**Table S1: Center for Epidemiologic Studies Depression Scale (CES-D)**

|  |  |
| --- | --- |
| **Items** | **During the past week** |
| Rarely or none of the time (less than 1 day ) | Some or a little of the time (1-2 days) | Occasionally or a moderate amount of time (3-4 days) | Most or all of the time (5-7 days) |
| 1. I was bothered by things that usually don’t bother me.\*
 | □ | □ | □ | □ |
| 1. I did not feel like eating; my appetite was poor.
 | □ | □ | □ | □ |
| 1. I felt that I could not shake off the blues even with help from my family or friends.
 | □ | □ | □ | □ |
| 1. I felt I was just as good as other people.
 | □ | □ | □ | □ |
| 1. I had trouble keeping my mind on what I was doing.\*
 | □ | □ | □ | □ |
| 1. I felt depressed.\*
 | □ | □ | □ | □ |
| 1. I felt that everything I did was an effort.\*
 | □ | □ | □ | □ |
| 1. I felt hopeful about the future.\*
 | □ | □ | □ | □ |
| 1. I thought my life had been a failure.
 | □ | □ | □ | □ |
| 1. I felt fearful.\*
 | □ | □ | □ | □ |
| 1. My sleep was restless.\*
 | □ | □ | □ | □ |
| 1. I was happy.\*
 | □ | □ | □ | □ |
| 1. I talked less than usual.
 | □ | □ | □ | □ |
| 1. I felt lonely.\*
 | □ | □ | □ | □ |
| 1. People were unfriendly.
 | □ | □ | □ | □ |
| 1. I enjoyed life.
 | □ | □ | □ | □ |
| 1. I had crying spells.
 | □ | □ | □ | □ |
| 1. I felt sad.
 | □ | □ | □ | □ |
| 1. I felt that people dislike me.
 | □ | □ | □ | □ |
| 1. I could not get “going.”\*
 | □ | □ | □ | □ |

Notes:\*Items in the 10-item CES-D

Scoring: zero for answers in the first column, 1 for answers in the second column, 2 for answers in the third column, 3 for answers in the fourth column. The scoring of positive items is reversed. Possible range of scores is zero to 60, with the higher scores indicating the presence of more symptomatology.

**Table S2: Multivariate logistical regression analysis of determinants of CHE in middle-aged and old people in China**

| Characteristics | Events of CHE (n=1109, %) | aOR (95%CI) | p value |
| --- | --- | --- | --- |
| Demographic characteristics |  |  |  |
| Gender  |  |  |  |
| Men | 630 (56.8) | 1.00 | — |
| Women | 479 (43.2) | 0.81 (0.66-0.99) | 0.044 |
| Age group |  |  |  |
| 45-54 | 281 (25.3) | 1.00 | — |
| 55-64 | 422 (38.1) | 1.71 (1.47-1.99) | <0.001 |
| ≥65 | 406 (36.6) | 1.06 (0.94-1.20) | 0.358 |
| Marital status |  |  |  |
| Married/Partnered | 1006 (90.7) | 1.00 | — |
| Other | 103 (9.3) | 0.42 (0.33-0.54) | <0.001 |
| Education |  |  |  |
| Illiterate/semiliterate | 469 (42.3) | 1.00 | — |
| Primary school | 257 (23.2) | 1.11 (0.92-1.34) | 0.275 |
| Middle school | 236 (21.3) | 1.01 (0.86-1.18) | 0.907 |
| High school and above | 147 (13.3) | 0.97 (0.83-1.12) | 0.653 |
| Insurance |  |  |  |
| None | 55 (5.0) | 1.00 | — |
| UEBMI | 112 (10.1) | 0.73 (0.49-1.09) | 0.121 |
| URBMI | 57 (5.1) | 1.46 (0.94-2.27) | 0.094 |
| NRCMS | 807 (72.8) | 1.06 (0.78-1.46) | 0.728 |
| Other | 56 (5.0) | 0.89 (0.56-1.39) | 0.590 |
| Health-related characteristics |  |  |  |
| Smoking status |  |  |  |
| Never | 636 (57.3) | 1.00 | — |
| Smoked | 128 (11.5) | 0.93 (0.71-1.21) | 0.589 |
| Smoking | 345 (31.1) | 0.86 (0.70-1.05) | 0.132 |
| Drinking |  |  |  |
| No | 716 (64.6) | 1.00 | — |
| Yes | 393 (35.4) | 0.91 (0.77-1.08) | 0.295 |
| Chronic diseases |  |  |  |
| No | 266 (24.0) | 1.00 | — |
| Yes | 843 (76.0) | 1.61 (1.37-1.90) | <0.001 |
| BMI |  |  |  |
| Normal | 648 (58.4) | 1.00 | — |
| Lower | 53 (4.8) | 0.81 (0.57-1.13) | 0.215 |
| Overweight | 287 (25.9) | 1.00 (0.85-1.19) | 0.961 |
| Obesity | 121 (10.9) | 1.12 (0.88-1.43) | 0.340 |
| Outpatient services |  |  |  |
| No | 735 (66.3) | 1.00 | — |
| Yes | 374 (33.7) | 3.91 (3.31-4.62) | <0.001 |
| Inpatient services |  |  |  |
| No | 912 (82.2) | 1.00 | — |
| Yes | 197 (17.8) | 4.10 (3.27-5.14) | <0.001 |
| Socioeconomic characteristics |  |  |  |
| Residence |  |  |  |
| Urban | 430 (38.8) | 1.00 | — |
| rural | 679 (61.2) | 1.16 (0.98-1.38) | 0.084 |
| Family economic level |  |  |  |
| Lowest | 306 (27.6) | 1.00 | — |
| Lower | 305 (27.5) | 0.67 (0.57-0.80) | <0.001 |
| Higher | 295 (26.6) | 0.86 (0.75-1.99) | 0.045 |
| Highest | 203 (18.3) | 0.91 (0.80-1.06) | 0.247 |
| Family size  |  |  |  |
| 1-2 | 527 (47.5) | 1.00 | — |
| 3-4 | 306 (27.6) | 0.67 (0.58-0.76) | <0.001 |
| ≥5 | 276 (24.9) | 1.13 (0.99-1.29) | 0.073 |
| Economic development level |  |  |  |
| Lowest | 300 (27.1) | 1.00 | — |
| Lower | 195 (17.6) | 1.18 (1.02-1.36) | 0.026 |
| Higher | 317 (28.6) | 0.99 (0.85-1.14) | 0.839 |
| Highest | 297 (26.8) | 1.17 (1.01-1.37) | 0.040 |

Notes: CHE: catastrophic health expenditure; aOR: adjusted odds ratio; CI: confident interval; UEBMI: urban employee basic medical insurance; URBMI: urban resident basic medical insurance; NRCMS: new rural cooperative medical scheme; BMI: body mass index.

**Table S3: Sensitive analyses about association between CHE and the risk of depression**

| CHE | The first sensitive analysis : model 1a |  | The first sensitive analysis: model 2b |  | The second sensitive analysis c |  | The third sensitive analysis d |  | The forth sensitive analysis e |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| aHR (95%CI) | p value |  | aHR (95%CI) | p value |  | aHR (95%CI) | p value |  | aHR (95%CI) | p value |  | aHR (95%CI) | p value |
| With | 1.00 | — |  | 1.00 | — |  | 1.00 | — |  | 1.00 | — |  | 1.00  | — |
| Without | 1.19 (1.08-1.31) | <0.001 |  | 1.13 (1.02-1.25) | 0.023 |  | 1.14 (1.02-1.27) | 0.017 |  | 1.11 (1.01-1.22) | 0.038 |  | 1.24 (1.12-1.38) | <0.001 |

Notes: CHE: catastrophic health expenditure; aHR: adjusted hazard ratio; CI: confident interval.

a: In model 1, hazard ratio was adjusted for demographic characteristics, including gender, age group, education, marital status and insurance.

b: In addition factors included in model1, hazard ratio in model 2 was additionally adjusted for health-related characteristics, including smoking status, drinking, chronic disease, body mass index, outpatient and inpatient services.

c: The categorical variables age group and family economic level were transferred to continuous variables in final model.

d: The threshold for definition of catastrophic health expenditure was changed from 40% to 25% in the final model.

e: The original main respondents of households with 2 eligible respondents were changed to the 2171 excluded participants in the final model.