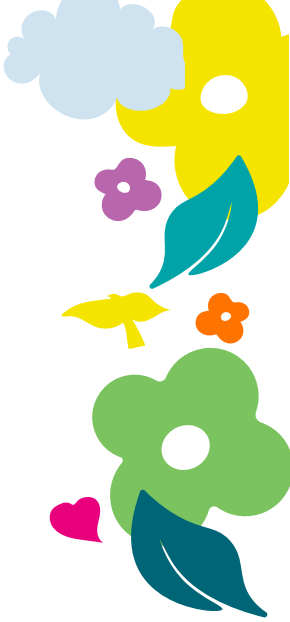
trigger



# Something in the air: Uncovering the overlapping crises of mental health, air pollution and climate change

Funded by the European Union

This project has received funding from the European Union under grant agreement n° 101057739.

climate-health cluster

# SUMMARY

Climate change and air pollution are critical environmental challenges with far reaching societal consequences, affecting public health, well-being, and sustainability. Alongside mental health, these issues pose significant risks across Europe and globally. Yet, these three issues are also interconnected, creating opportunities for synergistic ("win-win-win") policy solutions. The EU research project **TRIGGER**, part of the Climate-Health Cluster, aims to enhance understanding of the connections between climate change and health effects, providing insights for evidence-based policymaking. In recent years, there has been a growing recognition of the need to incorporate mental health into climate and environmental policy. This policy brief summarizes current evidence on the relationship between mental health and air pollution in Europe within the context of climate change and provides recommendations for policymakers to address these challenges in an integrated manner.

# KEY RECOMMENDATIONS

1. Integrate climate-related mental health challenges in EU policies
2. Strengthen air quality regulations and monitoring
3. Expand early warning systems for air pollution and climate hazards
4. Invest in climate-resilient health infrastructure
5. Support vulnerable groups and community resilience
6. Promote research, awareness, and capacity building

Funded by the European Union
This project has received funding from the European Union under grant agreement n° 101057739.

# THE NEXUS BETWEEN MENTAL HEALTH, CLIMATE CHANGE AND AIR POLLUTION

**Mental health** is a significant public health concern in the European Union (EU), affecting over 84 million people and imposing an annual economic cost of up to 4% of the EU's GDP (~ €600 billion).[1] The young and the elderly, people with disabilities and people in vulnerable situations (e.g., poverty) are particularly susceptible to mental health issues caused by various stressors. Recent global events – including the COVID-19 pandemic, rising costs of living and unemployment, the Russian war against Ukraine, and the ongoing climate crisis – have significantly impacted the mental health of many EU citizens.[2] While the COVID-19 pandemic has subsided, the climate crisis and persistent air pollution continue to impact mental health.

**Climate change** affects mental health through various pathways, from acute impacts of extreme weather events to chronic stresses such as prolonged heatwaves and degraded living environments.[3–5] These effects can contribute to anxiety, depression, and other mental health disorders, particularly among vulnerable groups. In addition, the indirect psychological effects of climate change are increasingly recognized, including experiences of anxiety and worry about climate change impacts (i.e., eco-anxiety), hopelessness and helplessness (i.e., eco-paralysis), grief over environmental degradation (i.e., solastalgia), or frustration about inaction in addressing the climate crisis (i.e., eco-anger).[3–5]

**Air pollution** is closely linked to climate change, as both air pollutants and greenhouse gases are often released from common sources, such as fossil fuel combustion for domestic heating, transportation, industrial activities, and agriculture. Moreover, climate change can exacerbate air pollution by altering weather conditions (e.g., temperature, precipitation, wind, and humidity) and raising risks of wildfires. Although the air quality in Europe has improved significantly over recent decades for most regulated air pollutants[6], it remains the most important direct environmental risk to human health[6], being responsible for over 239.000 premature deaths annually.[7] These deaths are mainly due to physical health impacts of air pollution, which are well-documented.[7] However, its detrimental effects on mental health are also becoming increasingly apparent.[7–10]

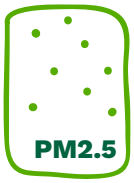
Despite this growing evidence base, **policy measures that simultaneously improve mental health, support climate action and tackle air pollution remain neglected**.[11] Although the EU has launched several initiatives to improve mental health — such as the **Healthier Together** initiative, where tackling mental health is a priority, and the **EU4Health Programme** (2021–2027), which funds research and prevention efforts addressing environmental risk factors — mental health remains largely overlooked in EU climate and environmental policies.[5,12] This policy brief explores the relationship between mental health and air pollution in Europe within the broader context of climate change and provides policy recommendations to address these challenges in an integrated manner.

Funded by the European Union
This project has received funding from the European Union under grant agreement n° 101057739.

# MENTAL HEALTH AND AIR POLLUTION

**Air pollution** refers to the presence of chemical, physical, or biological substances in the air that are harmful to human health or cause damage to the environment. Major sources of ambient air pollution include fossil fuel combustion (for heating, transportation, industry) and animal agriculture, as well as natural sources such as wildfires and volcanic eruptions. Air pollution typically consists of a mixture of various pollutants. Pollutants of major health concern are particulate matter ($PM_{2.5}$ and $PM_{10}$) and gaseous pollutants including nitrogen dioxide ($NO_2$), ground-level ozone ($O_3$), sulphur dioxide ($SO_2$), and carbon monoxide (CO).[9,13] While their impacts on respiratory and cardiovascular health are well known[14], there is a rapidly growing body of research documenting adverse mental health effects of acute and chronic exposure to air pollution **(Table 1)**.[9,10,15–19]

**Table 1 – Mental health impacts of prominent air pollutants**

| Particulate matter (PM) | Description | Mental health impacts |
|---|---|---|
|  | Solid or fluid particles with an aerodynamic diameter of ≤10 µm, mainly consisting of pollen, sea-spray, wind-blown dust (from erosion, agriculture, construction sites, roadways) and $PM_{2.5}$. | - Short term exposure increases the risk of **depression** and **suicide**.[15,16]<br>- Increased exposure during the second trimester of pregnancy may increase the risk of **post-partum depression**.[10] |
|  | Solid or fluid particles with an aerodynamic diameter of ≤2.5 µm, mainly from burning fossil fuels and chemical reactions. | - Long-term exposure increases the risk of **depression** and **anxiety**.[15–17]<br>- Increased exposure may **impair cognitive development,** contributing to attention problems and memory deficits.[9] |
| **Gaseous pollutants** | **Description** | **Mental health impacts** |
|  | Reddish-brown gas with a pungent odour, released from burning fossil fuels in traffic and industry. Involved in smog formation. | - Increased exposure might contribute to **depression**.[17,18]<br>- Long-term $NO_x$ exposure can contribute to **vascular dementia**.[10] |
|  | Major component of photochemical smog, formed by sunlight that interacts with $NO_x$ and volatile organic compounds. | - Although current associations with mental health outcomes are inconclusive[10], short-term exposure might contribute to **depression**.[17,18] |
|  | Colourless, toxic gas released from burning sulphur-bearing fossil fuels and volcanic activity. | - Short-term exposure may increase the risk of **depression**.[17,18]<br>- Acute exposure is associated with a higher risk of relapse in **schizophrenia** patients shortly after (5 to 7 days).[10] |
|  | Colourless, odourless gas produced by the incomplete combustion of organic fuels. | - Long-term exposure to high (vs. low) levels increases the risk for **dementia**.[10] |

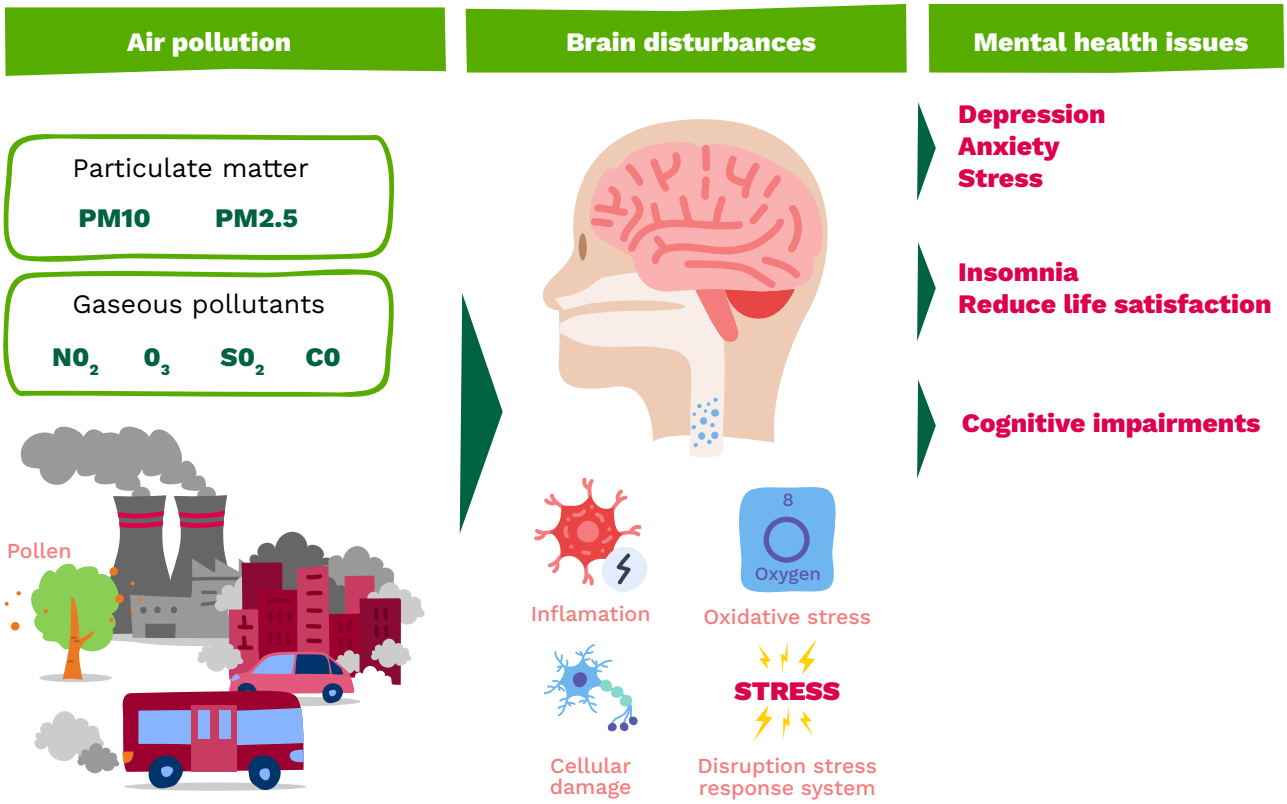
*Note.* The WHO provides more information about these air pollutants.

Funded by the European Union
This project has received funding from the European Union under grant agreement n° 101057739.

# How air pollution affects mental health

Chronic exposure to air pollution has been linked to sustained **mental health issues (Figure 1)**, such as increased rates of depression, anxiety, and stress.[9,15] Poor air quality can also lead to sleep disturbances like insomnia and reduced life satisfaction. The underlying biological mechanisms driving these effects are multifaceted, involving inflammation, oxidative stress and cellular damage in the brain, as well as disruptions to the stress response system (the hypothalamic-pituitary-adrenal axis).[9,15,20] Long-term exposure to air pollution may lead to increased levels of the stress hormone cortisol, impair cognitive functions, and increase the likelihood of mood and anxiety disorders.[9,21]

**Figure 1 – Mental health impacts of air pollution**




**The relationship between mental health and air pollution is highly complex.** Mental health outcomes rarely stem from a single factor but emerge from the interaction of multiple stressors, including other environmental influences such as urbanicity, temperature and weather conditions, as well as psychosocial factors such as personal experience, socioeconomic conditions and pre-existing mental health issues.[9,15] This multitude of factors makes it difficult to isolate causal effects of air pollution on mental health. Research efforts are further complicated by methodological challenges, such as limited longitudinal data, inconsistent definitions and measures of mental health and exposure, and variability in accounting for environmental and individual factors.[15] Addressing these challenges in the European context requires a nuanced research approach that further examines interactions between environmental stressors and individual vulnerabilities.[19]

Funded by the European Union
This project has received funding from the European Union under grant agreement n° 101057739.

# Environmental stressors

Key environmental stressors relevant to the nexus between mental health, air pollution and climate change include urbanicity, heatwaves, cold spells, droughts, wildfires and pollen.

Mental health impacts of air pollution are most severe in **urban areas.** Elevated pollution levels are part of urban living due to factors such as high population densities, traffic, and industrial activities. Furthermore, densely packed infrastructure traps air pollution and heat closer to the ground.

During **heatwaves,** prolonged conditions of heat and sunlight intensify the rate of chemical reactions, including the photochemical formation of ozone in "summer" smog, which can amplify heat-related mental distress. Extreme heat is linked with higher rates of aggression, irritability, and interpersonal conflict[22], and an increased risk of hospitalization due to mental disorders or suicidal behaviour.[10,19] These mental health problems may worsen under climate change, as the frequency and intensity of heatwaves are likely to increase in the coming decades, with southern Europe being more prone due to the warmer climate and higher pollution levels.[23]

During **cold winter months**, smog formation increases due to higher emissions from burning wood, coal, and fossil fuels for heating and accumulation of the pollutants near-surface under inversion weather types.[24] This "winter" smog tends to contain higher $NO_2$ and PM concentrations.

**Droughts** have become more severe in recent decades due to climate change, particularly in southern, eastern and western Europe.[23] Prolonged drought can cause economic stress (e.g., water scarcity, crop failures), especially in rural areas among farmers[4,5], and can also impact mental health by worsening air pollution. Dry conditions release more soil dust (PM) into the air and increase wildfire risks.[13,23]

**Wildfires** are a growing concern despite improved fire management[23], as climate change intensifies their frequency and severity. Wildfires threaten mental health in several ways. They can affect mental health directly—through acute effects such as anxiety, depression, and PTSD, but also indirectly, for example through smoke-related air pollution and the loss of natural spaces.[8,11] These risks are particularly pronounced in Mediterranean regions, where wildfires are more frequent.[25]

**Pollen** concentrations in the air may also increase due to climate change, adding complexity to the nexus between mental health, air pollution and climate. Pollen, naturally released by plants as part of their reproduction, can act as an environmental stressor and pollutant if allergenic. Rising temperatures and prolonged plant growing seasons increase pollen production, including highly allergenic species such as birch and ragweed. People living near green spaces with more allergenic pollen (real or perceived) experience poorer mental health.[26] Moreover, air pollutants such as $NO_2$ and ozone have been shown to increase the allergenicity of pollen, and thus the severity of allergies and asthma.[26]

Funded by the European Union
This project has received funding from the European Union under grant agreement n° 101057739.

# Vulnerable groups

Some groups are at higher risk of mental health effects from air pollution and climate change, including children and adolescents, the elderly, women, outdoor workers, and people with disabilities, pre-existing health issues or lower socioeconomic status.

**Children** and **adolescents** are more vulnerable to depression and anxiety following air pollution and its toxic effects on the brain.[20] Exposure to $PM_{2.5}$ pollution in early life can lead to cognitive impairments, including working memory and attention problems. Air pollution further increases the risk of autism, Attention Deficit Hyperactivity Disorder (ADHD), and behavioural problems.[9] Young people are also more anxious and distressed about climate change, and more vulnerable to hot and cold temperatures.[8]

**Older people** are also more vulnerable to depression and anxiety following air pollution and its toxic effects on the brain.[20] Long-term exposure to air pollution ($PM_{2.5}$, $NO_2$) is associated with cognitive decline and a higher risk of dementia, including Alzheimer's disease.[9] Older people are more likely to have pre-existing health issues that make them more vulnerable.[9,14]

**Women** are generally more physically vulnerable to environmental stressors than **men**[14], though evidence on the effects of air pollution on depression and anxiety is mixed.[20] Women are more likely to worry about climate change and generally have higher risk perceptions.[9]

**Outdoor workers** are more exposed to environmental stressors, including air pollution, heat and cold temperatures. Exposure to air pollution can negatively affect job performance and lead to higher work absenteeism because of mental health conditions such as anxiety.[8,27]

**People with disabilities** experience more severe physical and mental health impacts from air pollution and extreme temperatures.[28] Additionally, people with more severe disabilities are typically less able to cope with disrupted access to health care services due to extreme weather or with environmental changes, such as finding shelter or staying hydrated during heatwaves. However, the impacts vary significantly according to the type of disability and social factors such as the level of social care received and socioeconomic status.[28]

**Socioeconomic status** (SES) is a major vulnerability factor for both air pollution exposure and its mental health effects. People with a lower SES are more likely to live in high-pollution areas, such as industrial zones and busy roads, and are less likely to access the health benefits of green spaces.[29] These exposure disparities are compounded by existing major life stressors—including financial stress, job insecurity, and limited access to healthcare and social support networks—that already put them at higher risk for mental health issues such as depression and anxiety.[19] Together, these factors not only hinder the prevention and treatment of mental health conditions but also intensify the psychological toll of environmental stressors such as air pollution, heatwaves, and natural disasters.

Funded by the European Union
This project has received funding from the European Union under grant agreement n° 101057739.

# RECOMMENDATIONS

The following policy recommendations aim to confront the challenges of climate change, air pollution, and mental health in an integrated manner.

## 1. Integrate climate-related mental health challenges in EU policies

- **Embed mental health considerations in climate and environmental policies,** as the psychological impact of air pollution and climate change remains largely overlooked in EU and national policies.[5,12]
- **Ensure climate stressors are accounted for in mental health policies.** Mental health frameworks should include the impacts of heatwaves, displacement, and pollution-related stress, to ensure a holistic response.[12]
- **Expand access to mental health and psychosocial support (MHPSS) services** within national climate-health plans to better prevent and manage mental health issues related to environmental stressors.[11]

## 2. Strengthen air quality regulations and monitoring

- **Enforce stricter EU-wide air quality regulations** by aligning limits on key air pollutants ($PM_{2.5}$, $PM_{10}$, $NO_2$, $O_3$, $SO_2$, CO) with WHO guidelines. While the **2024 Ambient Air Quality Directive** is a significant step forward, further action is needed to meet the EU **Zero Pollution targets** by 2050 and further reduce pollution-related diseases and deaths. Strengthening air pollution regulations also supports the transition to **cleaner energy sources**, contributing to EU **climate neutrality** goals.
- **Enhance air pollution monitoring in high-risk areas** by deploying **real-time air quality sensors**, particularly in **schools, hospitals,** and **public transport hubs.**
- **Create an EU-wide Inequalities Register**, as proposed in the Zero Pollution Action Plan, to track regional disparities in pollution-related diseases and ensure equitable access to MHPSS services.

## 3. Expand early warning systems for air pollution and climate hazards

- **Implement real-time air pollution warning systems** that provide **mobile alerts, public health advisories, and urban digital displays** in high-pollution areas.
- **Strengthen early warning systems** for heatwaves, cold spells, wildfires and pollen to help at-risk populations prepare and protect themselves.
- **Support the Early Warnings for All (EW4All) initiative,** launched by the United Nations Secretary-General, which aims to ensure that by 2027, everyone on Earth is protected from hazardous weather, water, or climate events through life-saving early warning systems. The EU should actively contribute to this global effort by expanding access to climate and air pollution alerts, emergency preparedness programs, and community-based risk communication strategies.

Funded by the European Union
This project has received funding from the European Union under grant agreement n° 101057739.

## 4. Invest in climate-resilient health infrastructure

- **Expand urban greening initiatives in European cities.** Green (e.g., parks, forests, gardens) and blue spaces (e.g., rivers, lakes) provide multiple benefits: they can protect both physical and mental health by improving air quality, reducing urban heat, providing restorative "low stress" environments and encouraging physical and social activity.[4,9] Urban greening can also capture $CO_2$ from the atmosphere and restore biodiversity. The **Nature Restoration Law** and **EU Biodiversity Strategy 2030** reinforce this recommendation, calling upon cities to develop Urban Greening Plans to systematically bring nature back to cities.

- **Ensure equitable access to green spaces,** prioritizing low-income and high-pollution urban areas. Unintended negative effects on health should be avoided through strategic planning, by carefully selecting plant species and identifying priority areas to improve air quality and minimize urban heat, allergen exposure, and fire risks.[26]

- **Invest in infrastructure for sustainable transportation** (e.g., cycling and walking infrastructure, clean public transport, electric vehicles) and **energy efficient housing** to reduce pollution from traffic and heating, associated mental health risks and greenhouse gas emissions. More physical activity also supports mental health.[4]

## 5. Support vulnerable groups and community resilience

- **Strengthen social support of vulnerable groups** (e.g., children, the elderly, people with disabilities or low socioeconomic status) by providing targeted interventions. This includes MHPSS services in schools, elderly homes, work places and care centres, improving healthcare access for people with disabilities and marginalized communities, providing climate-adaptive public spaces, and offering timely information about climate-related health effects inclusive for all affected groups.[11]

- **Support community-based projects,** such as neighbourhood initiatives, local environmental action groups, or peer support networks, to build resilience, strengthen social cohesion and promote environmental justice.[4] To maximize the mental and social health benefits of urban greening projects (e.g., tree-planting, urban gardening), policymakers should pay particular attention to socially disadvantaged groups. Engaging local communities in the co-design and stewardship of green spaces ensures equitable access, can strengthen social ties, and can foster a sense of ownership in facing climate-related challenges.[4,9]

## 6. Promote research, awareness, and capacity building

- **Increase funding for interdisciplinary research** on the links between climate change, air pollution, and mental health to close the still huge knowledge and awareness gap.[9] **Promote the standardization of data collection methods across EU countries** to enable comparisons between studies. Currently, definitions of both environmental exposures and mental health outcomes vary considerably, making such comparisons difficult. Longitudinal study designs also remain scarce and should be supported to capture not only short- but also long-term mental health impacts.[5,9] More research on mental health interventions is also needed.[5,9]

Funded by the European Union
This project has received funding from the European Union under grant agreement n° 101057739.

- **Raise awareness on the mental health impacts of climate change** through targeted social outreach and engagement with health professionals, educators and the public. Information about the negative impacts of climate change on mental health should be combined with practical strategies to cope with environmental stressors such as air pollution and heat. Including psychological support, positive storytelling and empowerment techniques can foster resilience and encourage both individual and collective climate action.[9,11]
- **Train health professionals** to recognize and address the mental health impacts of climate change and environmental stressors through specialized education on stress, anxiety, trauma, and resilience-building strategies.[4,11]

# CONCLUSION

Climate change, air pollution and mental health are interconnected public health concerns that demand greater visibility and action. This policy brief from the TRIGGER project calls for a coordinated response, offering win-win-win opportunities for public health, environmental sustainability, and social equity. Key recommendations include integrating climate-related mental health challenges in EU policies, strengthening air quality regulations, investing in climate-resilient health infrastructure, supporting vulnerable groups and community resilience, and promoting research, awareness and capacity-building to elevate these issues. Implementing these measures will help build a healthier, more resilient and just society. As the TRIGGER project advances, it will provide novel scientific evidence, user-friendly tools and refined policy recommendations to prevent and reduce climate-related health impacts.

# ACKNOWLEDGEMENTS

This policy brief builds on findings from the report *The relation of climate change and human wellbeing in Europe: a systematic review* [9], produced as part of the **TRIGGER** project *(Solutions for Mitigating Climate-Induced Health Threats;* **https://project-trigger.eu**). TRIGGER is funded by the European Union under the Horizon Europe Funding Programme for Research and Innovation and is one of six member projects of the European Climate-Health Cluster (**https://climate-health.eu**). This brief is part of a broader series, complementing policy briefs on cardiovascular and respiratory health in relation to air pollution and temperature changes.

**Authors** (in alphabetical order): Ben De Groeve*, Barbara Mihók, Petros Mouzourides
*E-mail of corresponding author: **Benjamin.DeGroeve@joanneum.at**

**Reviewers** (in alphabetical order): Erika Brattich, Elke Hertig, Judith Köberl

**Design:** WeDo | Project Intelligence Made Easy SL

**Project coordinator:** Silvana Di Sabatino

Funded by the European Union
This project has received funding from the European Union under grant agreement n° 101057739.

# REFERENCES


**1.** European Union. (2023). Mental health in the EU. https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/751416/EPRS_BRI(2023)751416_EN.pdf

**2.** European Commission. Directorate General for Health and Food Safety. & Ipsos European Public Affairs. (2023). Flash Eurobarometer 530: Mental health. Publications Office. https://data.europa.eu/doi/10.2875/48999

**3.** Clayton, S., & Crandon, T. (2025). Climate Change and Mental Health. Annual Review of Clinical Psychology, 21. https://doi.org/10.1146/annurev-clinpsy-081423-025932

**4.** Lawrance, D. E., Thompson, R., Fontana, G., & Jennings, D. N. (2021). The impact of climate change on mental health and emotional wellbeing: Current evidence and implications for policy and practice. 36.

**5.** ECHO. (2022). Climate change impacts on mental health in Europe: An overview of evidence. https://climate-adapt.eea.europa.eu/en/observatory/evidence/health-effects/mental-health-effects/european_climate_health_observatory_mental-health_evidence_review_2022.pdf/

**6.** EEA. (2025). Air quality status report 2025. European Environmental Agency. https://www.eea.europa.eu/en/analysis/publications/air-quality-status-report-2025

**7.** EEA. (2024). Harm to human health from air pollution in Europe: Burden of disease status. European Environment Agency. https://doi.org/10.2800/3950756

**8.** Tota, M., Karska, J., Kowalski, S., Piątek, N., Pszczołowska, M., Mazur, K., & Piotrowski, P. (2024). Environmental pollution and extreme weather conditions: Insights into the effect on mental health. Frontiers in Psychiatry, 15, 1389051. https://doi.org/10.3389/fpsyt.2024.1389051

**9.** Rückle, K., Agrawal, A., Anderson, H., Balázs, B., Brattich, E., Carelli, M., De Luca, C., Di Sabatino, S., Johansson, M., Krishnan V, S., Mihók, B., Molter, A., Pilla, F., Pomee, M., Rohrer, Ruova, G., & M., Ruggieri, P., Scolobig, A., Vergadi, E., Hertig, E. (2024). The relation of climate change and human wellbeing in Europe: A systematic review (TRIGGER D2.1).

**10.** Radua, J., De Prisco, M., Oliva, V., Fico, G., Vieta, E., & Fusar-Poli, P. (2024). Impact of air pollution and climate change on mental health outcomes: An umbrella review of global evidence. World Psychiatry, 23(2), 244–256. https://doi.org/10.1002/wps.21219

**11.** Corvalan, C., Gray, B., Villalobos Prats, E., Sena, A., Hanna, F., & Campbell-Lendrum, D. (2022). Mental health and the global climate crisis. Epidemiology and Psychiatric Sciences, 31, e86. https://doi.org/10.1017/S2045796022000361

**12.** De Luca, C., Cavalieri, B., Baldassare, B., Ommer, J., & Kalas, M. (2024). Mitigation and adaptation policies at EU and international level (TRIGGER D2.4).

**13.** WHO. (2021). WHO global air quality guidelines: Particulate matter ( PM2.5 and PM10) , ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. License: CC BY-NC-SA 3.0 IGO. https://www.who.int/publications/i/item/9789240034228



Funded by the European Union

This project has received funding from the European Union under grant agreement n° 101057739.

**14.** Pomee, M. S., Vergadi, E., Stoyanova, A., Rückle, K., Van Kersen, W., Berghaus, T. M., Hoffman, A., Diemberger, I., Paraskakis, E., Ikäheimo, T., Pulakka, A., Krause, E., Serrano, M., Di Napoli, C., Brattich, E., Ruggieri, P., Di Sabatino, S., Scobolig, A., Mayr, W., ... Hertig, E. (2024). The impact of climate change on cardiovascular and respiratory health in Europe: A systematic review (TRIGGER D2.1).

**15.** Braithwaite, I., Zhang, S., Kirkbride, J. B., Osborn, D. P. J., & Hayes, J. F. (2019). Air Pollution (Particulate Matter) Exposure and Associations with Depression, Anxiety, Bipolar, Psychosis and Suicide Risk: A Systematic Review and Meta-Analysis. Environmental Health Perspectives, 127(12), 126002. https://doi.org/10.1289/EHP4595

**16.** Zeng, Y., Lin, R., Liu, L., Liu, Y., & Li, Y. (2019). Ambient air pollution exposure and risk of depression: A systematic review and meta-analysis of observational studies. Psychiatry Research, 276, 69–78. https://doi.org/10.1016/j.psychres.2019.04.019

**17.** Borroni, E., Pesatori, A. C., Bollati, V., Buoli, M., & Carugno, M. (2022). Air pollution exposure and depression: A comprehensive updated systematic review and meta-analysis. Environmental Pollution, 292, 118245. https://doi.org/10.1016/j.envpol.2021.118245

**18.** Fan, S.-J., Heinrich, J., Bloom, M. S., Zhao, T.-Y., Shi, T.-X., Feng, W.-R., Sun, Y., Shen, J.-C., Yang, Z.-C., Yang, B.-Y., & Dong, G.-H. (2020). Ambient air pollution and depression: A systematic review with meta-analysis up to 2019. Science of The Total Environment, 701, 134721. https://doi.org/10.1016/j.scitotenv.2019.134721

**19.** Crane, K., Li, L., Subramanian, P., Rovit, E., & Liu, J. (2022). Climate Change and Mental Health: A Review of Empirical Evidence, Mechanisms and Implications. Atmosphere, 13(12), 2096. https://doi.org/10.3390/atmos13122096

**20.** Zundel, C. G., Ryan, P., Brokamp, C., Heeter, A., Huang, Y., Strawn, J. R., & Marusak, H. A. (2022). Air pollution, depressive and anxiety disorders, and brain effects: A systematic review. NeuroToxicology, 93, 272–300. https://doi.org/10.1016/j.neuro.2022.10.011

**21.** Sunyer, J., Esnaola, M., Alvarez-Pedrerol, M., Forns, J., Rivas, I., López-Vicente, M., Suades-González, E., Foraster, M., Garcia-Esteban, R., Basagaña, X., Viana, M., Cirach, M., Moreno, T., Alastuey, A., Sebastian-Galles, N., Nieuwenhuijsen, M., & Querol, X. (2015). Association between Traffic-Related Air Pollution in Schools and Cognitive Development in Primary School Children: A Prospective Cohort Study. PLOS Medicine, 12(3), e1001792. https://doi.org/10.1371/journal.pmed.1001792

**22.** Miles-Novelo, A., & Anderson, C. A. (2019). Climate Change and Psychology: Effects of Rapid Global Warming on Violence and Aggression. Current Climate Change Reports, 5(1), 36–46. https://doi.org/10.1007/s40641-019-00121-2

**23.** Van Daalen, K. R., Romanello, M., Rocklöv, J., Semenza, J. C., Tonne, C., Markandya, A., Dasandi, N., Jankin, S., Achebak, H., Ballester, J., Bechara, H., Callaghan, M. W., Chambers, J., Dasgupta, S., Drummond, P., Farooq, Z., Gasparyan, O., Gonzalez-Reviriego, N., Hamilton, I., ... Lowe, R. (2022). The 2022 Europe report of the Lancet Countdown on health and climate change: Towards a climate resilient future. The Lancet Public Health, 7(11), e942–e965. https://doi.org/10.1016/S2468-2667(22)00197-9

Funded by the European Union

This project has received funding from the European Union under grant agreement n° 101057739.

**24.** Rodrigues, V., Gama, C., Ascenso, A., Oliveira, K., Coelho, S., Monteiro, A., Hayes, E., & Lopes, M. (2021). Assessing air pollution in European cities to support a citizen centered approach to air quality management. Science of The Total Environment, 799, 149311. https://doi.org/10.1016/j.scitotenv.2021.149311

**25.** Ruffault, J., Curt, T., Moron, V., Trigo, R. M., Mouillot, F., Koutsias, N., Pimont, F., Martin-StPaul, N., Barbero, R., Dupuy, J.-L., Russo, A., & Belhadj-Khedher, C. (2020). Increased likelihood of heat-induced large wildfires in the Mediterranean Basin. Scientific Reports, 10(1), 13790. https://doi.org/10.1038/s41598-020-70069-z

**26.** Legg, R., & Kabisch, N. (2024). The effects of allergenic pollen in green space on mental health, behaviour and perceptions: A systematic review. Urban Forestry & Urban Greening, 92, 128204. https://doi.org/10.1016/j.ufug.2024.128204

**27.** Bruyneel, L., Kestens, W., Alberty, M., Karakaya, G., Van Woensel, R., Horemans, C., Trimpeneers, E., Vanpoucke, C., Fierens, F., Nawrot, T. S., & Cox, B. (2022). Short-term exposure to ambient air pollution and onset of work incapacity related to mental health conditions. Environment International, 164, 107245. https://doi.org/10.1016/j.envint.2022.107245

**28.** Rhim, N., Lee, S., & Choi, K.-H. (2024). Adverse health effects of climate change and air pollution in people with disabilities: A systematic review. Epidemiology and Health, 46, e2024080. https://doi.org/10.4178/epih.e2024080

**29.** Bloemsma, L. D., Wijga, A. H., Klompmaker, J. O., Hoek, G., Janssen, N. A. H., Lebret, E., Brunekreef, B., & Gehring, U. (2022). Green space, air pollution, traffic noise and mental wellbeing throughout adolescence: Findings from the PIAMA study. Environment International, 163, 107197. https://doi.org/10.1016/j.envint.2022.107197

Funded by the European Union

This project has received funding from the European Union under grant agreement n° 101057739.