

Title: Living Through Crisis: Climate Change and Geriatric Mental Health

Authors Antoine Sader, MD and Rita Khoury, MD

Department of Psychiatry, American University of Beirut, Faculty of Medicine & the Medical Center Beirut, Lebanon

Key highlights:

- Chronic climate stressors such as heat, drought, air pollution affect older adults' mental health through neuroinflammation, cognitive vulnerability in addition to disruption of routine activities, social participation, and economic insecurity, all of which affect older adult mental wellbeing.
- Consequent acute disasters such as hurricanes, floods, and wildfires are strongly associated with depression, anxiety, and post-traumatic stress disorder, with prevalence rates reaching up to 50%.
- Climate-informed geriatric care should include routine screening after extreme events, attention to vulnerable subgroups, and integration of exposure-reduction strategies into care.
- While evidence on psychiatric presentations is growing, intervention strategies remain underdeveloped. Priorities include developing culturally appropriate assessments and psychosocial interventions, pragmatic health-system trials, pharmacological evaluation, and co-design with older adults to enhance feasibility and equity.

Introduction

When faced with climate change, older adults are living through two related crises: one external, in the form of floods, fires, heatwaves, or drought, and another internal, fueled by grief, worry, isolation, and the physical and economic toll these hazards stir. This double exposure makes ageing in the era of climate change uniquely challenging, amplifying risks for depression, anxiety, post-traumatic stress, sleep disruption, and cognitive decline [1]. These burdens fall hardest on those with the fewest buffers, turning a planetary crisis into a geriatric mental-health equity issue [2].

Direct and indirect mental health impacts

Evidence from clinical reviews and disaster studies shows that acute hazards such as hurricanes, floods, and wildfires are linked to higher rates of depression, anxiety, and post-traumatic stress disorder (PTSD) in older adults, often with symptoms persisting long after the event [3, 4]. In some cases, post-disaster PTSD prevalence among older adults has reached 50% [3]. In fact, after Hurricane Sandy, exposure to storm-related injury, crime, and service disruptions significantly increased the risk of depression in the geriatric population. This is mainly

due to the presence of Pre-existing medical condition, limited mobility and evacuation challenges, and higher dependence on disrupted services (medical care, medications, community support) [5]

Notably, risk patterns differed by age: adults aged 60–74 were vulnerable to multiple stressors, whereas among those ≥ 75 , loss of medical care was the predominant factor [3]. Furthermore, extreme climate events undermine the mental health of older adults by threatening livelihoods, causing displacement, and eroding community structures that otherwise serve as essential protective factor for old age mental wellbeing [2]. This said, socioeconomic strain mediate the risk of depression and anxiety in this population [2].

Environmental exposures also matter outside disasters. Slow-onset changes such as droughts, rising temperatures, and shifting rainfall patterns can gradually affect the older population mental and physical health [2]. Additionally, meta-analytic evidence links higher ambient temperatures with increased suicide risk, underscoring the lethality of heat as more than a somatic stressor in older adults [6]. In fact, even when there is no named disaster, hotter and more unstable weather constrains everyday activities that protect late-life mental health. These activities include time spent outdoors, physical and social activities, as well as land-based practices [5]. Reduced participation in these activities negatively impacts mood, sleep, cognition, and recovery from stress, creating a feedback loop of isolation and diminished resilience [2]. Furthermore, age not only increases exposure-related risks but also reduces adaptive capacity, making recovery slower and mental health consequences more enduring [5]. Moreover, air-quality degradation adds another layer, with mounting evidence tying pollution to cognitive decline and mood disorders in later life [7, 8]. Both short-term exposure to air pollution and to higher temperatures have been linked to an increased number of psychiatric hospitalizations among older adults [8].

At the other end of the thermal spectrum, extreme cold has also been linked to higher depression risk in a study conducted on rural older Chinese adults [9]. This link was disproportionately evident in older women, widowed individuals, those with lower education, and agricultural workers [9]. Cold weather increased depression directly by intensifying social isolation and loneliness, and indirectly through deteriorating physical health, reduced outdoor activity, and impaired sleep. Cognitive decline also emerged as a clinical mediator of climate change's impact on depression in this population [9].

Pathways and mechanisms: a biopsychosocial lens

Pathways from climate exposure to mental-health outcomes span biological, psychological, and social determinants. Heat and air pollution can aggravate neuroinflammation and cognitive vulnerability, particularly in the context of neurodegenerative diseases [7]. Long-term exposure to fine particulate matter is associated with higher risk of late-life depression, suggesting that environmental neurotoxicity and mood are linked in older age [8]. At the same time, systems and societal-level factors, such as limited access to health and social services, inadequate transportation, and financial insecurity, can further exacerbate climate change impact on the older population [10]. Risk and adaptive capacity vary by geography, culture, and socioeconomic status [10]. The Intergovernmental Panel on Climate Change (IPCC) identifies older adults as disproportionately affected, particularly where poverty, marginal housing, limited healthcare access, and historical marginalization intersect with climate hazards [10].

Resilience in older age is relational. Strong ties to family and neighbors, culturally grounded roles for elders, and supportive public systems (healthcare, social care, heat-health and clean-air infrastructure) mitigate harms endured by older adults [2]. Designing services that intentionally leverage elders' adaptive wisdom can strengthen preparedness and recovery while enhancing purpose and agency in late life [2].

Clinical implications and public health policies

For clinicians, a climate-informed geriatric assessment includes screening for mood, anxiety, PTSD symptoms, sleep disturbances, and cognitive changes after heat waves, smoke episodes, and disasters [1]; anticipating higher

risk among those with neurocognitive disorders or prior psychiatric illness [1]; and integrating exposure-reduction strategies (cooling plans, air filtration, medication reviews for thermoregulation and hydration risks) into routine care [1]. Clinicians should be aware that older adults often reflect on environmental change across the lifespan, experiencing grief and solastalgia for altered places, a sense of responsibility for current climate challenges, and concern for the future of younger generations [6]. While these emotions are typically non-pathological, they remain clinically meaningful as they shape patterns of help-seeking, coping strategies, and engagement with adaptation efforts [6].

For long-term-care and emergency planners, shelter-in-place–first strategies with geriatric-specific evacuation criteria, staffing, and continuity-of-care plans are essential [11]. Policy should align health, housing, and social services with climate adaptation funding cooling and clean-air infrastructure, strengthening community networks, and ensuring continuity of medical care during disruptions [10]

Conclusion & future directions

Chronic stressors such as cumulative heat exposure, prolonged hot seasons, and degraded air quality erode wellbeing more quietly by disrupting care routines, social participation, and economic stability, while simultaneously increasing physiological strain [1, 10]. These background pressures sustain vulnerability, creating a layered burden in which climate shocks trigger acute psychiatric distress further exacerbated by the warming, polluted environment. Evidence is mounting that older adults present with a range of psychiatric symptoms linked to climate exposures; however, research on management strategies remains sparse. Priorities for future work include the development of tailored assessment tools studying the impact of climate change on the wellbeing of older adults, in addition to culturally appropriate, cost-effective psychosocial interventions for disaster-exposed elders, pragmatic clinical trials embedded in health systems, and evaluation of pharmacological options where indicated. Importantly, co-designing interventions with older adults, drawing on their lived experience and adaptive wisdom, will enhance feasibility, equity, and impact [2].

Impact of climate change on mental health

Direct impacts

Indirect impacts

Air pollution leading to increased neuropsychiatric disorders	Climate-related emotions (eg, ecoanxiety, climate distress, travel shame, or solastalgia)
Climate-related infectious diseases affecting the CNS	Stress-related adjustment disorders
Heat leading to aggression, suicide, and a higher number of heat deaths for vulnerable populations	Maladaptive coping (eg, increased alcohol or substance use)
Climate-related starvation and its associated nutrient deficiencies	Increase in domestic violence
Unavailable medical care during climate disasters compounding brain health	Prejudice, bullying, and poor social determinants of health in new environments (eg, displaced immigrants)
	Trauma-related disorders (acute and chronic)
	Grief (eg, uncomplicated bereavement, prolonged grief, or ecogrief)
	Exacerbating pre-existing psychiatric disorders
	Triggering new-onset psychiatric disorders (eg, anxiety, mood, or psychotic disorders)

Direct and Indirect Impact of Climate Change on Mental Health

References:

1. Mehta, M.M., et al., *Climate Change and Aging: Implications for Psychiatric Care*. *Curr Psychiatry Rep*, 2024. **26**(10): p. 499-513.
2. Marinova, N., L. Calabria, and E. Marks, *A meta-ethnography of global research on the mental health and emotional impacts of climate change on older adults*. *Journal of Environmental Psychology*, 2025. **102**: p. 102511.
3. Sirey, J.A., et al., *Storm Impact and Depression Among Older Adults Living in Hurricane Sandy-Affected Areas*. *Disaster Med Public Health Prep*, 2017. **11**(1): p. 97-109.
4. Carnes, B.A., D. Staats, and B.J. Willcox, *Impact of climate change on elder health*. *J Gerontol A Biol Sci Med Sci*, 2014. **69**(9): p. 1087-91.
5. Thompson, R., et al., *Ambient temperature and mental health: a systematic review and meta-analysis*. *The Lancet Planetary Health*, 2023. **7**(7): p. e580-e589.
6. Gao, J., et al., *Ambient temperature, sunlight duration, and suicide: A systematic review and meta-analysis*. *Sci Total Environ*, 2019. **646**: p. 1021-1029.
7. Peters, A., *Ambient air pollution and Alzheimer's disease: the role of the composition of fine particles*. *Proc Natl Acad Sci U S A*, 2023. **120**(3): p. e2220028120.
8. Qiu, X., et al., *Association of Long-term Exposure to Air Pollution With Late-Life Depression in Older Adults in the US*. *JAMA Netw Open*, 2023. **6**(2): p. e2253668.
9. Liu, C., et al., *The impact of climate change on depression in rural Chinese older adult*. *Frontiers in Public Health*, 2025. **Volume 13 - 2025**.

10. Intergovernmental Panel on Climate, C., *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. 2022, Cambridge University Press: Cambridge, UK and New York, NY, USA.
11. Willoughby, M., et al., *Mortality in Nursing Homes Following Emergency Evacuation: A Systematic Review*. *J Am Med Dir Assoc*, 2017. **18**(8): p. 664-670.



Antoine Sader, MD, holds a medical degree from the University of Balamand and has been a Research Fellow in the Department of Psychiatry at the American University of Beirut since 2023. His primary research interests are neuropsychiatric symptoms associated with neurodegenerative diseases, particularly Alzheimer's and Parkinson's, and novel interventional treatments for Alzheimer's disease. Email: as326@aub.edu.lb



Dr. Rita Khoury is an adult and geriatric Psychiatrist, Assistant Professor of clinical psychiatry at the American University of Beirut, Lebanon. Email: rk224@aub.edu.lb