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Supplementary Methods

The China Health and Retirement Longitudinal Study

To select participants for the study, a multistage sampling method was used, stratified by region (urban districts and rural counties) and per capita GDP statistics. A total of 150 district or county-level units were randomly chosen using a probability-proportional-to-size sampling technique from a sampling frame that included all county-level units in 28 provinces across China.

The study protocol was approved by the Ethical Review Committee at Peking University. Written informed consent was obtained from all the participants. The China Health and Retirement Longitudinal Study was supported by the Behavioral and Social Research division of the National Institute on Aging of the National Institute of Health (grants 1-R21-AG031372-01, 1-R01-AG037031-01, and 3-R01AG037031-03S1); the Natural Science Foundation of China (grants 70773002, 70910107022, and 71130002), the World Bank (contracts 7145915 and 7159234), and Peking University. The Health and Retirement Study is grateful to the Division of Behavioral and Social Research of the National Institute on Aging of the National Institutes of Health for primary support of this project (U01 AG009740) and to the Social Security Administration for substantial co-funding.

The English Longitudinal Study of Ageing

Ethical consent has been obtained for all waves. ELSA was approved by the London Multi-Centre Research Ethics Committee, the National Hospital for Neurology and Neurosurgery & Institute of Neurology Joint Research Ethics Committee, the Berkshire Research Ethics Committee, the NRES Committee South Central - Berkshire, the South Central – Berkshire Research Ethics Committee.

Funding for the English Longitudinal Study of Ageing is provided by the National Institute of Aging [grants 2R01AG7644-01A1 and 2R01AG017644] and a consortium of UK government departments coordinated by the Office for National Statistics.

The Health and Retirement Study

Participants in the study were selected using a stratified, multistage, probability-sampling design, with oversampling of African-American and Hispanic households. Prior to 2004, follow-up interviews were conducted by telephone for individuals aged 80 and younger, while those over 80 received face-to-face interviews. Starting in 2006, the sample was divided, with half receiving face-to-face follow-up interviews and the other half receiving telephone interviews. These half-samples alternated in waves, allowing for longitudinal data from face-to-face interviews to be collected every four years at the individual level.

The HRS has been approved by the Institutional Review Board at the University of Michigan. The HRS obtained informed verbal consent from the voluntary participants and followed strict procedures to protect study participants from disclosure (including maintaining a Federal Certificate of Confidentiality).

The Survey of Health, Ageing and Retirement in Europe

The SHARE was approved by the Ethics Committee of the University of Mannheim. The SHARE data collection procedures are subject to continuous ethics review by international research ethics principles such as the professional and ethical guidelines for the conduct of socio-economic research and the Declaration of Helsinki.

The SHARE data collection has been primarily funded by the European Commission through the 5th framework programme (project QLK6-CT-2001-00360 in the thematic programme Quality of Life). Additional funding came from the US National Institute on Ageing (U01 AG09740-13S2, P01 AG005842, P01 AG08291, P30 AG12815, Y1-AG-4553-01 and OGHA 04-064). Data collection in Austria (through the Austrian Science Fund, FWF), Belgium (through the Belgian Science Policy Office) and Switzerland (through BBW/OFES/UFES) was nationally funded.

Covariates

Highest educational attainment was categorized as low (CHARLS: 0 years of education; ELSA: <10 years; HRS: <12 years; SHARE: <7 years), intermediate (CHARLS: 1-11 years of education; ELSA: 10-12 years; HRS: 12 years; SHARE: 7-12 years), and high (CHARLS: ≥ 12 years of education; ELSA: >12 years; HRS: >12 years; SHARE: >12 years).

The frequency of moderate and vigorous physical activity was self-reported in CHARLS, ELSA, and SHARE, while only vigorous physical activity was assessed in HRS. The frequency of alcohol consumption was self-reported in CHARLS, ELSA, and HRS, while only the presence of alcohol consumption was assessed in SHARE. In CHARLS, physical activity was assessed based on the duration and frequency spent in different physical activities, from which the metabolic equivalent of task (MET) was calculated.¹⁹ MET from moderate and vigorous physical activity was computed by multiplying the length (minutes per week) by an assigned MET value (4 MET for moderate physical activity and 7.5 MET for vigorous physical activity).¹⁹ In HRS, participants were divided into quintiles according to moderate physical activity or vigorous physical activity. In SHARE, self-reported physical activity data were collected, encompassing questions regarding the frequency of participation in vigorous, moderate, and light physical activities. Participants were asked to indicate their frequency of engagement as more than once per week, once per week, one to three times per month, or hardly ever.

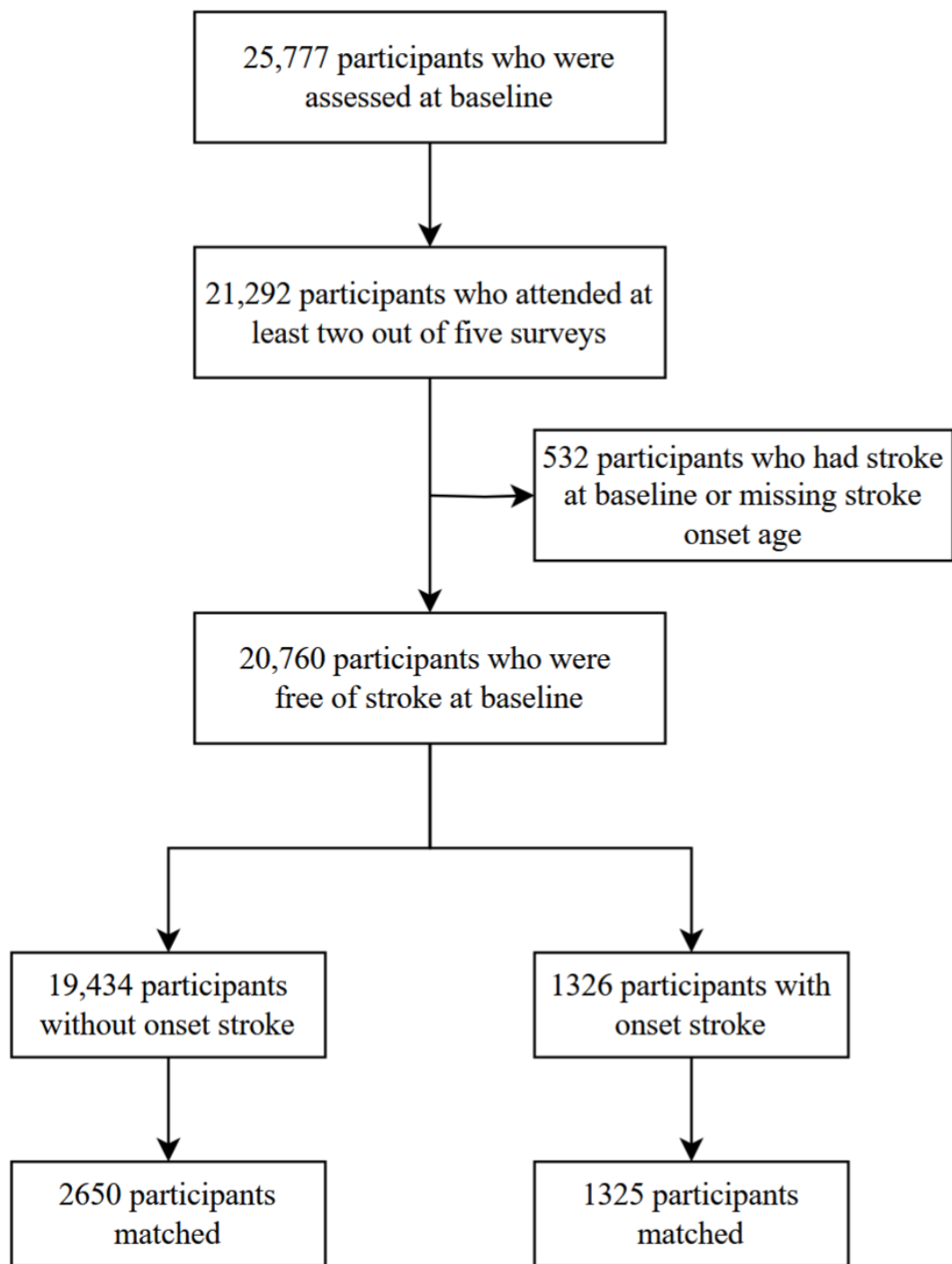


Figure S1. Flowchart of the population selection for the China Health and Retirement Longitudinal Study

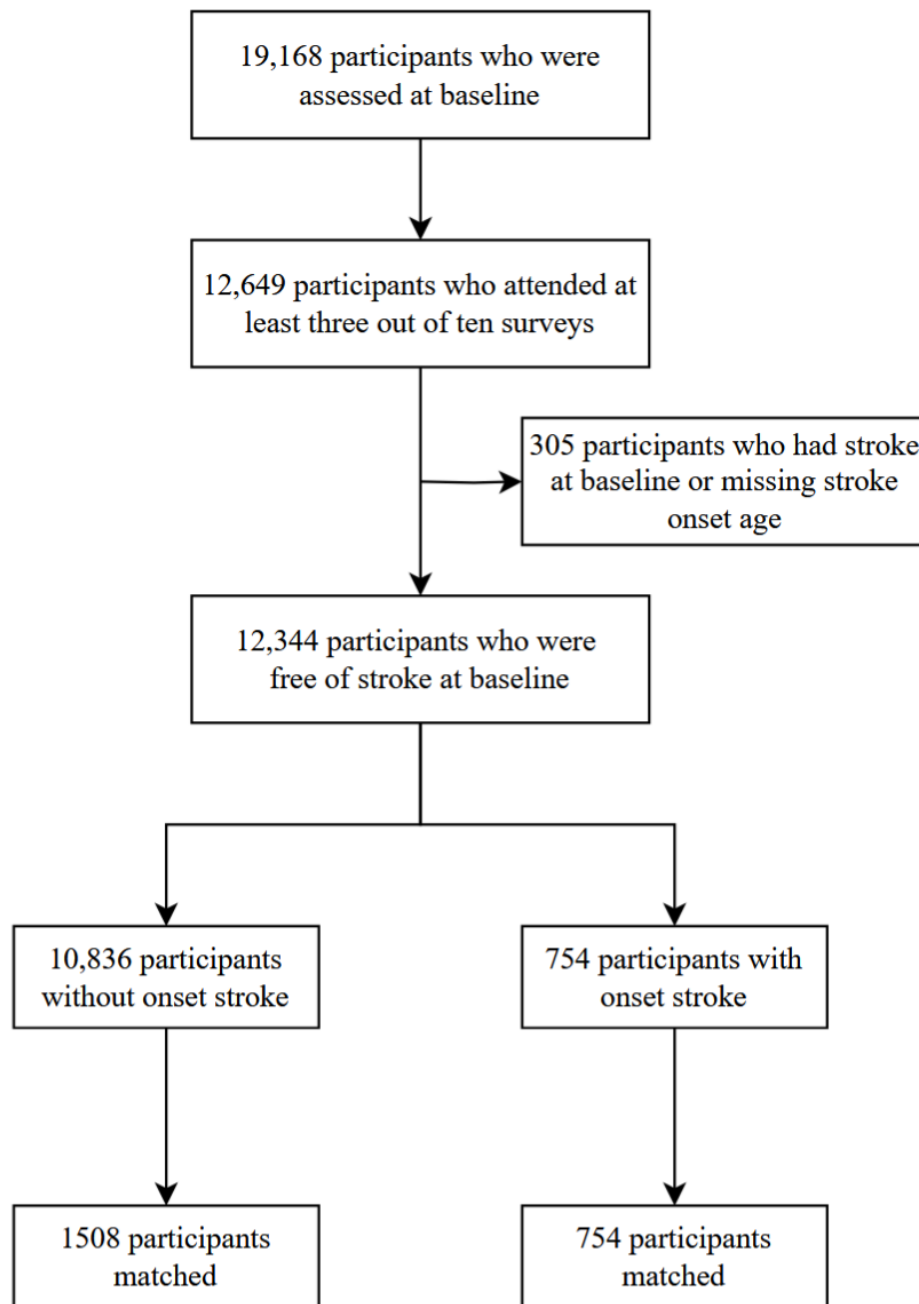


Figure S2. Flowchart of the population selection for the English Longitudinal Study of Ageing

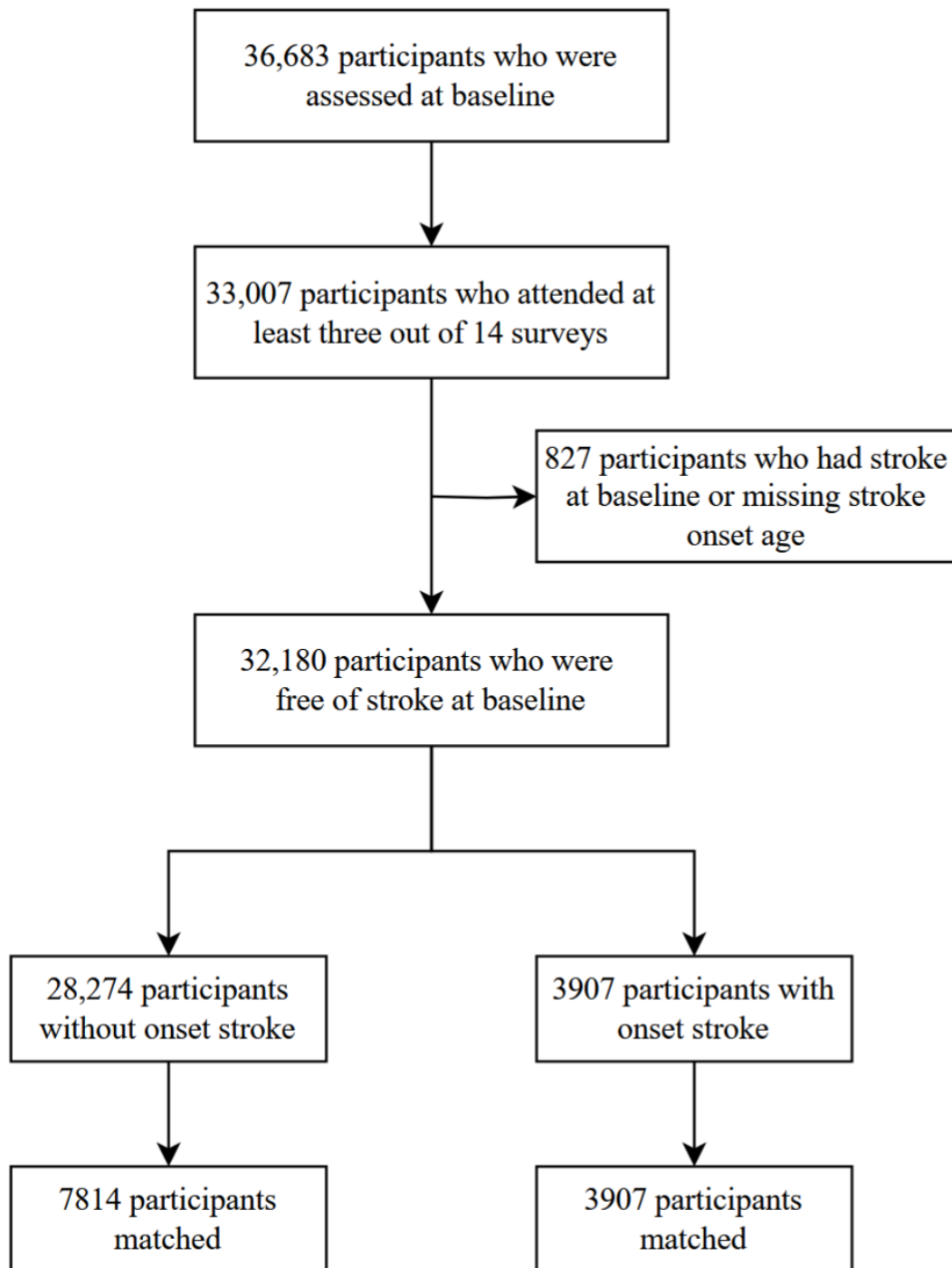


Figure S3. Flowchart of the population for the Health and Retirement Study

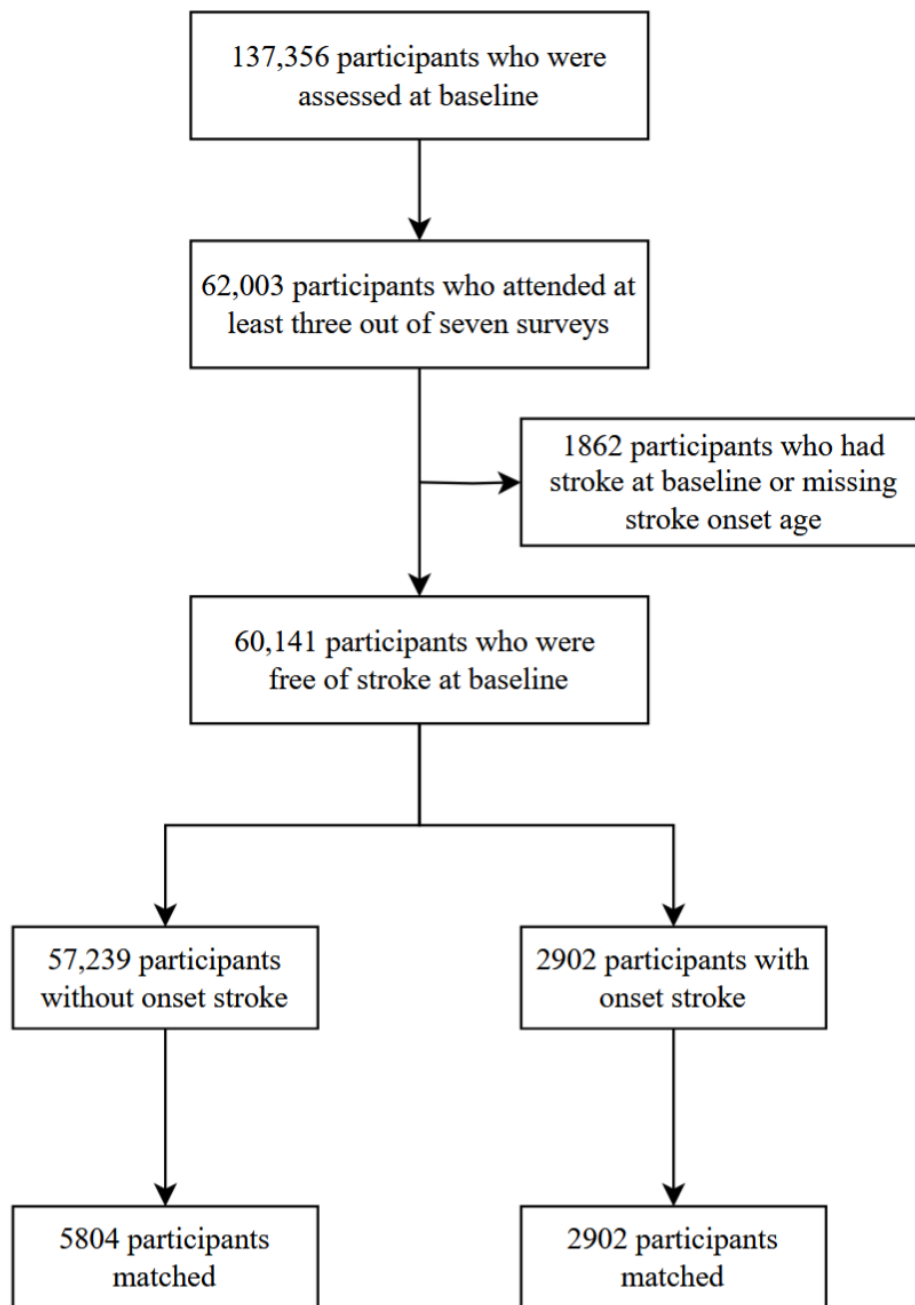


Figure S4. Flowchart of the population for the Survey of Health, Ageing and Retirement in Europe

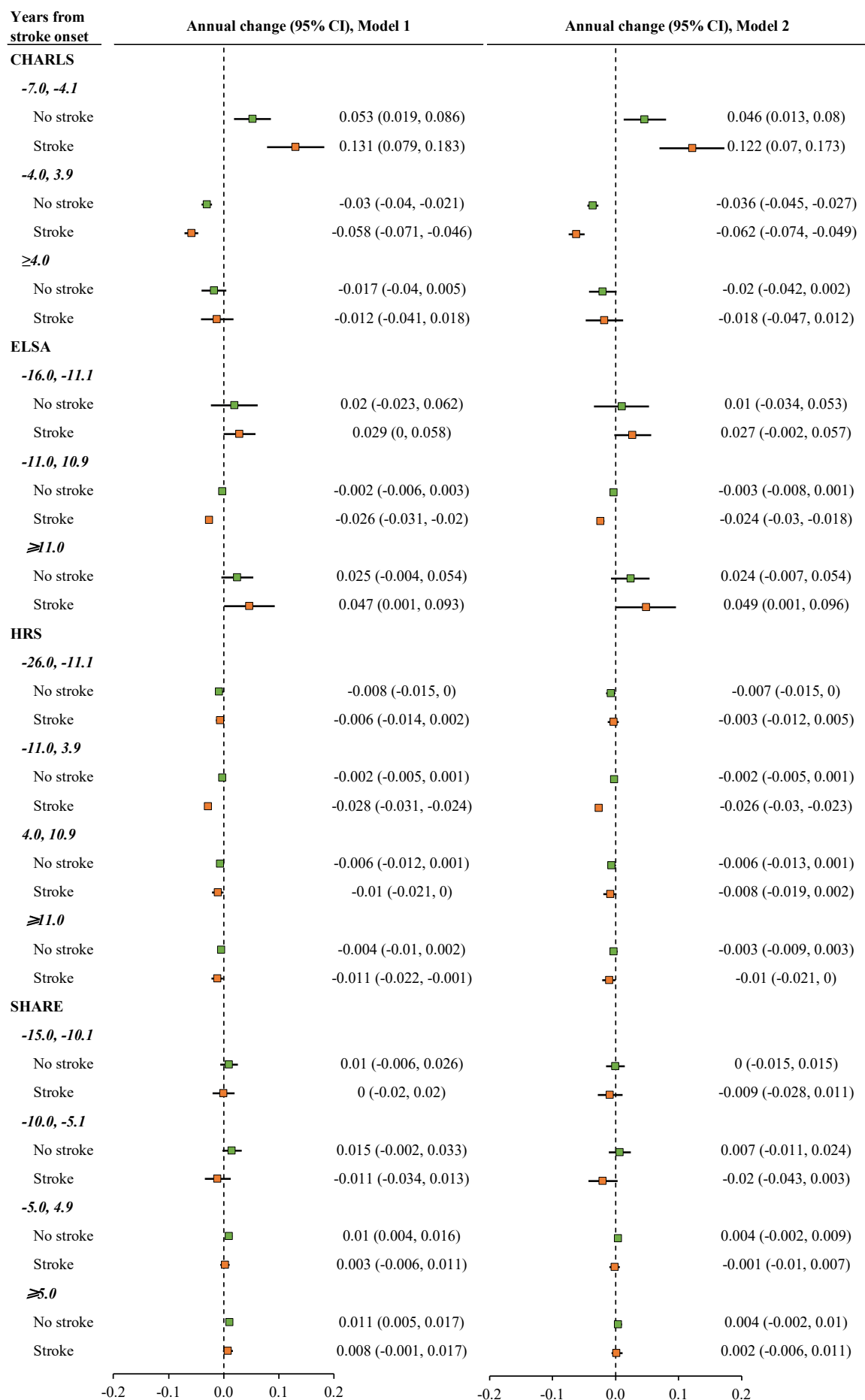


Figure S5. Annual changes in memory in by years from stroke onset in individual cohorts

The optimal number of knots was determined using the Akaike and Bayesian information criteria. Ranges of years from stroke onset were then divided according to these knots. Linear mixed models were used to estimate the annual change in memory for each range of years from stroke onset. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for individuals without stroke, and red colors refer to the estimates for individuals with stroke.

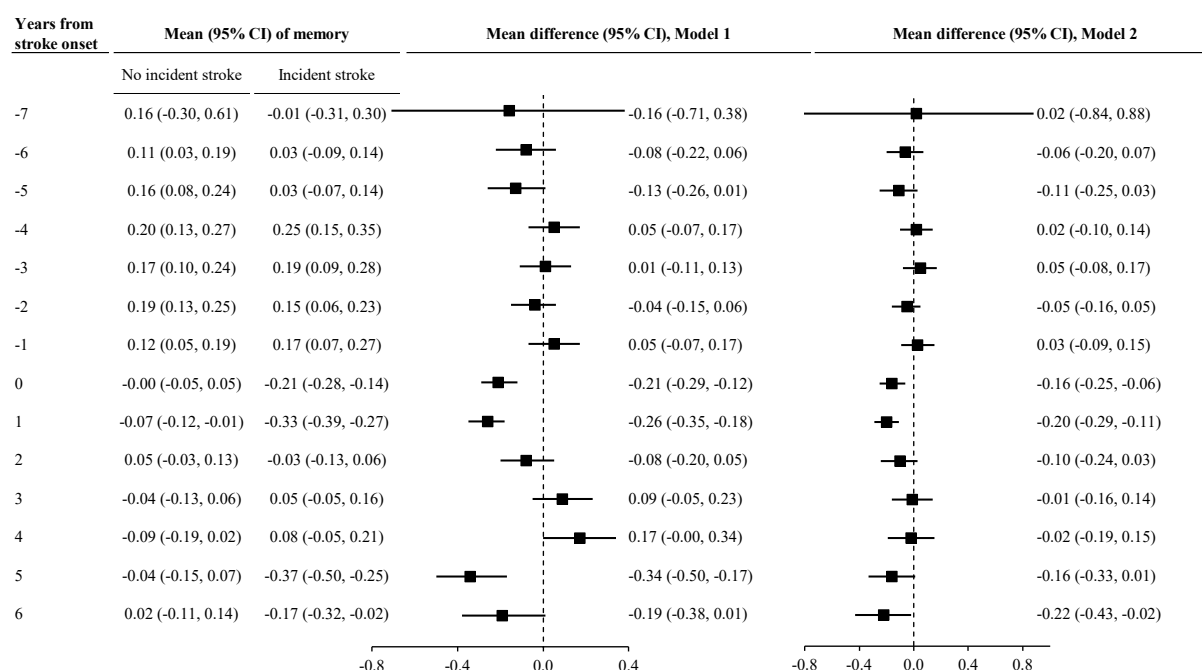


Figure S6. Memory associated with incident stroke by years from stroke onset in the China Health and Retirement Longitudinal Study

The mean difference in memory between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

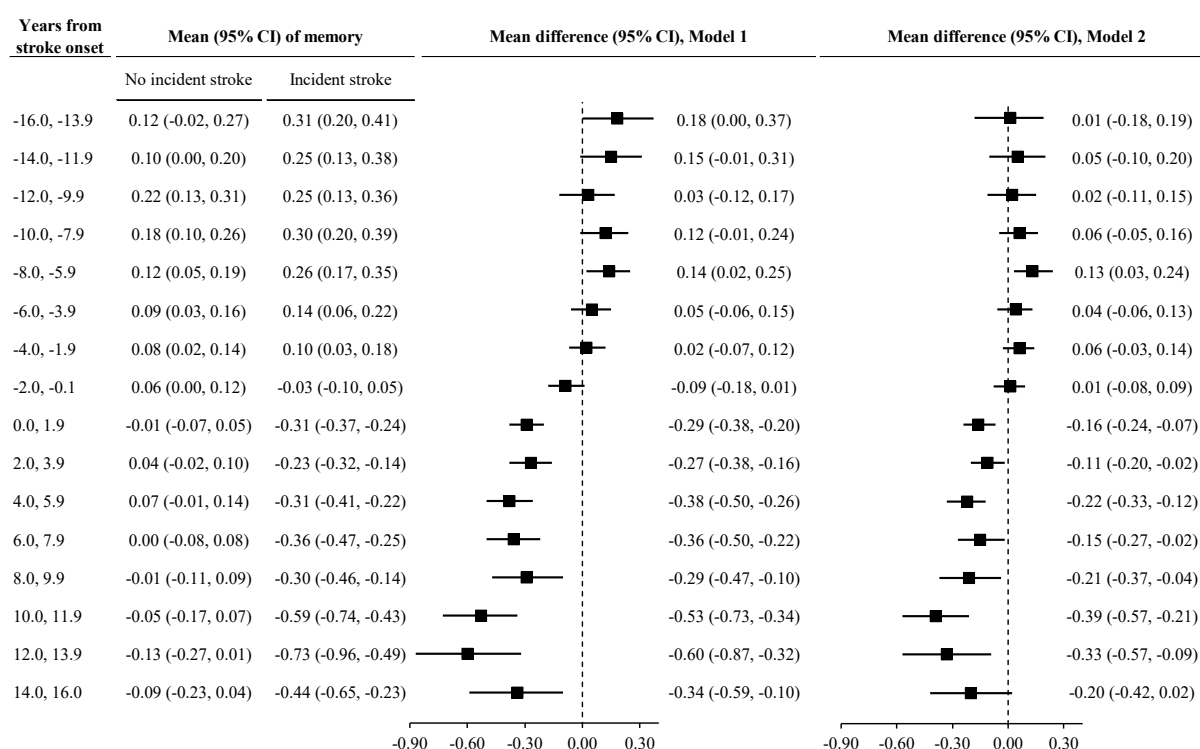


Figure S7. Memory associated with incident stroke by years from stroke onset in the English Longitudinal Study of Ageing

The mean difference in memory between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

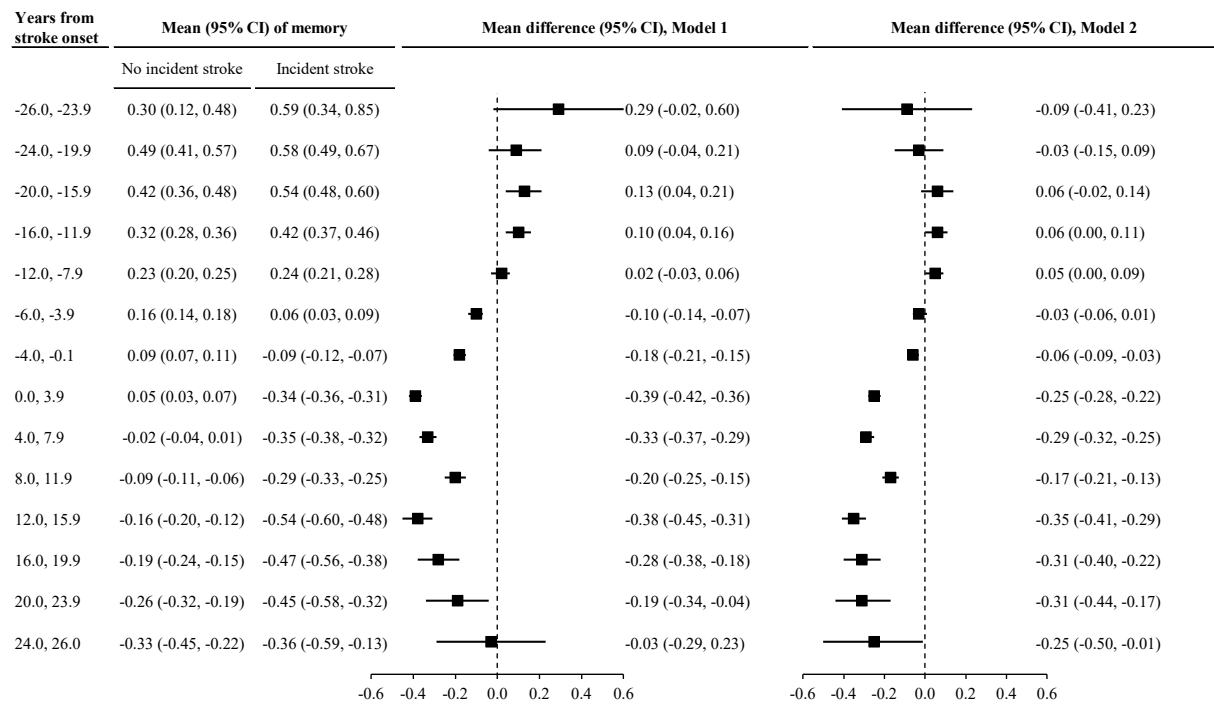


Figure S8. Memory associated with incident stroke by years from stroke onset in the Health and Retirement Study

The mean difference in memory between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

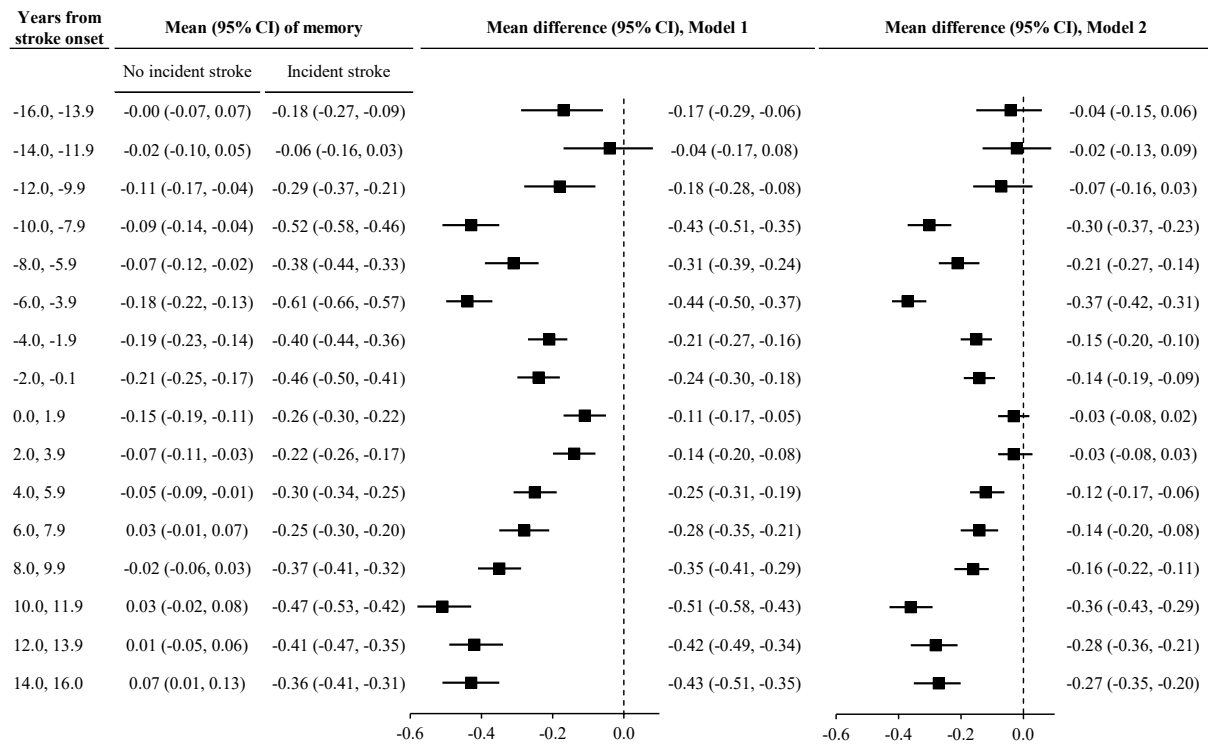


Figure S9. Memory associated with incident stroke by years from stroke onset in the Survey of Health, Ageing and Retirement in Europe

The mean difference in memory between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

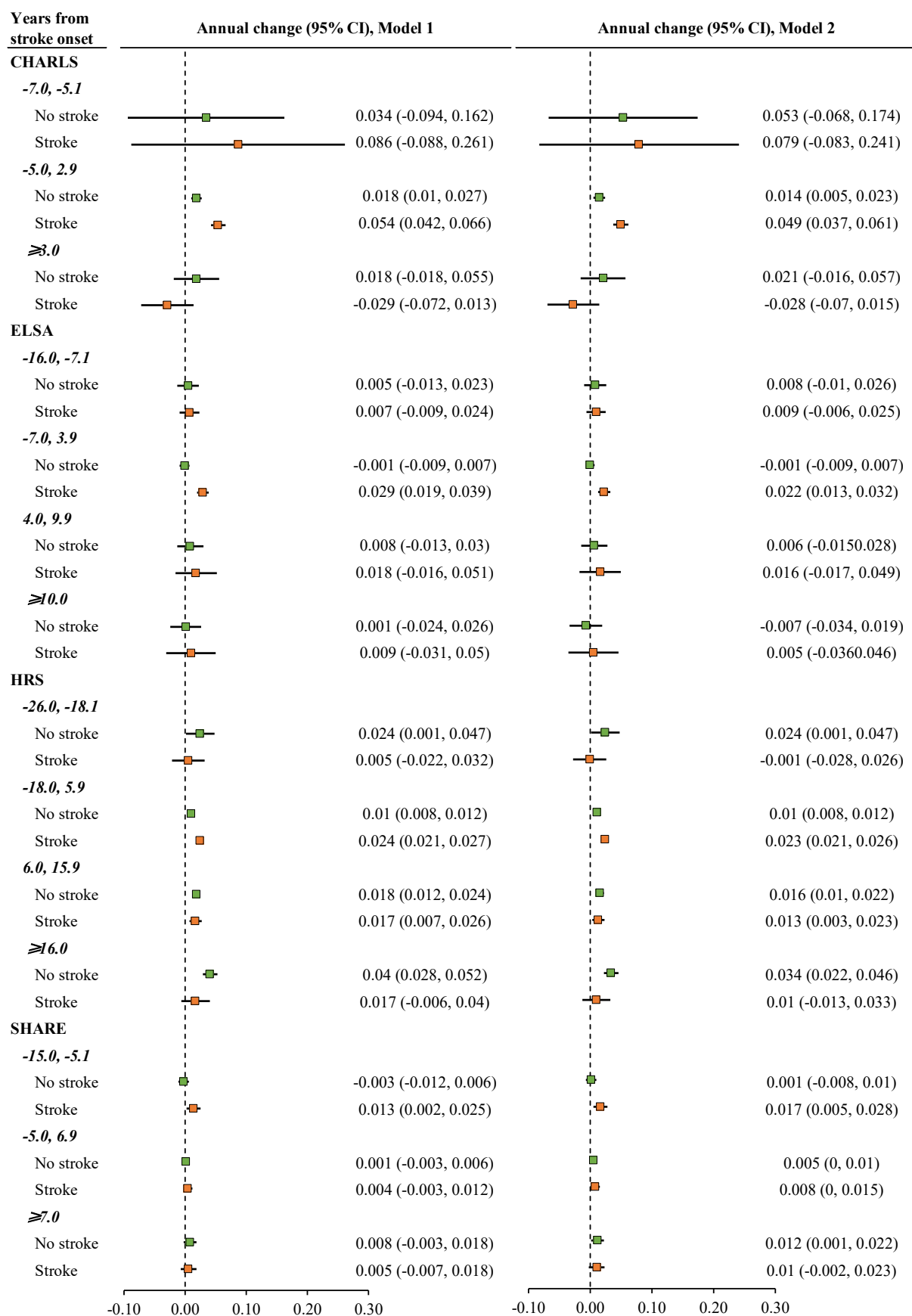


Figure S10. Annual changes in depressive symptoms by years from stroke onset in individual cohorts

The optimal number of knots was determined using the Akaike and Bayesian information criteria. Ranges of years from stroke onset were then divided according to these knots. Linear mixed models were used to estimate the annual change in depressive symptoms for each range of years from stroke onset. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for individuals without stroke, and red colors refer to the estimates for individuals with stroke.

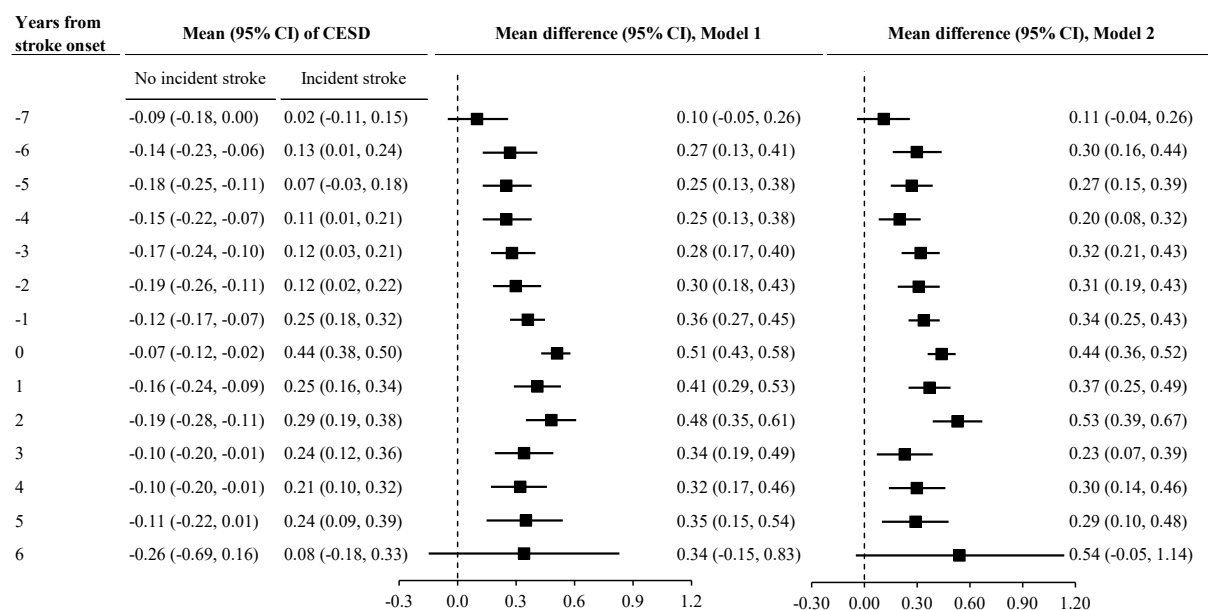


Figure S11. Depressive symptoms associated with incident stroke by years from stroke onset in the China Health and Retirement Longitudinal Study

The mean difference in depressive symptoms between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

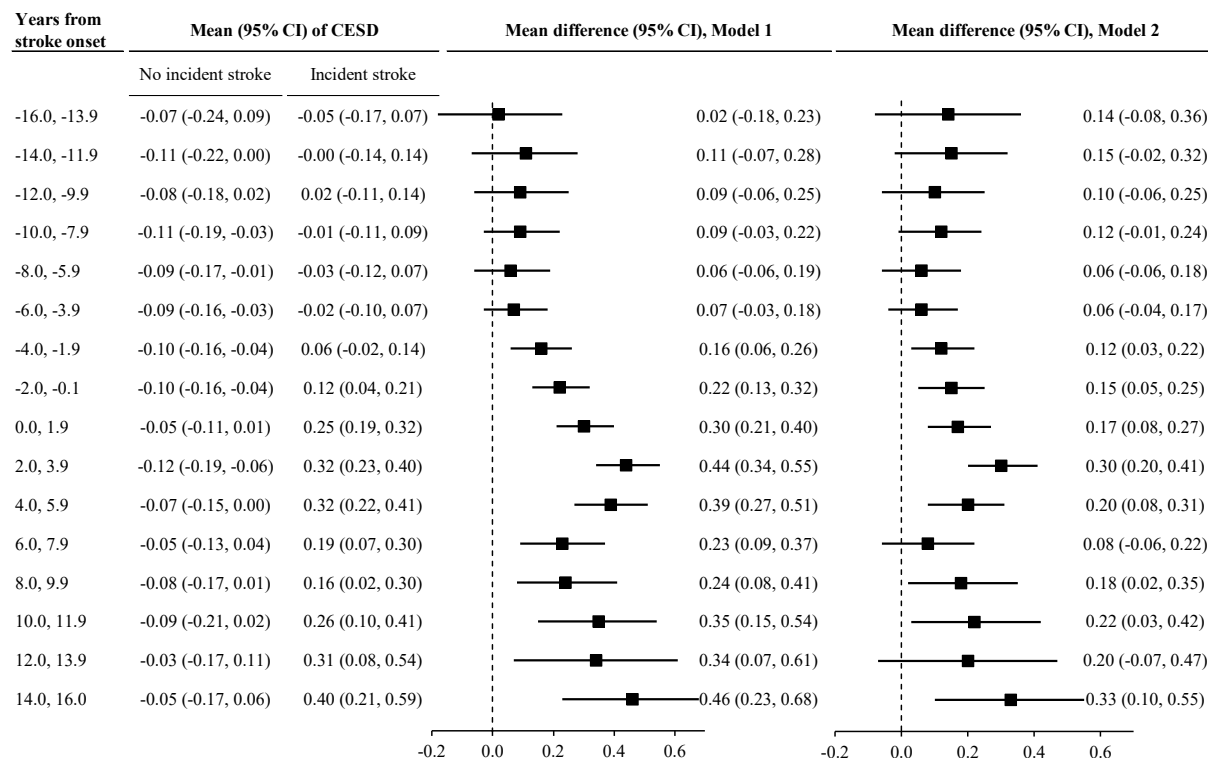


Figure S12. Depressive symptoms associated with incident stroke by years from stroke onset in the English Longitudinal Study of Ageing

The mean difference in depressive symptoms between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

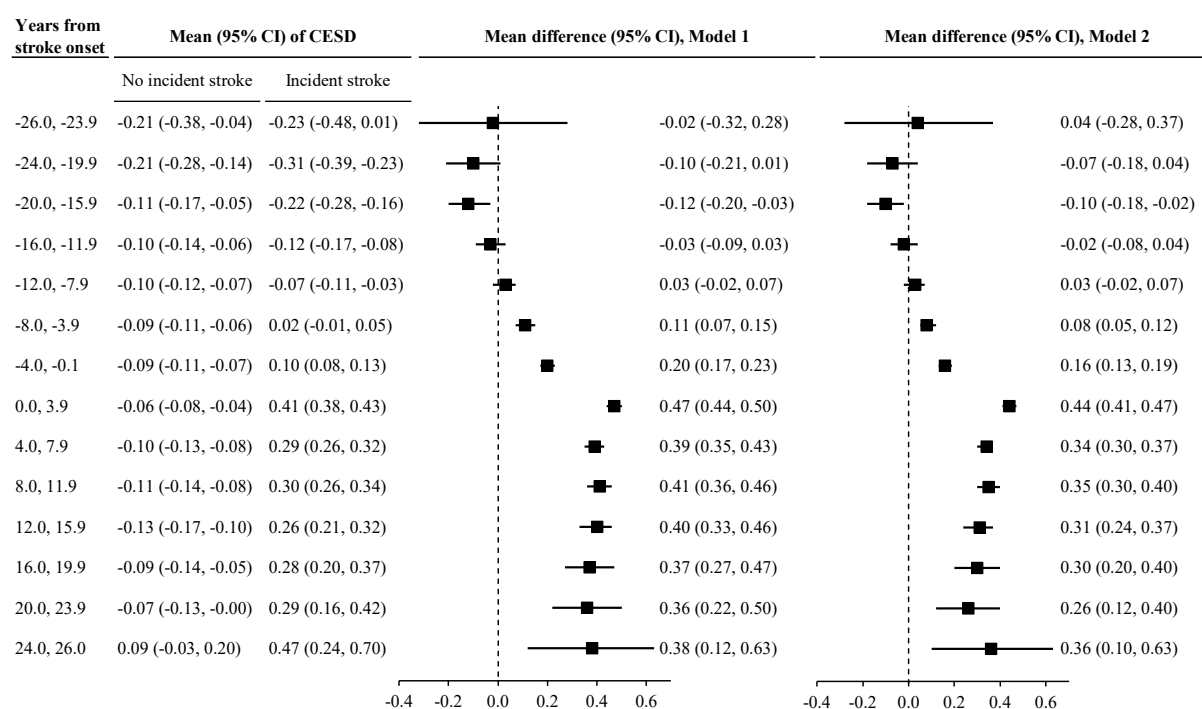


Figure S13. Depressive symptoms associated with incident stroke by years from stroke onset in the Health and Retirement Study

The mean difference in depressive symptoms between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

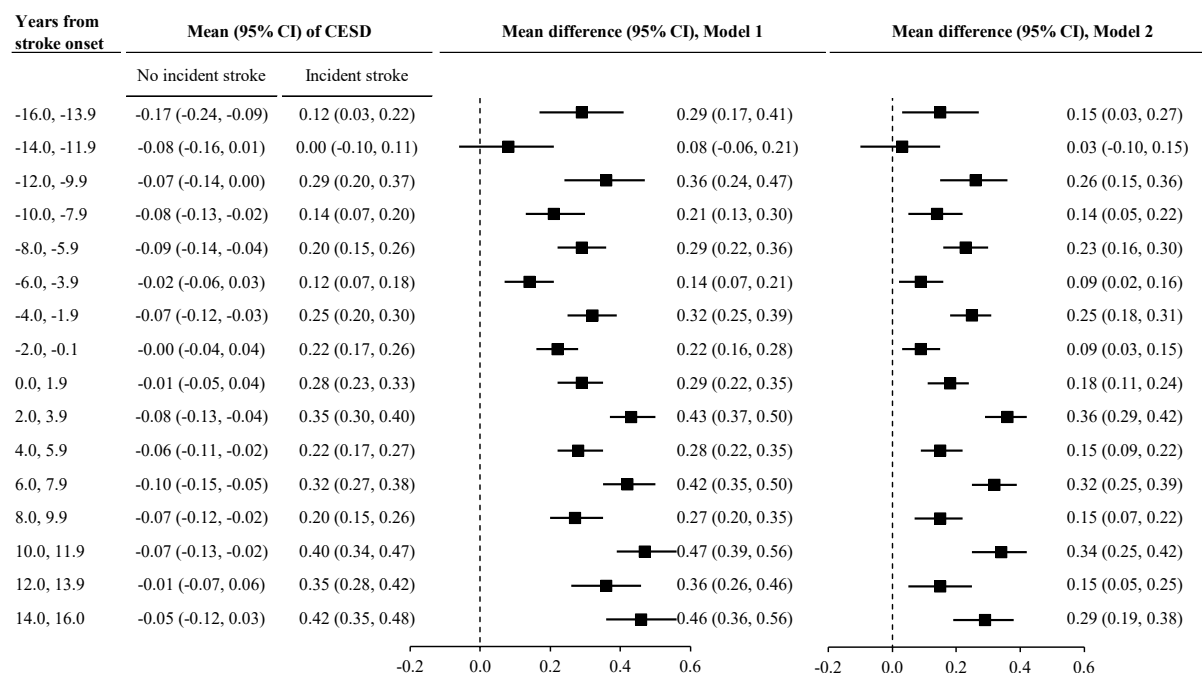


Figure S14. Depressive symptoms associated with incident stroke by years from stroke onset in the Survey of Health, Ageing and Retirement in Europe

The mean difference in depressive symptoms between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

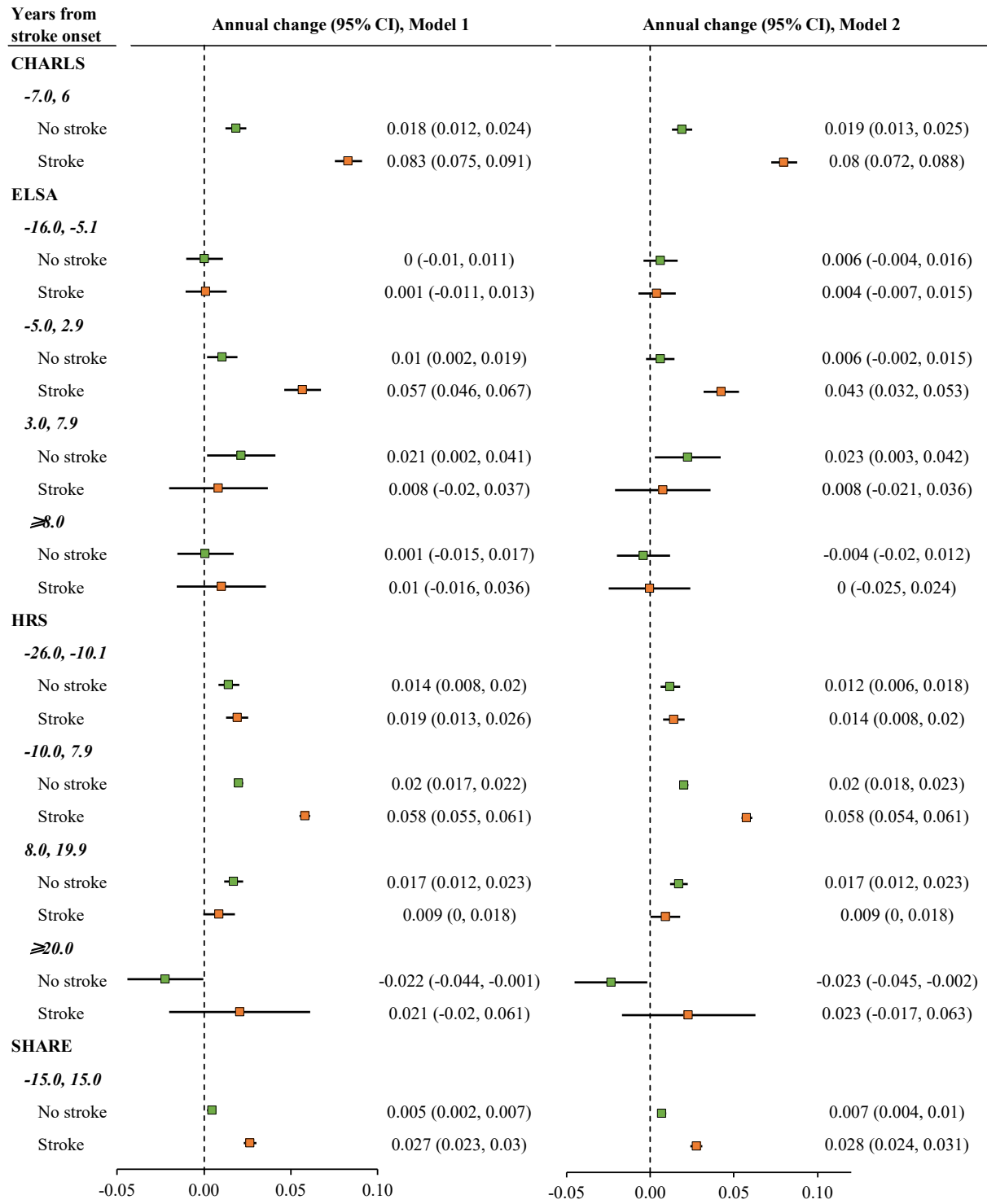


Figure S15. Annual changes in activities of daily living in individual cohorts

The optimal number of knots was determined using the Akaike and Bayesian information criteria. Ranges of years from stroke onset were then divided according to these knots. Linear mixed models were used to estimate the annual change in activities of daily living for each range of years from stroke onset. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for individuals without stroke, and red colors refer to the estimates for individuals with stroke.

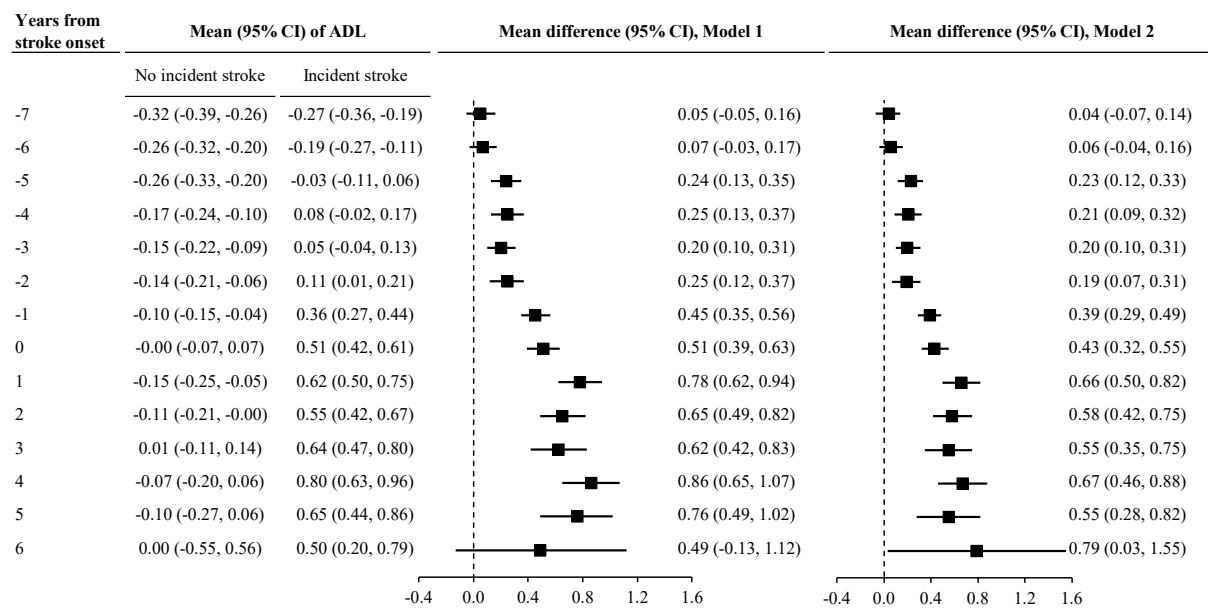


Figure S16. Activities of daily living associated with incident stroke by years from stroke onset in the China Health and Retirement Longitudinal Study

The mean difference in activities of daily living between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

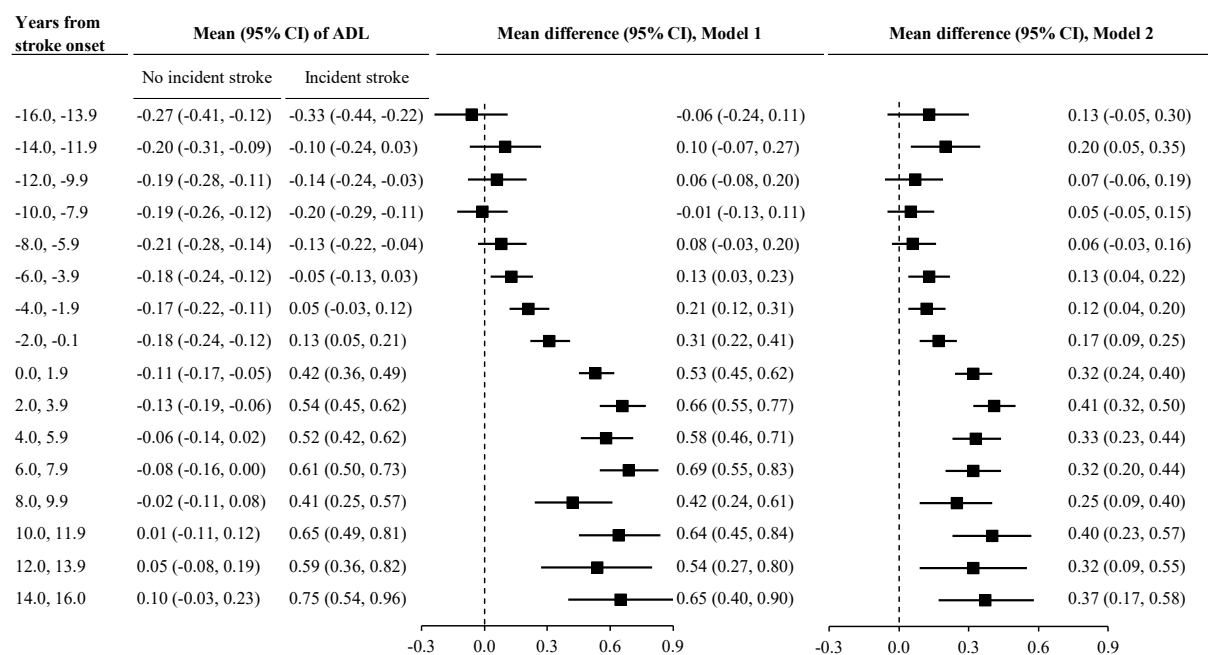


Figure S17. Activities of daily living associated with incident stroke by years from stroke onset in the English Longitudinal Study of Ageing

The mean difference in activities of daily living between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

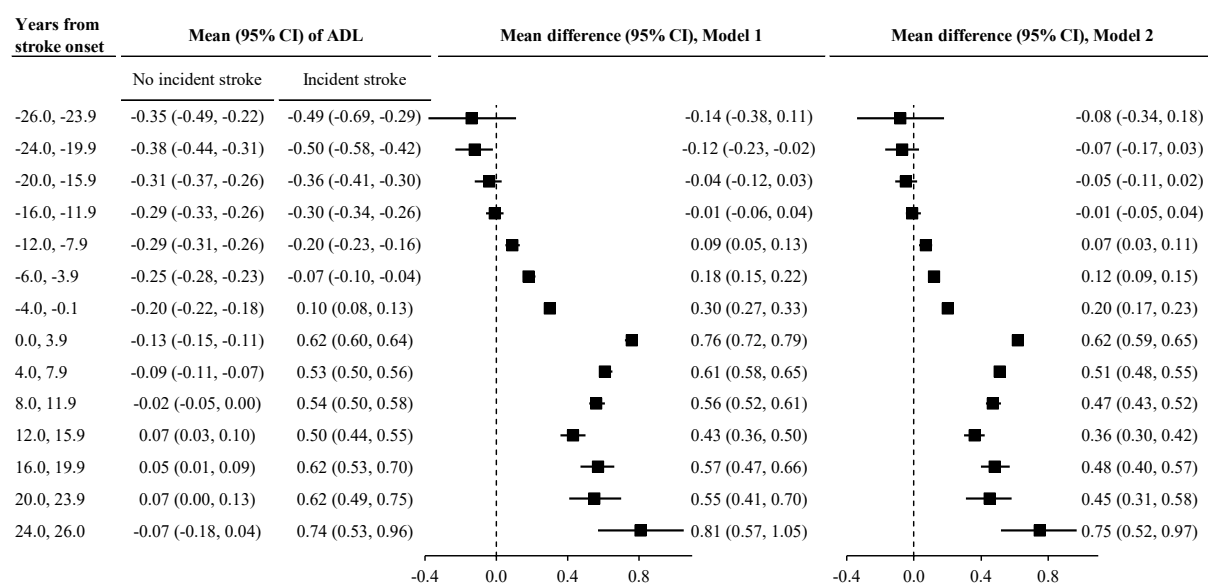


Figure S18. Activities of daily living associated with incident stroke by years from stroke onset in the Health and Retirement Study

The mean difference in activities of daily living between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

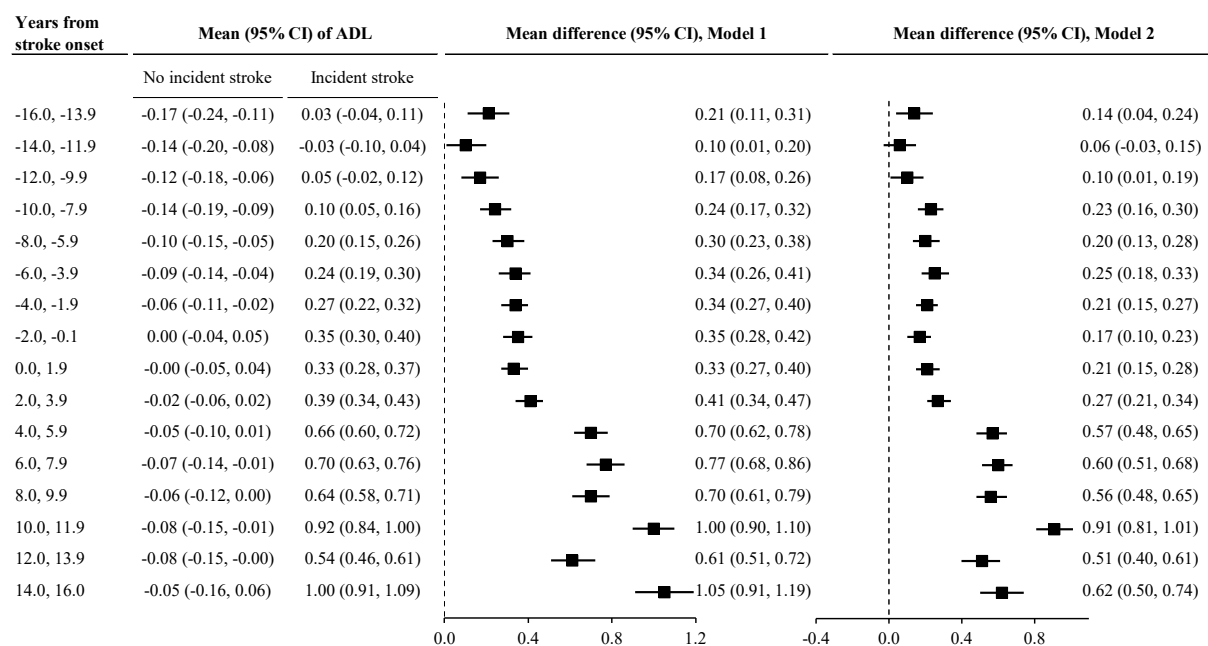


Figure S19. Activities of daily living associated with incident stroke by years from stroke onset in the Survey of Health, Ageing and Retirement in Europe

The mean difference in activities of daily living between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

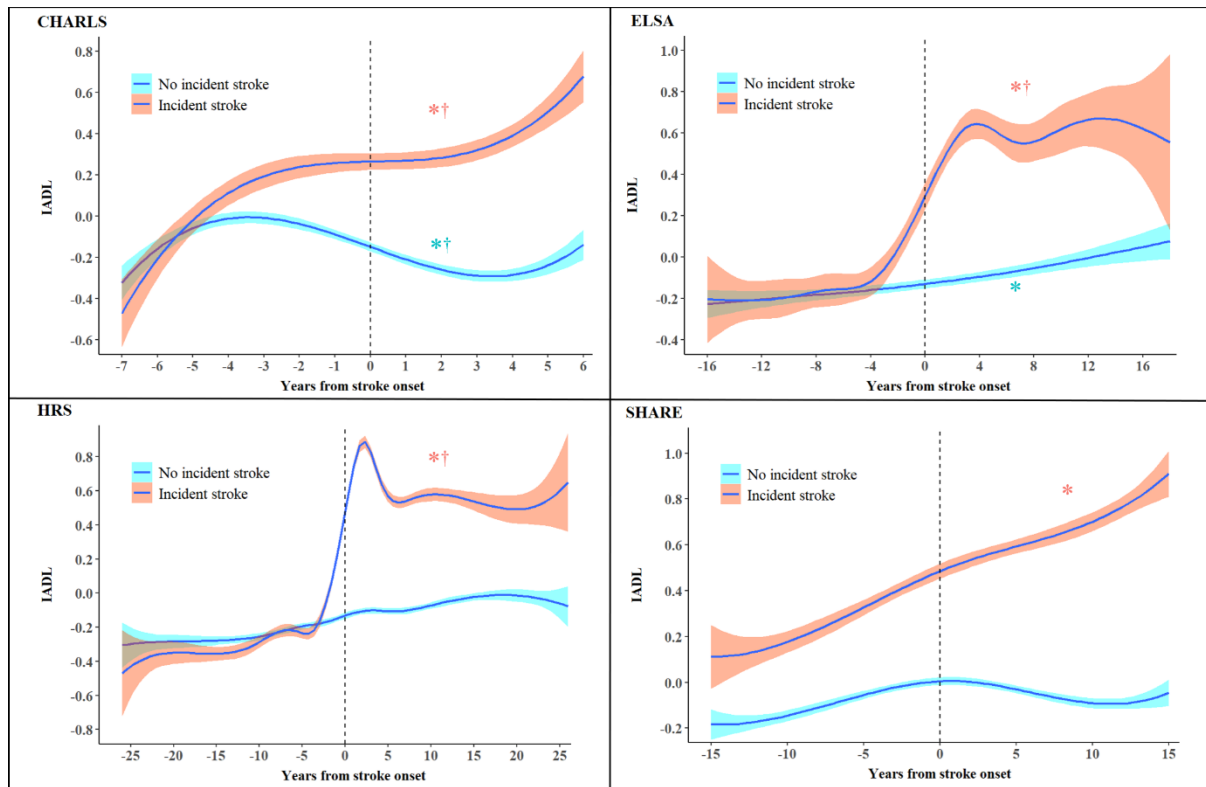


Figure S20. Trajectories of instrumental activities of daily living before and after the diagnosis of stroke

CHARLS, China Health and Retirement Longitudinal Study; ELSA, English Longitudinal Study of Ageing; HRS, Health and Retirement Study; SHARE, Survey of Health, Ageing and Retirement in Europe.

Linear mixed models were used to estimate the trajectories of activities of instrumental daily living over time in individuals with and without incident stroke. The optimal number of knots were determined with the use of the Akaike and Bayesian information criteria. Both linear and non-linear relationships were tested.

*refers to significance for linear relationships. Linear relationships were tested using the fixed effect coefficient in a linear mixed model.

†refers to significance for non-linear relationships. Non-linear relationships were tested by comparing models with and without quadratic/spline terms using likelihood ratio tests.

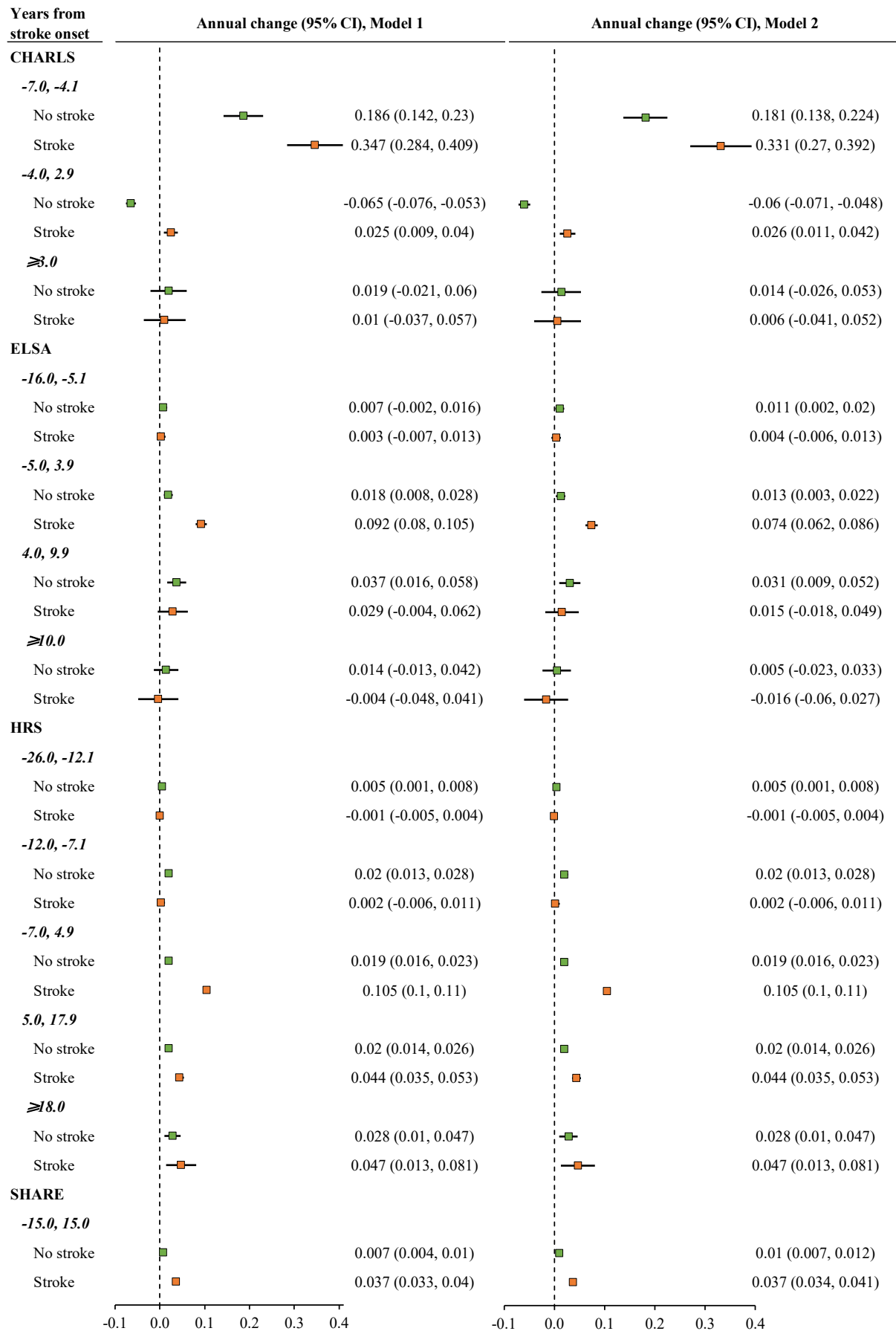


Figure S21. Annual changes in instrumental activities of daily living in individual cohorts

The optimal number of knots was determined using the Akaike and Bayesian information criteria. Ranges of years from stroke onset were then divided according to these knots. Linear mixed models were used to estimate the annual change in instrumental activities of daily living for each range of years from stroke onset. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for individuals without stroke, and red colors refer to the estimates for individuals with stroke.

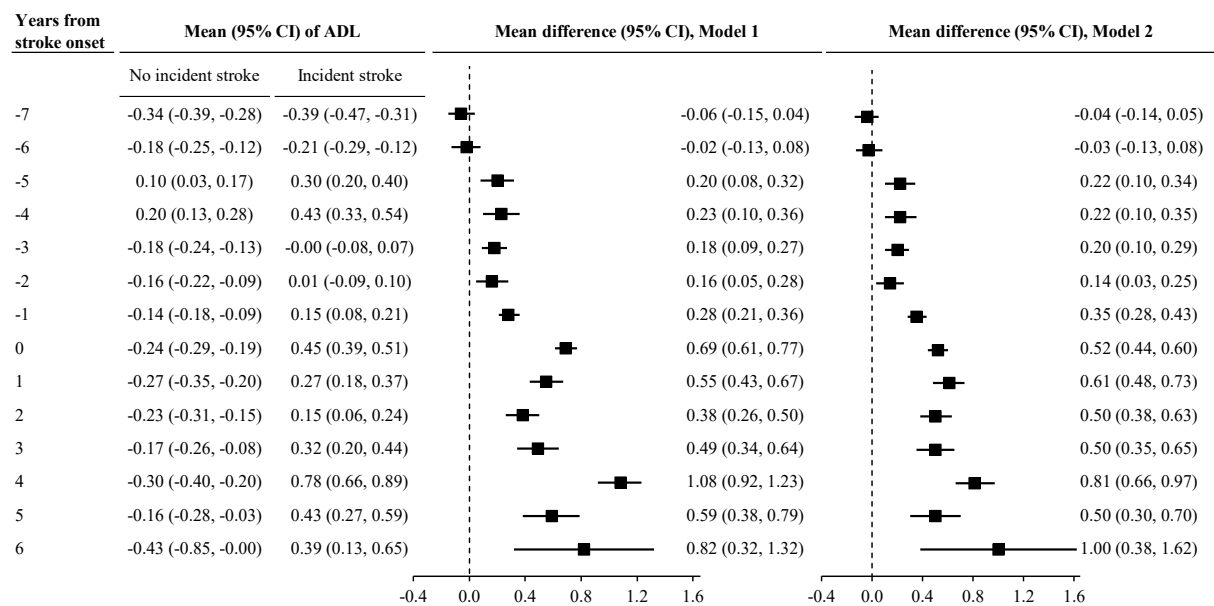


Figure S22. Instrumental activities of daily living associated with incident stroke by years from stroke onset in the China Health and Retirement Longitudinal Study

The mean difference in instrumental activities of daily living between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

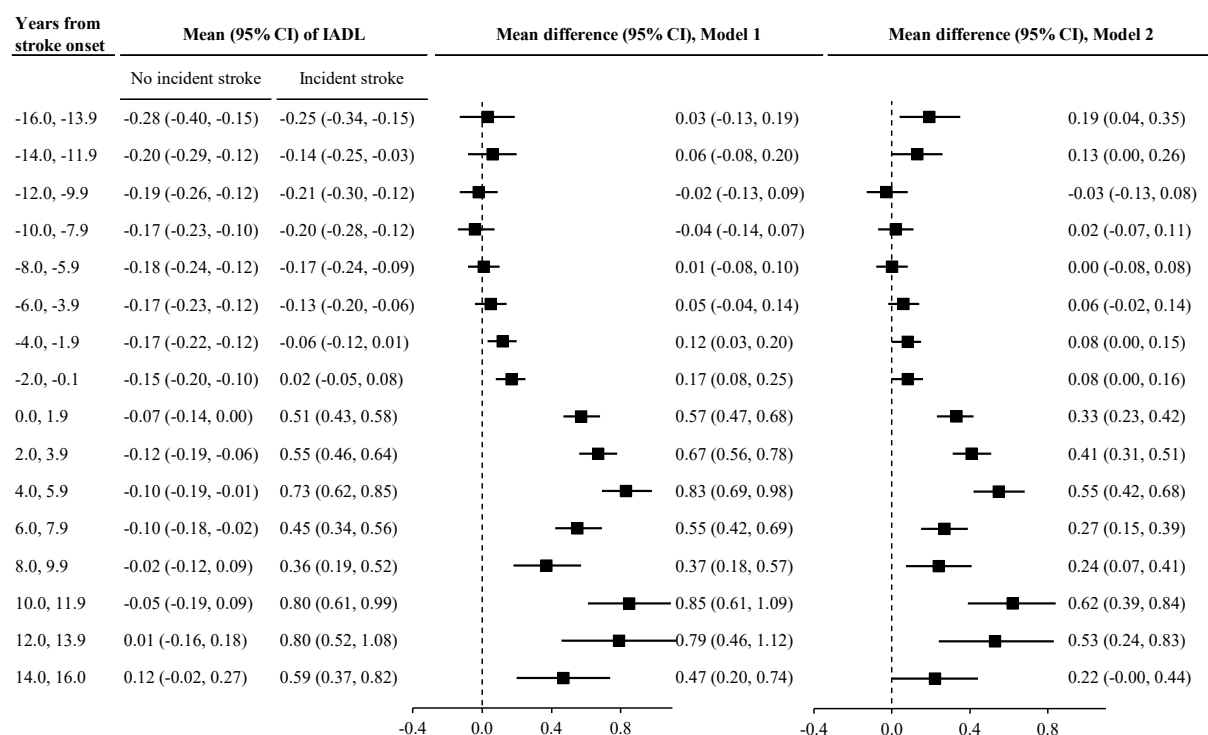


Figure S23. Instrumental activities of daily living associated with incident stroke by years from stroke onset in the English Longitudinal Study of Ageing

The mean difference in instrumental activities of daily living between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

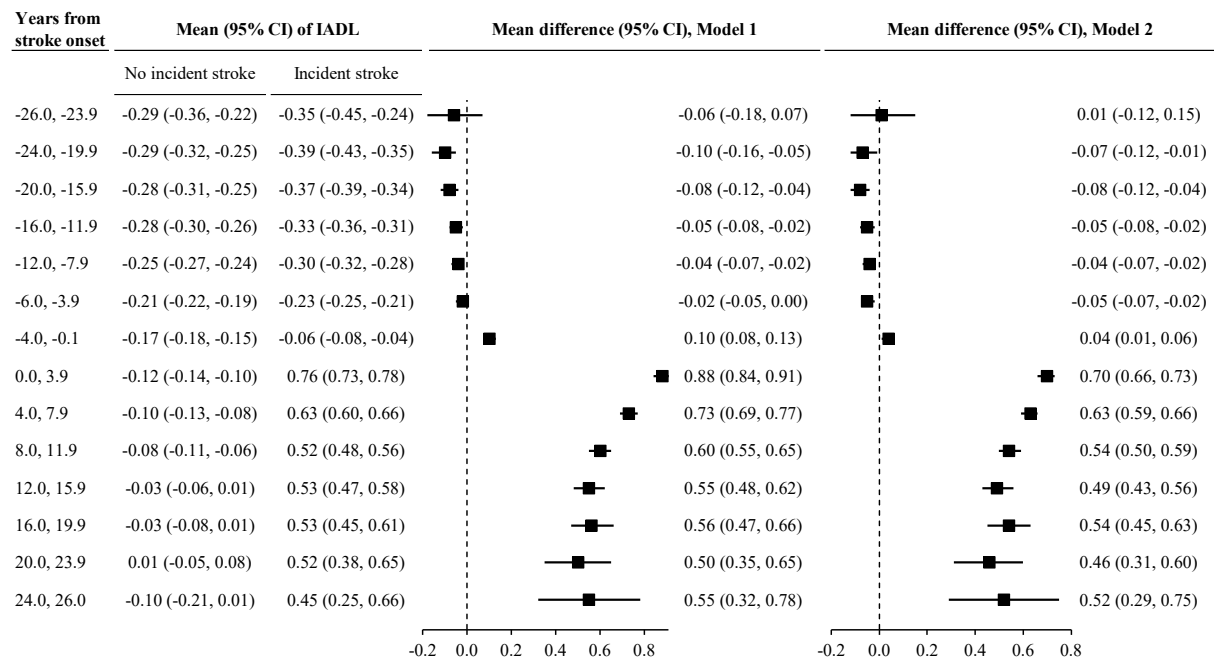


Figure S24. Instrumental activities of daily living associated with incident stroke by years from stroke onset in the Health and Retirement Study

The mean difference in instrumental activities of daily living between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

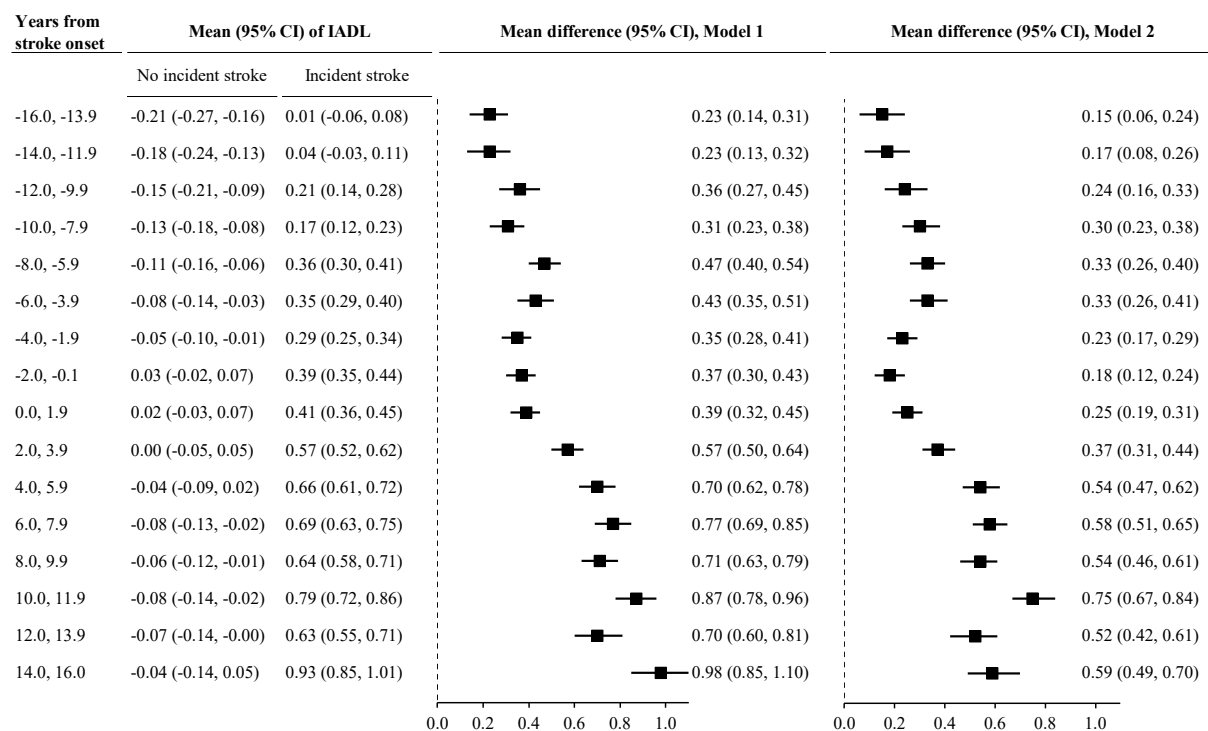


Figure S25. Instrumental activities of daily living associated with incident stroke by years from stroke onset in the Survey of Health, Ageing and Retirement in Europe

The mean difference in instrumental activities of daily living between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

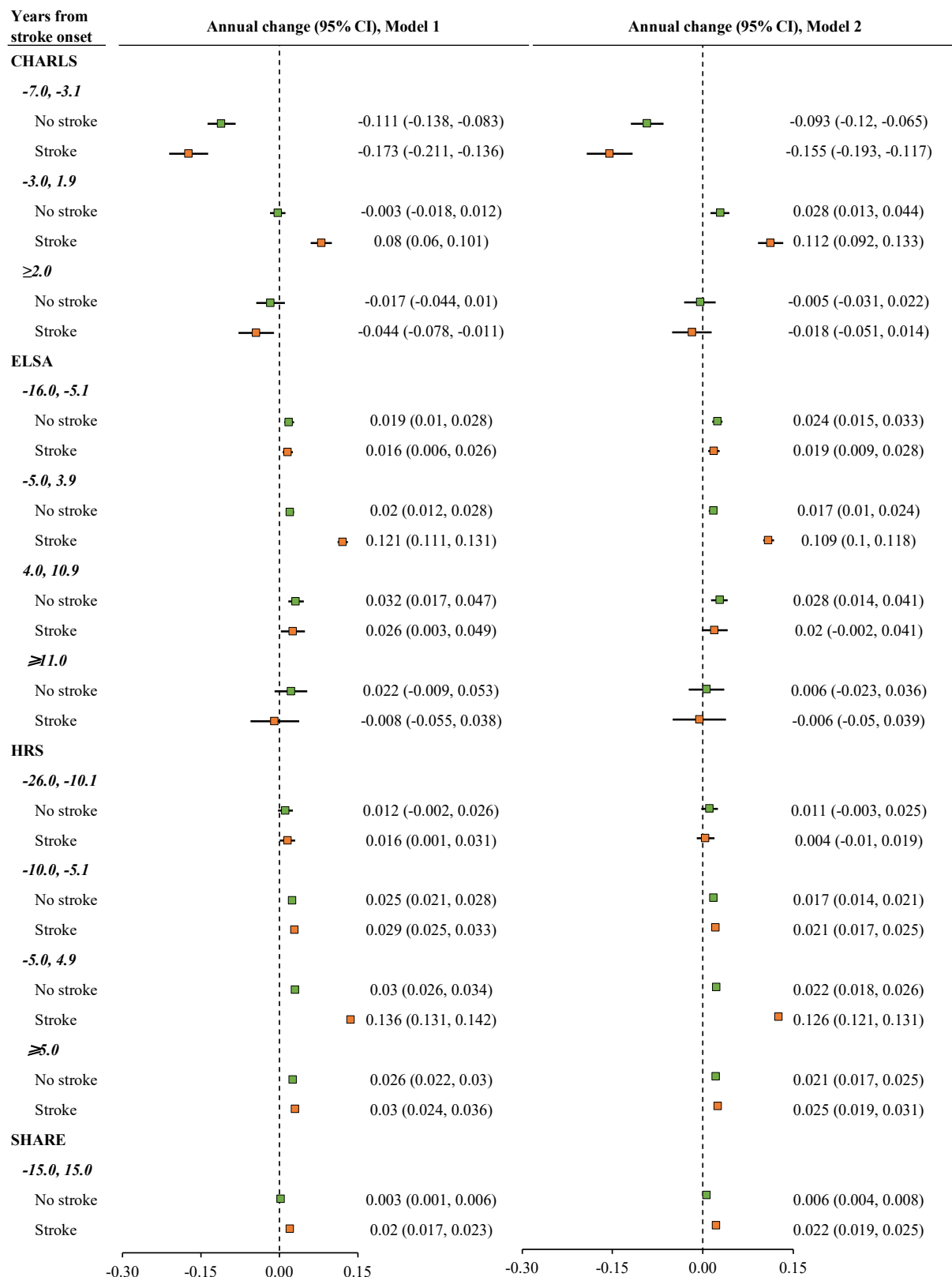


Figure S26. Annual changes in frailty index in individual cohorts

The optimal number of knots was determined using the Akaike and Bayesian information criteria. Ranges of years from stroke onset were then divided according to these knots. Linear mixed models were used to estimate the annual change in frailty index for each range of years from stroke onset. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for individuals without stroke, and red colors refer to the estimates for individuals with stroke.

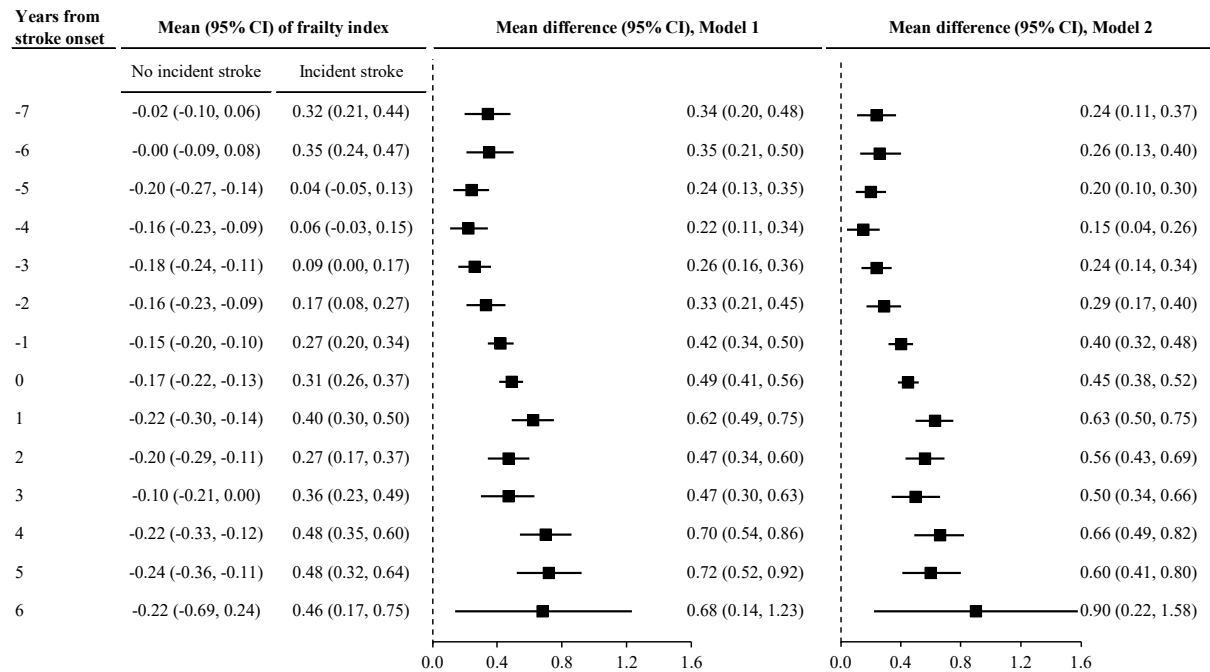


Figure S27. Frailty index associated with incident stroke by years from stroke onset in the China Health and Retirement Longitudinal Study

The mean difference in frailty index between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

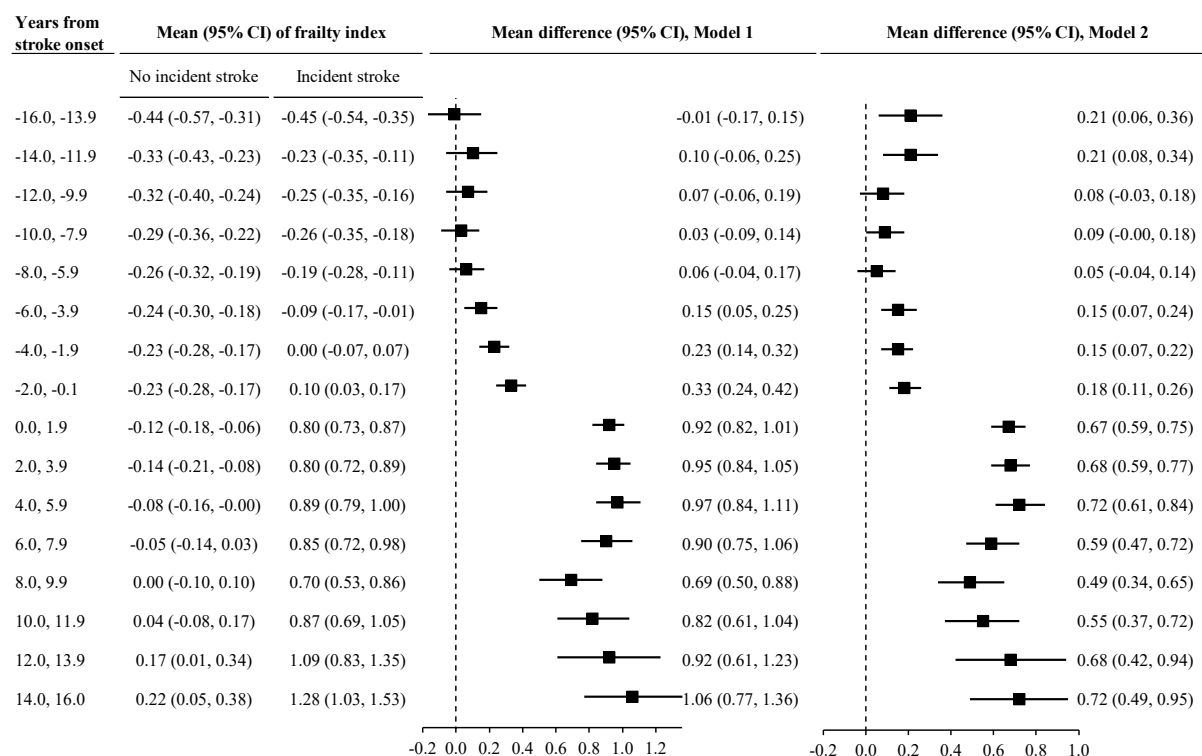


Figure S28. Frailty index associated with incident stroke by years from stroke onset in the English Longitudinal Study of Ageing

The mean difference in frailty index between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

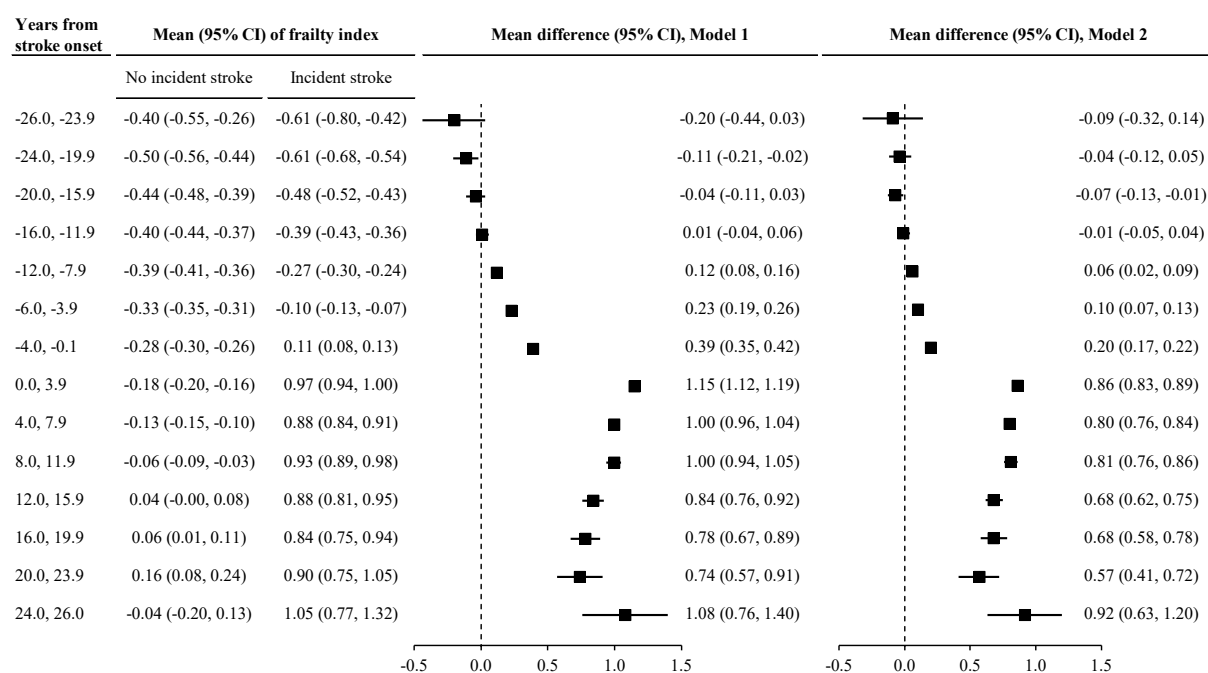


Figure S29. Frailty index associated with incident stroke by years from stroke onset in the Health and Retirement Study

The mean difference in frailty index between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

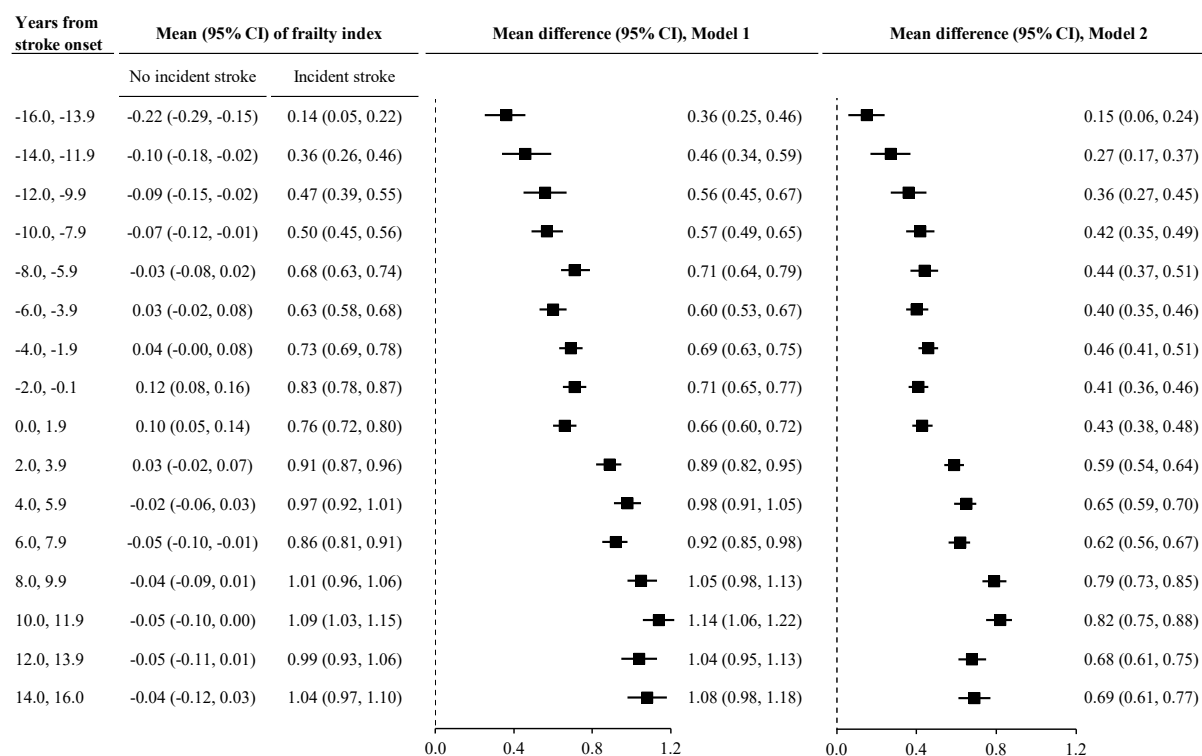


Figure S30. Frailty index associated with incident stroke by years from stroke onset in the Survey of Health, Ageing and Retirement in Europe

The mean difference in frailty index between individuals with and without incident stroke was estimated using linear mixed models. Model 1 was unadjusted, while Model 2 was adjusted for age, gender, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate a mean difference of 0.

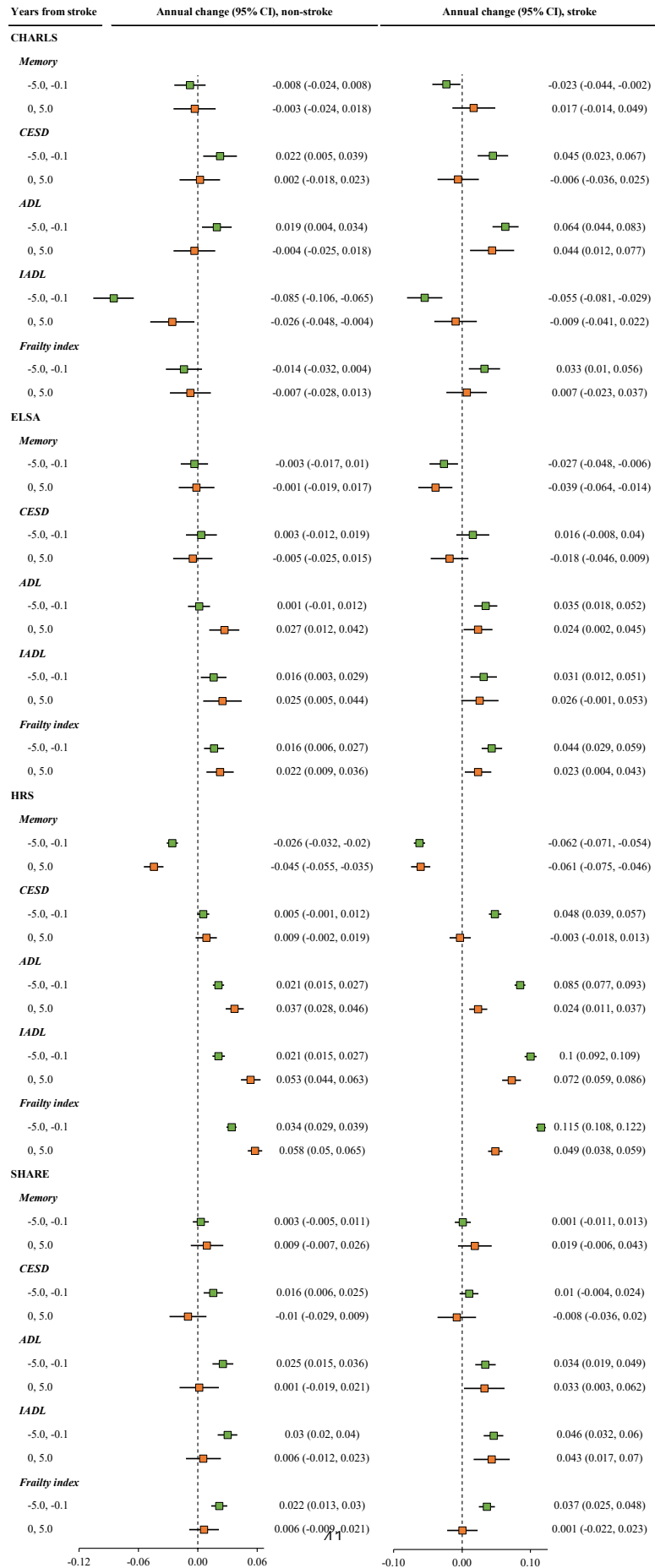


Figure S31. Annual changes in functional scores within 5 years before and after stroke onset in individual cohorts

Linear mixed models were used to estimate the annual change in frailty index for each range of years from stroke onset. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for individuals without stroke, and red colors refer to the estimates for individuals with stroke.

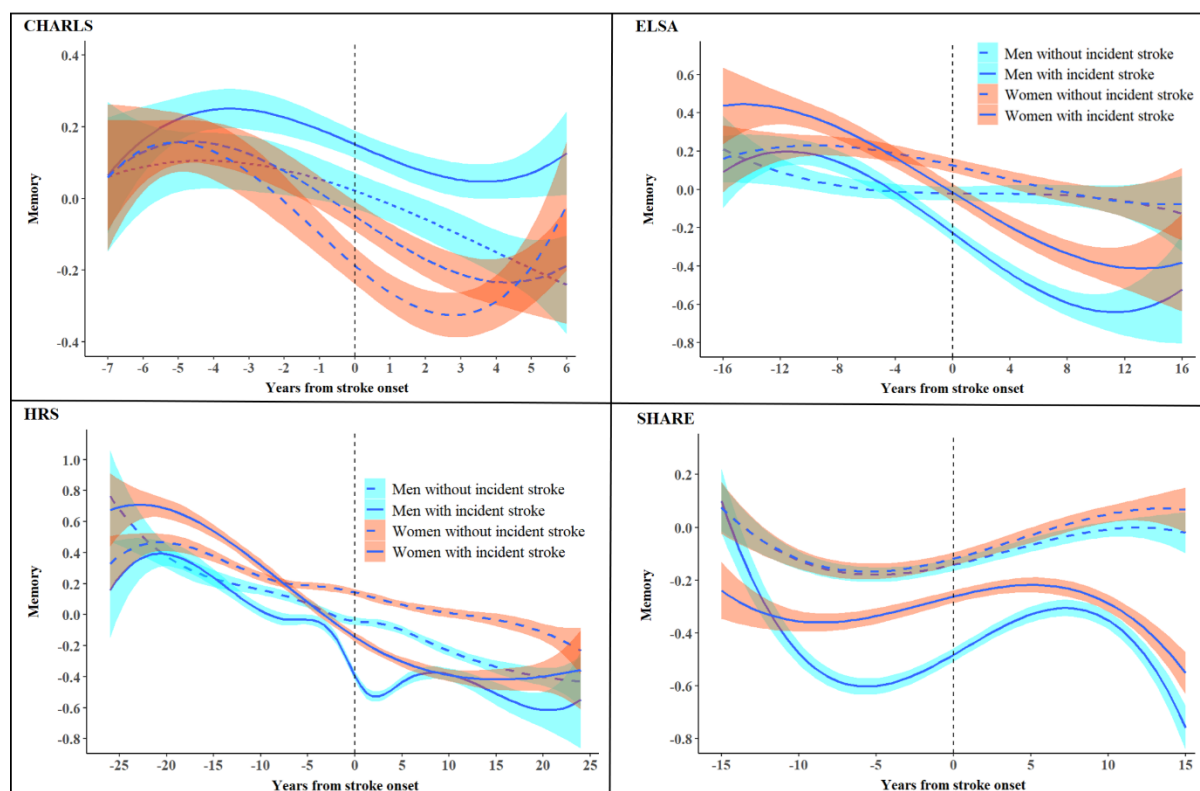


Figure S32. Trajectories of memory before and after the diagnosis of stroke by gender

CHARLS, China Health and Retirement Longitudinal Study; ELSA, English Longitudinal Study of Ageing; HRS, Health and Retirement Study; SHARE, Survey of Health, Ageing and Retirement in Europe.

Linear mixed models were used to estimate the trajectories of memory over time in individuals with and without incident stroke. The optimal number of knots were determined with the use of the Akaike and Bayesian information criteria.

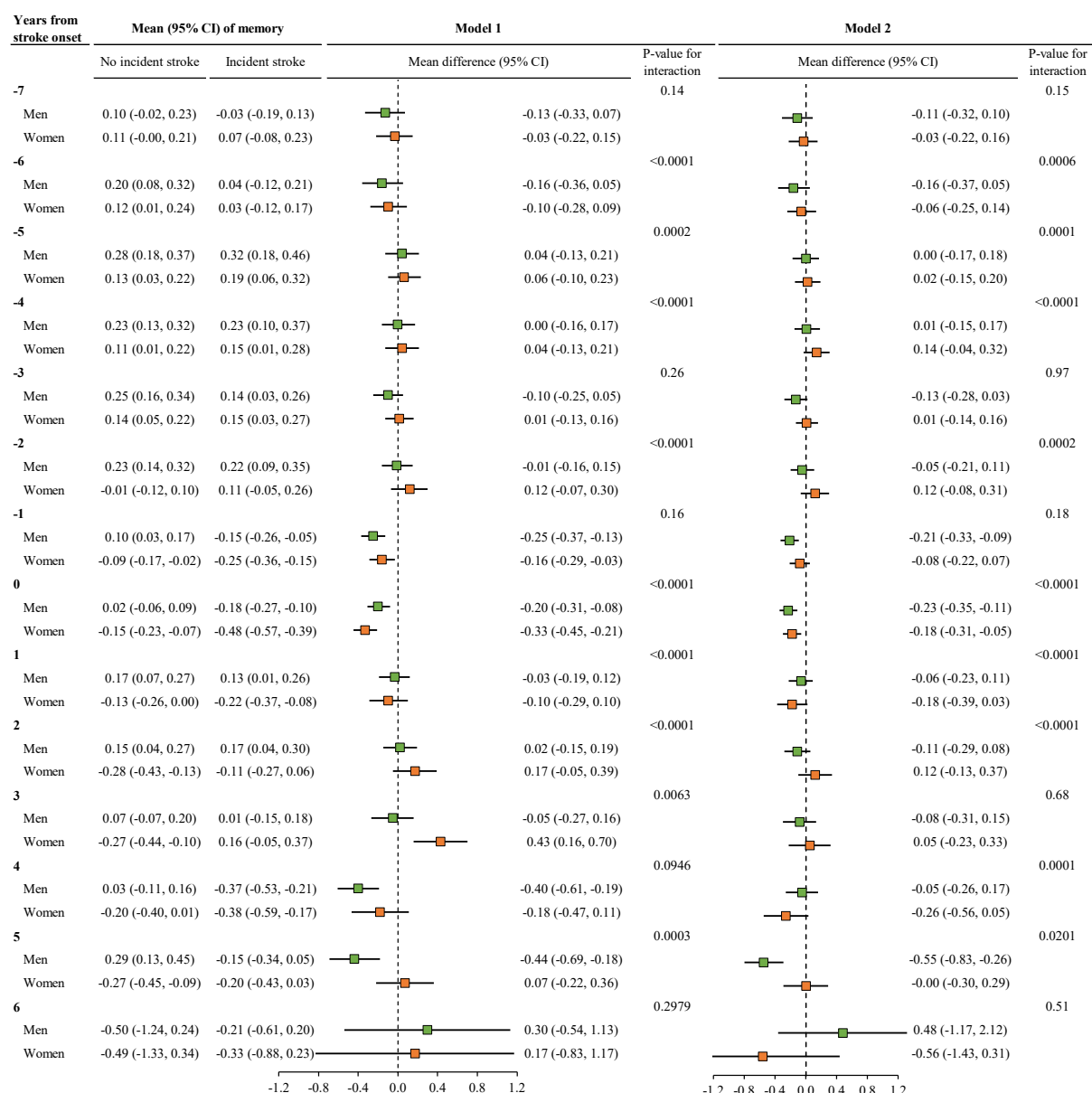


Figure S33. The association between incident stroke and memory by gender in the China Health and Retirement Longitudinal Study

Linear mixed models were used to test whether the association between incident stroke and memory was moderated by gender. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

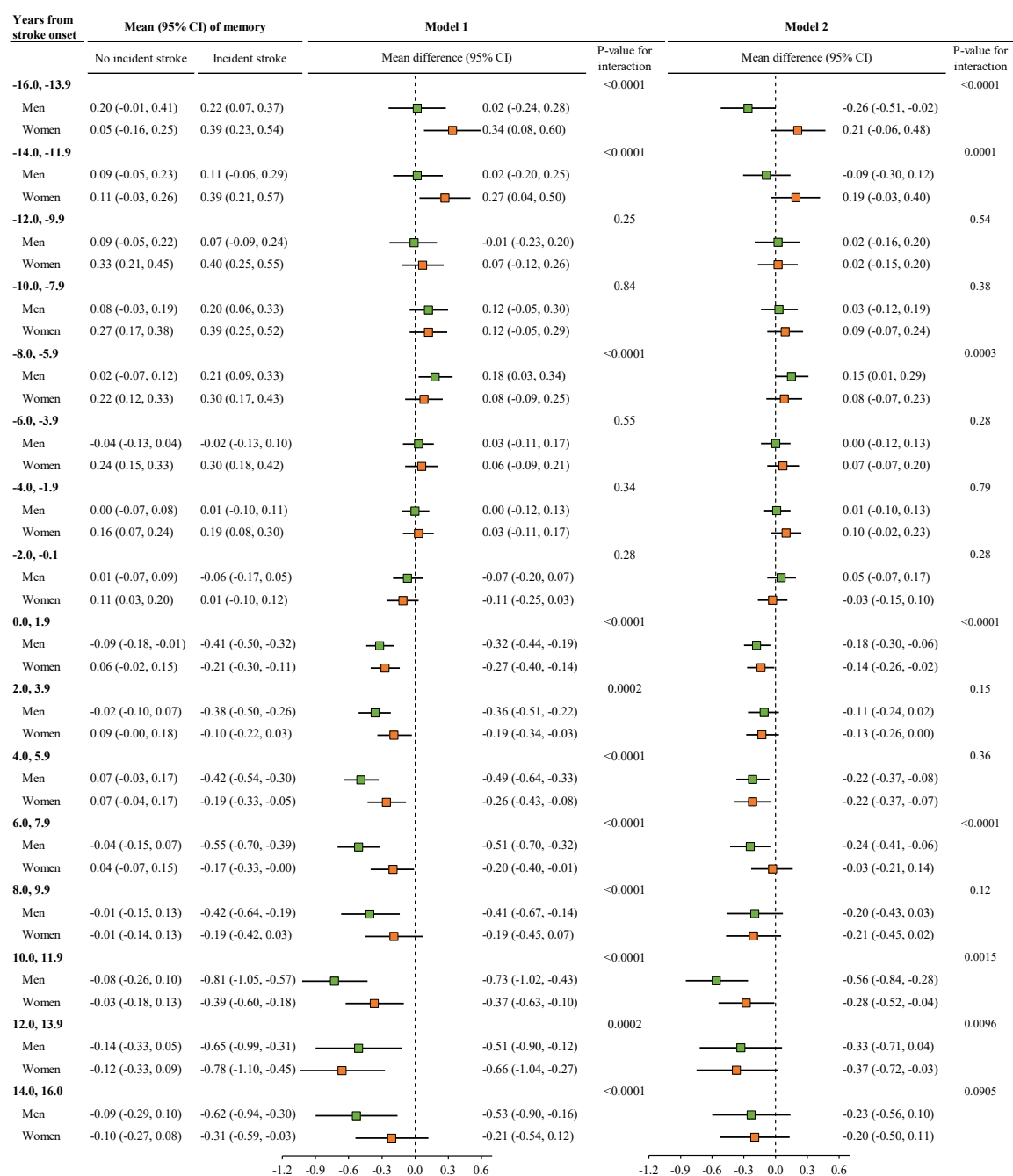


Figure S34. The association between incident stroke and memory by gender in the English Longitudinal Study of Ageing

Linear mixed models were used to test whether the association between incident stroke and memory was moderated by gender. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

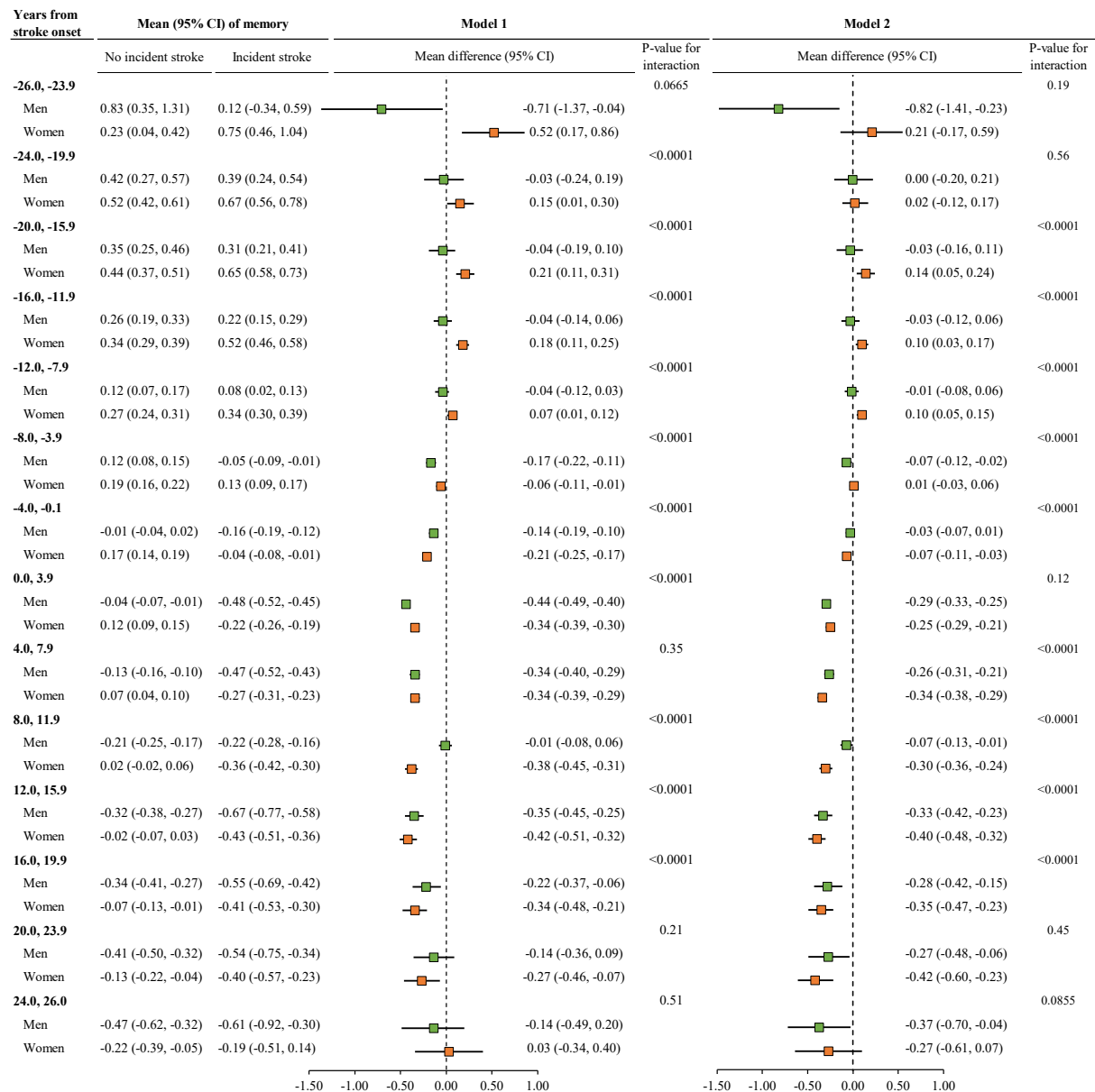


Figure S35. The association between incident stroke and memory by gender in the Health and Retirement Study

Linear mixed models were used to test whether the association between incident stroke and memory was moderated by gender. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

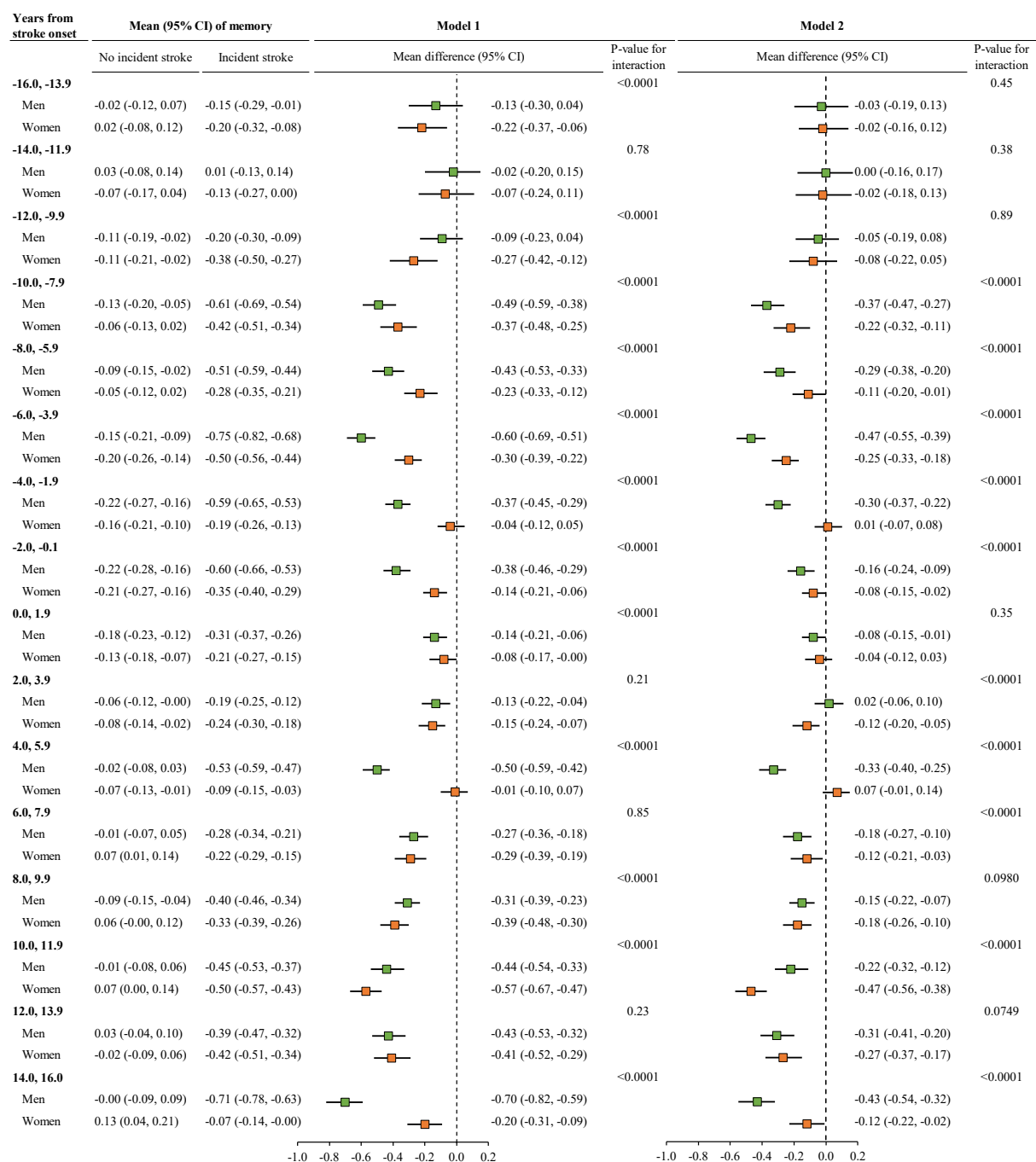


Figure S36. The association between incident stroke and memory by gender in the Survey of Health, Ageing and Retirement in Europe

Linear mixed models were used to test whether the association between incident stroke and memory was moderated by gender. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

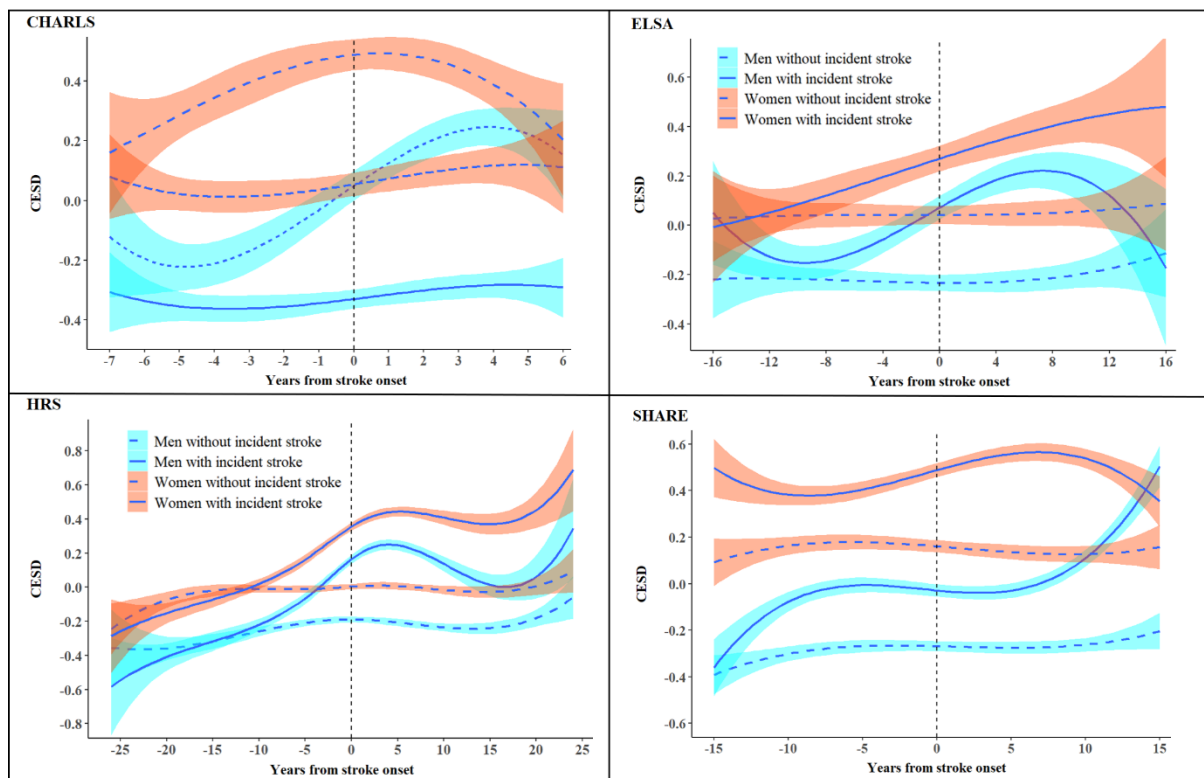


Figure S37. Trajectories of depressive symptoms before and after the diagnosis of stroke by gender

CHARLS, China Health and Retirement Longitudinal Study; ELSA, English Longitudinal Study of Ageing; HRS, Health and Retirement Study; SHARE, Survey of Health, Ageing and Retirement in Europe.

Linear mixed models were used to estimate the trajectories of depressive symptoms over time in individuals with and without incident stroke. The optimal number of knots were determined with the use of the Akaike and Bayesian information criteria.

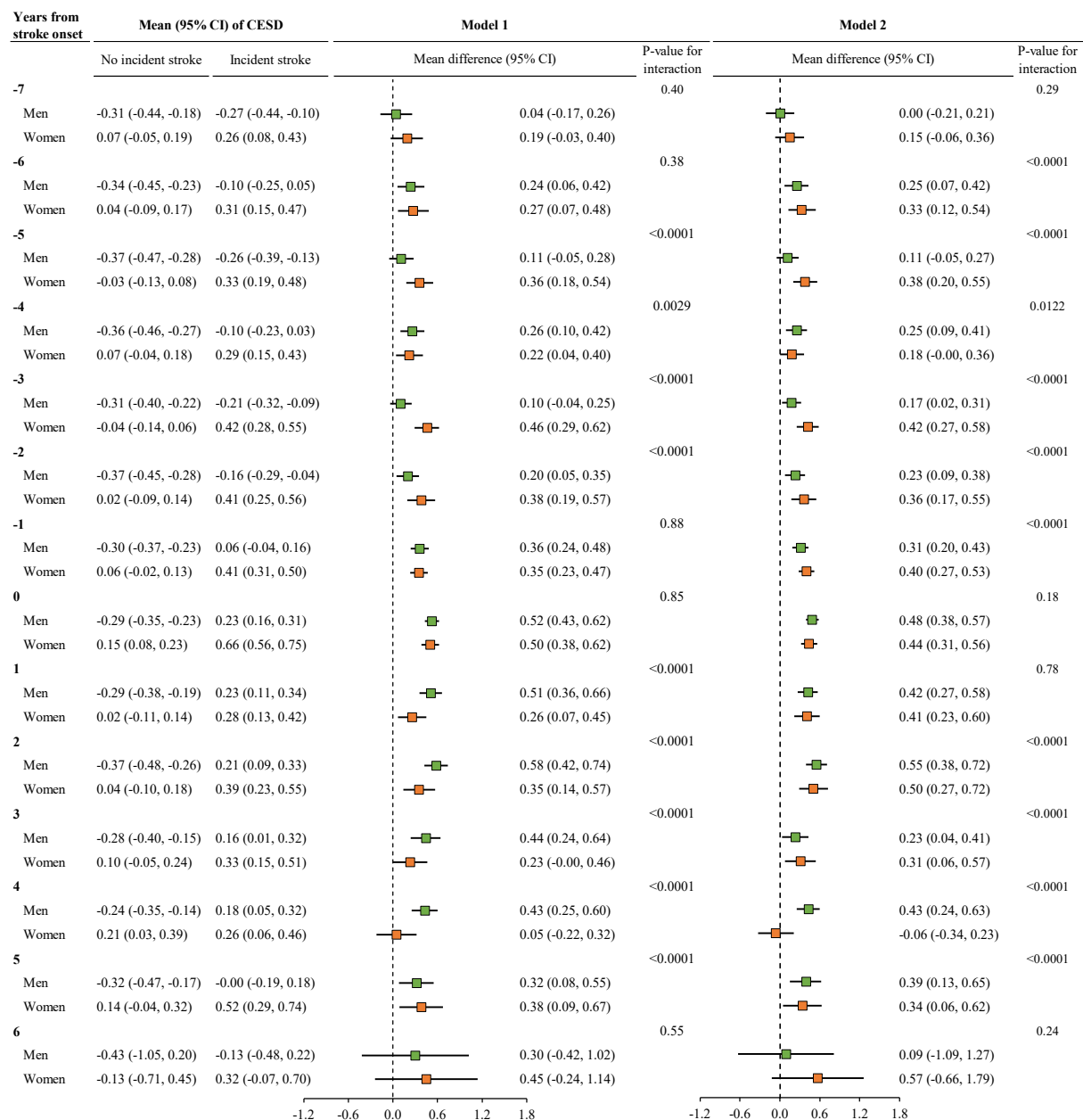


Figure S38. The association between incident stroke and depressive symptoms by gender in the China Health and Retirement Longitudinal Study

Linear mixed models were used to test whether the association between incident stroke and depressive symptoms was moderated by gender. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

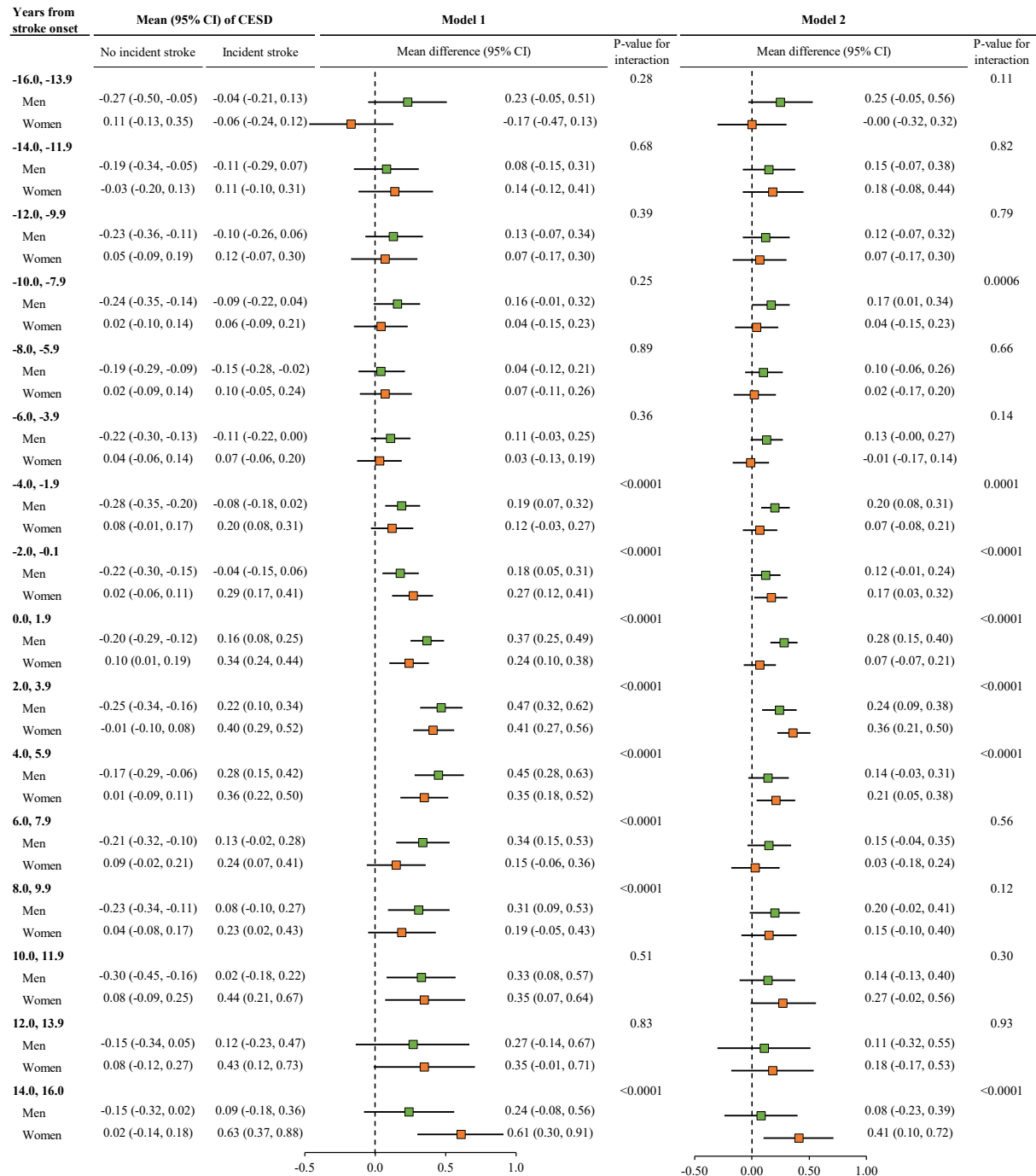


Figure S39. The association between incident stroke and depressive symptoms by gender in the English Longitudinal Study of Ageing

Linear mixed models were used to test whether the association between incident stroke and depressive symptoms was moderated by gender. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

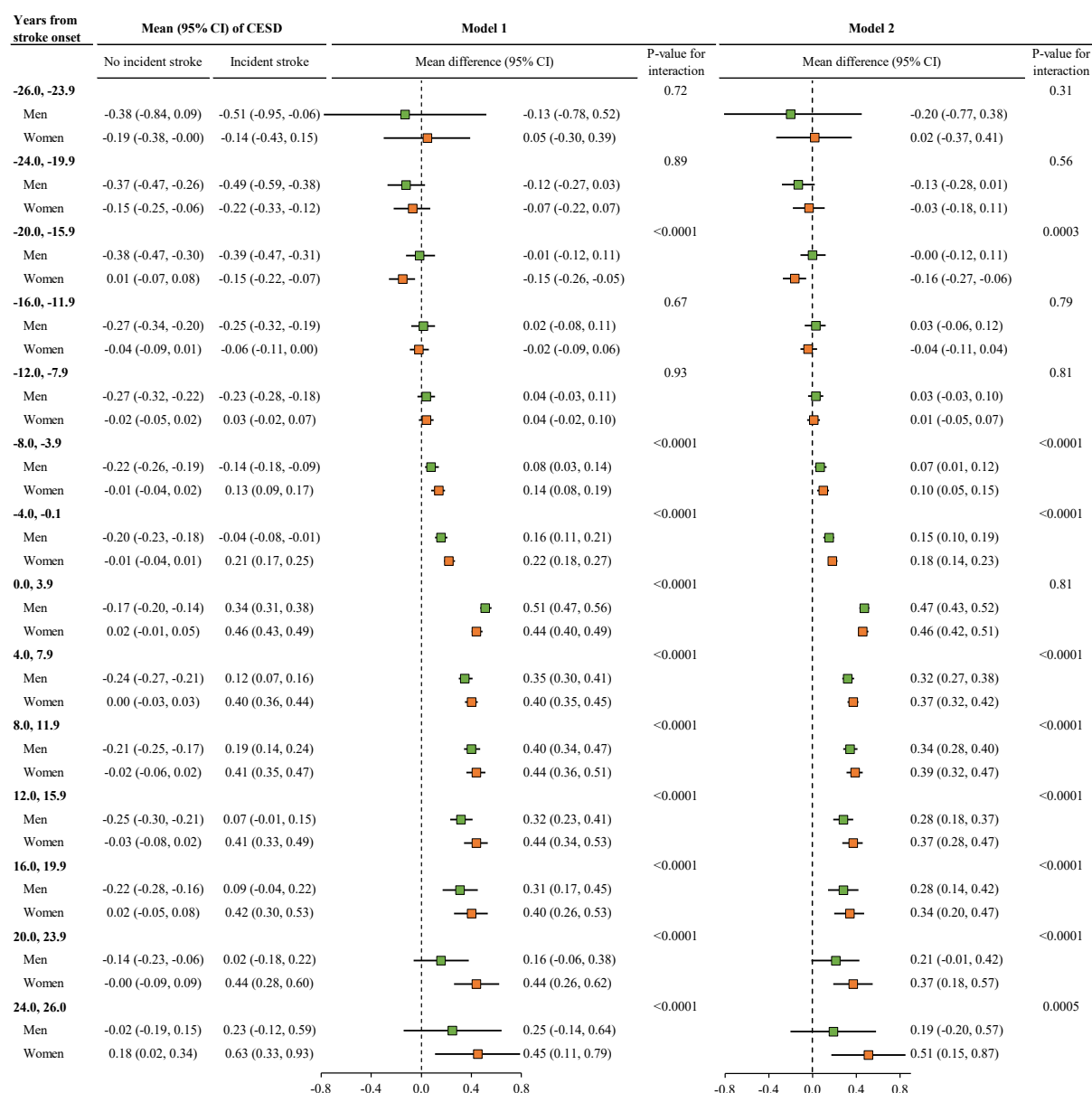


Figure S40. The association between incident stroke and depressive symptoms by gender in the Health and Retirement Study

Linear mixed models were used to test whether the association between incident stroke and depressive symptoms was moderated by gender. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

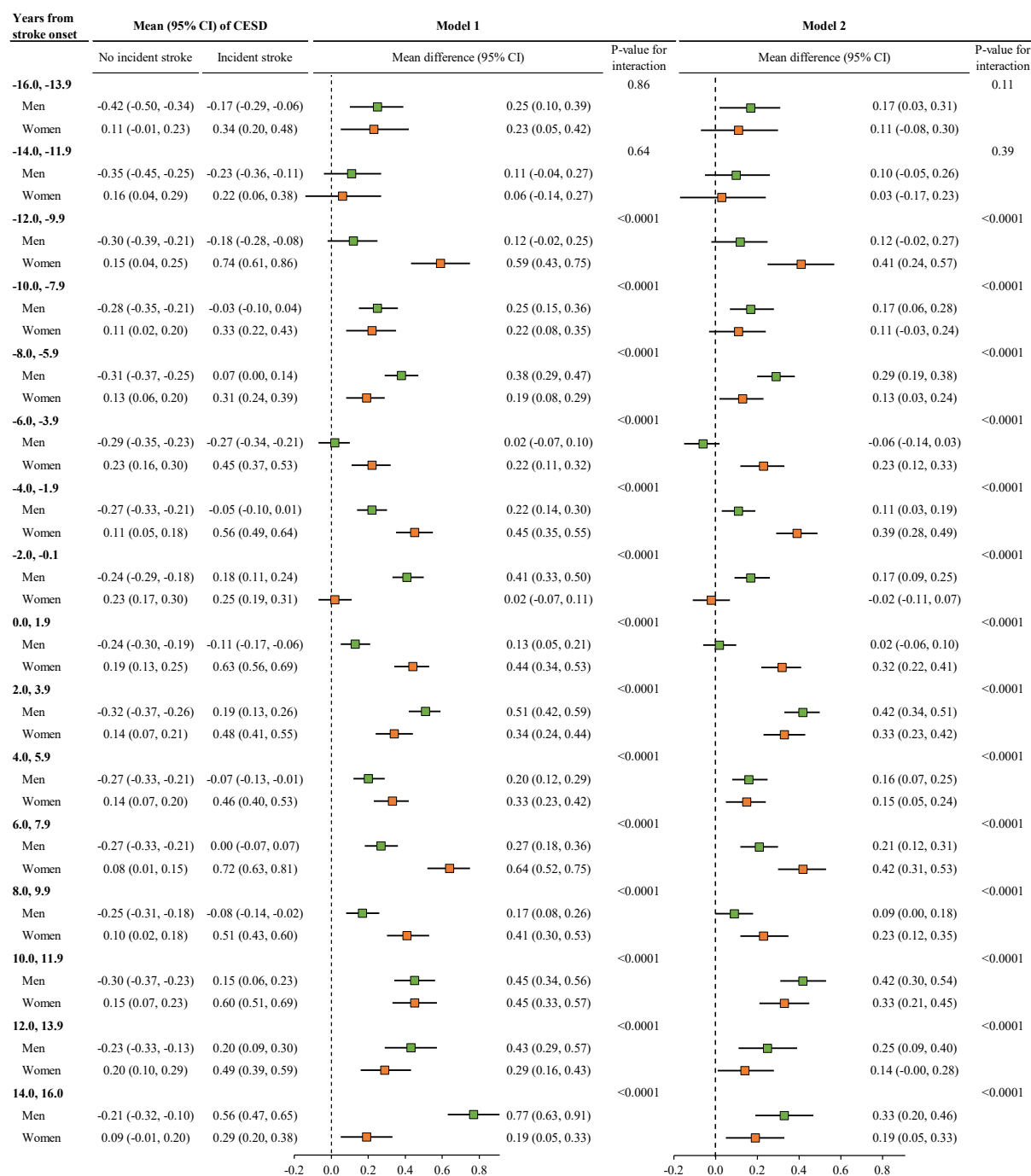


Figure S41. The association between incident stroke and depressive symptoms by gender in the Survey of Health, Ageing and Retirement in Europe

Linear mixed models were used to test whether the association between incident stroke and depressive symptoms was moderated by gender. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

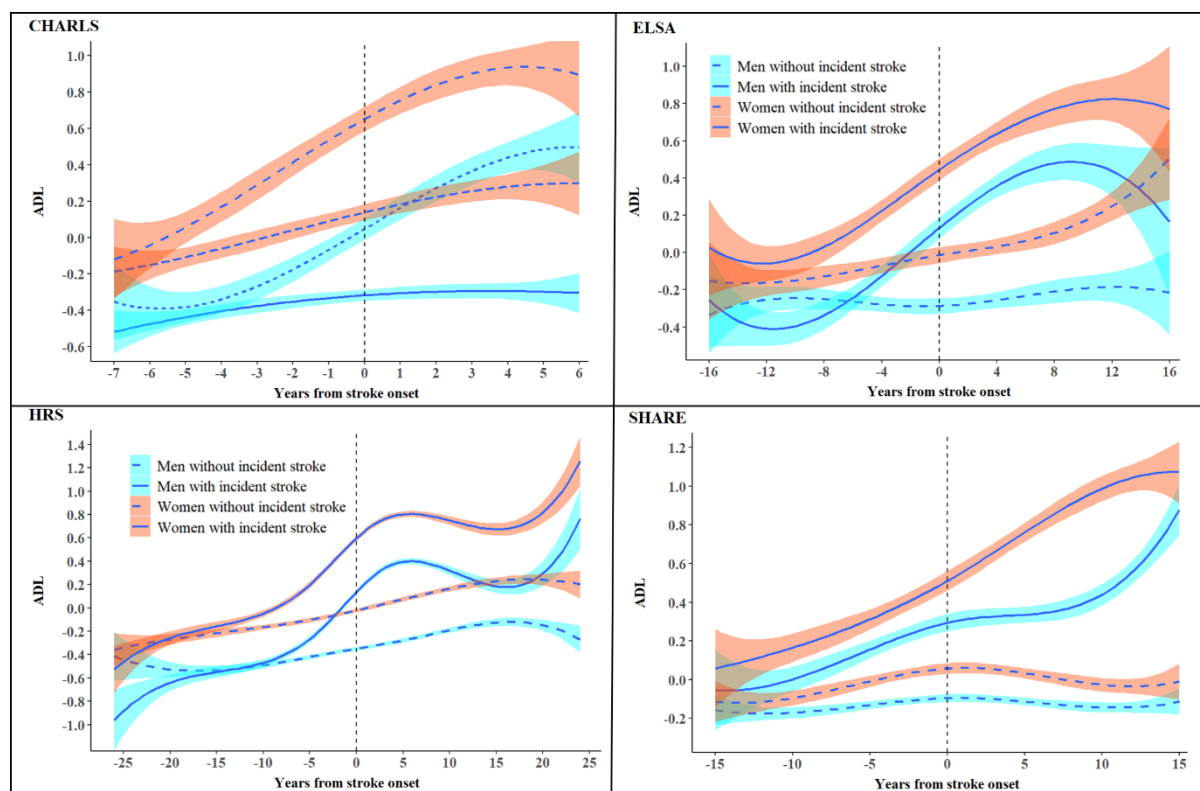


Figure S42. Trajectories of activities of daily living before and after the diagnosis of stroke by gender

CHARLS, China Health and Retirement Longitudinal Study; ELSA, English Longitudinal Study of Ageing; HRS, Health and Retirement Study; SHARE, Survey of Health, Ageing and Retirement in Europe.

Linear mixed models were used to estimate the trajectories of activities of daily living over time in individuals with and without incident stroke. The optimal number of knots were determined with the use of the Akaike and Bayesian information criteria.

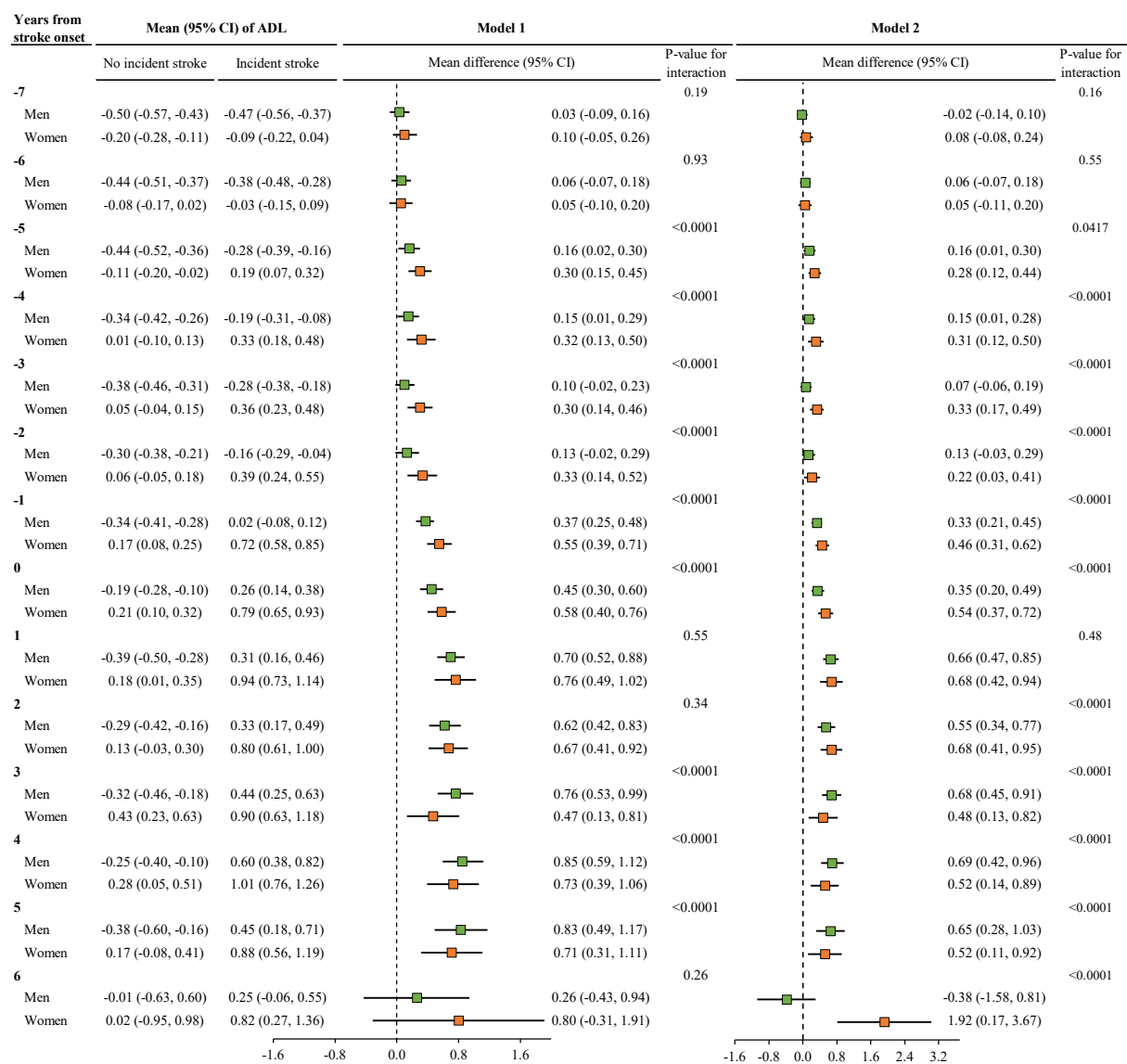


Figure S43. The association between incident stroke and activities of daily living by gender in the China Health and Retirement Longitudinal Study

Linear mixed models were used to test whether the association between incident stroke and activities of daily living was moderated by gender. P-values refer to false discovery rate-adjusted P-values for the interaction. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

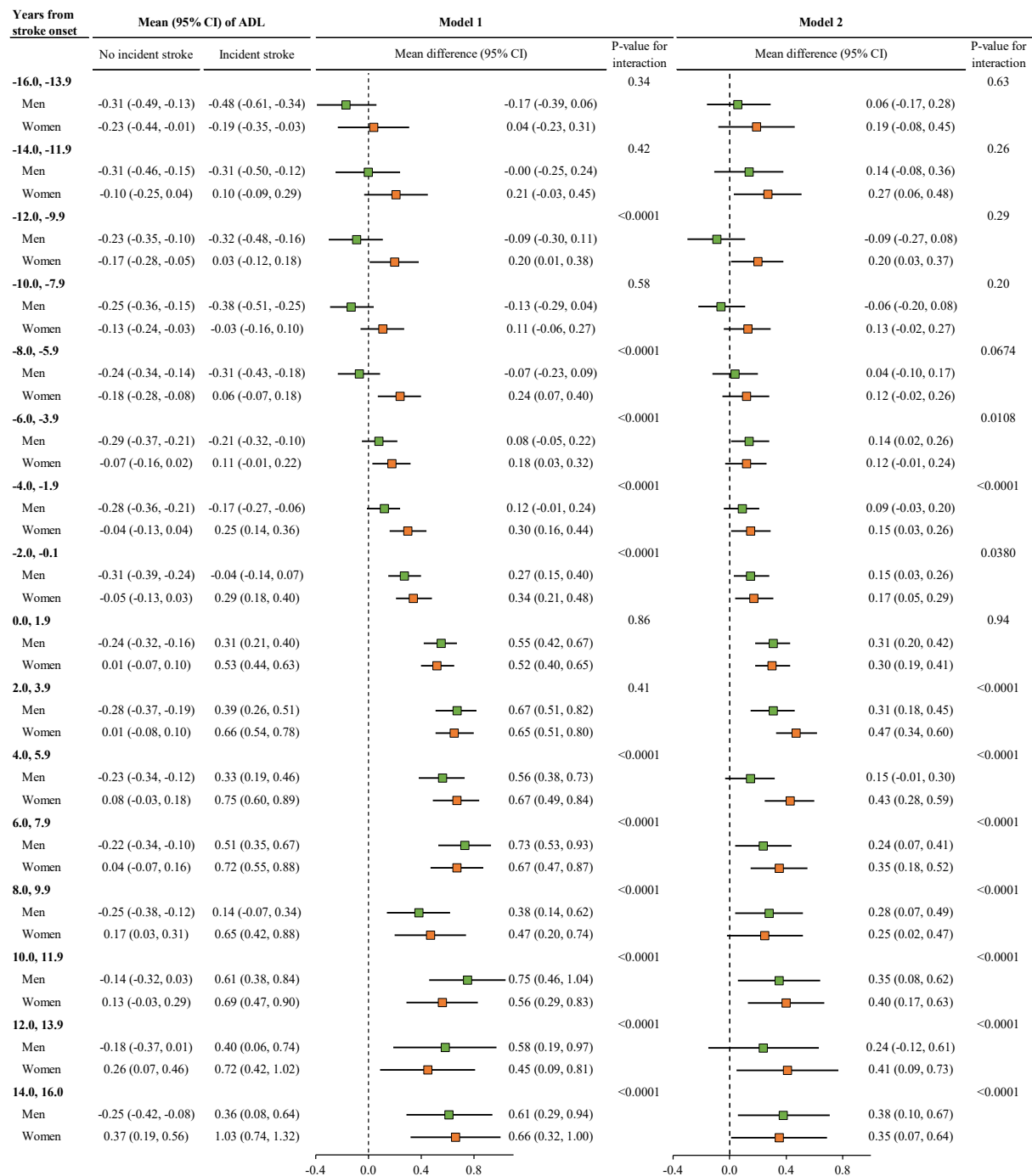


Figure S44. The association between incident stroke and activities of daily living by gender in the English Longitudinal Study of Ageing

Linear mixed models were used to test whether the association between incident stroke and activities of daily living was moderated by gender. P-values refer to false discovery rate-adjusted P-values for the interaction. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

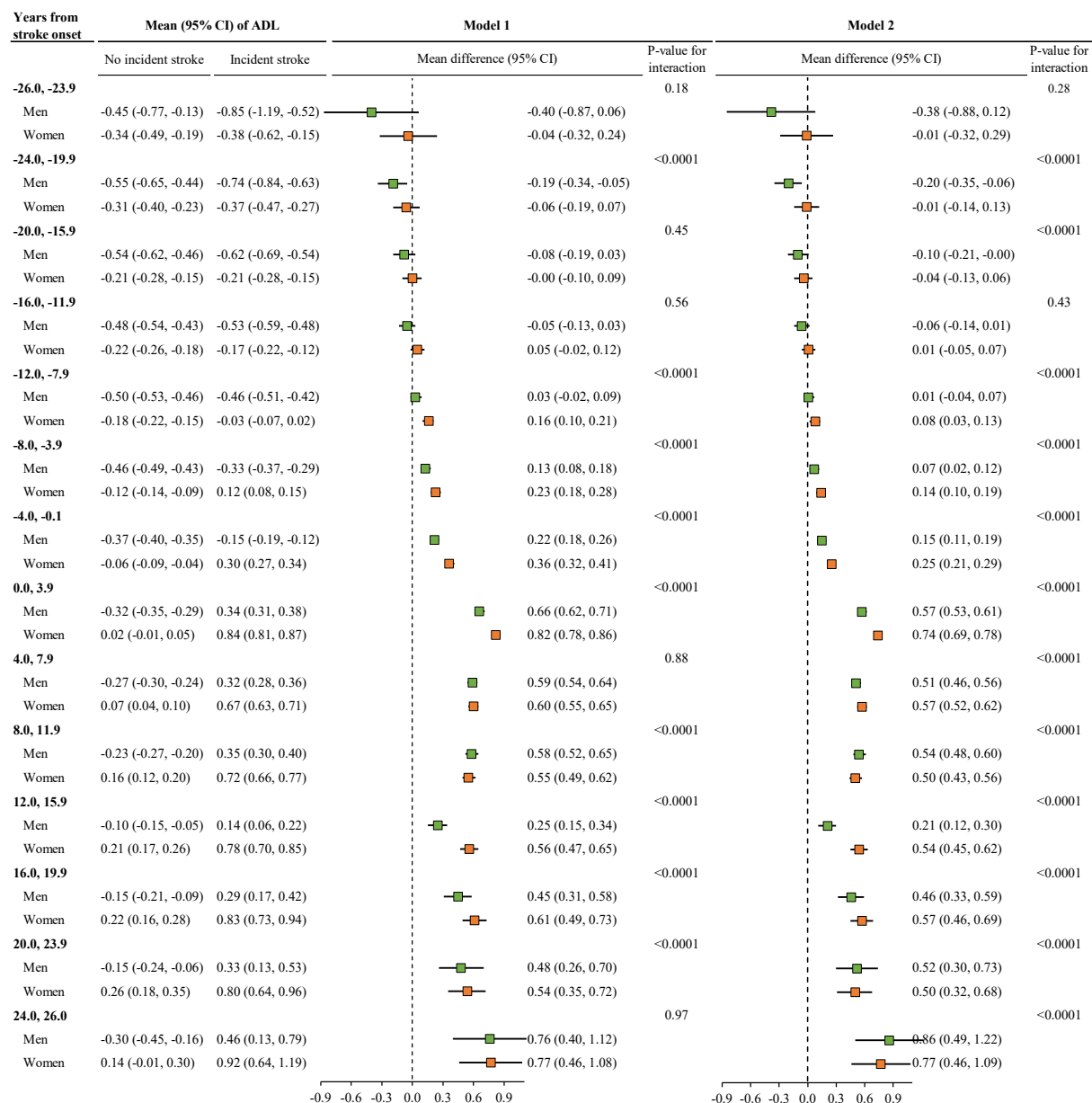


Figure S45. The association between incident stroke and activities of daily living by gender in the Health and Retirement Study

Linear mixed models were used to test whether the association between incident stroke and activities of daily living was moderated by gender. P-values refer to false discovery rate-adjusted P-values for the interaction. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

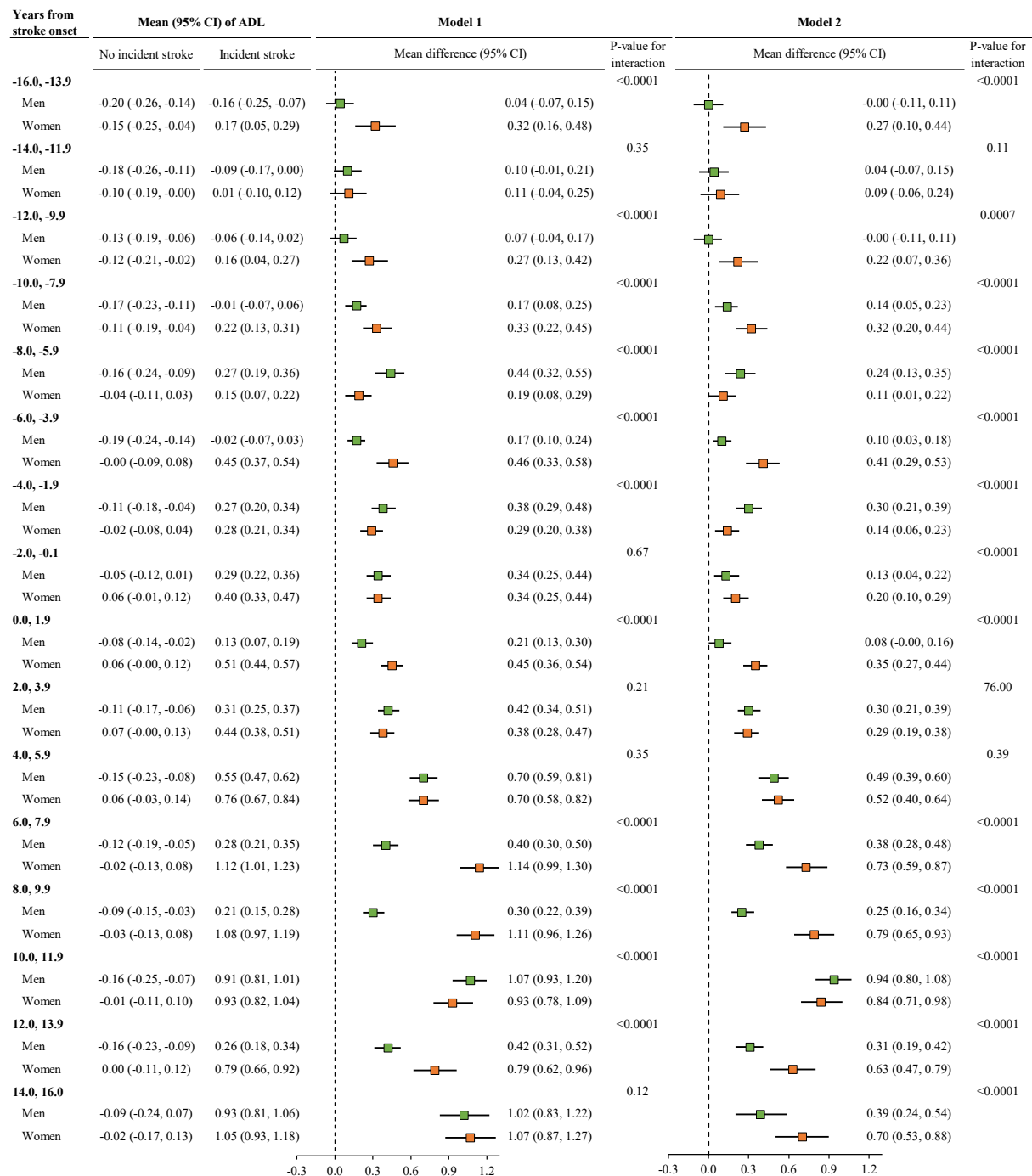


Figure S46. The association between incident stroke and activities of daily living by gender in the Survey of Health, Ageing and Retirement in Europe

Linear mixed models were used to test whether the association between incident stroke and activities of daily living was moderated by gender. P-values refer to false discovery rate-adjusted P-values for the interaction. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

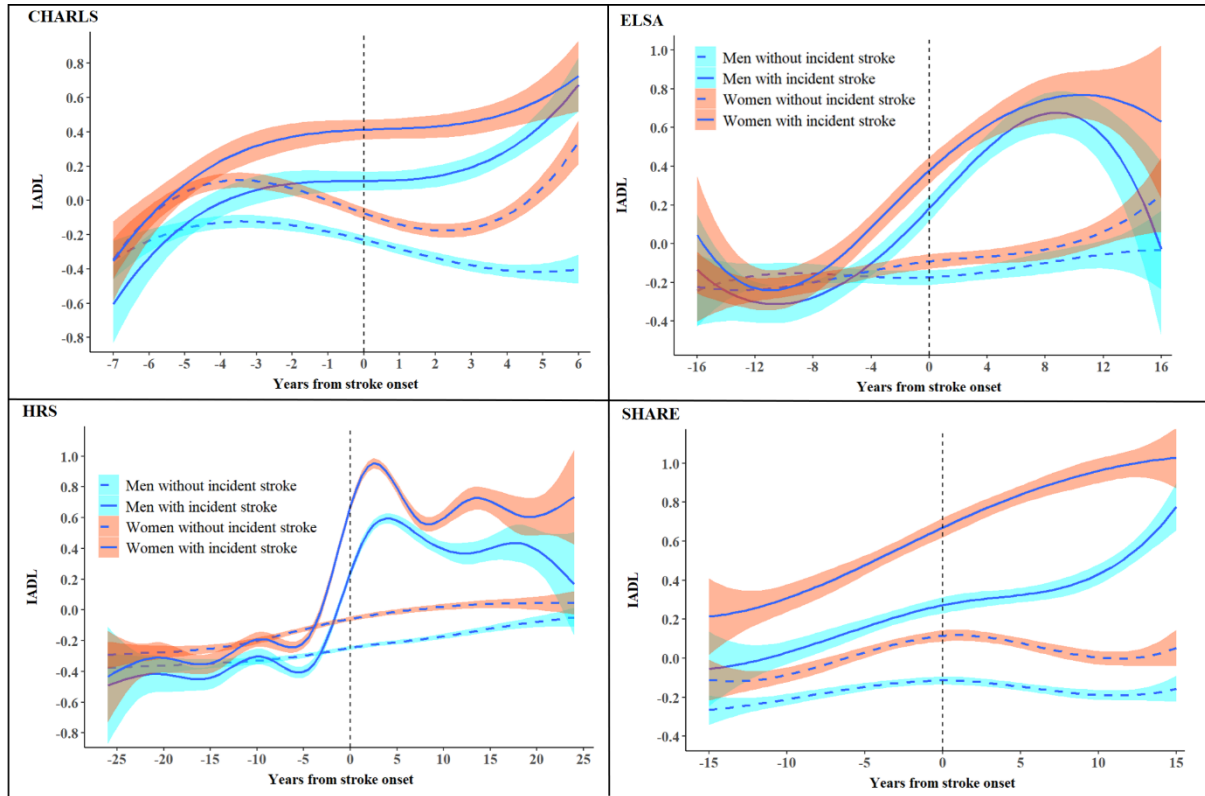


Figure S47. Trajectories of instrumental activities of daily living before and after the diagnosis of stroke by gender

CHARLS, China Health and Retirement Longitudinal Study; ELSA, English Longitudinal Study of Ageing; HRS, Health and Retirement Study; SHARE, Survey of Health, Ageing and Retirement in Europe.

Linear mixed models were used to estimate the trajectories of instrumental activities of daily living over time in individuals with and without incident stroke. The optimal number of knots were determined with the use of the Akaike and Bayesian information criteria.

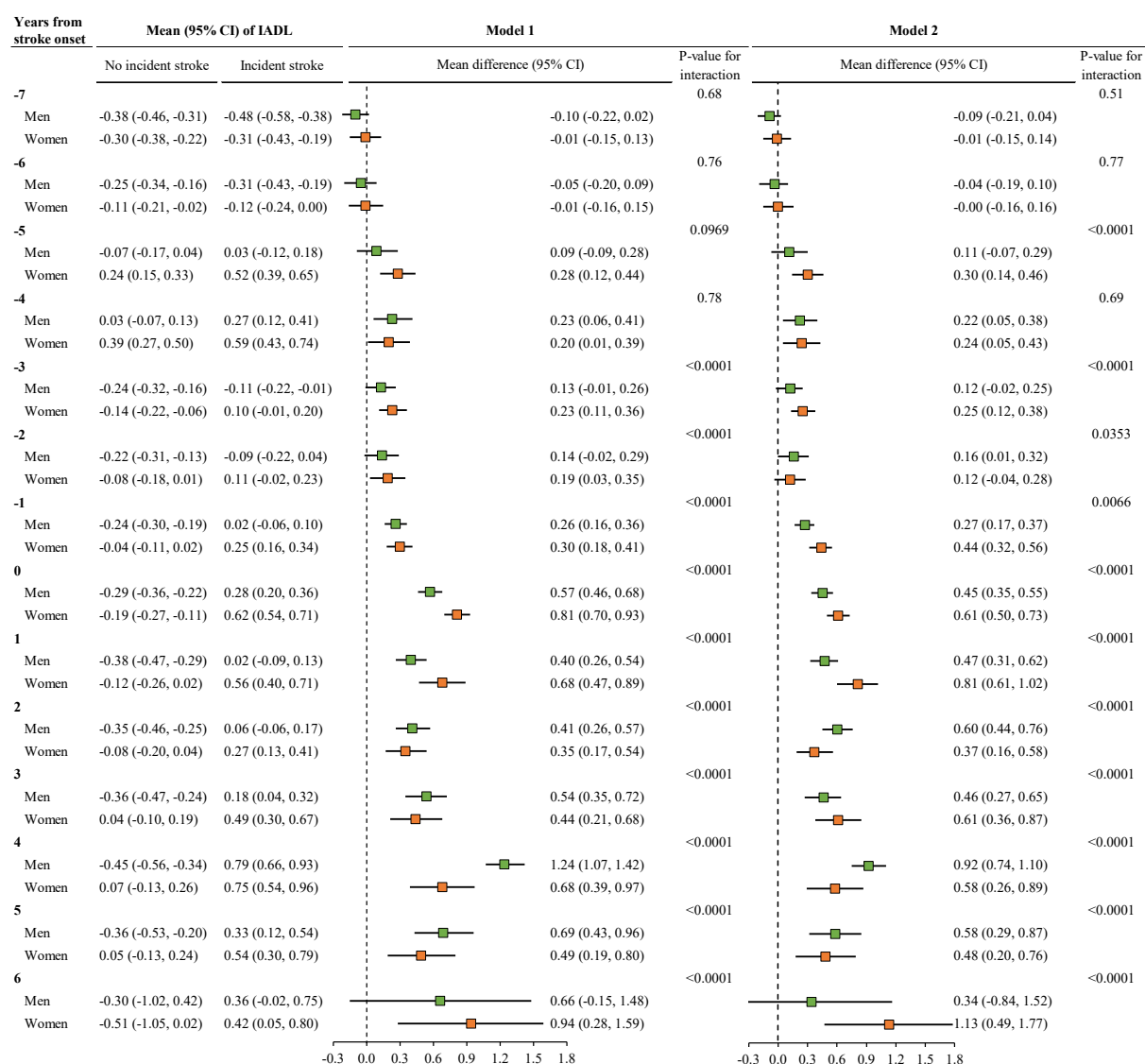


Figure S48. The association between incident stroke and instrumental activities of daily living by gender in the China Health and Retirement Longitudinal Study

Linear mixed models were used to test whether the association between incident stroke and instrumental activities of daily living was moderated by gender. P-values refer to false discovery rate-adjusted P-values for the interaction. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

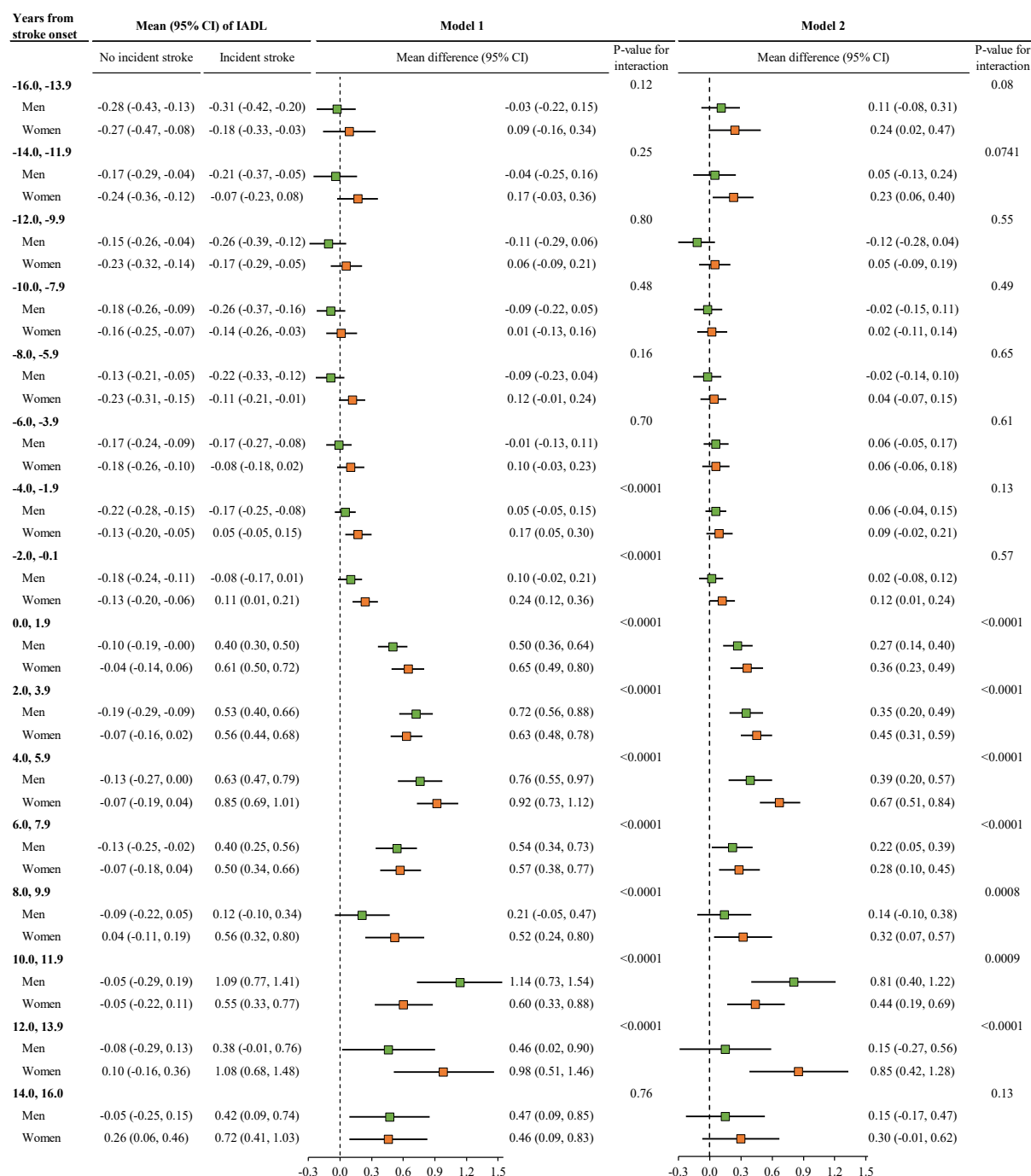


Figure S49. The association between incident stroke and instrumental activities of daily living by gender in the English Longitudinal Study of Ageing

Linear mixed models were used to test whether the association between incident stroke and instrumental activities of daily living was moderated by gender. P-values refer to false discovery rate-adjusted P-values for the interaction. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

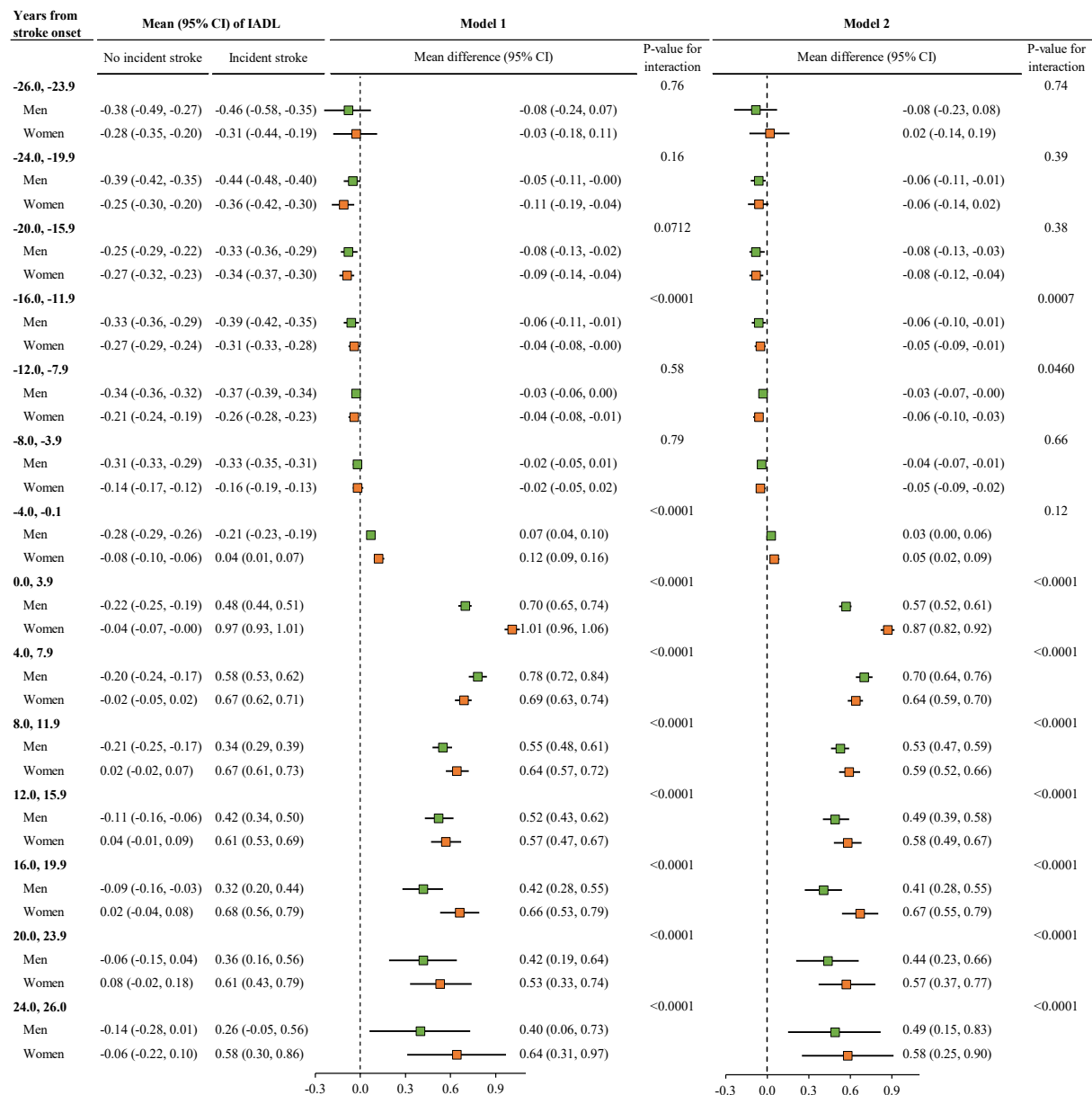


Figure S50. The association between incident stroke and instrumental activities of daily living by gender in the Health and Retirement Study

Linear mixed models were used to test whether the association between incident stroke and instrumental activities of daily living was moderated by gender. P-values refer to false discovery rate-adjusted P-values for the interaction. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

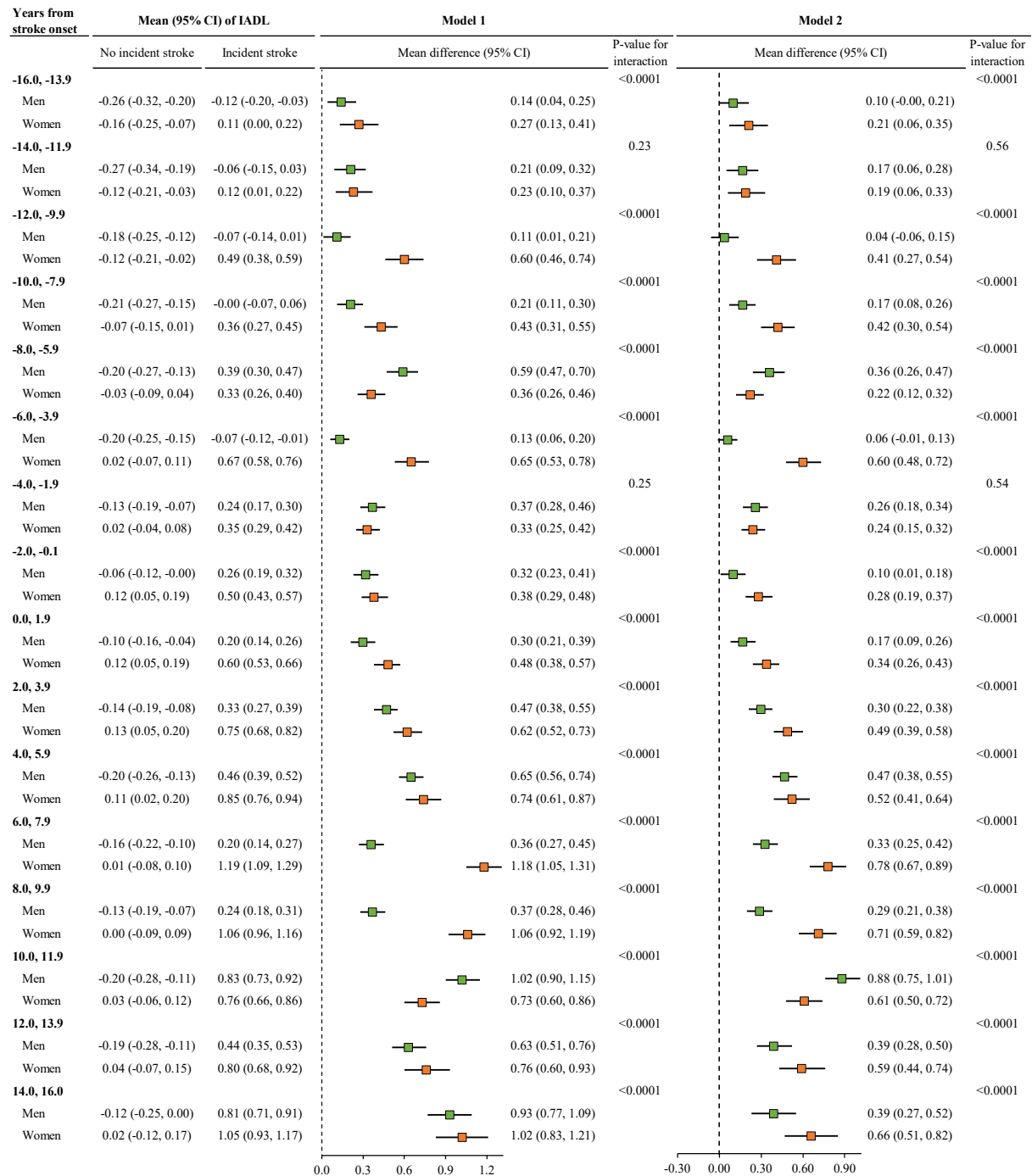


Figure S51. The association between incident stroke and instrumental activities of daily living by gender in the Survey of Health, Ageing and Retirement in Europe

Linear mixed models were used to test whether the association between incident stroke and instrumental activities of daily living was moderated by gender. P-values refer to false discovery rate-adjusted P-values for the interaction. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

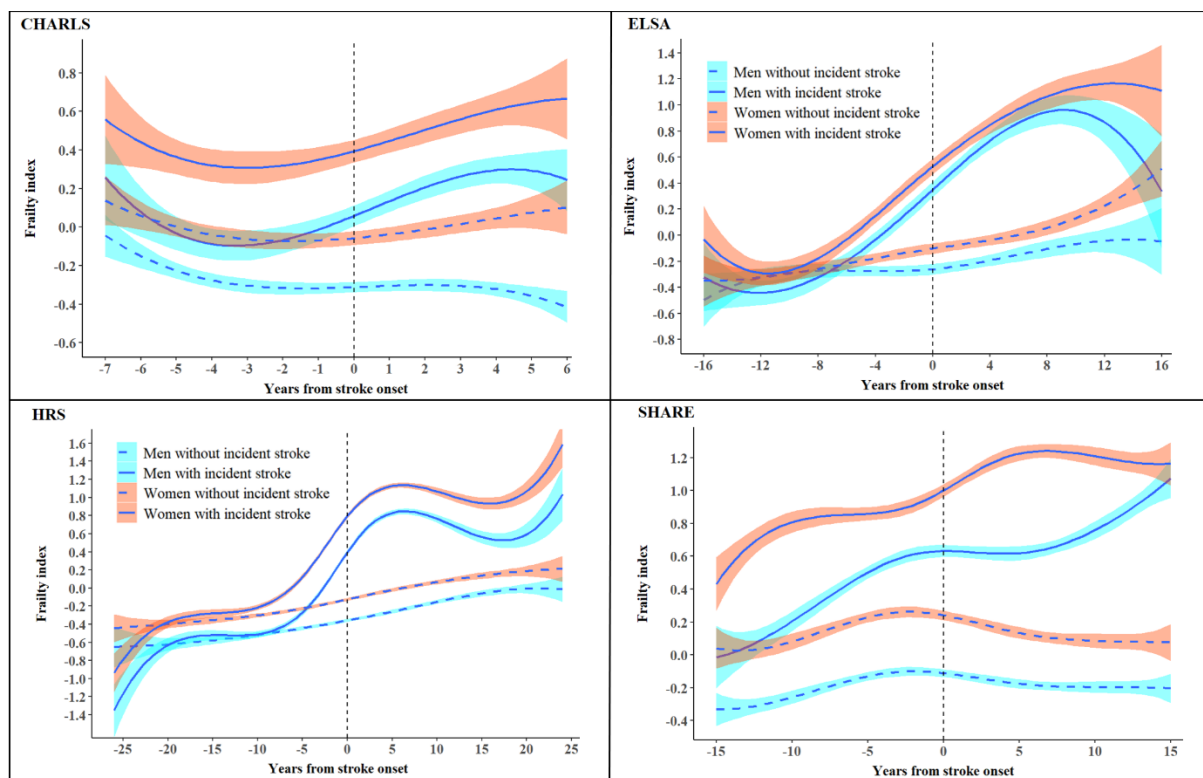


Figure S52. Trajectories of frailty index before and after the diagnosis of stroke by gender

CHARLS, China Health and Retirement Longitudinal Study; ELSA, English Longitudinal Study of Ageing; HRS, Health and Retirement Study; SHARE, Survey of Health, Ageing and Retirement in Europe.

Linear mixed models were used to estimate the trajectories of frailty index over time in individuals with and without incident stroke. The optimal number of knots were determined with the use of the Akaike and Bayesian information criteria.

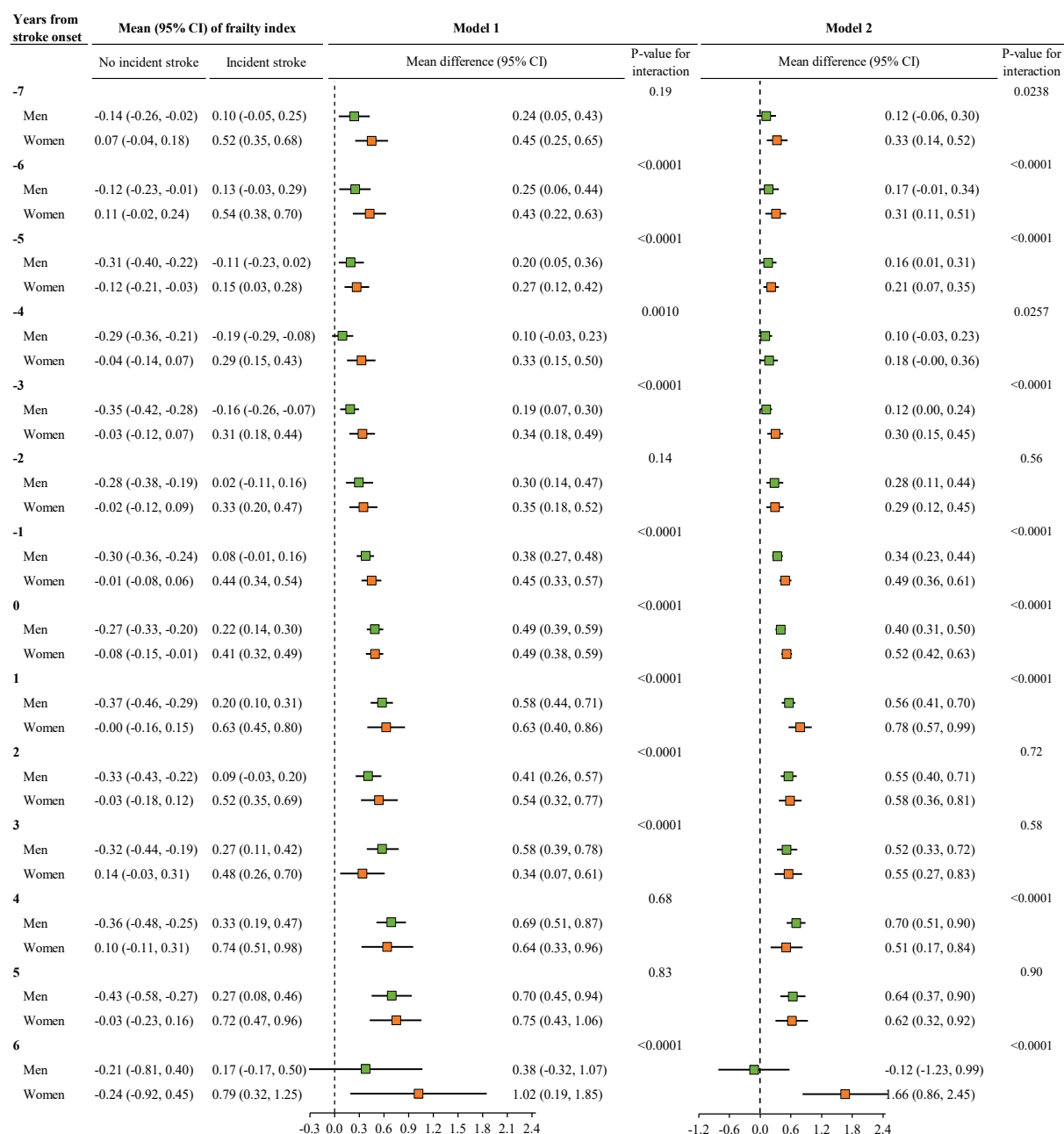


Figure S53. The association between incident stroke and frailty index by gender in the China Health and Retirement Longitudinal Study

Linear mixed models were used to test whether the association between incident stroke and frailty index was moderated by gender. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

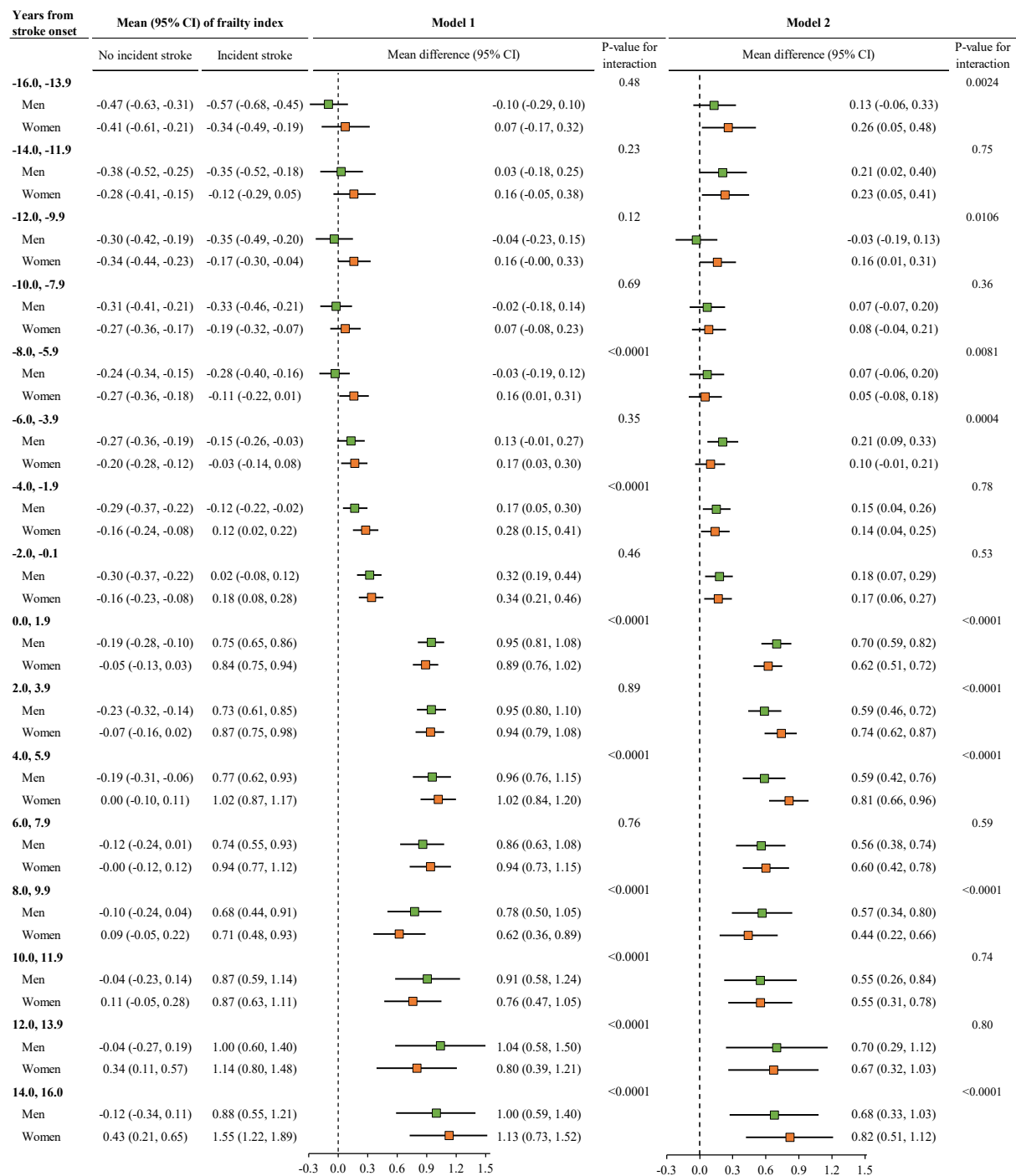


Figure S54. The association between incident stroke and frailty index by gender in the English Longitudinal Study of Ageing

Linear mixed models were used to test whether the association between incident stroke and frailty index was moderated by gender. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

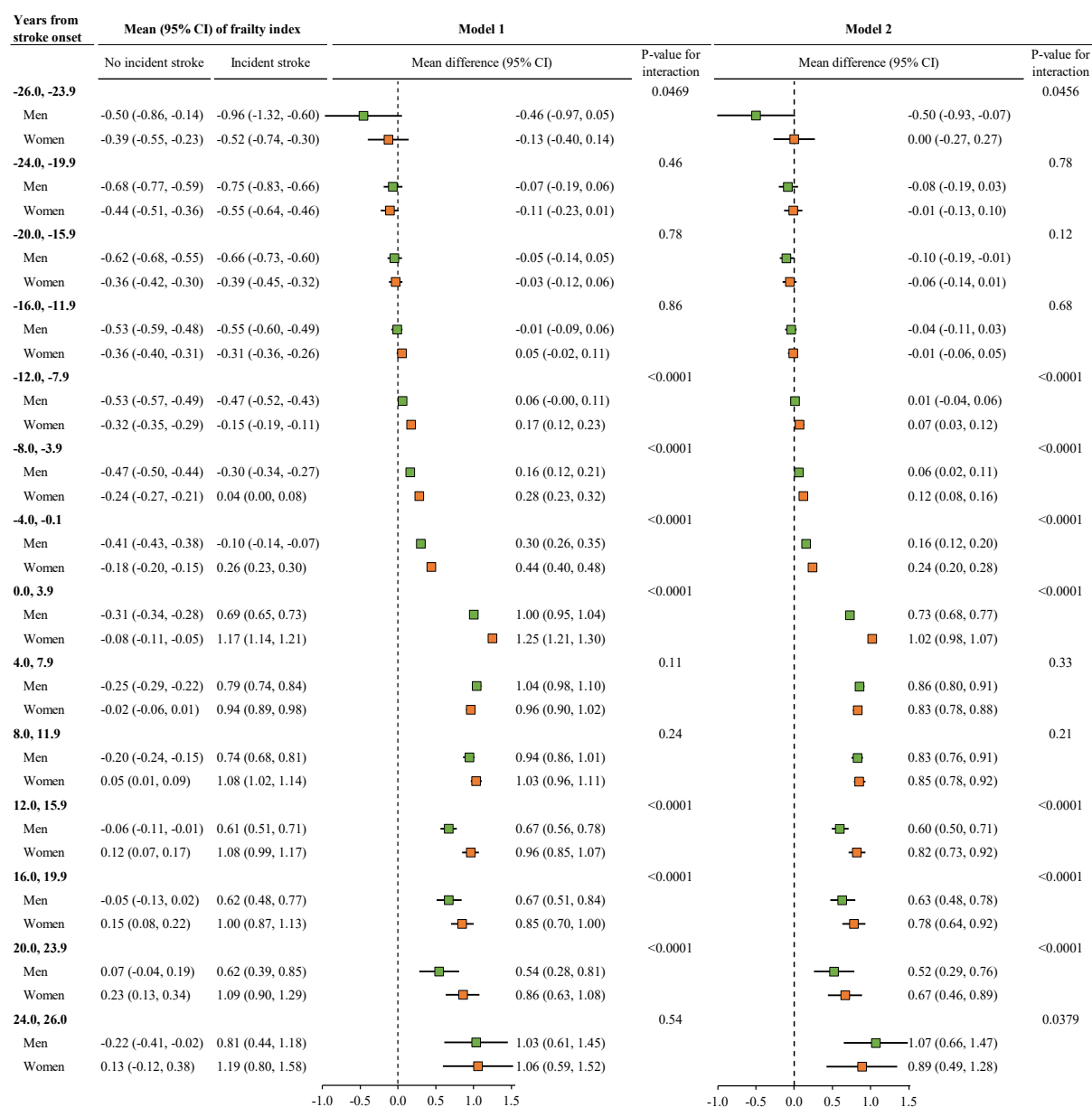


Figure S55. The association between incident stroke and frailty index by gender in the Health and Retirement Study

Linear mixed models were used to test whether the association between incident stroke and frailty index was moderated by gender. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

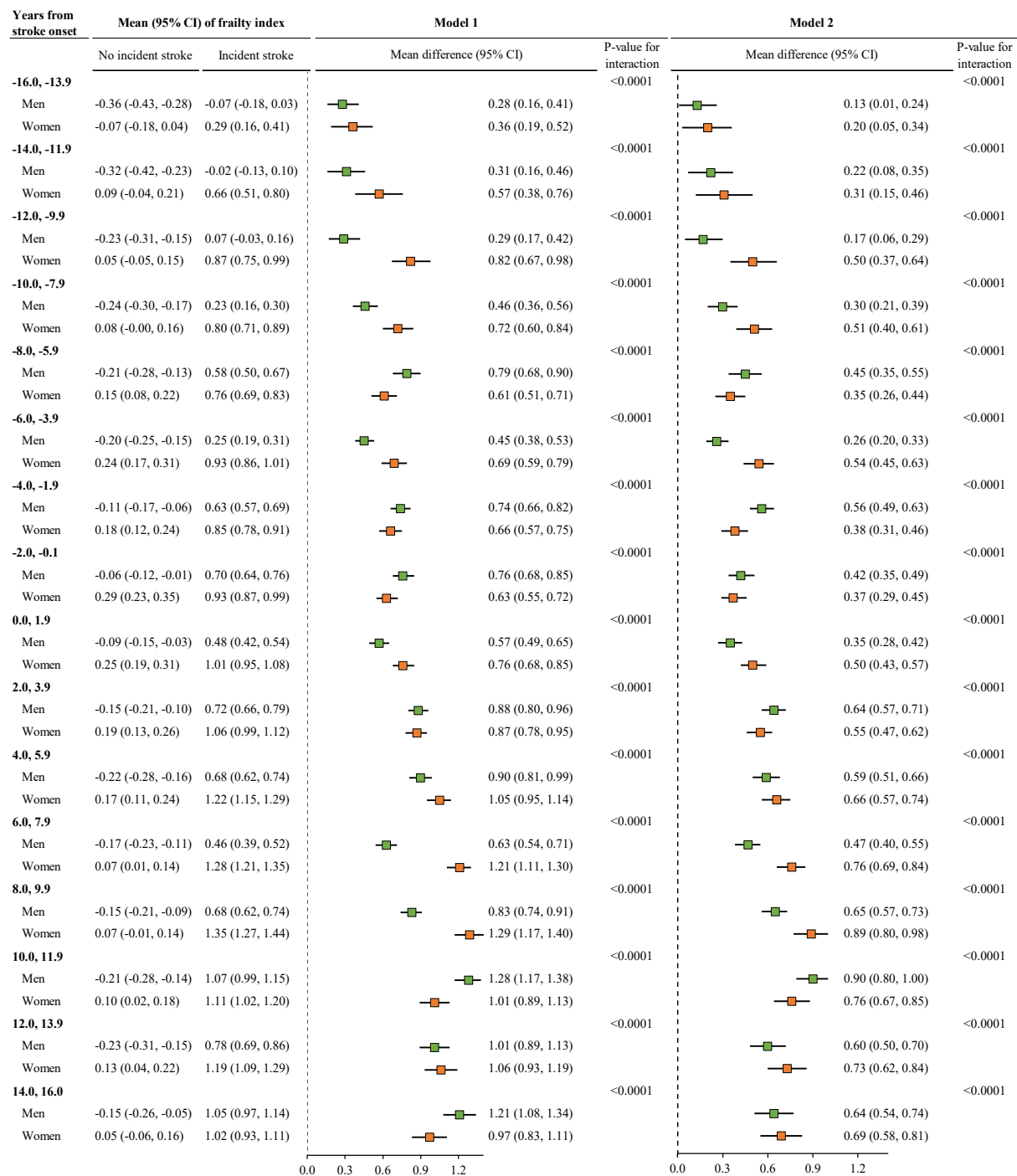


Figure S56. The association between incident stroke and frailty index by gender in the Survey of Health, Ageing and Retirement in Europe

Linear mixed models were used to test whether the association between incident stroke and frailty index was moderated by gender. Model 1 was unadjusted. Model 2 was adjusted for age, education, BMI, smoking, physical activity, alcohol consumption, hypertension, and diabetes at baseline. Horizontal lines indicate the ranges of the 95% confidence intervals, and vertical dashed lines indicate an annual change of 0. Green colors refer to the estimates for men, and red colors refer to the estimates for women.

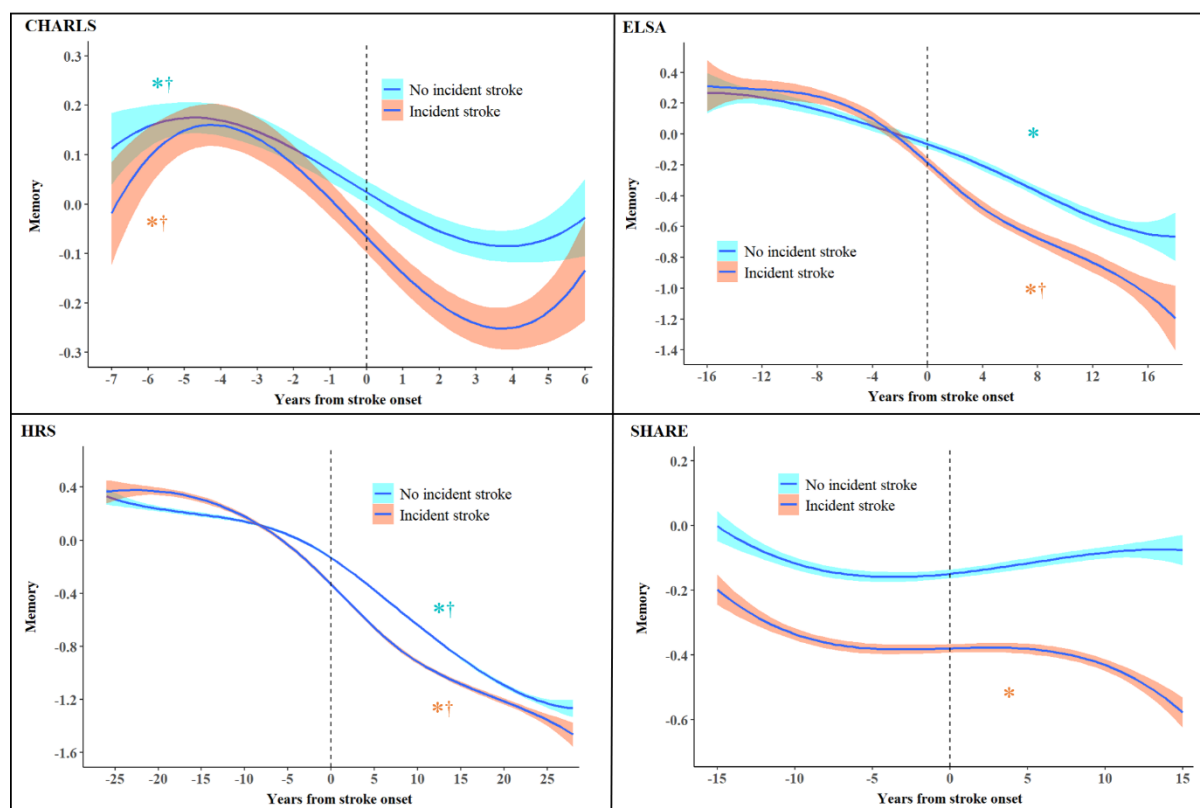


Figure S57. Trajectories of memory before and after the diagnosis of stroke, using imputed data

CHARLS, China Health and Retirement Longitudinal Study; ELSA, English Longitudinal Study of Ageing; HRS, Health and Retirement Study; SHARE, Survey of Health, Ageing and Retirement in Europe.

Linear mixed models were used to estimate the trajectories of activities of instrumental daily living over time in individuals with and without incident stroke. The optimal number of knots were determined with the use of the Akaike and Bayesian information criteria. Both linear and non-linear relationships were tested.

*refers to significance for linear relationships. Linear relationships were tested using the fixed effect coefficient in a linear mixed model.

†refers to significance for non-linear relationships. Non-linear relationships were tested by comparing models with and without quadratic/spline terms using likelihood ratio tests.

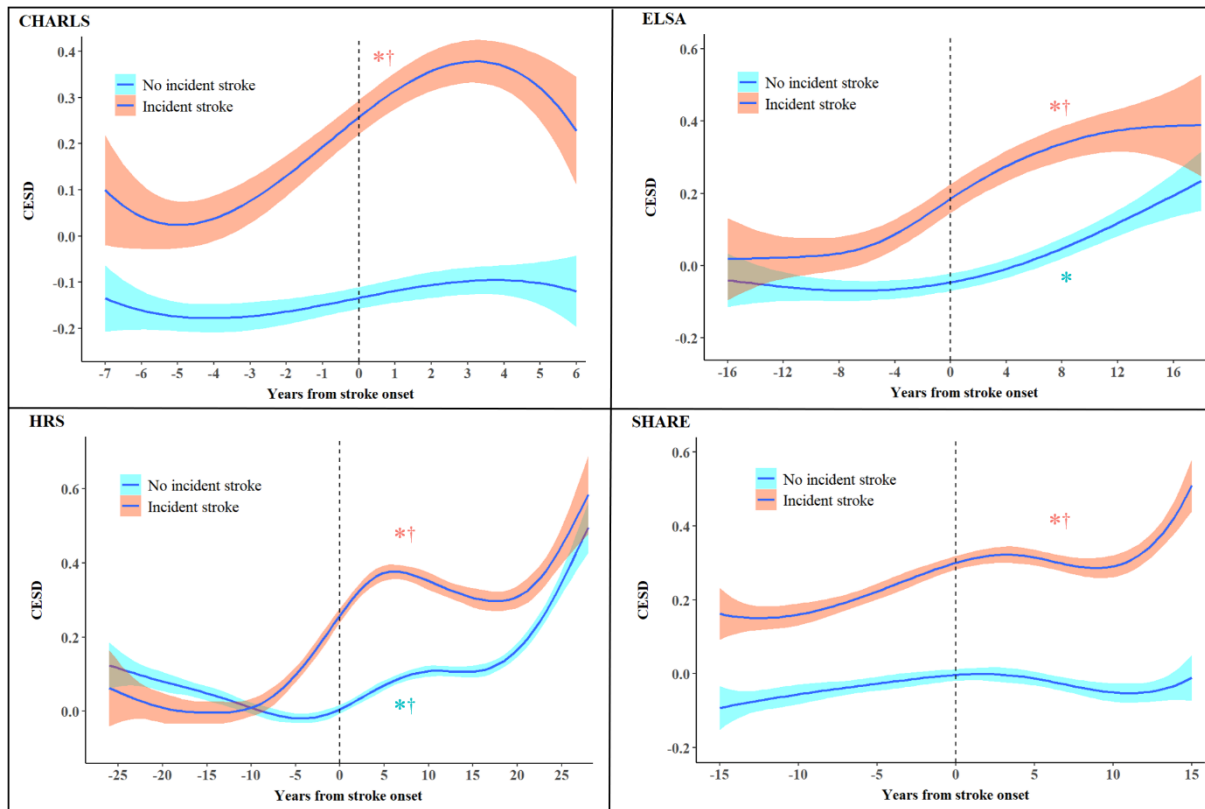


Figure S58. Trajectories of depressive symptoms before and after the diagnosis of stroke, using imputed data

CHARLS, China Health and Retirement Longitudinal Study; ELSA, English Longitudinal Study of Ageing; HRS, Health and Retirement Study; SHARE, Survey of Health, Ageing and Retirement in Europe.

Linear mixed models were used to estimate the trajectories of activities of instrumental daily living over time in individuals with and without incident stroke. The optimal number of knots were determined with the use of the Akaike and Bayesian information criteria. Both linear and non-linear relationships were tested.

*refers to significance for linear relationships. Linear relationships were tested using the fixed effect coefficient in a linear mixed model.

†refers to significance for non-linear relationships. Non-linear relationships were tested by comparing models with and without quadratic/spline terms using likelihood ratio tests.

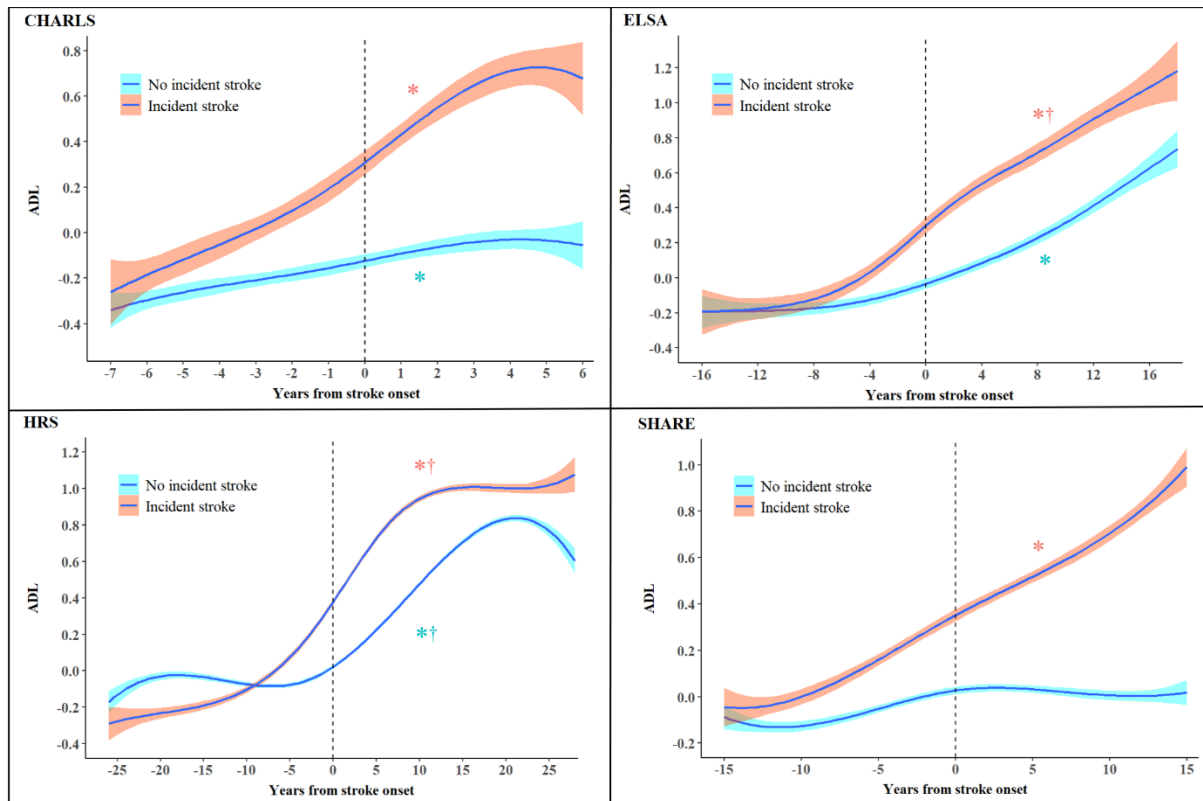


Figure S59. Trajectories of activities of daily living before and after the diagnosis of stroke, using imputed data

CHARLS, China Health and Retirement Longitudinal Study; ELSA, English Longitudinal Study of Ageing; HRS, Health and Retirement Study; SHARE, Survey of Health, Ageing and Retirement in Europe.

Linear mixed models were used to estimate the trajectories of activities of instrumental daily living over time in individuals with and without incident stroke. The optimal number of knots were determined with the use of the Akaike and Bayesian information criteria. Both linear and non-linear relationships were tested.

*refers to significance for linear relationships. Linear relationships were tested using the fixed effect coefficient in a linear mixed model.

†refers to significance for non-linear relationships. Non-linear relationships were tested by comparing models with and without quadratic/spline terms using likelihood ratio tests.

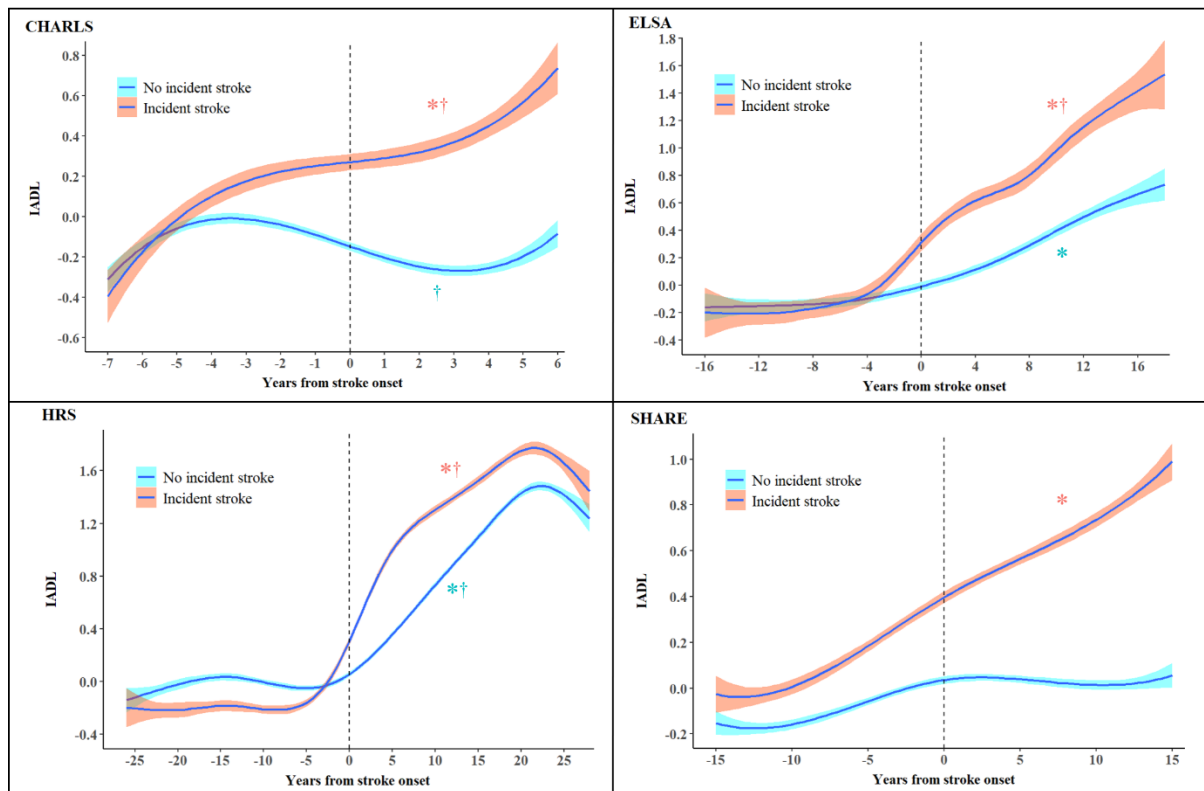


Figure S60. Trajectories of instrumental activities of daily living before and after the diagnosis of stroke, using imputed data

CHARLS, China Health and Retirement Longitudinal Study; ELSA, English Longitudinal Study of Ageing; HRS, Health and Retirement Study; SHARE, Survey of Health, Ageing and Retirement in Europe.

Linear mixed models were used to estimate the trajectories of activities of instrumental daily living over time in individuals with and without incident stroke. The optimal number of knots were determined with the use of the Akaike and Bayesian information criteria. Both linear and non-linear relationships were tested.

*refers to significance for linear relationships. Linear relationships were tested using the fixed effect coefficient in a linear mixed model.

†refers to significance for non-linear relationships. Non-linear relationships were tested by comparing models with and without quadratic/spline terms using likelihood ratio tests.

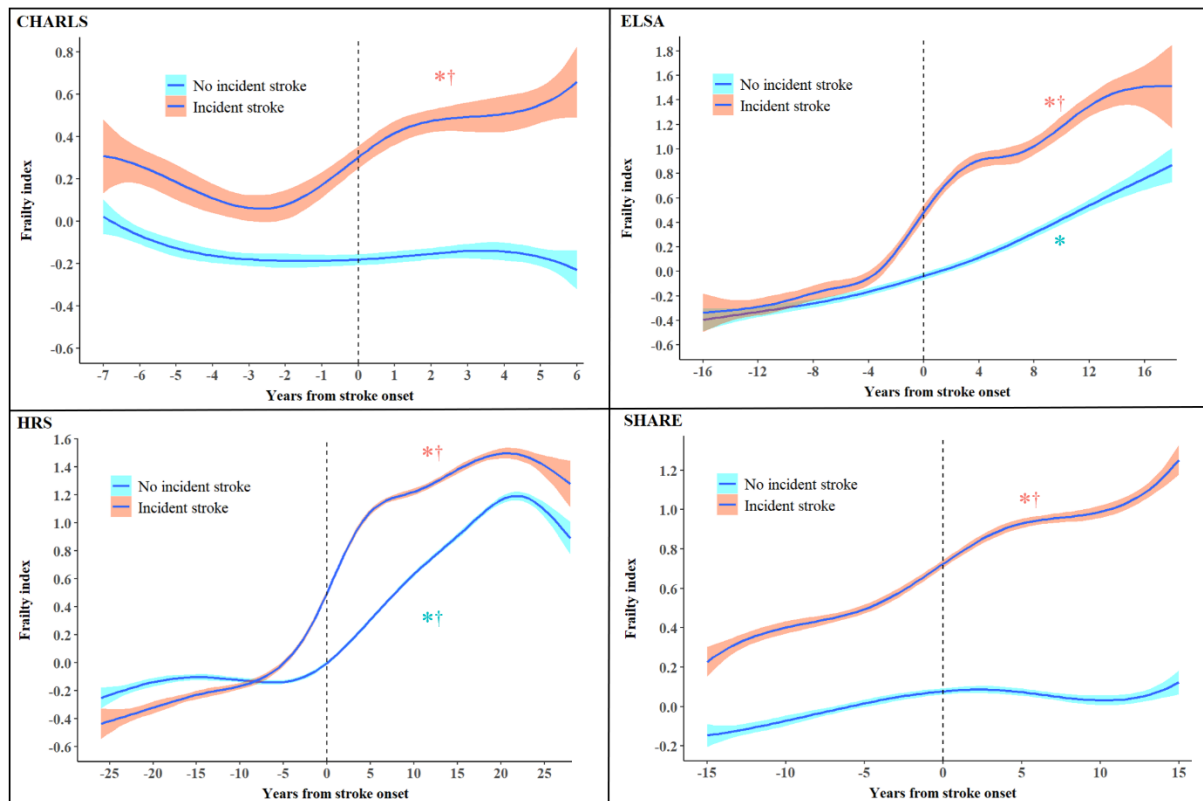


Figure S61. Trajectories of frailty index before and after the diagnosis of stroke, using imputed data

CHARLS, China Health and Retirement Longitudinal Study; ELSA, English Longitudinal Study of Ageing; HRS, Health and Retirement Study; SHARE, Survey of Health, Ageing and Retirement in Europe.

Linear mixed models were used to estimate the trajectories of activities of instrumental daily living over time in individuals with and without incident stroke. The optimal number of knots were determined with the use of the Akaike and Bayesian information criteria. Both linear and non-linear relationships were tested.

*refers to significance for linear relationships. Linear relationships were tested using the fixed effect coefficient in a linear mixed model.

†refers to significance for non-linear relationships. Non-linear relationships were tested by comparing models with and without quadratic/spline terms using likelihood ratio tests.

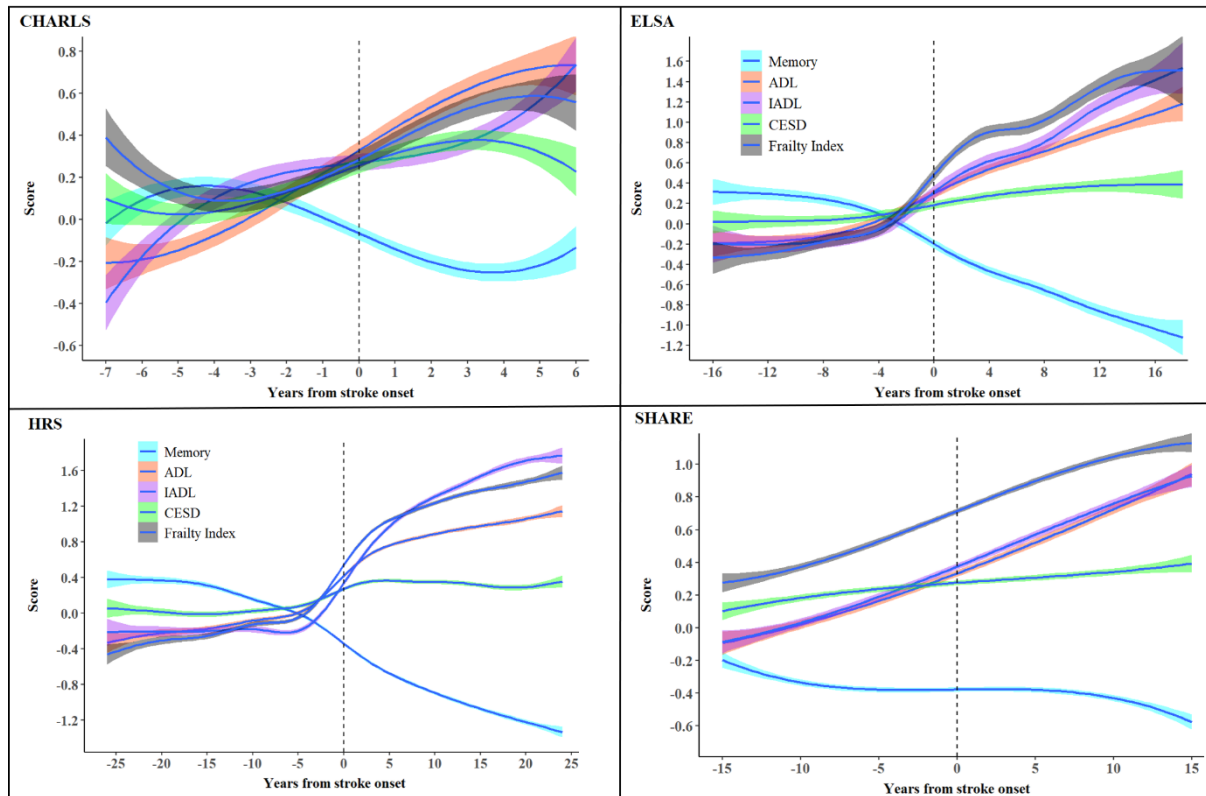


Figure S62. Trajectories of individual scores before and after the diagnosis of stroke among individuals with stroke, using imputed data

CHARLS, China Health and Retirement Longitudinal Study; ELSA, English Longitudinal Study of Ageing; HRS, Health and Retirement Study; SHARE, Survey of Health, Ageing and Retirement in Europe.

Table S1. Items for activities of daily living in the China Health and Retirement Longitudinal Study

No.	Questions	Answers (score)
1	Do you have any difficulty with running or jogging about 1 Km?	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
2	Do you have difficulty with Walking 1 km	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
3	Do you have difficulty with Walking 100 metres	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
4	Do you have difficulty with Getting up from a chair after sitting for a long period	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
5	Do you have difficulty with Climbing several flights of stairs without resting	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
6	Do you have difficulty with Stooping, kneeling, or crouching	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
7	Do you have difficulty with Reaching or extending your arms above shoulder level	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
8	Do you have difficulty with Lifting or carrying weights over 10 jin, like a heavy bag of groceries	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
9	Do you have difficulty with Picking up a small coin from a table	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)

Table S2. Items for activities of daily living in the English Longitudinal Study of Ageing

No.	Questions	Answers (score)
1	Because of a health problem, whether you have any difficulty with Walking 100 yards	(1) No (score=0); (2) Yes (score=1)
2	Because of a health problem, whether you have any difficulty with Sitting for about two hours	(1) No (score=0); (2) Yes (score=1)
3	Because of a health problem, whether you have any difficulty with Getting up from a chair after sitting for long periods	(1) No (score=0); (2) Yes (score=1)
4	Because of a health problem, whether you have any difficulty with Climbing several flights of stairs without resting	(1) No (score=0); (2) Yes (score=1)
5	Because of a health problem, whether you have any difficulty with Climbing one flight of stairs without resting	(1) No (score=0); (2) Yes (score=1)
6	Because of a health problem, whether you have any difficulty with Stooping, kneeling, or crouching	(1) No (score=0); (2) Yes (score=1)
7	Because of a health problem, whether you have any difficulty with Reaching or extending your arms above shoulder level	(1) No (score=0); (2) Yes (score=1)
8	Because of a health problem, whether you have any difficulty with Pulling or pushing large objects like a living room chair	(1) No (score=0); (2) Yes (score=1)
9	Because of a health problem, whether you have any difficulty with Lifting or carrying weights over 10 pounds, like a heavy bag	(1) No (score=0); (2) Yes (score=1)
10	Because of a health problem, whether you have any difficulty with Picking up a 5p coin from a table	(1) No (score=0); (2) Yes (score=1)

Table S3. Items for activities of daily living in the Health and Retirement Study

No.	Questions	Answers (score)
1	Because of a health problem do you have any difficulty with walking one block?	(1) No (score=0); (2) Yes (score=1)
2	Because of a health problem do you have any difficulty with sitting for about two hours?	(1) No (score=0); (2) Yes (score=1)
3	Because of a health problem do you have any difficulty with getting up from a chair after sitting for long periods?	(1) No (score=0); (2) Yes (score=1)
4	Because of a health problem do you have any difficulty with climbing several flights of stairs without resting?	(1) No (score=0); (2) Yes (score=1)
5	Because of a health problem do you have any difficulty with climbing one flight of stairs without resting?	(1) No (score=0); (2) Yes (score=1)
6	Because of a health problem do you have any difficulty with stooping, kneeling, or crouching?	(1) No (score=0); (2) Yes (score=1)
7	Because of a health problem do you have any difficulty with reaching or extending your arms above shoulder level?	(1) No (score=0); (2) Yes (score=1)
8	Because of a health problem do you have any difficulty with pulling or pushing large objects like a living room chair?	(1) No (score=0); (2) Yes (score=1)
9	Because of a health problem do you have any difficulty with lifting or carrying weights over 10 pounds, like a heavy bag of groceries?	(1) No (score=0); (2) Yes (score=1)
10	Because of a health problem do you have any difficulty with picking up a dime from a table?	(1) No (score=0); (2) Yes (score=1)

Table S4. Items for activities of daily living in the Survey of Health, Ageing and Retirement in Europe

No.	Questions	Answers (score)
1	Difficulties: walking 100 metres	(1) No (score=0); (2) Yes (score=1)
2	Difficulties: sitting two hours	(1) No (score=0); (2) Yes (score=1)
3	Difficulties: getting up from chair	(1) No (score=0); (2) Yes (score=1)
4	Difficulties: climbing several flights of stairs	(1) No (score=0); (2) Yes (score=1)
5	Difficulties: climbing one flight of stairs	(1) No (score=0); (2) Yes (score=1)
6	Difficulties: stooping, kneeling, crouching	(1) No (score=0); (2) Yes (score=1)
7	Difficulties: reaching or extending arms above shoulder	(1) No (score=0); (2) Yes (score=1)
8	Difficulties: pulling or pushing large objects	(1) No (score=0); (2) Yes (score=1)
9	Difficulties: lifting or carrying weights over 5 kilos	(1) No (score=0); (2) Yes (score=1)
10	Difficulties: picking up a small coin from a table	(1) No (score=0); (2) Yes (score=1)

Table S5. Items for instrumental activities of daily living in the China Health and Retirement Longitudinal Study

No.	Questions	Answers (score)
1	Because of health and memory problems, do you have any difficulty with dressing? Dressing includes taking clothes out from a closet, putting them on, buttoning up, and fastening a belt	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I cannot do it (score=2)
2	Because of health and memory problems, do you have any difficulty with bathing or showering?	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
3	Because of health and memory problems, do you have any difficulty with eating, such as cutting up your food?	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
4	Do you have any difficulty with getting into or out of bed?	
5	Because of health and memory problems, do you have any difficulties with using the toilet, including getting up and down?	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
6	Because of health and memory problems, do you have any difficulties with controlling urination and defecation? If you use a catheter (conduit) or a pouch by yourself, then you are not considered to have difficulties.	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
7	Because of health and memory problems, do you have any difficulties with doing household chores?	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
8	Because of health and memory problems, do you have any difficulties with preparing hot meals?	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
9	Because of health and memory problems, do you have any difficulties with shopping for groceries?	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
10	Because of health and memory problems, do you have any difficulties with managing your money, such as paying your bills, keeping track of expenses, or managing assets?	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have difficulty and need help (score=2); (4) I can not do it (score=2)
11	Because of health and memory problems, do you have any difficulties with taking medications?	(1) No, I don't have any difficulty (score=0); (2) I have difficulty but can still do it (score=1); (3) Yes, I have

difficulty and need help (score=2); (4) I can not do it
(score=2)

Table S6. Items for instrumental activities of daily living in the English Longitudinal Study of Ageing

No.	Questions	Answers (score)
1	Because of a health or memory problem, do you have any difficulty with Dressing, including putting on shoes and socks	(1) No (score=0); (2) Yes (score=1)
2	Because of a health or memory problem, do you have any difficulty with Walking across a room	(1) No (score=0); (2) Yes (score=1)
3	Because of a health or memory problem, do you have any difficulty with Bathing or showering	(1) No (score=0); (2) Yes (score=1)
4	Because of a health or memory problem, do you have any difficulty with Eating, such as cutting up your food	(1) No (score=0); (2) Yes (score=1)
5	Because of a health or memory problem, do you have any difficulty with Getting in or out of bed	(1) No (score=0); (2) Yes (score=1)
6	Because of a health or memory problem, do you have any difficulty with Using the toilet, including getting up or down	(1) No (score=0); (2) Yes (score=1)
7	Because of a health or memory problem, do you have any difficulty with Using a map to figure out how to get around in a strange place	(1) No (score=0); (2) Yes (score=1)
8	Because of a health or memory problem, do you have any difficulty with Preparing a hot meal	(1) No (score=0); (2) Yes (score=1)
9	Because of a health or memory problem, do you have any difficulty with Shopping for groceries	(1) No (score=0); (2) Yes (score=1)
10	Because of a health or memory problem, do you have any difficulty with Making telephone calls	(1) No (score=0); (2) Yes (score=1)
11	Because of a health or memory problem, do you have any difficulty with Taking medications	(1) No (score=0); (2) Yes (score=1)
12	Because of a health or memory problem, do you have any difficulty with Doing work around the house or garden	(1) No (score=0); (2) Yes (score=1)
13	Because of a health or memory problem, do you have any difficulty with Managing money, such as paying bills and keeping track of ex	(1) No (score=0); (2) Yes (score=1)

Table S7. Items for instrumental activities of daily living in the Health and Retirement Study

No.	Questions	Answers (score)
1	Because of a health or memory problem do you have any difficulty with dressing, including putting on shoes and socks?	(1) No (score=0); (2) Yes (score=1)
2	Because of a health or memory problem do you have any difficulty with walking across a room?	(1) No (score=0); (2) Yes (score=1)
3	Because of a health or memory problem do you have any difficulty with bathing or showering?	(1) No (score=0); (2) Yes (score=1)
4	Because of a health or memory problem do you have any difficulty with eating, such as cutting up your food?	(1) No (score=0); (2) Yes (score=1)
5	Because of a health or memory problem do you have any difficulty with getting in or out of bed?	(1) No (score=0); (2) Yes (score=1)
6	Because of a health or memory problem do you have) any difficulty with using the toilet, including getting up and down?	(1) No (score=0); (2) Yes (score=1)

Table S8. Items for instrumental activities of daily living in the Survey of Health, Ageing and Retirement in Europe

No.	Questions	Answers (score)
1	Difficulties: dressing, including shoes and socks	(1) No (score=0); (2) Yes (score=1)
2	Difficulties: walking across a room	(1) No (score=0); (2) Yes (score=1)
3	Difficulties: bathing or showering	(1) No (score=0); (2) Yes (score=1)
4	Difficulties: eating, cutting up food	(1) No (score=0); (2) Yes (score=1)
5	Difficulties: getting in or out of bed	(1) No (score=0); (2) Yes (score=1)
6	Difficulties: using the toilet, incl getting up or down	(1) No (score=0); (2) Yes (score=1)
7	Difficulties: using a map in a strange place	(1) No (score=0); (2) Yes (score=1)
8	Difficulties: preparing a hot meal	(1) No (score=0); (2) Yes (score=1)
9	Difficulties: shopping for groceries	(1) No (score=0); (2) Yes (score=1)
10	Difficulties: telephone calls	(1) No (score=0); (2) Yes (score=1)
11	Difficulties: taking medications	(1) No (score=0); (2) Yes (score=1)
12	Difficulties: doing work around the house or garden	(1) No (score=0); (2) Yes (score=1)
13	Difficulties: managing money	(1) No (score=0); (2) Yes (score=1)

Table S9. Items for depressive symptoms in the China Health and Retirement Longitudinal Study

No.	Questions	Answers (score)
1	I was bothered by things that don't usually bother me	(1) Rarely or none of the time (<1 day)-score=0; (2) Some or a little of the time (1-2 days)-score=1; (3) Occasionally or a moderate amount of the time (3-4 days)-score=2; (4) Most or all of the time (5-7 days)-score=3
2	I had trouble keeping my mind on what I was doing.	(1) Rarely or none of the time (<1 day)-score=0; (2) Some or a little of the time (1-2 days)-score=1; (3) Occasionally or a moderate amount of the time (3-4 days)-score=2; (4) Most or all of the time (5-7 days)-score=3
3	I felt depressed	(1) Rarely or none of the time (<1 day)-score=0; (2) Some or a little of the time (1-2 days)-score=1; (3) Occasionally or a moderate amount of the time (3-4 days)-score=2; (4) Most or all of the time (5-7 days)-score=3
4	I felt everything I did was an effort	(1) Rarely or none of the time (<1 day)-score=0; (2) Some or a little of the time (1-2 days)-score=1; (3) Occasionally or a moderate amount of the time (3-4 days)-score=2; (4) Most or all of the time (5-7 days)-score=3
5	I felt hopeful about the future	(1) Rarely or none of the time (<1 day)-score=3; (2) Some or a little of the time (1-2 days)-score=2; (3) Occasionally or a moderate amount of the time (3-4 days)-score=1; (4) Most or all of the time (5-7 days)-score=0
6	I felt fearful	(1) Rarely or none of the time (<1 day)-score=0; (2) Some or a little of the time (1-2 days)-score=1; (3) Occasionally or a moderate amount of the time (3-4 days)-score=2; (4) Most or all of the time (5-7 days)-score=3
7	My sleep was restless	(1) Rarely or none of the time (<1 day)-score=0; (2) Some or a little of the time (1-2 days)-score=1; (3) Occasionally or a moderate amount of the time (3-4 days)-score=2; (4) Most or all of the time (5-7 days)-score=3
8	I was happy	(1) Rarely or none of the time (<1 day)-score=3; (2) Some or a little of the time (1-2 days)-score=2; (3) Occasionally or a moderate amount of the time (3-4 days)-score=1; (4) Most or all of the time (5-7 days)-score=0
9	I felt lonely	(1) Rarely or none of the time (<1 day)-score=0; (2) Some or a little of the time (1-2 days)-score=1; (3) Occasionally or a moderate amount of the time (3-4 days)-score=2; (4) Most or all of the time (5-7 days)-score=3
10	I could not get "going"	(1) Rarely or none of the time (<1 day)-score=0; (2) Some or a little of the time (1-2 days)-score=1; (3) Occasionally or a moderate amount of the time (3-4 days)-score=2; (4) Most or all of the time (5-7 days)-score=3

Table S10. Items for depressive symptoms in the English Longitudinal Study of Ageing

No.	Questions	Answers (score)
1	Much of the time during the past week, have you felt depressed?	(1) No (score=0); (2) Yes (score=1)
2	Much of the time during the past week, have you felt that everything you did was an effort?	(1) No (score=0); (2) Yes (score=1)
3	Much of the time during the past week, has your sleep been restless?	(1) No (score=0); (2) Yes (score=1)
4	Much of the time during the past week, were you happy?	(1) No (score=1); (2) Yes (score=0)
5	Much of the time during the past week, have you felt lonely?	(1) No (score=0); (2) Yes (score=1)
6	Much of the time during the past week, have you enjoyed life?	(1) No (score=1); (2) Yes (score=0)
7	Much of the time during the past week, have you felt sad?	(1) No (score=0); (2) Yes (score=1)
8	Much of the time during the past week, could you not get going?	(1) No (score=0); (2) Yes (score=1)

Table S11. Items for depressive symptoms in the Health and Retirement Study

No.	Questions	Answers (score)
1	During the last 12 months, was there ever a time when you felt sad, blue, or depressed for two weeks or more in a row?	(1) No (score=0); (2) Yes (score=1)
2	During those two weeks, did you lose interest in most things?	(1) No (score=0); (2) Yes (score=1)
3	During those same two weeks, did you lose your appetite?	(1) No (score=0); (2) Yes (score=1)
4	Did your appetite increase during those same two weeks?	(1) No (score=1); (2) Yes (score=0)
5	Did you have more trouble falling asleep than you usually do during those two weeks?	(1) No (score=0); (2) Yes (score=1)
6	During that same two-week period did you have a lot more trouble concentrating than usual?	(1) No (score=0); (2) Yes (score=1)
7	People sometimes feel down on themselves, and no good or worthless. During that two-week period, did you feel this way?	(1) No (score=0); (2) Yes (score=1)
8	Did you think a lot about death – either your own, someone else's, or death in general – during those two weeks?	(1) No (score=0); (2) Yes (score=1)

Table S12. Items for depressive symptoms in the Survey of Health, Ageing and Retirement in Europe

No.	Questions	Answers (score)
1	Sad or depressed last month	(1) No (score=0); (2) Yes (score=1)
2	Hopes for the future	(1) No (score=1); (2) Yes (score=0)
3	Suicidal feelings or wish to be dead suicide feelings	(1) No (score=0); (2) Yes (score=1)
4	Feels guilty feels guilty	(1) No (score=0); (2) Yes (score=1)
5	Trouble sleeping trouble sleep	(1) No (score=0); (2) Yes (score=1)
6	Less or same interest in things	(1) No (score=0); (2) Yes (score=1)
7	Irritability	(1) No (score=0); (2) Yes (score=1)
8	Appetite	(1) No (score=0); (2) Yes (score=1)
9	Fatigue	(1) No (score=0); (2) Yes (score=1)
10	Concentration on reading concentration	(1) No (score=0); (2) Yes (score=1)
11	Enjoyment	(1) No (score=1); (2) Yes (score=0)
12	Tearfulness	(1) No (score=0); (2) Yes (score=1)

Table S13. Items for frailty index

No	Description of the item				Cut-off value
	CHARLS	ELSA	HRS	SHARE	
1	Self-reported physician diagnosed hypertension				Yes = 1, No = 0
2	Self-reported physician diagnosed diabetes				Yes = 1, No = 0
3	Self-reported physician diagnosed heart disease				Yes = 1, No = 0
4	Self-reported physician diagnosed cancer				Yes = 1, No = 0
5	Self-reported physician diagnosed arthritis				Yes = 1, No = 0
6	Self-reported physician diagnosed chronic lung disease				Yes = 1, No = 0
7	Self-reported physician diagnosed any emotional, nervous, or psychiatric problems				Yes = 1, No = 0
8	Self-reported physician diagnosed memory-related disease*				Yes = 1, No = 0
9	Self-reported vision problems				Yes = 1, No = 0 in CHARLS; Poor or fair = 1, excellent, very good, or good = 0 in ELSA, HRS, and SHARE
10	Self-reported hearing problems				Yes = 1, No = 0 in CHARLS; Poor or fair = 1, excellent, very good, or good = 0 in ELSA, HRS, and SHARE
11	Self-reported general health status				Very poor or poor = 1, Very good, good, or fair = 0 in CHARLS, ELSA, and HRS; Very poor, poor, spontaneous registered or legally blind = 1, Very good, good, or fair = 0 in SHARE
12	Mobility: difficulty with walking 100 yards or one block				Yes = 1, No = 0
13	Mobility: difficulty with getting up from a chair after sitting for long periods				Yes = 1, No = 0
14	Mobility: difficulty with climbing several flights of stairs without resting				Yes = 1, No = 0
15	Mobility: difficulty with lifting or carrying weights over 10 pounds				Yes = 1, No = 0
16	Mobility: difficulty with picking up a coin from the table				Yes = 1, No = 0
17	Mobility: difficulty with stooping, kneeling, or crouching				Yes = 1, No = 0
18	Mobility: difficulty with reaching arms above shoulder level				Yes = 1, No = 0
19	Difficulty with dressing				Yes = 1, No = 0
20	Difficulty with bathing or showering				Yes = 1, No = 0
21	Difficulty with eating				Yes = 1, No = 0
22	Difficulty with getting in and out of bed				Yes = 1, No = 0
23	Difficulty with using the toilet				Yes = 1, No = 0
24	Difficulty with managing money				Yes = 1, No = 0
25	Difficulty with taking medication				Yes = 1, No = 0
26	Difficulty with shopping for groceries				Yes = 1, No = 0
27	Difficulty with preparing meals				Yes = 1, No = 0

28 [†]	Depression: CESD-10 questionnaire	Depression: CESD-8 questionnaire	Depression: CESD-12 questionnaire	CESD-10 >10 = 1, ≤10 = 0 in CHARLS; CESD-8 ≥ 4 = 1, <4 = 0 in ELSA, HRS, and SHARE
29 [‡]	Cognition: (20-memory test score) /20			Continuous variable, ranging from 0 to 1

CHARLS, China Health and Retirement Longitudinal Study; ELSA, English Longitudinal Study of Ageing; HRS, Health and Retirement Study; SHARE, Survey of Health, Ageing and Retirement in Europe.

*Memory-related disease included Alzheimer's disease, dementia, organic brain senility, and other serious memory impairment.

[†]Depression was assessed by the Center for Epidemiologic Studies Depression Scale (CESD). In the CHARLS, CESD-10 was used, and the total score ranged from 0 to 30. In the ELSA and HRS, CESD-8 was used, and the total score ranged from 0 to 8. A higher score indicated more severe depressive symptoms.

[‡]The memory score was the average of words which were not recalled in the immediate and delayed word recall tasks. The memory score ranged from 0 to 10. The orientation test comprised 4 questions about the day of the week, the month, the date of the month, and the year. One point was given for each wrong answer, and the range was from 0 to 4.

Table S14. Akaike and Bayesian information criteria for the number of knots in CHARLS

Score	Control		Case	
	AIC	BIC	AIC	BIC
Memory				
2 knots	24682.44	24703.92	15681.64	15707.94
3 knots	24682.44	24703.92	15681.64	15707.94
4 knots	24666.28	24701.58	15671.49	15704.42
5 knots	24665.53	24707.29	15594.64	15634.33
6 knots	24662.84	24709.4	15578.7	15624.76
7 knots	24664.16	24711.99	15585.06	15636.57
8 knots	24663.25	24712.97	15555.39	15613.58
CESD				
2 knots	26126.17	26147.73	17235.16	17261.85
3 knots	26126.17	26147.73	17235.16	17261.85
4 knots	26126.05	26159.17	17228.15	17261.34
5 knots	26125.88	26162.65	17223.15	17262.56
6 knots	26125.01	26165.24	17221.65	17266.19
7 knots	26125.32	26165.74	17219.43	17268.82
8 knots	26124.05	26169.03	17218.58	17269.82
ADL				
2 knots	20334.67	20362.44	13008.06	13033.26
3 knots	20334.67	20362.44	13008.06	13033.26
4 knots	20335.41	20368.1	12997.64	13029.29
5 knots	20335.75	20370.03	12999.87	13036.35
6 knots	20335.82	20371.08	12994.96	13037.1
7 knots	20335.96	20371.48	12997.55	13040.57
8 knots	20335.75	20372.15	12995.9	13042.84
IADL				
2 knots	24306.72	24328.42	20334.09	20360.63
3 knots	24306.72	24328.42	20334.09	20360.63
4 knots	24246.15	24282.28	20329.83	20362.91
5 knots	24193.65	24236.99	20321.82	20361.52
6 knots	24154.68	24205.24	20241.08	20288.34
7 knots	24145.47	24202.94	20252.89	20306.71
8 knots	24164.86	24227.64	20215	20275.11
Frailty index				
2 knots	24901.32	24930.07	19336.17	19362.59
3 knots	24901.32	24930.07	19336.17	19362.59
4 knots	24890.22	24926.17	19318.19	19351.7
5 knots	24891.24	24932.75	19313.35	19353.31
6 knots	24892.13	24935.83	19314.06	19358.06
7 knots	24892.45	24936.88	19314.17	19360.22
8 knots	24892.46	24937.79	19314.12	19361.62

Table S15. Akaike and Bayesian information criteria for the number of knots in ELSA

Score	Control		Case	
	AIC	BIC	AIC	BIC
Memory				
2 knots	26478.07	26499.54	15619.06	15639.06
3 knots	26478.07	26499.54	15619.06	15639.06
4 knots	26478.07	26499.56	15597.7	15630.94
5 knots	26478.06	26499.52	15587.87	15627.16
6 knots	26478.08	26499.59	15592.44	15634.79
7 knots	26478.12	26499.8	15582.7	15633.69
8 knots	26478.12	26499.81	15586.56	15637.58
CESD				
2 knots	25753.96	25775.6	16955.06	16975.16
3 knots	25753.96	25775.6	16955.06	16975.16
4 knots	25753.95	25775.54	16949.66	16982.57
5 knots	25753.98	25775.77	16946.17	16984.36
6 knots	25753.94	25775.47	16948.7	16989.13
7 knots	25753.93	25775.42	16942.24	16990.8
8 knots	25753.94	25775.5	16942.78	16994.04
ADL				
2 knots	25401.81	25430.18	16666.5	16690.96
3 knots	25401.81	25430.18	16666.5	16690.96
4 knots	25402.74	25434.74	16633.25	16666.52
5 knots	25402.94	25436.25	16631.7	16670.41
6 knots	25403.05	25436.98	16631.42	16675.13
7 knots	25403.12	25437.39	16622.75	16673.07
8 knots	25403.17	25437.6	16624.86	16676.93
IADL				
2 knots	22915.77	22944.05	18204.95	18224.95
3 knots	22915.77	22944.05	18204.95	18224.95
4 knots	22916.51	22948.53	18139.46	18172.74
5 knots	22916.96	22949.8	18137.02	18176.19
6 knots	22917.09	22950.38	18128.95	18175
7 knots	22917.1	22950.91	18112.19	18164.11
8 knots	22917.09	22951.26	18112.14	18170.71
Frailty index				
2 knots	23349.69	23378.03	15172.81	15192.55
3 knots	23349.69	23378.03	15172.81	15192.55
4 knots	23350.7	23384.18	15081.07	15113.93
5 knots	23351.17	23386.53	15075.47	15114.38
6 knots	23351.34	23387.73	15035.16	15081.12
7 knots	23351.45	23388.5	15017.18	15068.7
8 knots	23351.54	23388.75	15006.86	15065.61

Table S16. Akaike and Bayesian information criteria for the number of knots in HRS

Score	Control		Case	
	AIC	BIC	AIC	BIC
Memory				
2 knots	145528.6	145560.9	83376.55	83409.81
3 knots	145528.6	145560.9	83376.55	83409.81
4 knots	145528.9	145562.9	83331.54	83373.09
5 knots	145528.8	145561	83306.06	83355.6
6 knots	145528.9	145562.5	83302.83	83359.58
7 knots	145528.9	145562.7	83305.06	83365.34
8 knots	145529	145563.5	83274.02	83348.15
CESD				
2 knots	142554.1	142588.9	88938.48	88971.74
3 knots	142554.1	142588.9	88938.48	88971.74
4 knots	142544.6	142588.7	88911.26	88952.83
5 knots	142540.8	142592.8	88870.75	88920.6
6 knots	142537.1	142597.7	88859.99	88918.09
7 knots	142538.3	142604	88838.09	88902.73
8 knots	142539.2	142607.1	88843.81	88913.53
ADL				
2 knots	145590.8	145625.5	92705.96	92739.53
3 knots	145590.8	145625.5	92705.96	92739.53
4 knots	145563.9	145608.4	92464.84	92506.8
5 knots	145555.2	145608.3	92386.83	92437.13
6 knots	145553.4	145613.7	92272.98	92331.69
7 knots	145551.3	145620.4	92248.95	92315.51
8 knots	145553.7	145626.6	92200.41	92274.89
IADL				
2 knots	131530.8	131565.6	106590.5	106624.2
3 knots	131530.8	131565.6	106590.5	106624.2
4 knots	131523.3	131567.5	105876.9	105919
5 knots	131521	131573	105824	105874.5
6 knots	131523.4	131578.8	105434.4	105493.4
7 knots	131519.4	131582.7	105475.8	105543
8 knots	131521.7	131584.3	105187	105262.7
Frailty index				
2 knots	106583	106617.6	69829.55	69862
3 knots	106583	106617.6	69829.55	69862
4 knots	106570.4	106613.6	69055.28	69095.85
5 knots	106570.6	106620.9	69073.32	69121.93
6 knots	106570.7	106624	68735.6	68792.38
7 knots	106571.3	106627.3	68784.5	68849.09
8 knots	106571.4	106627.8	68629.66	68702.07

Table S17. Akaike and Bayesian information criteria for the number of knots in SHARE

Score	Control		Case	
	AIC	BIC	AIC	BIC
Memory				
2 knots	69078.15	69110.64	62883.83	62915.81
3 knots	69078.15	69110.64	62883.83	62915.81
4 knots	69082.09	69122.53	62773.83	62813.99
5 knots	69055.38	69103.82	62789.35	62837.36
6 knots	69050.71	69102.7	62687.86	62744.05
7 knots	69055.93	69112.3	62662.32	62726.55
8 knots	69044.24	69107.05	62635.62	62706.92
CESD				
2 knots	59037.93	59069.6	55060.91	55084.74
3 knots	59037.93	59069.6	55060.91	55084.74
4 knots	59038.41	59075.55	55061.16	55094.25
5 knots	59034.95	59077.15	55061.17	55087.43
6 knots	59035.42	59080.71	55061.38	55090.94
7 knots	59036.36	59081.71	55061.15	55099
8 knots	59034.49	59084.63	55061.43	55091.42
ADL				
2 knots	61113.34	61145.87	87241.76	87273.99
3 knots	61113.34	61145.87	87241.76	87273.99
4 knots	61114.81	61153.39	87240.41	87279.72
5 knots	61106.42	61154.21	87238.19	87285.02
6 knots	61097.47	61150.76	87239.68	87290.71
7 knots	61101.47	61158.99	87240.81	87289.86
8 knots	61097.05	61156.02	87225	87293.01
IADL				
2 knots	60829.97	60862.51	84678.18	84710.27
3 knots	60829.97	60862.51	84678.18	84710.27
4 knots	60833.85	60873.26	84670.71	84710.63
5 knots	60810.45	60859.02	84666.16	84713.61
6 knots	60795.77	60849.91	84668.54	84721.44
7 knots	60800.62	60859.81	84668.74	84720.39
8 knots	60795.21	60856.64	84637.46	84708.76
Frailty index				
2 knots	66384.7	66417.24	74961.33	74993.58
3 knots	66384.7	66417.24	74961.33	74993.58
4 knots	66387.34	66427.96	74958.84	74998.99
5 knots	66350.46	66399.12	74959.69	75004.35
6 knots	66350.89	66404.97	74959.91	75006.36
7 knots	66350.2	66407.76	74960.11	75008.24
8 knots	66345.76	66405.82	74959.94	75009.78

Table S18. Baseline characteristics in CHALRS

	No stroke (n=2650)	Incident stroke (n=1325)	P-value
Age (years)	60.2 ± 9.1	59.8 ± 8.9	0.21
Gender			0.91
Male	1363 (51.4)	679 (51.2)	
Female	1287 (48.6)	646 (48.8)	
Education			0.93
Low	680 (25.7)	339 (25.6)	
Intermediate	1111 (41.9)	567 (42.8)	
High	824 (31.1)	407 (30.7)	
Missing	35 (1.3)	12 (0.9)	
Smoking			0.16
Never	1579 (59.6)	753 (56.8)	
Former	275 (10.4)	159 (12.0)	
Current	796 (30.0)	413 (31.2)	
Moderate physical activity			0.0001
Never	812 (30.6)	477 (36.0)	
1-6 times/week	1147 (43.3)	548 (41.5)	
7 times/week	668 (25.2)	300 (22.6)	
Missing	23 (0.9)		
Vigorous physical activity			<0.0001
Never	1391 (52.5)	798 (60.2)	
1-6 times/week	869 (32.9)	388 (29.2)	
7 times/week	364 (13.7)	139 (10.5)	
Alcohol consumption			0.0277
Never	14 (0.5)		
Less than one time per month	778 (29.4)	364 (27.5)	
One or more times per month	1858 (70.0)	961 (72.5)	
BMI (kg/m ²)	23.6 ± 3.7	24.6 ± 4.0	<0.0001
Hypertension			<0.0001
No	2158 (81.4)	844 (63.7)	
Yes	492 (18.6)	481 (36.3)	
Diabetes			<0.0001
No	2543 (96.0)	1203 (90.8)	
Yes	107 (4.0)	122 (9.2)	
Mortality			<0.0001
No	2490 (93.9)	1232 (93.0)	
Yes	160 (6.1)	93 (7.0)	
Number of surveys			<0.0001
2	358 (13.5)	112 (8.5)	
3	539 (20.3)	212 (16.0)	

4	544 (20.5)	285 (21.5)
5	1209 (45.6)	716 (54.0)

CHARLS, China Health and Retirement Longitudinal Study. Baseline in the analysis refers to the time of the first survey of included participants. Data are means $\pm$ SDs or frequency (percentage). T-test for continuous variables and Chi-square test for categorical variables were used to analyze the difference of baseline characteristics between stroke patients and matched controls.

Table S19. Baseline characteristics in ELSA

	No stroke (n=1508)	Incident stroke (n=754)	P-value
Age (years)	64.6 ± 10.2	64.5 ± 10.2	0.67
Gender			1.00
Male	752 (49.9)	376 (49.9)	
Female	756 (50.1)	378 (50.1)	
Education			0.30
Low	550 (36.5)	289 (38.3)	
Intermediate	569 (37.7)	275 (36.4)	
High	389 (25.8)	190 (25.2)	
Smoking			0.0008
Never	596 (39.5)	258 (34.2)	
Former	690 (45.8)	343 (45.5)	
Current	222 (14.7)	153 (20.3)	
Moderate physical activity			0.0712
Never	227 (15.1)	149 (19.8)	
One to three times a month	125 (8.3)	55 (7.3)	
Once a week	246 (16.3)	116 (15.4)	
More than once a week	910 (60.3)	434 (57.5)	
Vigorous physical activity			0.87
Never	920 (61.0)	466 (61.8)	
One to three times a month	162 (10.7)	72 (9.5)	
Once a week	150 (9.9)	75 (9.9)	
More than once a week	276 (18.3)	141 (18.7)	
Alcohol consumption			0.70
Never	33 (2.2)	23 (3.1)	
Less than one time per month	190 (12.0)	92 (12.2)	
One or more times per month	1237 (82.0)	617 (81.9)	
Missing	58 (3.9)	22 (2.9)	
BMI (kg/m ²)	28.1 ± 4.9	28.8 ± 5.1	<0.0001
Hypertension			0.0352
No	949 (62.9)	440 (58.4)	
Yes	559 (37.1)	314 (41.6)	
Diabetes			0.0365
No	1402 (93.0)	682 (90.5)	
Yes	106 (7.0)	72 (9.5)	
Mortality*			<0.0001
No	1336 (88.6)	686 (91.0)	
Yes	172 (11.4)	68 (9.0)	
Number of surveys			<0.0001
3	233 (15.1)	57 (7.2)	

4	209 (13.9)	68 (9.0)
5	169 (11.2)	81 (10.7)
6	202 (13.4)	86 (11.4)
7	208 (13.8)	119 (15.8)
8	140 (9.3)	92 (12.2)
9	188 (12.5)	123 (16.3)
10	159 (10.5)	128 (17.0)

ELSA, English Longitudinal Study of Ageing. Mortality data was available from 2002 to 2012 in ELSA. Baseline in the analysis refers to the time of the first survey of included participants. Data are means $\pm$ SDs or frequency (percentage). T-test for continuous variables and Chi-square test for categorical variables were used to analyze the difference of baseline characteristics between stroke patients and matched controls.

Table S20. Baseline characteristics in HRS

	No stroke (n=7814)	Incident stroke (n=3907)	P-value
Age (years)	64.4 ± 10.6	64.4 ± 10.6	0.99
Gender			0.96
Male	3345 (42.8)	1672 (42.8)	
Female	4469 (57.2)	2235 (57.2)	
Education			<0.0001
Low	2064 (26.4)	1212 (31.0)	
Intermediate	2577 (32.9)	1341 (34.3)	
High	3173 (40.6)	1354 (34.7)	
Current smoking			0.0008
No	6341 (81.1)	3064 (78.4)	
Yes	1473 (18.9)	843 (21.6)	
Vigorous physical activity			<0.0001
Never	4080 (55.6)	2287 (63.1)	
1-6 times/week	2984 (40.7)	1211 (33.4)	
7 times/week	272 (3.7)	130 (3.6)	
Alcohol consumption (days/week)			<0.0001
0	5101 (65.3)	2766 (70.8)	
1	838 (10.7)	367 (9.4)	
2	540 (6.9)	215 (5.5)	
3	409 (5.2)	170 (4.4)	
4	175 (2.2)	64 (1.6)	
5	174 (2.2)	63 (1.6)	
6	58 (0.7)	22 (0.6)	
7	519 (6.6)	240 (6.1)	
BMI (kg/m ²)	27.8 ± 5.6	28.1 ± 5.7	0.0099
Hypertension			<0.0001
No	4342 (55.6)	1713 (43.8)	
Yes	3472 (44.4)	2194 (56.2)	
Diabetes			<0.0001
No	6779 (86.8)	3155 (80.8)	
Yes	1035 (13.2)	752 (19.2)	
Mortality*			<0.0001
No	5008 (64.1)	2244 (57.4)	
Yes	2806 (35.9)	1663 (42.6)	
Number of surveys			<0.0001
3	950 (12.2)	334 (8.6)	
4	1082 (13.9)	395 (10.1)	
5	721 (9.2)	314 (8.0)	

6	750 (9.6)	321 (8.2)
7	1103 (14.1)	474 (12.1)
8	489 (6.3)	332 (8.5)
9	476 (6.1)	304 (7.8)
10	614 (7.9)	384 (9.8)
11	407 (5.2)	238 (6.1)
12	330 (4.2)	253 (6.5)
13	403 (5.2)	278 (7.1)
14	489 (6.3)	280 (7.2)

HRS, Health and Retirement Study. Baseline in the analysis refers to the time of the first survey of included participants. Data are means $\pm$ SDs or frequency (percentage). T-test for continuous variables and Chi-square test for categorical variables were used to analyze the difference of baseline characteristics between stroke patients and matched controls.

Table S21. Baseline characteristics in SHARE

	No stroke (n=5804)	Incident stroke (n=2902)	P-value
Age (years)	66.4 ± 9.6	67.3 ± 9.3	<0.0001
Gender			1.00
Male	2986 (51.4)	1493 (51.4)	
Female	2818 (48.6)	1409 (48.6)	
Education			0.0072
Low	1141 (19.7)	536 (18.5)	
Intermediate	2027 (34.9)	1191 (41.0)	
High	2636 (45.4)	1175 (40.5)	
Smoking			0.0949
Never	3973 (68.5)	1948 (67.1)	
Former	1123 (19.3)	543 (18.7)	
Current	708 (12.2)	411 (14.2)	
Moderate physical activity			<0.0001
Never	3634 (62.6)	1461 (50.3)	
One to three times a month	728 (12.5)	355 (12.2)	
Once a week	386 (6.7)	193 (6.7)	
More than once a week	1056 (18.2)	893 (30.8)	
Vigorous physical activity			<0.0001
Never	1577 (27.2)	531 (18.3)	
One to three times a month	764 (13.2)	269 (9.3)	
Once a week	553 (9.5)	202 (7.0)	
More than once a week	2910 (50.1)	1900 (65.5)	
Alcohol consumption			<0.0001
No	2787 (48.0)	1700 (58.6)	
Yes	3017 (52.0)	1202 (41.4)	
BMI (kg/m ²)	25.8 ± 6.5	26.5 ± 7.4	<0.0001
Hypertension			<0.0001
No	3600 (62.0)	1318 (45.4)	
Yes	2204 (38.0)	1584 (54.6)	
Diabetes			<0.0001
No	5171 (89.1)	2352 (81.0)	
Yes	633 (10.9)	550 (19.0)	
Mortality*			<0.0001
No	5804 (91.0)	2902 (89.3)	
Yes	575 (9.0)	349 (10.7)	
Number of surveys			0.004
3	1786 (30.8)	829 (28.6)	
4	1786 (30.8)	932 (32.1)	

5	1297 (22.4)	720 (24.8)
6	544 (9.4)	265 (9.1)
7	391 (6.7)	156 (5.4)

SHARE, Survey of Health, Ageing and Retirement in Europe. Baseline in the analysis refers to the time of the first survey of included participants. Data are means $\pm$ SDs or frequency (percentage). T-test for continuous variables and Chi-square test for categorical variables were used to analyze the difference of baseline characteristics between stroke patients and matched controls.