

Assessing the Distribution of Indoor Air Quality Cases in Louisiana, 2021-2024

Paula Dinh¹, Adrienne Katner¹, Kate Puszykowski²



Background

We spend nearly 90% of our lifetime indoors, yet the Environmental Protection Agency (EPA) does not regulate nor provide policies for indoor air quality (IAQ) as it does with outdoor air quality (i.e., the Clean Air Act).¹ Instead, they provide guidelines and let states create their own IAQ policies. Thus, the Louisiana Department of Health's (LDH) Indoor Environmental Quality Education Service (IEQES) offers telephone consultations to the public for multiple IAQ concerns. Past assessment of LDH IEQES calls revealed the top concern was mold (~85%).² Mold, an indoor air pollutant, has been well-documented to trigger a myriad of adverse health effects like asthma, allergic reactions, respiratory infections, rashes, headaches, sore throat, immune deficiency, and neurological disorders.³

Objective

Analyze self-reports of mold exposure from LDH's IEQES call logs within the last four years (2021-2024) for spatial and temporal distributions.

Methods

Data Source & Cleaning

- Extract mold-related calls (2021-2024) from REDCap
- Excluded incomplete records (missing parish/Zip Code)

Spatial Analysis

- Join case counts with parish boundaries in ArcGIS
- Calculate call rates per 1,000 residents

Temporal Analysis

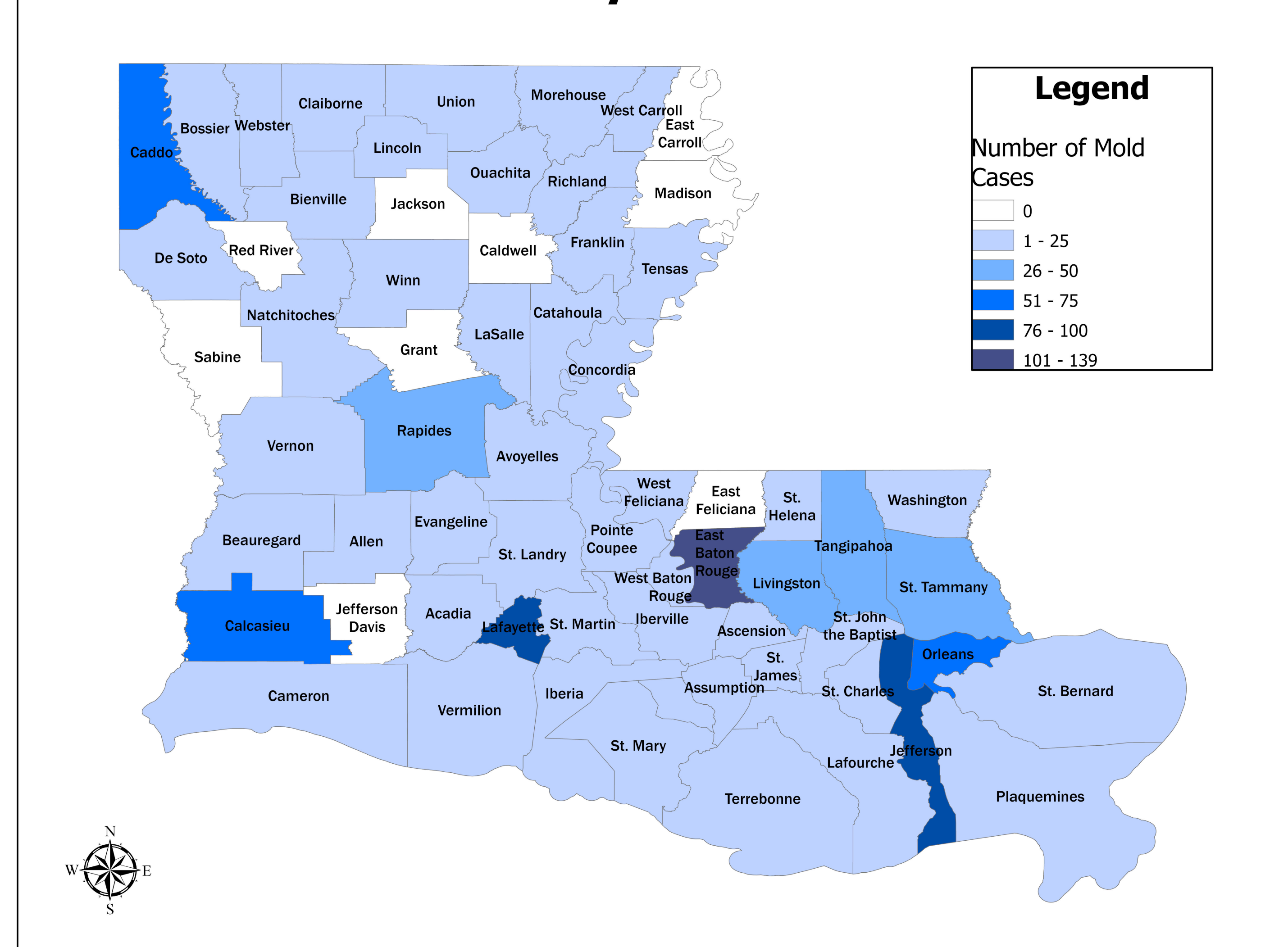
- Chart monthly trends in Excel
- Perform Chi-square Goodness of Fit test

Required Data	Data Representation	Source
Parish boundary lines	vector, polygon	Tiger/Line Shapefile
Parish count of mold cases	text	REDCap
2020 parish population	numeric	US Census Bureau

Table 1. Data description and source for ArcGIS.

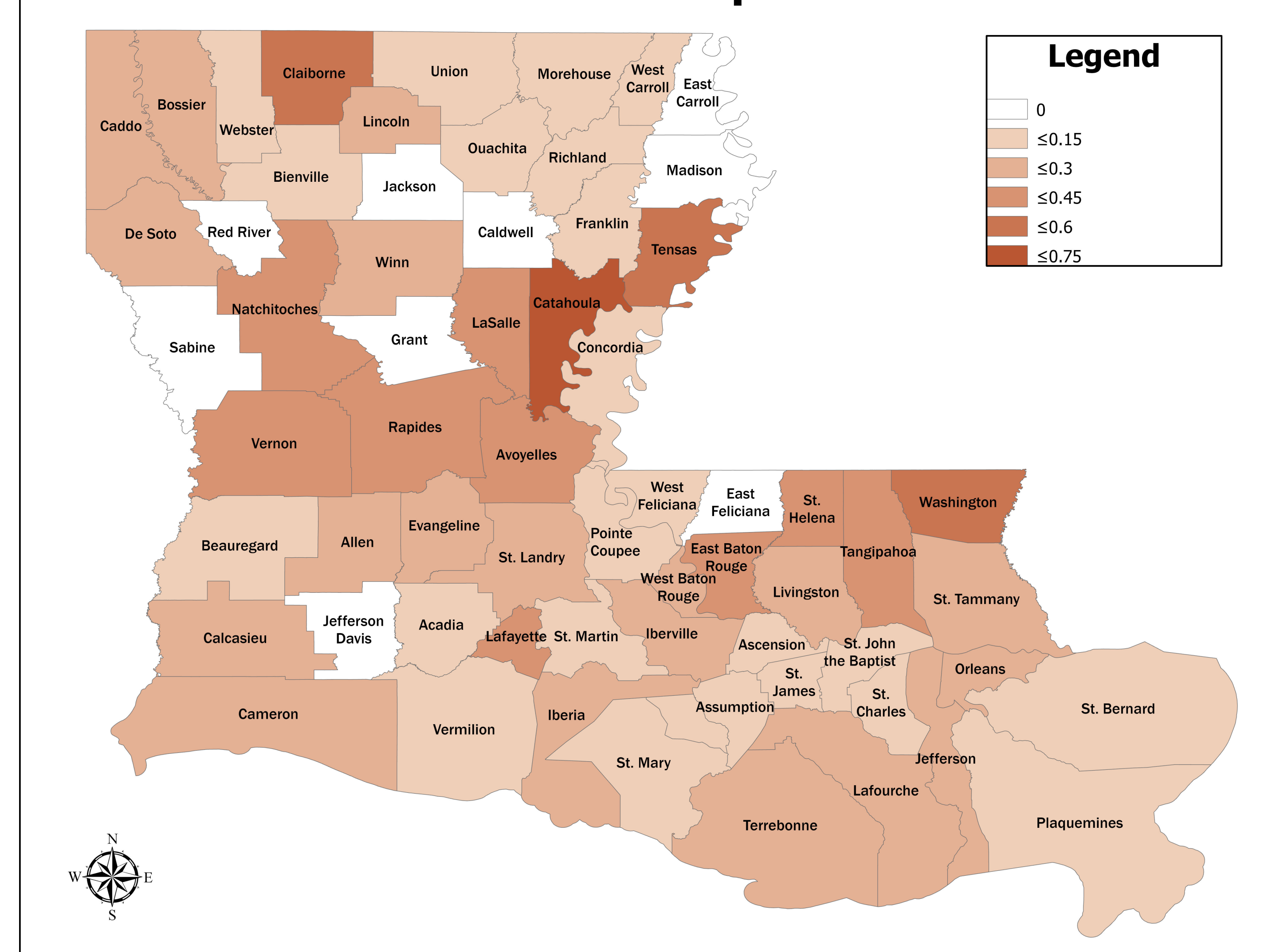
Results

Mold Cases by Parish 2021-2024



Map 1. Number of mold-related cases in each Louisiana parish are represented by shades of blue. White areas have zero cases. Light to dark blue areas have smallest to highest cases, respectively.

Mold Call Rates Per Capita 2021-2024

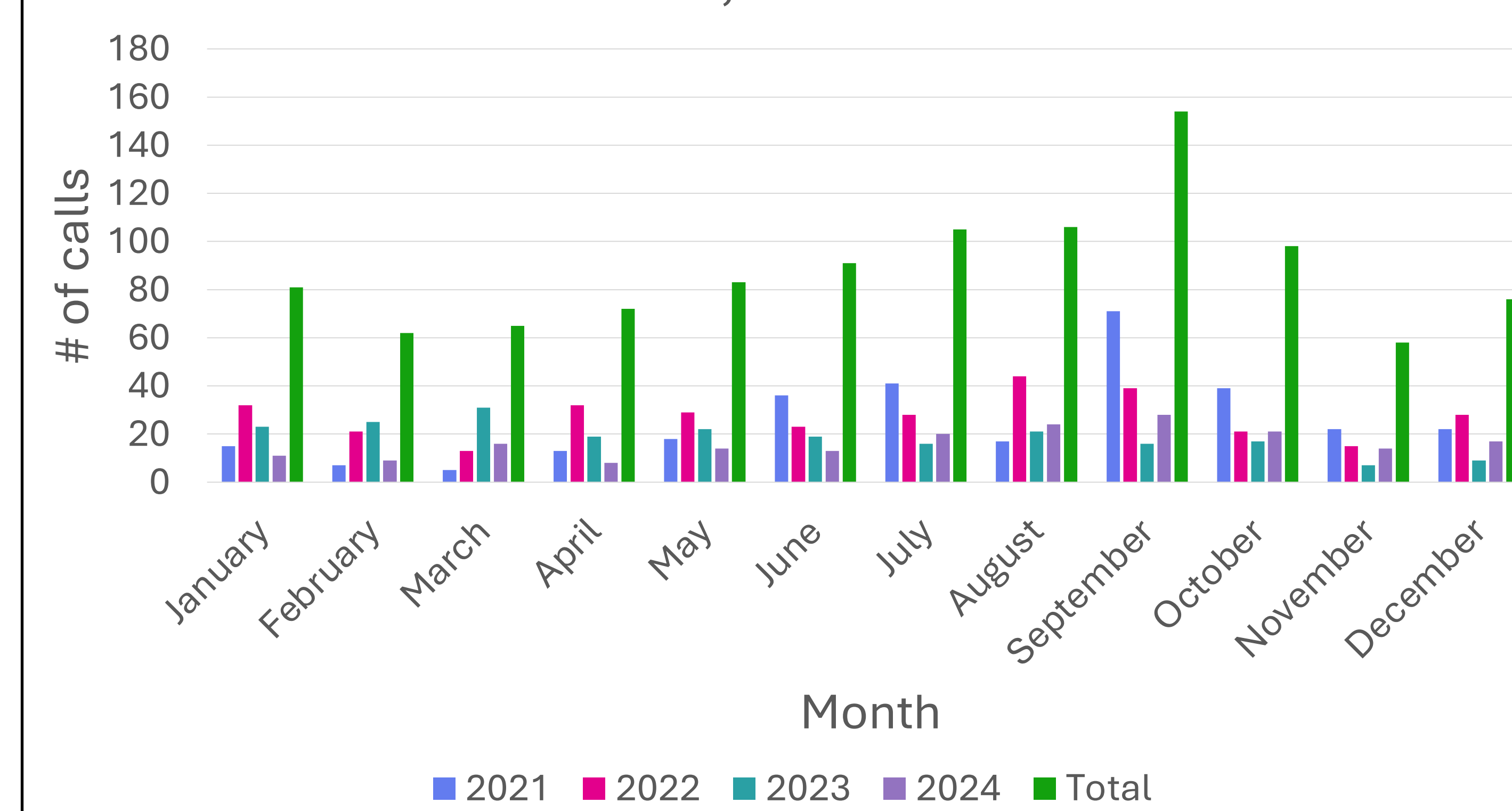


Map 2. Number of mold-related cases per capita (1,000 residents) in each Louisiana parish are characterized by shades of orange. White areas have zero cases. Light to dark orange areas have smallest to highest cases, respectively.

References

1. US Environmental Protection Agency (EPA). Indoor air quality (IAQ). Washington (DC): US EPA; <https://www.epa.gov/indoor-air-quality-iaq>
2. Louisiana Department of Health. A descriptive summary of Indoor Environmental Education Service (IEES) cases between 2008–2017. Baton Rouge (LA): Office of Public Health; 2018. [LDHDescriptiveSummary2008-2017](https://www.louisianadepartmentofhealth.gov/Portals/0/IEES%20Summary%202008-2017.pdf)
3. Siddique A, Al-Shamlan MYM, Al-Romaihi HE, Khwaja HA. Beyond the outdoors: indoor air quality guidelines and standards—challenges, inequalities, and the path forward. Rev Environ Health. 2023;40(1):21–35. doi:10.1515/revh-2023-0150.

Number of Mold-related IAQ Calls to LDH by Month, 2021-2024



Graph 1. Monthly distribution of mold-related cases in Louisiana.

	2021 Calls	2022 Calls	2023 Calls	2024 Calls	2021-2024 Calls
X² Statistic	148.43	33.86	25.29	24.88	87.40
DOF	11	11	11	11	11
X² Critical Value	19.68	19.68	19.68	19.68	19.68
p-value	3.12E-26	3.82E-4	8.26E-3	9.50E-3	5.37E-14

Table 2. Results from the Chi-square goodness of fit test.

Discussion & Conclusion

- 94% of LDH IEQES calls (2021-2024) were mold-related, about 9% higher than the 2008-2017 call cycle.
- Areas with high mold call rates may face disproportionate amounts of flooding, high humidity, and inadequate housing infrastructure causing persistent mold issues.
- Mold calls followed a seasonal trend that coincides with Louisiana's Hurricane season.
- This study is limited to the reliance of self-reported data without mold verification, underreporting (outreach/language barriers), short 4-year study period, and population estimates from 2020 census data.
- Advocating for increased funding and national standards through initiatives like Fix Moldy Housing Act and California's 2001 Toxic Mold Protection Act is critical to support research, mold assessment, and remediation programs.

Acknowledgements

I would like to thank LDH IEQES for the dataset. I am especially thankful to Kate Puszykowski, Dr. Adrienne Katner, Dr. Kari Brisolaro, Dr. Barry Keim, Dr. Md. Shahinoor Rahman for their mentorship, support and educational guidance. Thank you to the residents that utilized LDH IEQES.