



PFAS & Multimorbidity: Using Electronic Health Records to Probe Systemic Effects

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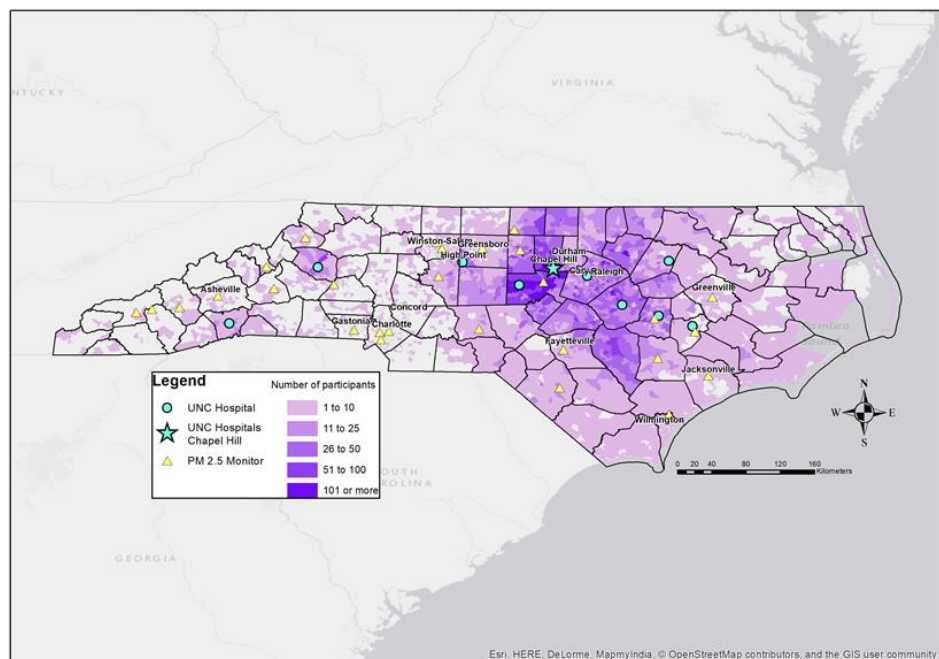
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- Exposure to various PFAS has been associated with health outcomes in humans ranging from cancer to high cholesterol.
- Studies evaluating how PFAS exposure might impact the co-occurrence of multiple chronic diseases co-occurring at the same time are limited.
- One resource that has not been widely applied to PFAS research is electronic health records (EHRs).
- This effort aims to both establish EHRs as a tool for the study of PFAS health effects and estimate the systemic health effects of PFAS.

Approach

1) Use EPA's UCMR 3 data on occurrence of PFAS as an indicator of potential PFAS exposure for specific zip codes in North Carolina



2) Using established EHR-based definition of multimorbidity examine association between multimorbidity and PFAS exposure in EPA Clinical and Archived records Research for Environmental Studies (CARES)

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PREVENTING CHRONIC DISEASE
PUBLIC HEALTH RESEARCH, PRACTICE, AND POLICY

SPECIAL TOPIC

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Defining and Measuring Chronic Conditions: Imperatives for Research, Policy, Program, and Practice

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Current Status

- Examined PFAS health effects in random sample (N = 10,168) of UNC Healthcare system patients seen between 7/1/2004 and 12/31/2016.
- Observed associations between PFAS exposure and multimorbidity (odds ratio = 1.25) as well as with individual chronic diseases after adjusting for confounders.
- Results presented at ISEE 2021 and accepted abstract published here: <https://ehp.niehs.nih.gov/doi/10.1289/isee.2021.P-619>

Chronic Disease	N	%
Hypertension	2556	25.1
Dyslipidemia	1762	17.3
Type 2 Diabetes	1068	10.5
Arrhythmia	852	8.38
Chronic Kidney Disease	460	4.52
Liver Disease*	456	4.48
Heart Failure	436	4.29
Osteoporosis	330	3.25
Stroke	305	3.00
Peripheral Arterial Disease	278	2.73
Chronic Obstructive Pulmonary Disease	180	1.77
Female Breast Cancer	160	1.57
Prostate Cancer	146	1.44
Lung Cancer	107	1.05
Colorectal Cancer	69	0.68
Ischemic Heart Disease	742	7.30



Conclusion & Contributors

- PFAS exposure is not just associated with individual chronic diseases, but also with multimorbidity.
- EHRs in conjunction with *in vivo* & *in vitro* approaches can contribute to understanding PFAS relevant AOPs.
- Accounting for the impact of PFAS on multiple chronic conditions may give an increasingly clear picture of the public health impacts of exposure to PFAS.
- Manuscript in preparation.

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