Why is it so hard to *think* about the impact of climate change and environmental exposure on mental/brain health?

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MY THESIS

Research shows that climate change and environmental exposures such as air pollution impact our brain health, from early-life cognitive development to mid-life mental wellbeing to later-life dementia and cognitive frailty.

- **Extreme weather events, like hurricanes and floods, can cause psychological distress and trauma.**
- **Rising temperatures can lead to increased rates of anxiety, depression, and suicide.**
- **Air pollution can lead to long-term neurodegenerative impacts.**

Despite these insights, most countries around the world continue to ignore these EnvironMental links.

In terms of how we think about the environment and climate change – both individually and collectively – how can we change thinking in this area?

Exploring this question is the purpose of this seminar.

Is there THINKING going on at all?

Yes, there is . . .

albeit amongst a small but growing network of researchers . . .

and their impact is starting to be felt!

Here is where our thinking is presently.

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Review

A critical review of the epidemiological evidence of effects of air pollution on dementia, cognitive function and cognitive decline in adult population

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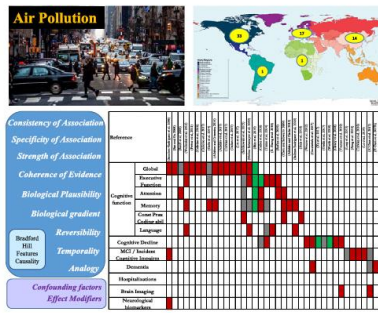
HIGHLIGHTS

- Epidemiological evidence suggests air pollution adversely affects cognitive function.
- Evidence suggests air pollution is causally associated with cognitive impairment.
- Evidence suggests air pollution is causally associated with increased risk of dementia.
- Residual confounding cannot be completely ruled out.
- Diversity of study designs, air pollutants and endpoints precludes meta-analysis.

GRAPHICAL ABSTRACT



environments

MDPI

Review

A scoping review of the effects of ambient air quality on cognitive frailty

James Robert Hodgson [1], Charlotte Benkowitz [2], Brian C. Castellani [3,*], Amanda Ellison [4], Rammina Yassaie [2], Helen Twohig [5], Roshni Bhudia [6], Otto-Emil Jutila [7] and Sally Fowler-Davis [8]

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Declines in mental health associated with air pollution and temperature variability in China

Tao Xue, Tong Zhu ✉, Yixuan Zheng & Qiang Zhang

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Review article

Is there a link between air pollution and mental disorders?

Massimiliano Buoli[a,*], Silvia Grassi[a], Alice Caldiroli[a], Greta Silvia Carnevali[a], Francesco Mucci[a], Simona Iodice[b], Laura Cantone[b], Laura Pergoli[b], Valentina Bollati[b]

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atmosphere

Article

Air Pollution and Long Term Mental Health

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ONE EXAMPLE OF IMPACT OF OUR THINKING FAILURE

Given the global impact of air pollution and PM2.5 on brain health and dementia, prevention through air quality improvement could lead to better-quality health outcomes, improve productivity and quality of life, and reduce health-related costs.

The WHO estimates that roughly 55 million people have dementia worldwide, at a global cost of roughly $1.3 trillion.

This figure is expected to rise to 139 million by 2050, with an estimated global cost of $2.8 trillion.

Even a modest reduction in those costs would have substantial societal and financial benefits, reducing pressures on the health and social care sectors and improving the lives of individuals, families, and carers.

Delaying the onset of Alzheimer's Disease for 5 years would result in 41% lower prevalence and 40% lower cost of the disease in 2050.

What is it that makes us seemingly unable to take the necessary action to avert the clearly impending environmental and social catastrophe?

The impact of air pollution on brain health is deeply intertwined with:

- Socio-economic inequality
- Pre-existing health inequalities

- Urban deprivation
- Urban metropolitan expansion

- Industrialisation

- Global mobility
- Western consumption lifestyle

- Rising temperatures, including usage of air conditioning and the need for a switch to fuel pumps

- Air pollution is generally invisible and its impact hard to concretely visualise for people

If thinking can change our path, does our inability to change our path suggest that we are not yet thinking?

Yes, we are not yet thinking in serious enough ways about the impact of air pollution on brain health.

Presently, while public policies have been developed to mitigate the impact of air pollution on a variety of health outcomes – from asthma and heart disease to chronic obstructive pulmonary disease and lung cancer – their value for brain and mental health are only just beginning to be explored.

The same is true of the need for new policies that are more ‘mental health’ specific, given that air pollution’s impact on the brain (e.g., dose response, pollutant mixture, pathways to disease), as in the case of vascular dementia versus Alzheimer’s for example, differs from how it increases the risk for asthma.

And so, what now?

Cognitive decline, dementia and air pollution

A report by the Committee on the Medical Effects of Air Pollutants

Chairman: Professor Frank Kelly
Chairman of Subgroup on Cognitive Decline and Dementia: Professor Robert L Maynard

Policy Agena for Mitigating the Impact of Air Pollution on Brain and Mental Health

1. Policy needs to focus on **how** the cities and towns in which we live impact the air we breath

2. We need strategies to **focus**, in particular, on the air quality of highly vulnerable groups, such as the elderly.

3. Scientists need to **build** historical models of air quality going back to the 1970s

4. We spend 80% of our time indoors. **More research** is needed on indoor air pollution

5. The next big scientific step is understanding **how** air pollution impacts brain health

6. Prental care, childhood, ageing -- these are the moments when air quality policies can have their **biggest impact**

7. Governments and foundations need to provide **more funding** in this area

8. We need to bring **public attention** to this issue. We need to get out the word

9. Universities, schools, healthcare providers, etc need to **educate** kids and adults about this issue

10. Existing campaigns on brain health, dementia, climate change, etc can **benefit** from linking to this issue

11. People need access to apps and monitors to **assess** the quality of the air they breath.

12. Scientists and governments need to better **evaluate** air pollution policies to improve mental and brain health

13. Everyone -- from citizens to businesses -- need to be **involved** in developing and implementing policy

14. Research needs to show how addressing air quality **helps** to address climate change and other environmental health issues

15. Policy needs to address how air pollution may **worsen** the health of those with dementia and other mental health issues