



NO₂ IAQ Guidelines Panel: Environmental Justice

May 2023

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Health Effects



NO₂

-Contributes to the development of:

- Asthma
- Aggravated asthma
- Increased susceptibility of respiratory infections

-Associated with negative general cognitive functioning



Standards & Guidelines

NO2 Standards & Guidelines

Outdoor Standards for NO ₂	1-hr average (ppb)
US National Standard (EPA)	100
Canadian National Standard	60
California State Standard	180

Lawrence Berkeley National Laboratory

Unventilated gas stove use exceeds EPA ambient air standards:



83% of the time

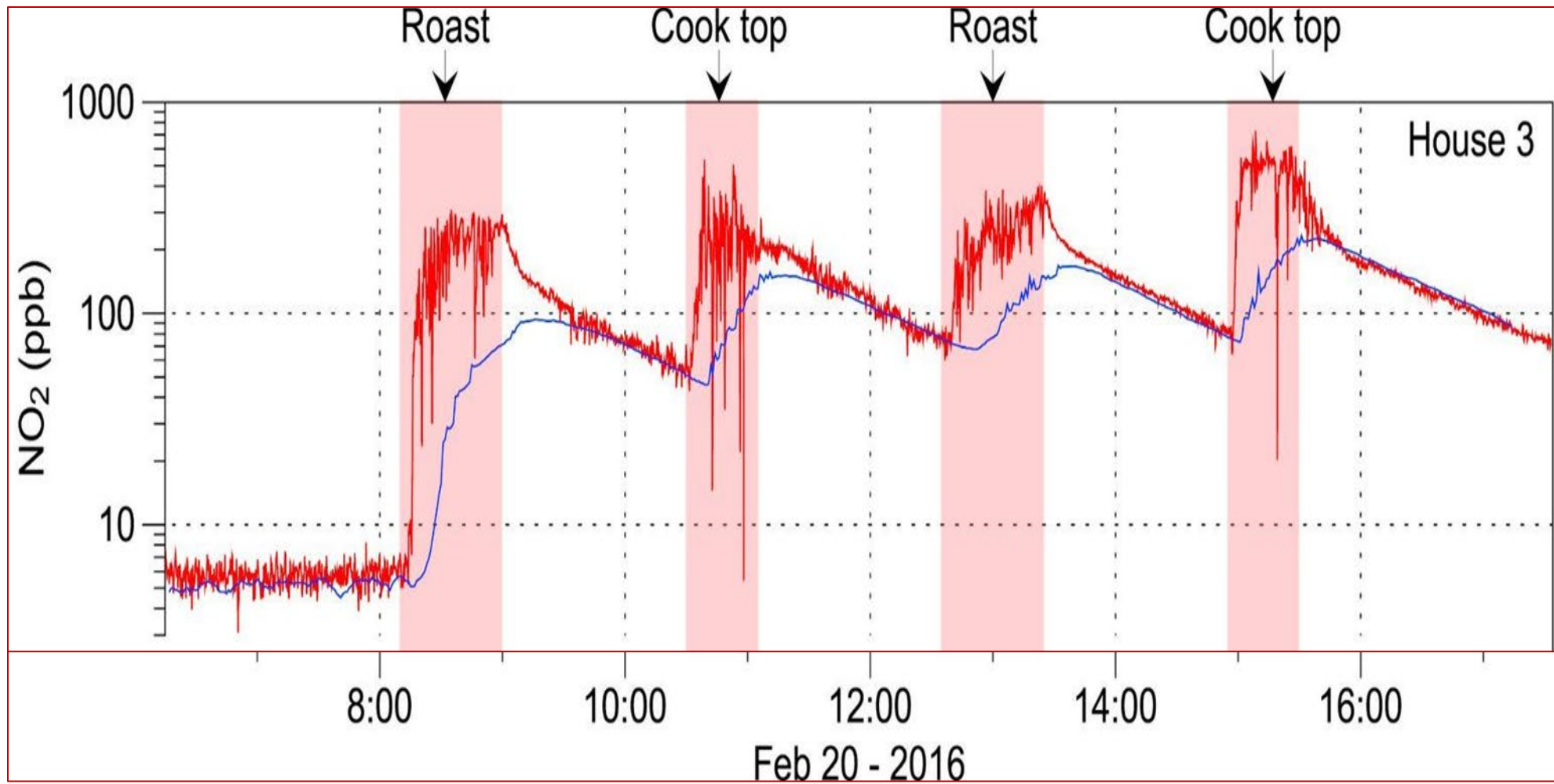


100% of the time

"NAAQS Table," US Environmental Protection Agency <https://www.epa.gov/criteriaair-pollutants/naaqs-table>

"Nitrogen Dioxide & Health," California Air Resources Board, <https://ww2.arb.ca.gov/resources/nitrogen-dioxide-and-health>

Singer BC, Pass RZ, Delp WW, Lorenzetti DM, Maddalena RL. Pollutant concentrations and emission rates from natural gas cookburners without and with range hood exhaust in nine California homes. *Building and Environment*. 2017;122:218-229. doi:10.1016/j.buildenv.2017.06.021





Vulnerable Population: Children

Increased Breath Rate

Higher Lung to Body Ratio

Developing Immune & Respiratory Systems





Environmental Justice – Health Disparities

Prevalence of Childhood Asthma

HOUSING

Public: **21.8%**

Mixed Use: **11.3-13.1%**

Private: **7.38%**

RACE/ETHNICITY

Black: **15.7%**

Puerto Rican: **12.9%**

White: **7.1%**

INCOME

Below 100% of the federal poverty level: **11.8%**

450% of federal poverty level or higher: **5.9%**

Northridge, J., Ramirez, O. F., Stingone, J. A., & Claudio, L. . The role of housing type and housing quality in urban ~~children~~ with asthma. *Journal of Urban Health*. (2010). 87(2), 21-224.

National Center for Environmental Health. 20172019 National Health Interview Survey. (2019)https://www.cdc.gov/asthma/most_recent_national_asthma_data.htm

National Center for Environmental Health. 2019 National Health Interview Survey. (2019)https://www.cdc.gov/asthma/most_recent_national_asthma_data.htm



Environmental Justice – Historical context

Federal Housing & Transportation Policies

Federal Housing Act of 1949

Federal Aid Highway Act of 1956

Redlining



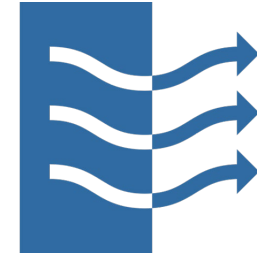
Environmental Justice – Low-Income Households



Smaller unit size



More people per home



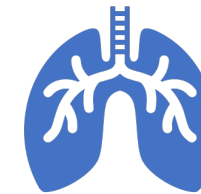
Older homes, inadequate ventilation



Using the stove/ oven for supplemental heat



Higher exposure to outdoor pollution



Greater asthma burden

Gary Adamkiewicz et al., "Moving Environmental Justice Indoors: Understanding Structural Influences on Residential Exposure Patterns in Low-Income Communities," *American Journal of Public Health*. 2011 <https://www.ncbi.nlm.nih.gov/pubmed/21836112>

Diana Hernández and Stephen Bird, *Energy Burden and the Need for Integrated Low-Income Housing and Energy Policy*, *Poverty PublPolicy*, November 2010, p. 6 <https://www.ncbi.nlm.nih.gov/pubmed/27053989>

Nadia N Hansel et al., "A Longitudinal Study of Indoor Nitrogen Dioxide Levels and Respiratory Symptoms in Inner-City Children with Asthma," *Environmental Health Perspectives* Volume 116 Number 10, October 2008, p. 1430 <https://ehp.niehs.nih.gov/doi/10.1289/ehp.11349>



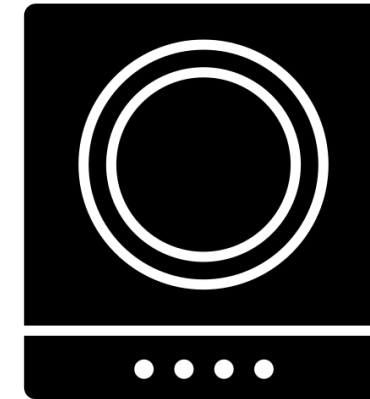
Install & maintain a CO detector



If available, run your exhaust hood while cooking

Open a window while cooking

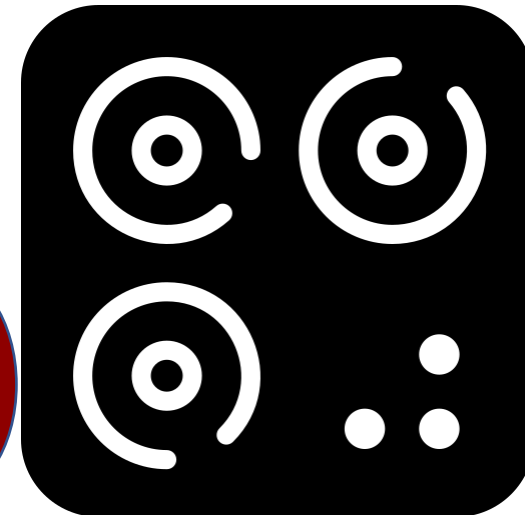
Cook on the back burners



Use electric appliances like toaster oven or kettle.

Try a plug-in induction stove (~\$60)

Switch to an electric/ induction stove





Environmental Justice & Guideline Development

What Can We Do?

Early Community & CBO Engagement - Co-Develop Policies

Tenant Protections

Remember that **People** live in Buildings



**Thank
You!**