

Why People Worry about Thirdhand Smoke: Insights from Four Years of Inquiries to the Thirdhand Smoke Resource Center

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Background

- Thirdhand smoke is chemical residue left on clothing, skin, furniture, walls, and other surfaces after smoking and contributes to ongoing exposure in indoor environments¹.
- The Thirdhand Smoke Resource Center (THSRC) provides Californians with information, resources, and technical support on the toxic legacy of tobacco smoke residue².
- Individuals and organizations contact the Center for support, including questions about exposure, testing, remediation, and educational resources.
- Inquiries help characterize who is contacting the Center, their experiences and concerns, and contamination levels to inform outreach strategies and policy efforts.

Our Goals

1. Characterize individuals contacting the Center, including location, demographics, concerns, experiences, and prior actions.
2. Assess thirdhand smoke contamination among individuals who completed testing, including nicotine levels in air and on surfaces.

Methods

- **Email inquiries (Feb 2019–Dec 2024):** Individuals contacted the Center via email. All inquiries were responded to by trained research staff and the Center director, and all correspondence was recorded.
- **DIY screening:** Inquiries were screened for DIY testing eligibility using a survey, team review, and interview. California residents were prioritized, and high-risk households. Eligible participants received a test kit.
- **DIY testing:** Participants collected surface, air, hand, and/or dust samples using mailed kits. Samples were analyzed for nicotine at the SDSU Public Health Laboratory. Results were returned within 2–3 months, and participants received an emailed report (Completed DIY Testing; see Fig. 1).
- **Coding Inquiries:** All inquiries were coded in Qualtrics using a standardized codebook by trained staff. For DIY participants, coding was supplemented with surveys and interviews. Intercooder reliability was assessed on a ~10% random subsample, with >80% agreement.

Homeowners with young children report thirdhand smoke health concerns supported by measurable contamination, highlighting gaps in smokefree indoor policies, testing, and real estate disclosure.

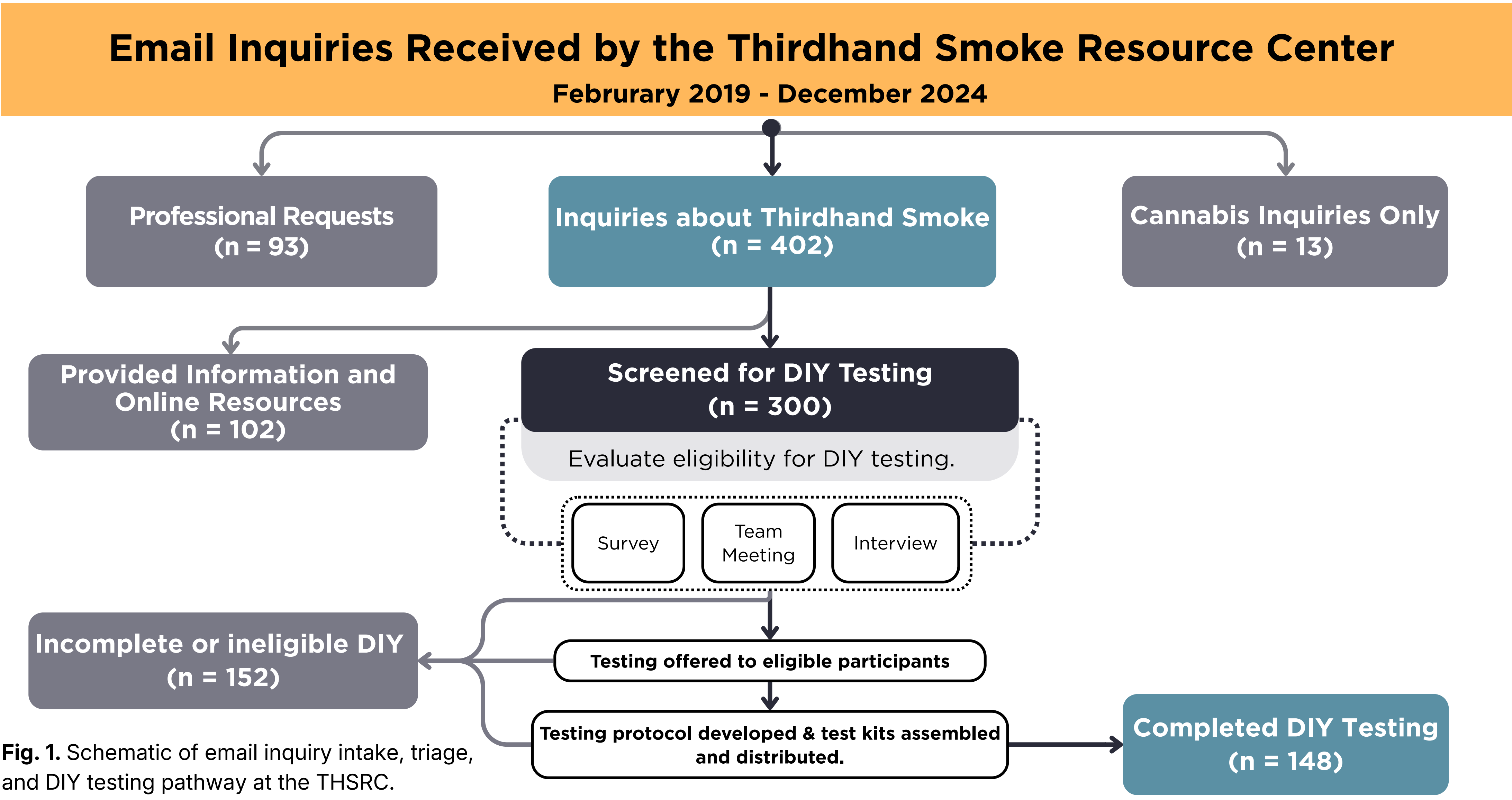
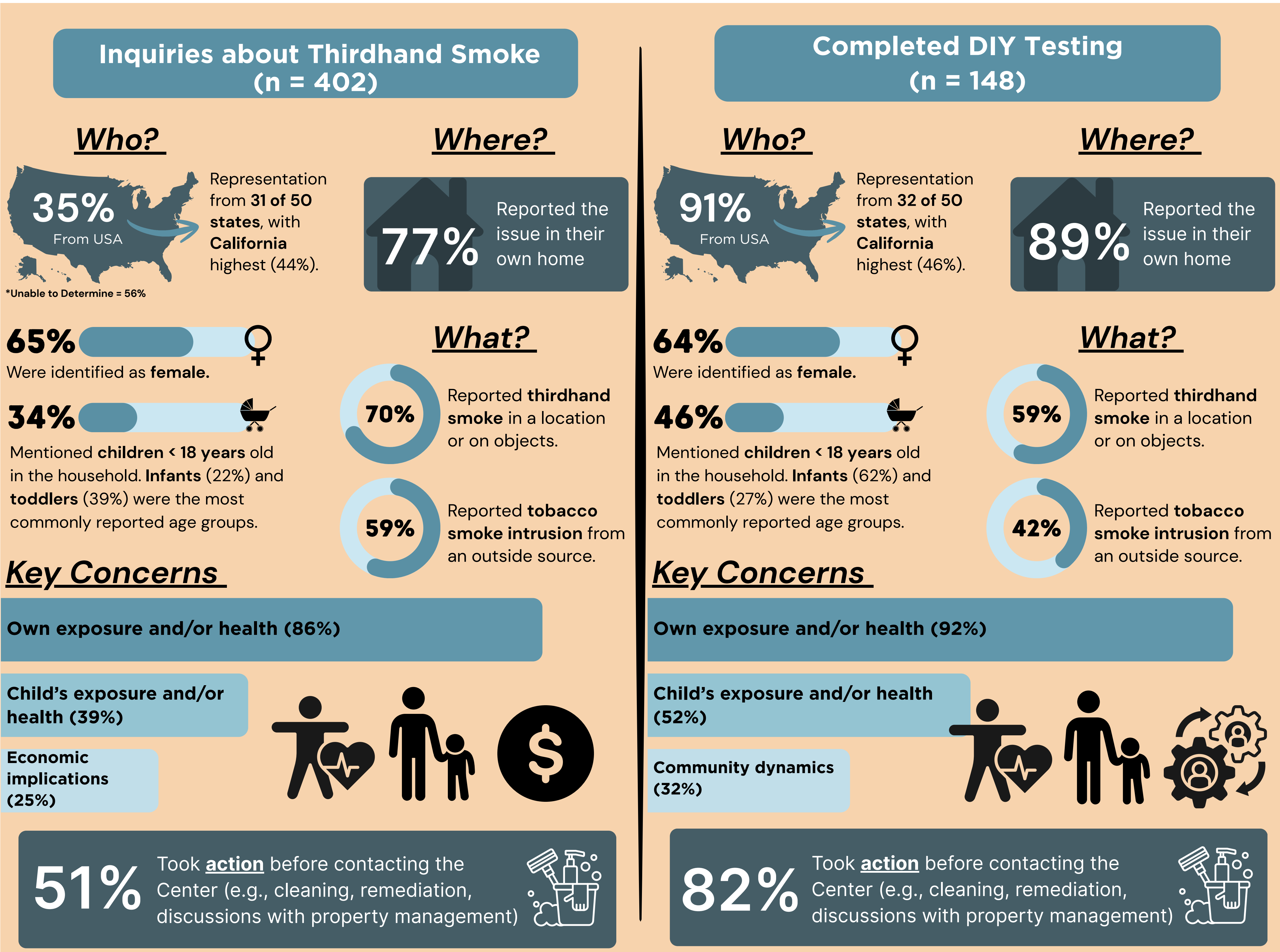


Fig. 1. Schematic of email inquiry intake, triage, and DIY testing pathway at the THSRC.



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Results

- The Thirdhand Smoke Resource Center was found through general web browser searches and AI-generated results, which led individuals to inquire about thirdhand smoke.
- Mostly from California, with additional inquiries across the U.S., Canada, and a few from Europe and Asia.
- Primarily homebuyers, often families with young children.
- Main concerns were their own and their children's health consequences from secondhand and thirdhand smoke.
- Previous efforts (e.g., remediation, cleaning) were unsuccessful for over 50% of individuals who contacted the Center.
- 50–60% of DIY samples show “unavoidable” background contamination levels (Figs. 2 & 3).
- 10–20% of DIY samples show nicotine pollution/exposure at levels equivalent to homes with indoor smoking (Figs. 2 & 3).

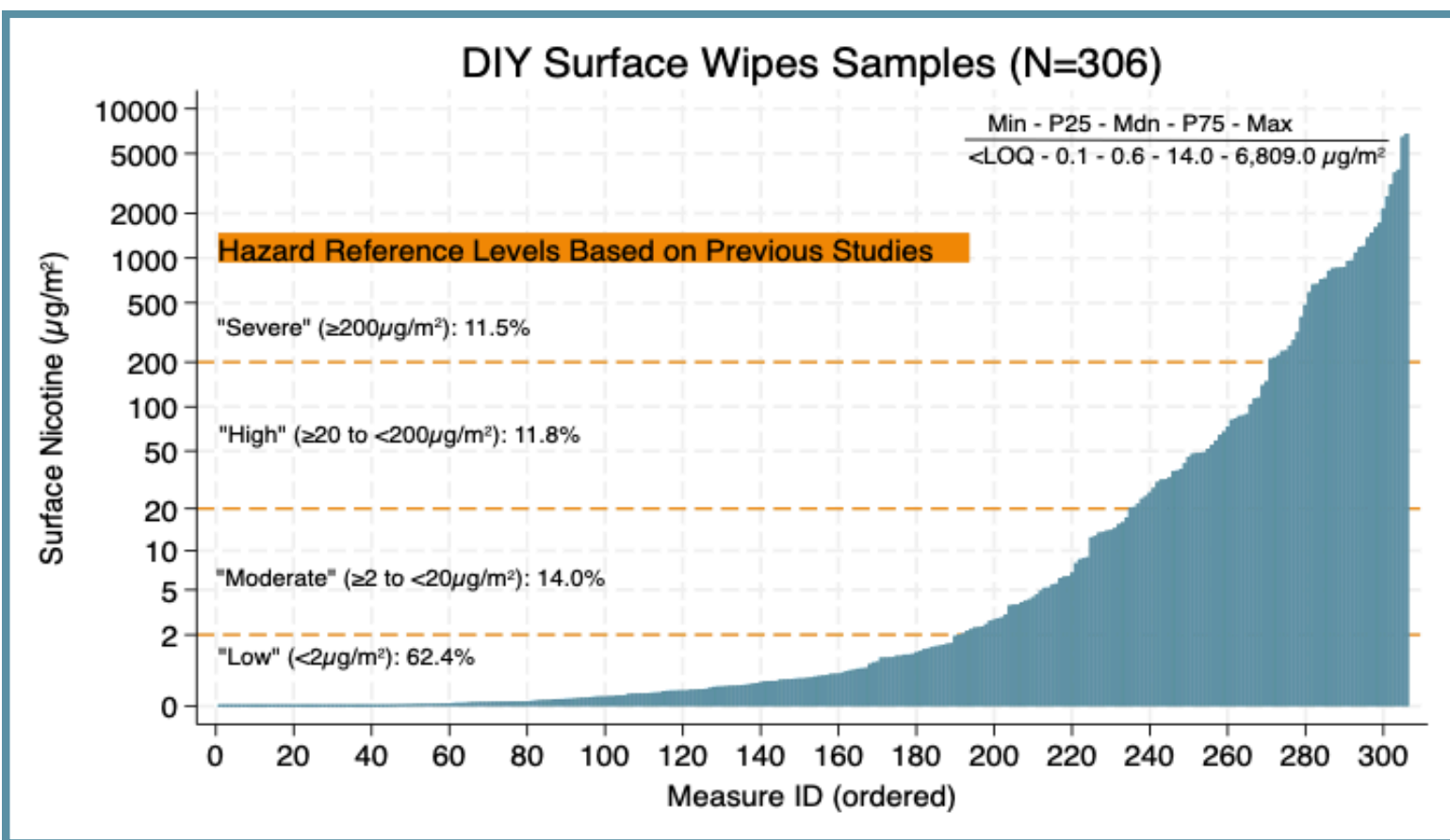


Fig. 2. Distribution of surface nicotine (µg/m²) in DIY surface wipe samples, with hazard reference levels indicating low (<20 µg/m²) to severe (>200 µg/m²) contamination thresholds.

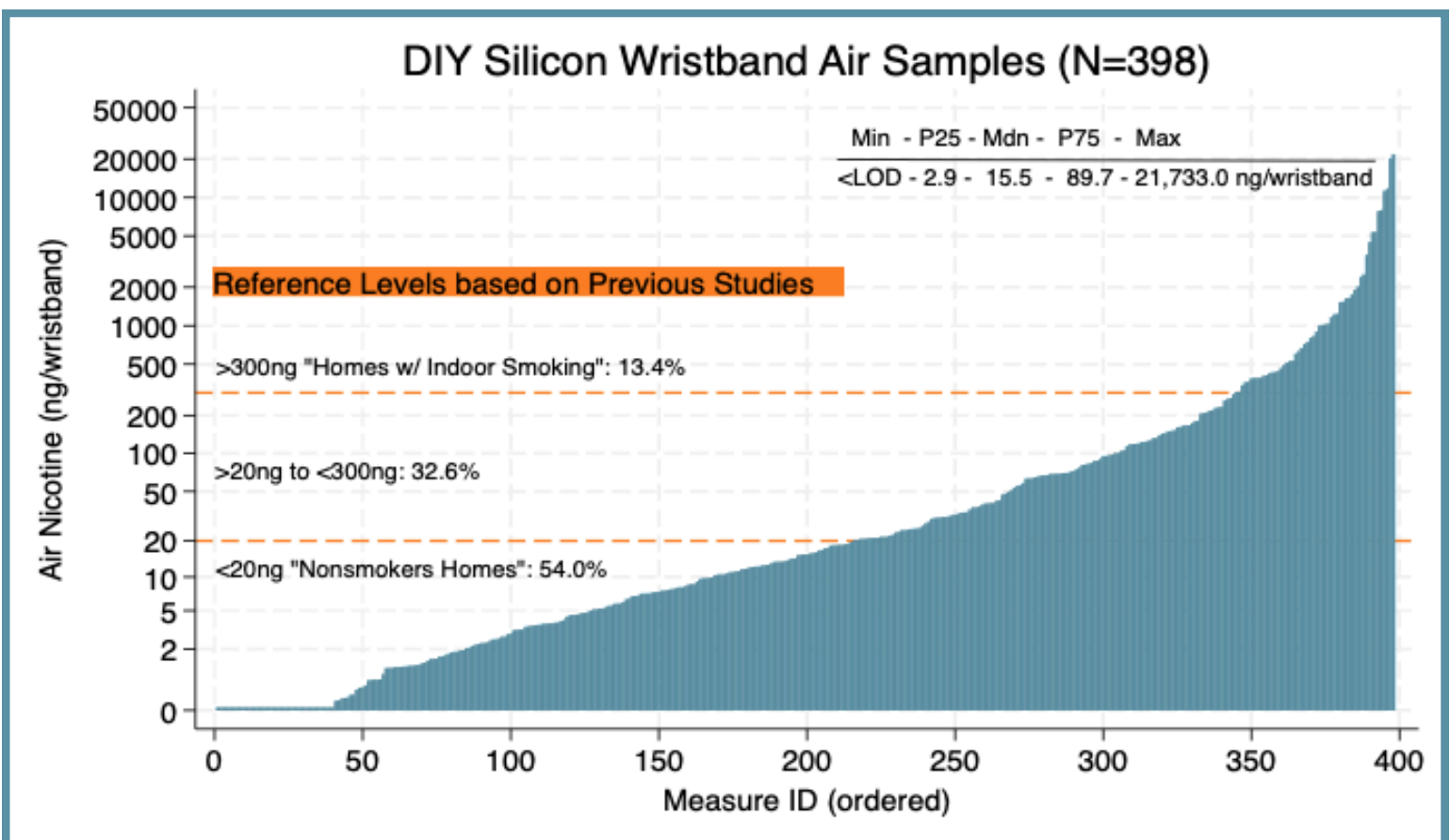


Fig. 3. Distribution of air nicotine (ng/wristband) in DIY wristband samples, with hazard reference levels indicating low (<20 ng) to severe (>300 ng) contamination thresholds.

Conclusion

- **Comprehensive Smokefree Indoor Policies**
 - Needed to improve public health, protect housing investments, and reduce income- and race-based health disparities.
- **Testing for Thirdhand Smoke**
 - Current tests lack sensitivity (e.g., EMSL: 50 µg/m²).
 - DIY options are costly (>\$300/kit).
 - More affordable, sensitive testing is needed.
- **AB455 - Real Estate Disclosure**
 - California law does not require testing.
 - Buyers and sellers would benefit from sensitive testing and clear THS reference levels.
 - Adopt similar disclosure policies to other states and countries.

References

1. Matt, G. E., Quintana, P. J., Destailats, H., Gundel, L. A., Sleiman, M., Singer, B. C., ... & Hovell, M. F. (2011). Thirdhand tobacco smoke: emerging evidence and arguments for a multidisciplinary research agenda. Environmental health perspectives, 119(9), 1218.
2. Thirdhand Smoke Resource Center. <https://thirdhandsmoke.org>.