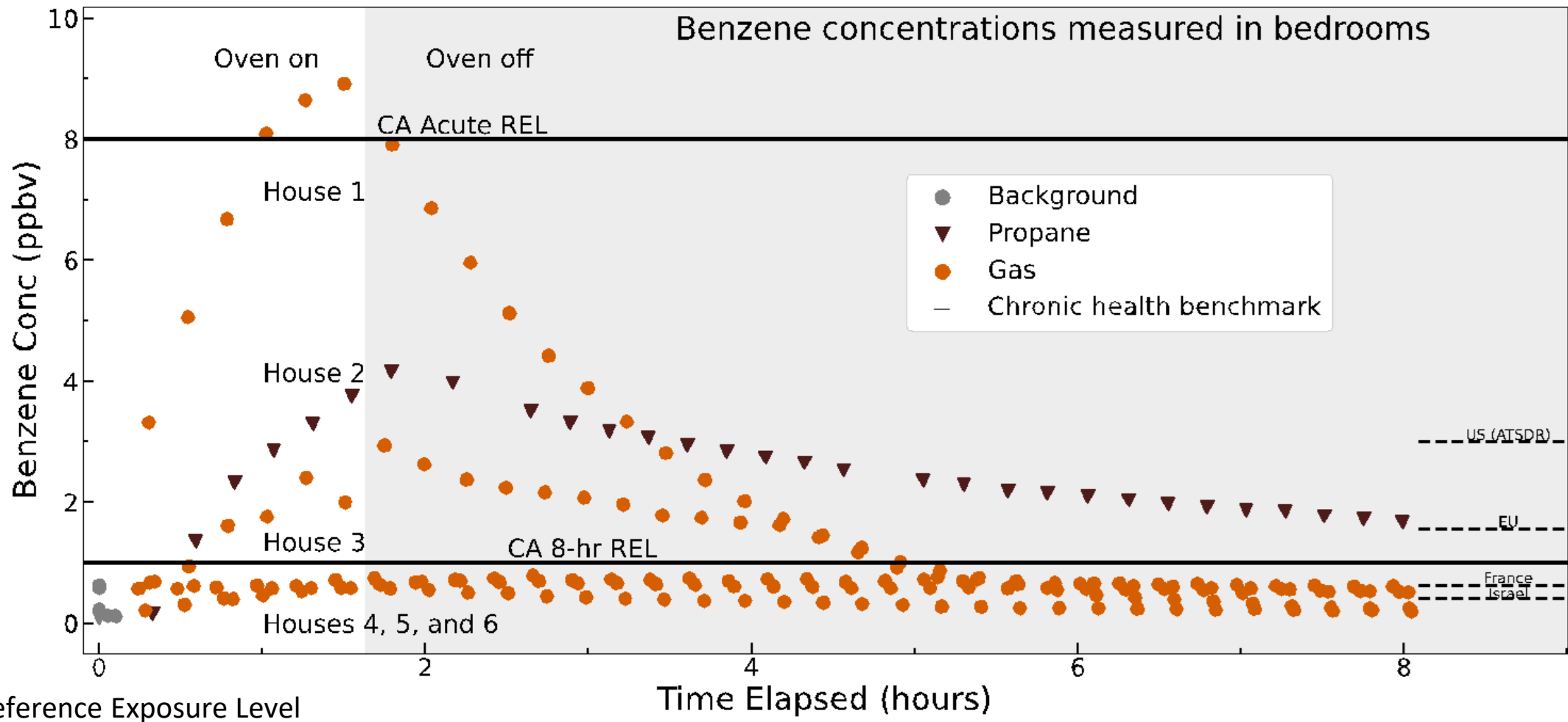


REL = Reference Exposure Level
Kashtan, et al., 2023

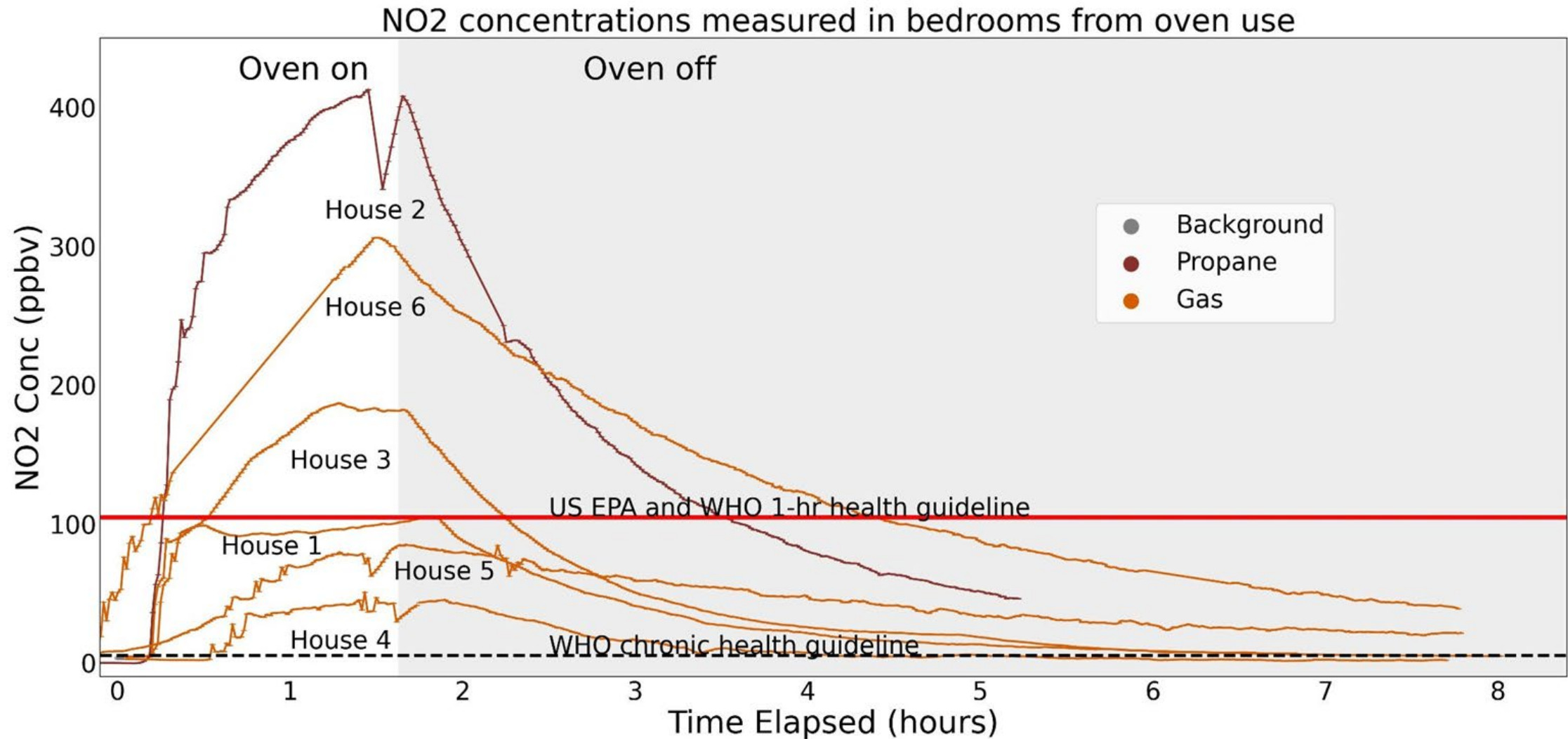
70% of CA households have a gas stove, the most in the nation (RECS 2020)



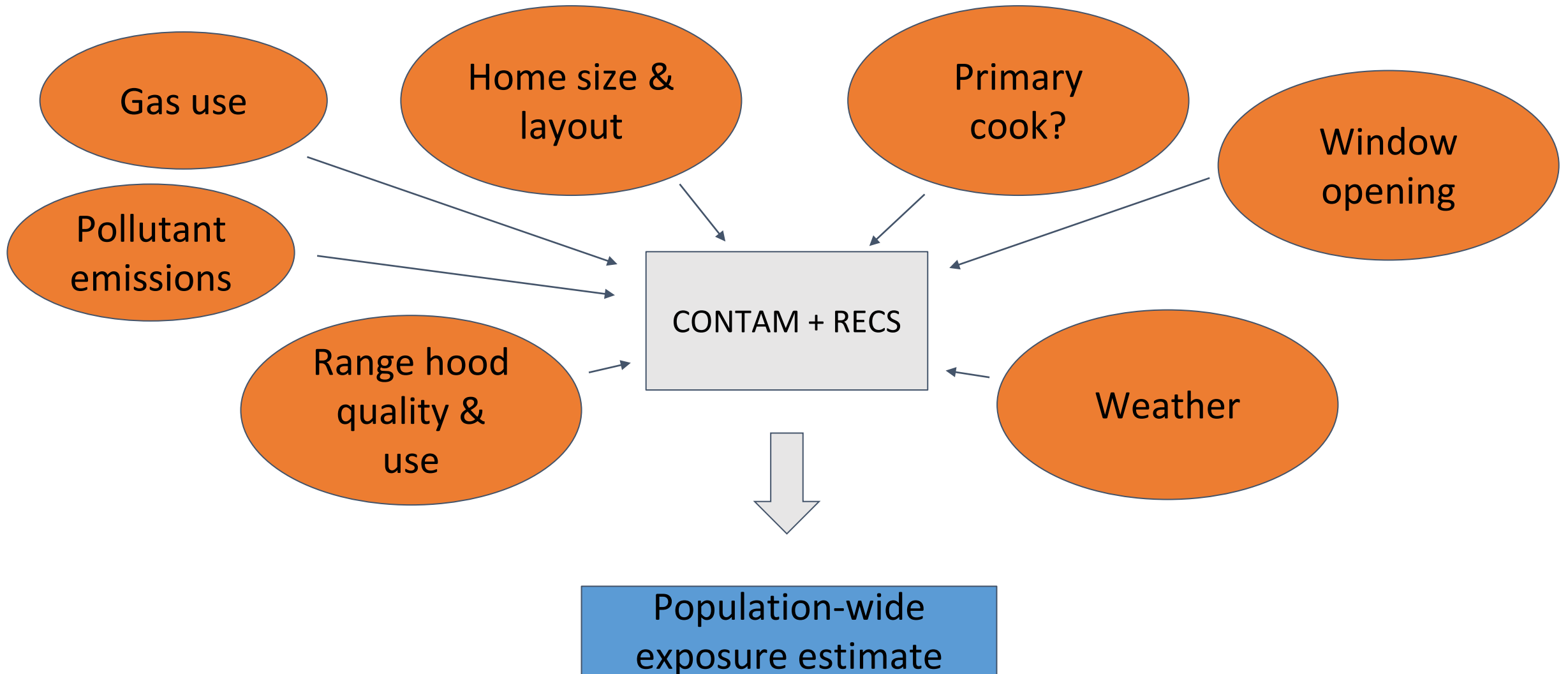
Benzene from the kitchen travels to distant bedrooms, sometimes staying above health benchmarks for hours



The same is true for NO₂ as well

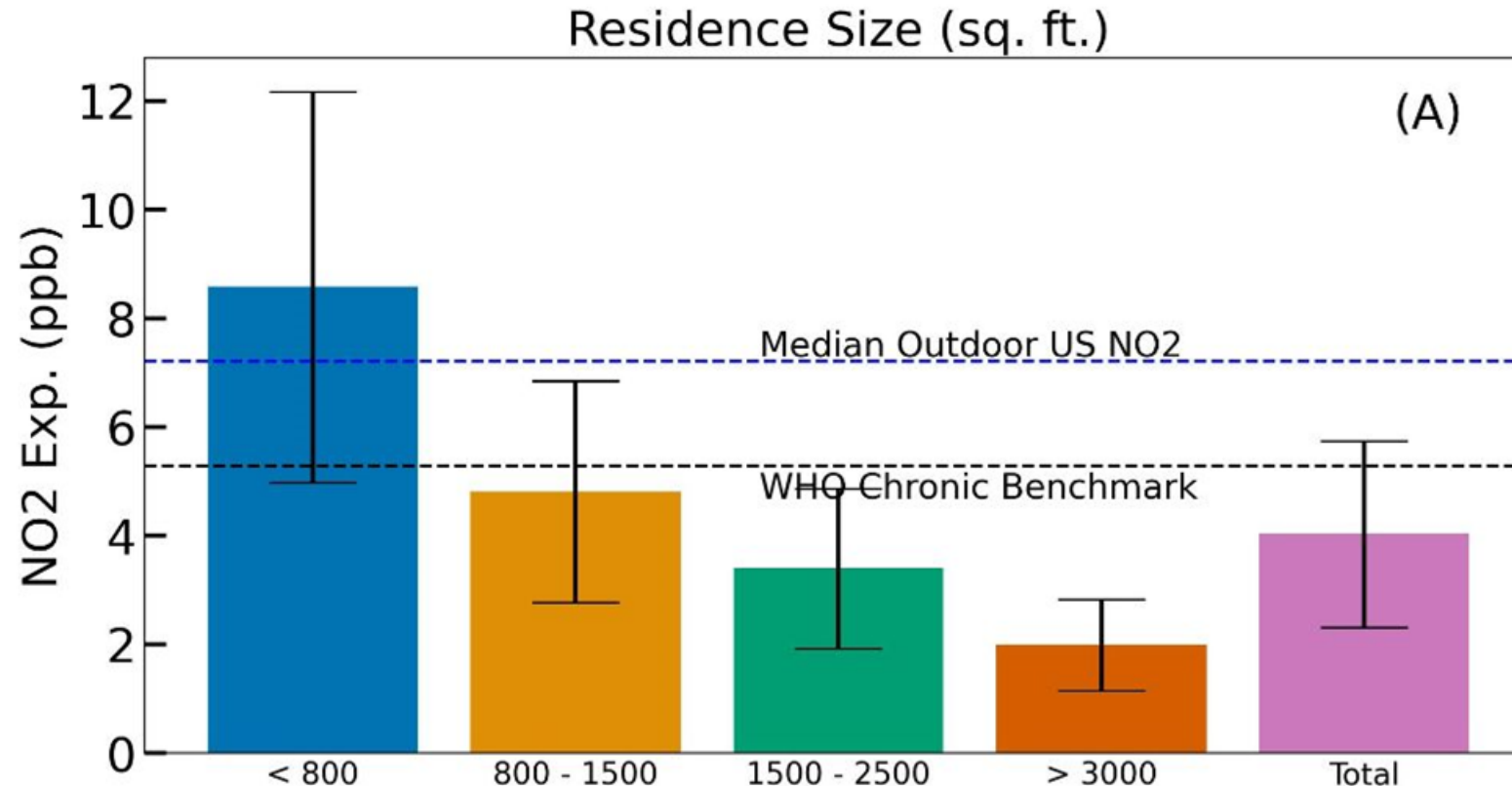


To assess health consequences, exposure data are needed from pollutant emission and concentration estimates



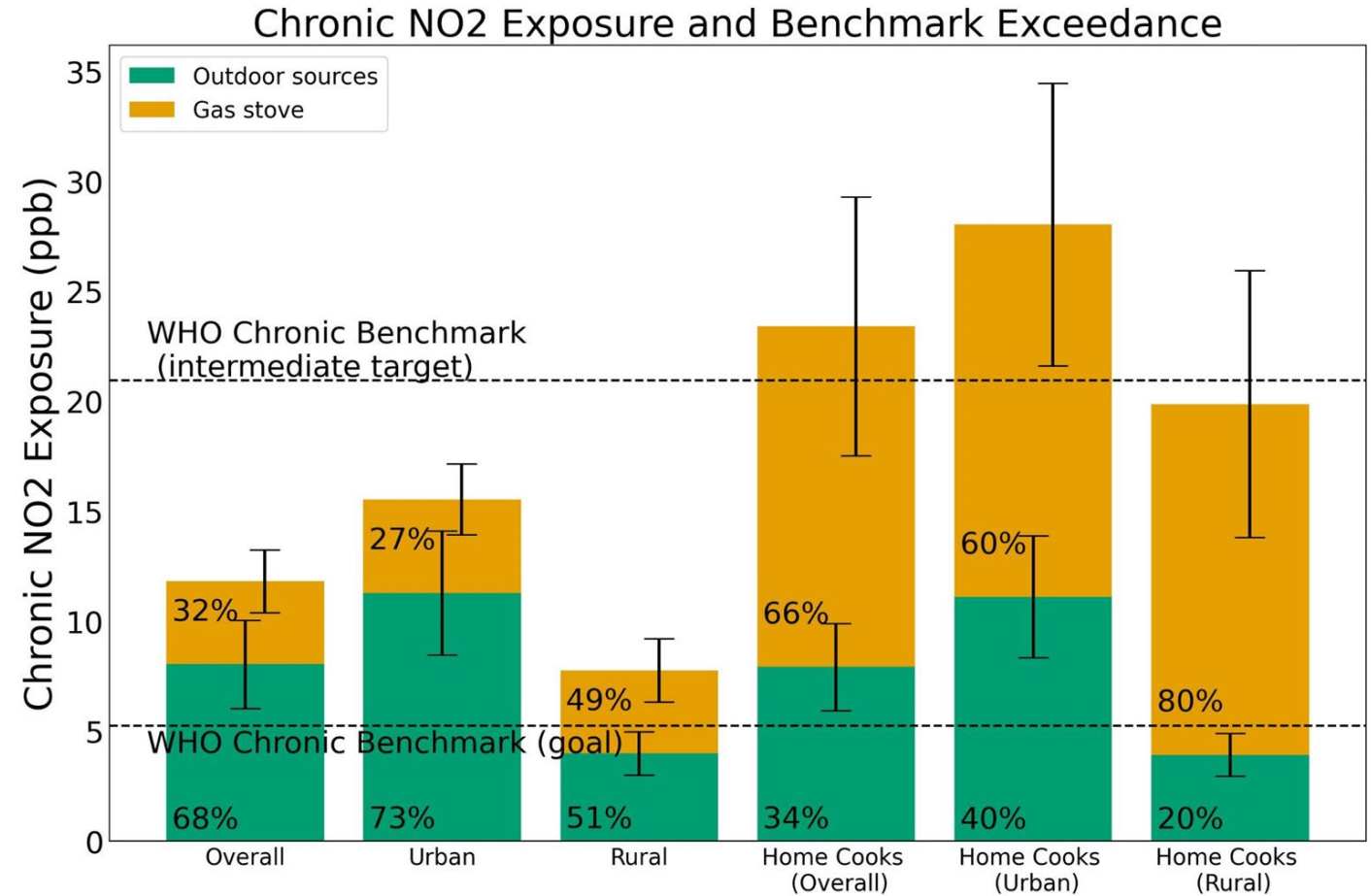
Gas stoves increase exposure for NO₂, carbon monoxide, and benzene

- ❖ People reach ~75% of their total WHO chronic exposure for NO₂ (~5.2 ppb NO₂) *just by using a gas or propane stove*. More gas use means more exposure.
- ❖ People living in smaller homes breathe more pollution and have higher exposures, driving racial and socioeconomic disparities.



Nationally, NO₂ exposure from **gas and propane stoves** approaches and can exceed NO₂ exposure from all **outdoor sources** combined

- ❖ Gas stoves in the U.S. are responsible for one-third of gas stove owners' total chronic NO₂ exposure
- ❖ Cooks breath more NO₂ from gas stoves than from outdoor air
- ❖ Together, outdoor and gas stove pollution push total NO₂ exposures above WHO health benchmarks



- 1) Fuel choice and use are the most important factors for predicting exposures.
- 2) Hoods—when turned on—reduce but do not eliminate risk.
- 3) Benzene and NO_2 exposures from gas stove use often exceed national and international health benchmarks.



Thank you, and Questions?

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Link to Kashtan et al.



Link to Lebel et al.