Title: Materializing the Air Quality Exposome: The Center of Excellence for Exposure Health Informatics

Abstract: Comprehensive quantification of effects of the modern environment on health requires taking into account data from all contributing environmental exposures (exposome), which can span endogenous processes within the body, biological responses of adaptation to the environment, physiological manifestations of these responses, and socio-behavioral factors. Generating air quality exposomes requires the integration of data from wearable and stationary sensors, environmental monitors, personal activities, physiology, medication use and other clinical data, genomic and other biospecimen-derived, person-reported and computational models, accommodating variable spatio-temporal resolutions and accounting for multiple study, experimental, and analytical designs.

We are establishing a Center of Excellence for Exposure Health Informatics (CEEHI) (<http://ceehi.ccts.utah.edu/>) that will serve as a go-to collaborative for continuing investigations into state-of-the-art informatics methods for exposomics and for researchers interested in conducting sensor-based, mobile and virtual exposure health studies. CEEHI seeks to advance the informatics infrastructure, Exposure Health Informatics Ecosystem (EHIE), derived from federally funded NIH/NIBIB PRISMS program, by the use of an ultra-large-scale infrastructure for integrated sensor monitoring systems, advance the use of novel sensors, and support the management of research processes and data for activities related to the study and its operations. In this presentation, we discuss CEEHI and EHIE, and its evolution towards a generalizable multi-scale and multi-omics platform providing robust pipelines for using real-time, low-cost air quality sensors based reproducible exposomic research.

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Authors: Philip Lundrigan, Ram Gouripeddi, Mollie Cummins, Julio Facelli, Katherine Sward for CEEHI Members