nature portfolio

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Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our Editorial Policies and the Editorial Policy Checklist.

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed
☐	☒ The exact sample size (*n*) for each experimental group/condition, given as a discrete number and unit of measurement
☒	☐ A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒ The statistical test(s) used AND whether they are one- or two-sided *Only common tests should be described solely by name; describe more complex techniques in the Methods section.*
☐	☒ A description of all covariates tested
☐	☒ A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒ A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☐	☒ For null hypothesis testing, the test statistic (e.g. *F*, *t*, *r*) with confidence intervals, effect sizes, degrees of freedom and *P* value noted *Give P values as exact values whenever suitable.*
☒	☐ For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☐	☒ For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☐	☒ Estimates of effect sizes (e.g. Cohen's *d*, Pearson's *r*), indicating how they were calculated

Our web collection on statistics for biologists contains articles on many of the points above.

Software and code

Policy information about availability of computer code

Data collection	R (version 4.3.3) was used for modeled temperature data extraction and pre-processing following collection. Modeled daily mean temperature data were downloaded from the Inter-Sectoral Impact Model Intercomparison Project (ISIMIP) database (https://www.isimip.org/) for five General Circulation Models (GFDL-ESM4, IPSL-CM6A-LR, MPI-ESM1-2-HR, MRI-ESM2-0, and UKESM1-0-LL) under three SSP scenarios (SSP1-2.6, SSP2-4.5, and SSP5-8.5).
Data analysis	All statistical analyses were performed in R (version 4.3.3). The R code used for the main analyses is publicly available on GitHub (https://github.com/hye0-n0/temperature-suicide-projection). Note that the deposited code uses simulated data for illustrative purposes only, as the original observed data cannot be shared publicly due to data-sharing agreements. Consequently, the outputs generated by the deposited code will differ from the results reported in this study.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio guidelines for submitting code & software for further information.

Data

Policy information about availability of data

All manuscripts must include a data availability statement. This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our policy

The observed daily temperature and suicide mortality data were obtained through the Multi-Country Multi-City (MCC) Collaborative Research Network (http://mccstudy.lshtm.ac.uk/) and cannot be made publicly available due to data-sharing agreements and privacy considerations. The data may be accessed for scientific purposes via a formal application to the MCC network. The dataset comprises daily suicide mortality counts and mean temperature data from 751 locations across 26 countries, sourced from official mortality registries and meteorological agencies. Further details are provided in the Supplementary Information.
Modeled daily mean temperature data are publicly available from the Inter-Sectoral Impact Model Intercomparison Project (ISIMIP) database (https://www.isimip.org/) for five General Circulation Models (GFDL-ESM4, IPSL-CM6A-LR, MPI-ESM1-2-HR, MRI-ESM2-0, and UKESM1-0-LL) under three SSP scenarios (SSP1-2.6, SSP2-4.5, and SSP5-8.5).

Research involving human participants, their data, or biological material

Policy information about studies with human participants or human data. See also policy information about sex, gender (identity/presentation), and sexual orientation and race, ethnicity and racism.

Reporting on sex and gender	N/A
Reporting on race, ethnicity, or other socially relevant groupings	N/A
Population characteristics	N/A
Recruitment	N/A
Ethics oversight	This study used suicide mortality data provided through the Multi-Country Multi-City (MCC) Collaborative Research Network. The use of these data for research purposes was approved by the local data providers in each country or conducted under existing data-sharing agreements that comply with national ethics regulations. No compensation was provided for this study.

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☒ Life sciences ☐ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Life sciences study design

All studies must disclose on these points even when the disclosure is negative.

Sample size	Daily time-series data on suicide mortality and mean ambient temperature from 751 locations across 26 countries, grouped into 10 geographical regions. The dataset covered diverse climatic zones and comprised a total of 1,781,922 suicide deaths. Modeled daily mean temperature data were obtained from the ISIMIP database for five GCMs under three SSP scenarios from 1970 to 2059 year.
Data exclusions	Locations with zero or only one recorded suicide case (Honolulu, Sotunga, Kökar, and Virdö) and locations with insufficient temperature data (Palencia and Ceuta) were excluded.
Replication	To quantify uncertainty in this study, eCIs for the estimates were obtained from 5,000 combinations generated using five general circulation models (GCMs) and 1,000 simulations based on the variance–covariance matrix of the second-stage meta-regression.
Randomization	We conducted an observational study with no experiments.
Blinding	We conducted an observational study with no experiments.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☒	☐ Clinical data
☒	☐ Dual use research of concern
☒	☐ Plants

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Plants

Seed stocks	N/A
Novel plant genotypes	N/A
Authentication	N/A