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Last updated by author(s): Nov 23, 2024

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	All data in this study were derived from China Kadoorie Biobank (CKB) and UK Biobank (UKB). Details are available from www.ckbiobank.org/site/Data+Access and https://www.ukbiobank.ac.uk.
Data analysis	Statistical analyses of data were performed with SAS 9.4 (SAS Institute, Cary, NC, USA) and R software (The R Foundation, http://www.r-project.org, version 4.0.2). The computer code used in this study is available from the corresponding author on reasonable request.

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 UK Biobank data are available from the UK Biobank on request (www.ukbiobank.ac.uk/). Details of how to access China Kadoorie Biobank data and details of the data release schedule are available from www.ckbiobank.org/site/Data+Access.

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	The information of sex was accessed through the questionnaire in UKB (filed ID:31) and CKB included as a covariate in the statistical analyses. For UKB, the sex information is acquired from central registry at recruitment, but in some cases updated by the participant. Hence this field may contain a mixture of the sex the NHS had recorded for the participant and self-reported sex. Sex proportion was reported and subgroup analyses on sex were also conducted.
Reporting on race, ethnicity, or other socially relevant groupings	Participants recruited in CKB were exclusively Asian. Ethnic background in UKB (filed ID: 21000) was acquired questions asked during the initial assessment as part of the touchscreen questionnaire. Over 94% participants were White in UKB. Other socially relevant variables such as household income were also collected. Confounding variables were adjusted in the models in our analysis.
Population characteristics	487,212 individuals from the CKB (mean age, 51.5 years; 40.9% male) and 418,895 individuals from the UKB (mean age, 55.9 years; 45.2% male) were included in this study. The baseline characteristics are shown in Supplementary Table 1 to 4. 69.3% participants in CKB reported never or rarely eat dairy products but the proportion was only 18.4% in UKB. Overall, participants with higher consumption of dairy products were more women and older whether in CKB or UKB.
Recruitment	CKB is one of the largest cohort studies that recruited over 500,000 adults from ten geographically diverse areas across China during 2004-2008. All participants gave written informed consent. For this analysis, participants with a history of CVD or cancer were excluded at baseline, which resulted in a sample of 487,212 individuals in the CKB. UKB is also a large prospective study of more than 500,000 people who were aged 37–73 years recruited from one of 22 assessment centers across the UK between 2007 and 2010. Participants were selected using the NHS register, and invited to volunteer for the study.
Ethics oversight	The CKB study received ethical approval from the Oxford University Tropical Research Ethics Committee, the Chinese Centre for Disease Control and Prevention (CDC) Ethical Review Committee and the local CDC of each study area. The UK Biobank received ethical approval from the research ethics committee (REC reference for UK Biobank 11/NW/0382).

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	This study explored the long-term association of total and different types of dairy consumption with the incidence of CVD in cohort studies including 487,212 individuals from the CKB and 418,895 individuals (for cheese intake frequency) or 183,446 individuals (for dairy products) from the UKB. This is the largest study investigating the association of dairy with CVD among the general population. The large size clearly implies that it will be very well powered to detect significant associations.
Data exclusions	In CKB, participants with a history of CVD or cancer were excluded at baseline, which resulted in a sample of 487,212 individuals in the CKB. In UKB, we excluded participants with a history of CVD or cancer at baseline and participants who withdrew during the follow-up (data cannot be used). Furthermore, we excluded persons without data on cheese consumption frequency from the food frequency questionnaire (FFQ) or those without information about 24-hour dietary recalls. Finally, 418,895 individuals in the UKB remained in the final analytical samples for cheese consumption and 183,446 individuals remained for individual dairy products.
Replication	In CKB, the adjusted Spearman coefficients of dairy consumption frequency were 0.4 for reproducibility and 0.5 for validity, comparing two FFQs conducted in the second and third surveys with the baseline FFQ, which implicated good performance of the FFQ. In UKB, five separate occasions of 24-hour dietary recalls were conducted during 2011-2012 to provide an average measure for individuals (repeated measurement per person).
Randomization	Not applicable: the CKB and UKB are observational cohort studies, not randomized studies.
Blinding	Not applicable: the CKB and UKB are observational cohort studies, not intervention studies.

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

Clinical data

Policy information about clinical studies

All manuscripts should comply with the ICMJE guidelines for publication of clinical research and a completed CONSORT checklist must be included with all submissions.

Clinical trial registration	The CKB study received ethical approval from the Oxford University Tropical Research Ethics Committee, the Chinese Centre for Disease Control and Prevention (CDC) Ethical Review Committee and the local CDC of each study area. The UK Biobank received ethical approval from the research ethics committee (REC reference for UK Biobank 11/NW/0382).
Study protocol	Sudlow C, Gallacher J, Allen N, Beral V, Burton P, Danesh J, Downey P, Elliott P, Green J, Landray M, Liu B, Matthews P, Ong G, Pell J, Silman A, Young A, Sprosen T, Peakman T, Collins R. UK biobank: an open access resource for identifying the causes of a wide range of complex diseases of middle and old age. PLoS Med. 2015;12(3):e1001779. Chen Z, Chen J, Collins R, Guo Y, Peto R, Wu F, Li L; China Kadoorie Biobank (CKB) collaborative group. China Kadoorie Biobank of 0.5 million people: survey methods, baseline characteristics and long-term follow-up. Int J Epidemiol. 2011;40(6):1652-66.
Data collection	CKB is one of the largest cohort studies that recruited over 500,000 adults from ten geographically diverse areas across China during 2004-2008. During recruitment, participants completed a laptop-based questionnaire (collecting information including sociodemographic characteristics, medical history and lifestyle factors), and provided anthropometric measurements and biological samples. Participants were asked about the consumption frequency of 12 major food groups, including total dairy products over the preceding year by a qualitative FFQ. In the UKB, Between 2006 and 2010, more than 500,000 individuals aged 37-73 years in England, Wales and Scotland consented to participate in the UKB. At 22 assessment centers, they completed touch screen questionnaires, underwent a series of physical examinations, and also provided biological samples. The touch-screen short dietary questionnaire that consisted of 29 diet questions over the past 12 months, including frequency of cheese intake and type of milk. Five separate occasions of 24-hour dietary recalls were conducted during 2011-2012 to provide an average measure for individuals (repeated measurement per person). The Oxford WebQ used in online 24-hour dietary recalls performed well across key nutrients which were validated using objective urine biomarkers.
Outcomes	Detailed information used to define incident CVD cases including fatal or non-fatal CHD and stroke is presented in Supplementary Table 27. Incident cases of CVD were identified by using linkages with disease registries, national health insurance claim databases, and the local disease surveillance points system death registries by reviewing residential records and/or by visits to local communities for those uninsured participants in CKB. In UKB, information on the CVD cases of all participants was obtained from cumulative hospital inpatient records, death certificates in the national death registries, and self-reports from interview during follow-up. All events were ascertained using the International Classification of Diseases, 10th Revision (ICD–10).

Plants

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