Purpose
Evidence from environmental neuroscience shows that our physical environments (exposure to air pollution, noise, greenspace etc.) significantly impact brain structures and networks, neural function and behavior, and biological mechanisms that influence risk for neurodevelopmental, neurodegenerative, and psychiatric disorders. Neuroimaging provides a powerful window into the brain to further elucidate these relationships, but is seldom analyzed in human studies of environmental neuroscience. To boost this area of research, we are launching the ENIGMA-Environment Working Group (ENIGMA-ENV), led by Drs. Lauren Salminen, Megan Herting, and JC Chen at the University of Southern California.

Goals
We aim to advance the environmental neurosciences through a collaborative network of neuroimaging cohorts that address key questions about how our physical environments impact the human brain. Initial research aims are to

1) Identify the impact of air pollution on neurodevelopment, brain aging and neurodegeneration
2) Determine how sex, race, and socioeconomic status modify the impact of air pollution on the brain
3) Define key interactions between environmental variables and brain structure that influence mental health
4) Determine how human behaviors (e.g., smoking, exercise, nutrition) modulate the environmental effects on the brain
5) Work with ENIGMA-Genetics group to identify gene x environment interactions that impact brain structure and function

Approach
ENIGMA-ENV will focus on georeferenced environmental measures that are defined through geocoded location data (e.g., residential address of each participant). Neuroimaging data will be harmonized using ENIGMA protocols for structural, diffusion, and resting-state functional MRI. Eventually we will expand these protocols to analyze neuroimaging features that may provide additional sensitivity to environmental exposures at various periods of the lifespan.

Join!
We are actively searching for international collaborators to join ENIGMA-ENV. The only prerequisites for potential new members are the collection of neuroimaging data, collection of residential address information from participants, and compliance with the ENIGMA Memorandum of Understanding (MOU).

Can I join if I’m unfamiliar with environmental neuroscience research?
YES! We highly encourage interested cohorts who meet the above prerequisites to contact us about participation, even if this content area is outside the scope of your current research program. Our working group Chairs and ENIGMA PIs collectively house a wide range of expertise to address any knowledge gaps in computational methods for extracting environmental and neuroimaging data as we begin data collection.

If you are interested in participating in ENIGMA-ENV, please complete the data query poll:
https://forms.gle/ogHSNoQNyvJCKQ419
Contacts: salminen@usc.edu | herting@usc.edu