The Impact of Perceived Air Quality on Respiratory Distress In College Housing



BACKGROUND

- *Exposure Route?:* Poor air quality plagues older, poorly maintained + crowded housing, straining already weak ventilation¹
- At risk?: Students seeking affordable, temporary housing susceptible due to a lack of housing options (occupancy at 98.5-99%)¹
- Understudied: Few studies explore the student population and collect selfreported exposure-outcome scores

OBJECTIVE

To investigate how student housing conditions relate to perceived air quality and self-reported respiratory symptoms in college students

METHODS

- **Design & Sample:** Cross-sectional survey of college students (18–25 yr), on- vs. offcampus, West vs. East Coast.
- *Instrument:* Survey adapted from European Community Respiratory Health Survey (ECRHS)³
- *Exclusions:* Cigarette smoke exposure, airpurifier use, non-students, age <18 or >25.
- Measures:
 - Exposure Volume (1 = not present, 5= high volume): Dampness/Mold/ Mold Odour
 - Outcome frequency (1 = rare, 5 = everyday): Cough, congestion, wheezing, etc.
- *Analysis:* Spearman's ρ for monotonic trends; Kruskal–Wallis for group differences.

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EXPOSURE-OUTCOME RELATIONSHIP



RESULTS: DATA ANALYSIS



Rank Averages: Exposure Volume vs Outcome Frequency split by Region of U.S.

• All correlations statistically insignificant - however...

• East Off-Campus indicates a moderate-strength, positive exposure-outcome relationship (Spearman's ρ) worth exploring with larger n, larger data collection period, and modeling

• West Off-Campus exposure-outcome relationship inconsistent with current knowledge likely due to **limited sample size**¹

RESULTS: DEMOGRAPHICS/KEY FINDINGS

AVERAGE SEVERITY OF EXPOSURE BY REGION OF **U.S. RESIDENCE, ORGANIZED BY HOUSING** STATUS



• No subgroup differs significantly in exposure or outcome distributions housing status and region alone don't explain much variance

- East

POLICY IMPLICATIONS

- evaluated for compliance with existing standards¹
- environments^{1,2}

CONCLUSION: LIMITS & THE FUTURE

- season
- pollution concentration in environment

- 2016;13(11):1154
- 3. ECRHS II. European Community Respiratory Health Survey. 2018.



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AVERAGE FREQUENCY OF SYMPTOMS BY REGION OF U.S. RESIDENCE, ORGANIZED BY HOUSING STATUS

• **Inconsistencies** with hypothesis and current knowledge of positive trend² Demographics: 69.7% Off-Campus, <u>30.3% On-Campus</u>, 60.4% West, <u>39.6%</u>

• Accuracy in Scoring: Future research employing objective, quantifiable measures of air quality (i.e. <u>sensors</u>) + respiratory health

• *Regulation Enforcement:* Rent prices and living conditions need to be

Periodic Assessments: College-driven to improve the quality of student housing, ensuring all students have access to healthy living

Pollen Exposure: Georgia responses overlap with GA during peak pollen

• Seasonality: San Diego responses affected by rainy weather impacting air

• **Overall:** Further research to explore the connection between indoor air pollutant exposure and respiratory symptoms is needed- esp. long term /hen students are house-poor: Urban universities, student marginality, and the hidden curriculum of student housing. Cities. 2022;124:103572

2. Lanthier-Veilleux M, Baron G, Généreux M. Respiratory Diseases in University Students Associated with Exposure to Residential Dampness or Mold. Int J Environ Res Public Health