

Extreme temperature and air pollution and dementia in the population: a systematic review and meta-analysis of cohort and case-control studies

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ADMINISTRATIVE INFORMATION

Support - School.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202670035

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 July 2026 and was last updated on 13 July 2026.

INTRODUCTION

Review question / Objective To assess the strength of association between exposure to extreme temperatures and/or air pollution and the risk of incident dementia in the general population, quantified by pooled effect measures (odds ratio [OR], risk ratio [RR], or hazard ratio [HR]).

Condition being studied Mixed crowd.

METHODS

Participant or population General adult population without a diagnosis of dementia at baseline. Studies focusing on specific subpopulations will be included if they represent a general risk population.

Intervention Not applicable.

Comparator Groups with lower exposure levels (e.g., lower quintiles of pollution concentration,

non-extreme temperature periods) or unexposed groups, as defined within each primary study.

Study designs to be included Observational studies: prospective or retrospective cohort studies, case-control studies, and nested case-control studies.

Eligibility criteria 1.No full text available. 2.Not English.

Information sources WOS, pubmed.

Main outcome(s) Mortality and incidence.

Quality assessment / Risk of bias analysis Newcastle-Ottawa Scale (NOS).

Strategy of data synthesis Where appropriate, meta-analysis will be performed using a random-effects model to pool adjusted effect measures (OR, RR, or HR). For multi-category exposures, data for each exposure category compared to the reference will be extracted. If different effect

measures are reported, HRs will be prioritized for cohort studies, followed by RRs and ORs, with appropriate notes on interpretation.

Subgroup analysis pm2.5, pm10, O3.

Sensitivity analysis Sensitivity analyses will include: performing a leave-one-out analysis to assess the influence of individual studies.

Country(ies) involved China.

Keywords Particulate matter; ozone; temperature; dementia.

Contributions of each author

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