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Reporting Summary

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Statistics

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

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<i>Only common tests should be described solely by name; describe more complex techniques in the Methods section.</i> |
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<i>Give P values as exact values whenever suitable.</i> |
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| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 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 No software was used.

Data analysis All statistical analyses were performed using Stata (version 15.0, StataCorp), and graphs were plotted using R version 4.0.3. Analysis code for this study is available at <https://github.com/qiufen-code/lifestyle-simulation-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](#)

CKB data are available to all bona fide researchers. Details of how to access and details of the data release schedule are available from www.ckbiobank.org/site/Data+Access. As stated in the access policy, the CKB study group must maintain the integrity of the database for future use and regulate data access to comply with

prior conditions agreed with the Chinese government. Data security is an integral part of the CKB study protocols. Data can be released outside the CKB research group only with appropriate security safeguards.

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	Sex was determined based on self-reporting in both CKB and CNHS, and all participants signed an informed consent form. We performed all analyses for men and women separately, and the findings of this study could be applied to both men and women.
Reporting on race, ethnicity, or other socially relevant groupings	We did not use any socially constructed categorization variables in this study.
Population characteristics	See description in the "Behavioural & social sciences study design" section. Details have also been given in Supplementary Table 3 in the supplementary material.
Recruitment	We utilized two data sources in this study: the China Kadoorie Biobank (CKB) and China Nutrition and Health Surveillance (CNHS, 2015). Detailed descriptions of the respective study designs for the two databases are provided in the "Methods" section of the main text.
Ethics oversight	The CKB study was approved by the Ethics Review Committee of the Chinese Center for Disease Control and Prevention (CDC; Beijing, China) and the Oxford Tropical Research Ethics Committee, University of Oxford (UK). The CNHS study was approved by the Ethical Committee of China CDC.

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](https://www.nature.com/documents/nr-reporting-summary-flat.pdf)

Behavioural & social sciences study design

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

Study description	This study is a comprehensive quantitative analysis integrating both cohort and cross-sectional study designs to examine the impact of changes in multiple lifestyle factors and their combined effects on life expectancy of the Chinese population.
Research sample	The CKB study is a nationwide population-based prospective cohort study with 5 urban and 5 rural locations. The mean baseline age of the 512,726 participants included in the 2004-08 baseline survey was 52 years, with 41% being males. The CNHS study is the latest round of cross-sectional surveys for Chinese national nutrition and chronic disease surveillance. We utilized data from the 2015 adult survey in this study. The participants were selected from 31 provincial-level administrative divisions in the mainland of China, ensuring national representativeness. The mean age of the 67,564 participants eligible for this study is 55 years, with 46.6% being males.
Sampling strategy	No sample size was pre-calculated for both CKB and CNHS study. Both studies incorporated large number of people from diverse populations, providing adequate statistical power to: (1) develop a robust all-cause mortality risk prediction model, and (2) characterize current population-level lifestyle patterns. In CKB, potentially eligible participants in each of 100-150 administrative units (rural villages or urban residential committees) randomly selected for the study within each region were identified through official residential records, and invitation letters (with study information leaflets) were delivered door-to-door by local community leaders or health workers, following extensive publicity campaigns. Participants in CNHS were selected using a stratified multistage cluster sampling scheme from 302 survey sites, which were drawn from 605 monitoring sites of Disease Surveillance points system across 31 provincial-level administrative divisions in the mainland of China. Details of the sampling process have been described elsewhere (Yu D. China CDC Weekly 2021).
Data collection	In CKB study, a Regional Coordinating Centre and survey team, consisting of about 15 full-time staff with medical qualifications and fieldwork experience, were established in each of the 10 study areas to collect data. At the baseline survey, detailed socio-demographic, lifestyle and medical history data were collected using an interviewer-administered laptop-based questionnaire. The physical measurements included height, weight, blood pressure and resting heart rate (UA-779 digital monitor), using standard instruments and protocols and with regular calibrations. For each participant, a 10-ml sample was collected into one EDTA vacutainer (BD Hemogard™). The CNHS survey was conducted by trained local CDC staff, and the information collection method was basically the same as that of CKB. The instruments used for anthropometric measurements were selected by the national project team. For each participant, 8-ml fasting venous blood was collected and properly stored. No other person was presented besides the researchers and participants, and the researchers were blind to the study hypothesis during data collection.

Timing	The baseline survey of the CKB study was conducted from 25 June 2004 to 15 July 2008. The CNHS study was completed during 2015.
Data exclusions	Two participants in the CKB were excluded due to missing data for body mass index. For CNHS study, participants were excluded if: (1) they could not be weighted due to lack of address information (n=62); (2) they were younger than 30 years of age (n=7,289; in accordance with the CKB population used for model development); (3) they had missing data on the predictors (n=3,605); (4) they had implausible food intakes (n=2,230; fresh fruits >600 g/d, red meat >400 g/d, fish/seafood >200 g/d; the cut-off values were chosen based on the upper 99th percentile value).
Non-participation	The CKB study invited all eligible participants to participate and the estimated population response rate was ~30% (26-38% in the five rural areas and 16-50% in the five urban areas). Overall, 515 681 people attended the baseline survey between June 2004 and July 2008, of whom approximately 0.5% withdrew before completion, or were found subsequently to have inadvertently attended the survey twice at different time points, or had major data errors. Among eligible participants in the CNHS, the overall response rate was about 85%.
Randomization	Not applicable in the present study because participants were not allocated to experimental groups.

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

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<input checked="" type="checkbox"/>	<input type="checkbox"/> Animals and other organisms
<input checked="" type="checkbox"/>	<input type="checkbox"/> Clinical data
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<input checked="" type="checkbox"/>	<input type="checkbox"/> Plants

Methods

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<input checked="" type="checkbox"/>	<input type="checkbox"/> Flow cytometry
<input checked="" type="checkbox"/>	<input type="checkbox"/> MRI-based neuroimaging

Plants

Seed stocks	Report on the source of all seed stocks or other plant material used. If applicable, state the seed stock centre and catalogue number. If plant specimens were collected from the field, describe the collection location, date and sampling procedures.
Novel plant genotypes	Describe the methods by which all novel plant genotypes were produced. This includes those generated by transgenic approaches, gene editing, chemical/radiation-based mutagenesis and hybridization. For transgenic lines, describe the transformation method, the number of independent lines analyzed and the generation upon which experiments were performed. For gene-edited lines, describe the editor used, the endogenous sequence targeted for editing, the targeting guide RNA sequence (if applicable) and how the editor was applied.
Authentication	Describe any authentication procedures for each seed stock used or novel genotype generated. Describe any experiments used to assess the effect of a mutation and, where applicable, how potential secondary effects (e.g. second site T-DNA insertions, mosaicism, off-target gene editing) were examined.