

# **Positive association between Internet use and mental health among adults aged $\geq 50$ years in 23 countries**

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## References

## **Supplementary Methods**

### **Meta-regressions with seven country-level factors**

Seven country-level factors that may explain the differences in the results across countries were collected based on the literature and covering economic, social, cultural, healthcare, and Internet-related measures<sup>1–3</sup>. They were GDP per capita (2022)<sup>4</sup>, Gini index (2018–2021)<sup>5</sup>, world happiness index (2023)<sup>6</sup>, Hofstede’s index (most recent available)<sup>7</sup>, healthy life expectancy (HALE) at birth (2019)<sup>8</sup>, Internet use rate (2021–2022)<sup>9</sup>, and digital skills among active population (2019)<sup>10</sup>. The Gini index is a measure of income and wealth inequality within a country, where a higher Gini index, ranging from 0 to 100, indicates greater inequality. Hofstede’s index, with a range between 0–100, is a widely used index that evaluates the level of collectivism–individualism in a nation. A higher score indicates a higher country-level degree of individualism. Digital skills among active population were measured by the Executive Opinion Survey question with seven response options (from “Not all” to “To a great extent”): “In your country, to what extent does the active population possess sufficient digital skills (e.g., computer skills, basic coding, digital reading)?” The responses are then converted to a 0–100 score, where 100 corresponds to the best population-level digital skills.

To explore the heterogeneity variance in the meta-analysis, we use random-effect models to run meta-regressions with seven country-level factors, including GDP per capita, Gini index, world happiness index, Hofstede’s index, Internet use rate, digital skills among active population, and HALE at birth, as the independent variable separately. To investigate the potential nonlinear relationship between effect sizes and each factor, we considered the linear, quadratic, or cubic term of country-level factors and determined the final meta-

regression model if the  $Q$ -test for the model is statistically significant or if the explained variation is higher than the model with the linear term by  $\geq 10\%$ <sup>11</sup>.

### **Inverse probability weights of attrition**

To account for selection bias due to attrition, we created the stabilized inverse probability weights of attrition using the following equation<sup>12</sup>:

$$IPW_{ij} = \prod_{k=0}^j \frac{\Pr\{C_{ik} = 0 | C_{i(k-1)} = 0, X_i, V_i\}}{\Pr\{C_{ik} = 0 | C_{i(k-1)} = 0, X_i, \bar{L}_{i(k-1)}\}}$$

where  $C_{ik} = 0$  indicates that participant  $i$  is not censored by wave  $k$ ;  $X_i$  represents the baseline Internet use;  $V_i$  represents fourteen baseline covariates in our study;  $\bar{L}_{i(k-1)}$  represents time-varying variables at the previous wave (i.e., wave  $k - 1$ ), including standardized values for depressive symptoms, life satisfaction, and self-reported health. The numerator represents the conditional probability of remaining uncensored up to wave  $k$ , given the baseline covariates and Internet use. Similarly, the denominator represents the conditional probability of remaining uncensored up to wave  $k$ , given the baseline covariates, Internet use, and standardized scores for three health outcomes at the previous wave. We estimated these probabilities using pooled logistic regression models. The weights for each participant at each wave were proportional to the inverse of the wave-specific probability of remaining uncensored. Since there were only two waves of follow-up in Brazil, we estimated the inverse probability weights of attrition as follows:

$$IPW_i = \frac{1}{\Pr\{C_i = 0 | X_i, V_i\}}$$

148

## 149 **Association between Internet use and the risk of incident depression**

150 To reduce the influence of existing depressive symptoms, we re-fitted covariate-adjusted  
151 linear mixed models among participants without depression at baseline ( $n=69,370$  from 23  
152 countries) to assess the association of Internet use with mental health. Depression was  
153 defined based on the recommended thresholds derived from validation work among older  
154 adults (Supplementary Table 10)<sup>13–17</sup>. Additionally, we performed Cox proportional hazards  
155 models (survival package) adjusted for all covariates to explore the relationship between  
156 Internet use and new onset depression. Participants were censored at the date of first  
157 occurrence of depression or the end of follow-up, whichever came first.

158

## 159 **Effect of cumulative Internet use on mental health**

160 We used the parametric g-formula to estimate the effect of sustained Internet use on mental  
161 health. Here, we treated age, gender, and education as time-constant covariates, while  
162 considering other variables, including Internet use, marital status, household size, contact  
163 with others, household wealth, labor force status, current smoking, alcohol consumption,  
164 physical activity, number of chronic conditions, activities of daily living disability, number of  
165 limitations on instrumental activities of daily living, and the number of waves, as time-  
166 varying covariates. An outline of the parametric g-formula algorithm is as follows<sup>18</sup>:

167       1) Fit parametric regression models for the time-varying covariates at each wave  $k$  as  
168 a function of the intervention (i.e., Internet use) and covariate history among individuals  
169 under follow up at  $k$  (only consider the value at the wave  $k - 1$ ).

170       2) Fit the linear regression models for each of the three standardized health indicators  
171 measured in the final wave (e.g., at the end of follow-up) as a function of the intervention and

covariate history (consider the value at both the wave  $k$  and  $k - 1$ ) among individuals under the final wave of follow-up.

3) Use a Monte Carlo simulation to generate populations with the same sizes of original analytic samples under each of the treatment strategies (i.e., whether to use the Internet). For each individual:

a) The values of baseline covariates at  $k = 0$  are randomly sampled with replacement from the individuals in the original study population.

b) The values of the time-varying covariates at  $k > 0$  are drawn from the parametric distribution estimated in Step 1.

c) The value of Internet use is set to the value specified by the strategy, e.g., one at all times  $k$  for the Internet use intervention.

d) The covariate-specific mean standardized health indicators at the end of follow-up is estimated from the model in Step 2.

4) Compute the mean standardized health indicators at the end of follow-up in the population under each strategy, and the mean differences between strategies.

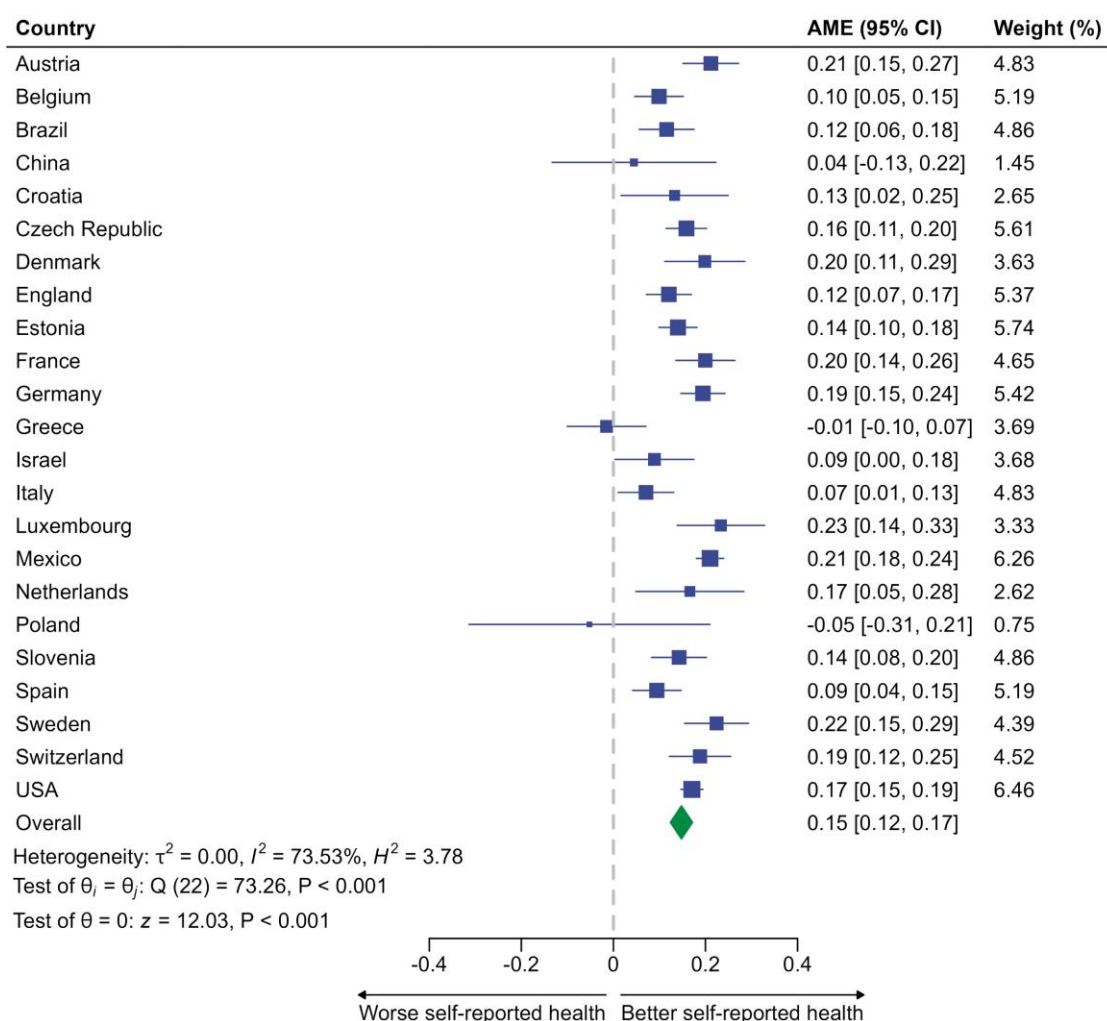
5) Repeat above steps in 100 bootstrap samples in order to obtain standard errors.

We estimated the mean difference in the standardized health indicator in the final wave between simulated populations following the natural course (as the reference group) and those who received the intervention consistently (denoted as *always-treat*). The natural course corresponds to no interventions<sup>19</sup>. We generated the *always-treat* populations by setting the Internet use to “yes” and simulating time-varying covariates and outcomes based on the regression models previously described<sup>19,20</sup>. To address the missing values, we created 10 imputed datasets using multiple imputation by chained equations. Within each imputed dataset, we calculated the point estimate using imputed, but not yet bootstrapped data and

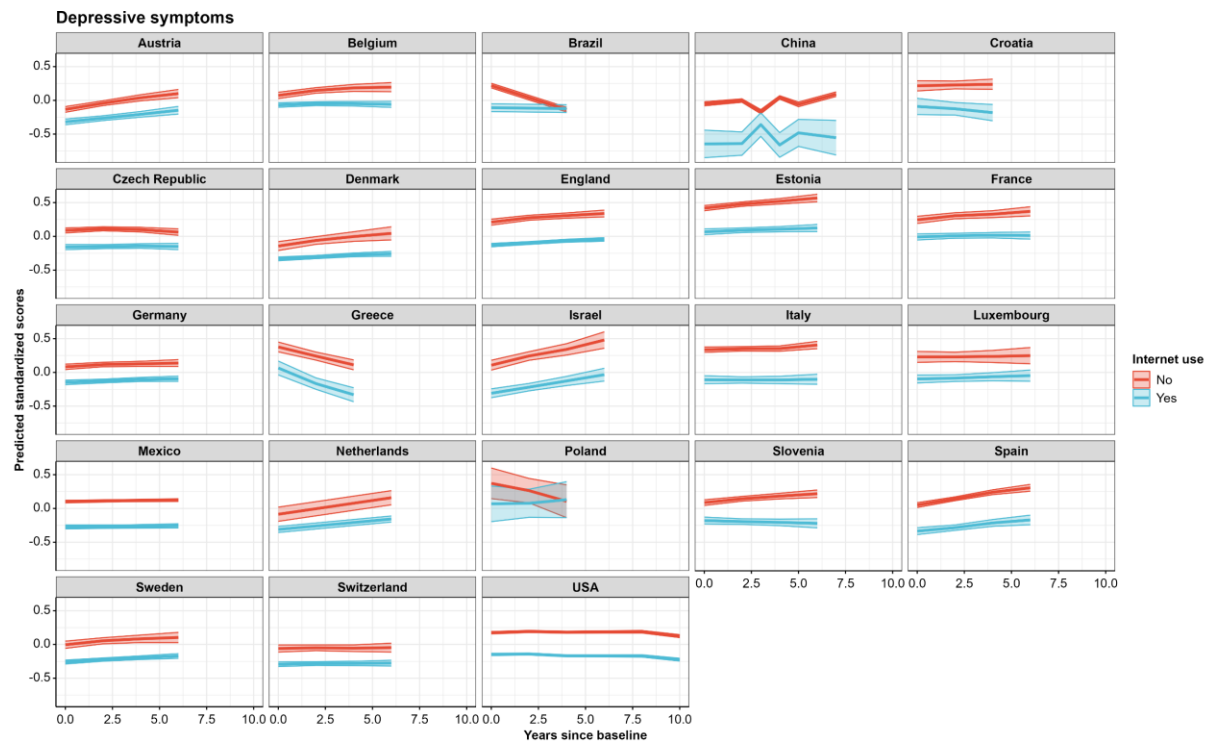
bootstrapped 100 times to derive the standard error. Finally, we pooled 10 point estimates and standard errors, and generated standard multiple imputation confidence intervals using Rubin's rules. This algorithm has been recommended especially when standard errors cannot be calculated easily for causal inference estimators such as the g-formula. Details of the algorithm can be found in the Schomaker et al.'s work (see "Method 2, MI Boot" part)<sup>21</sup>.

### **Bidirectional association between mental health and Internet use**

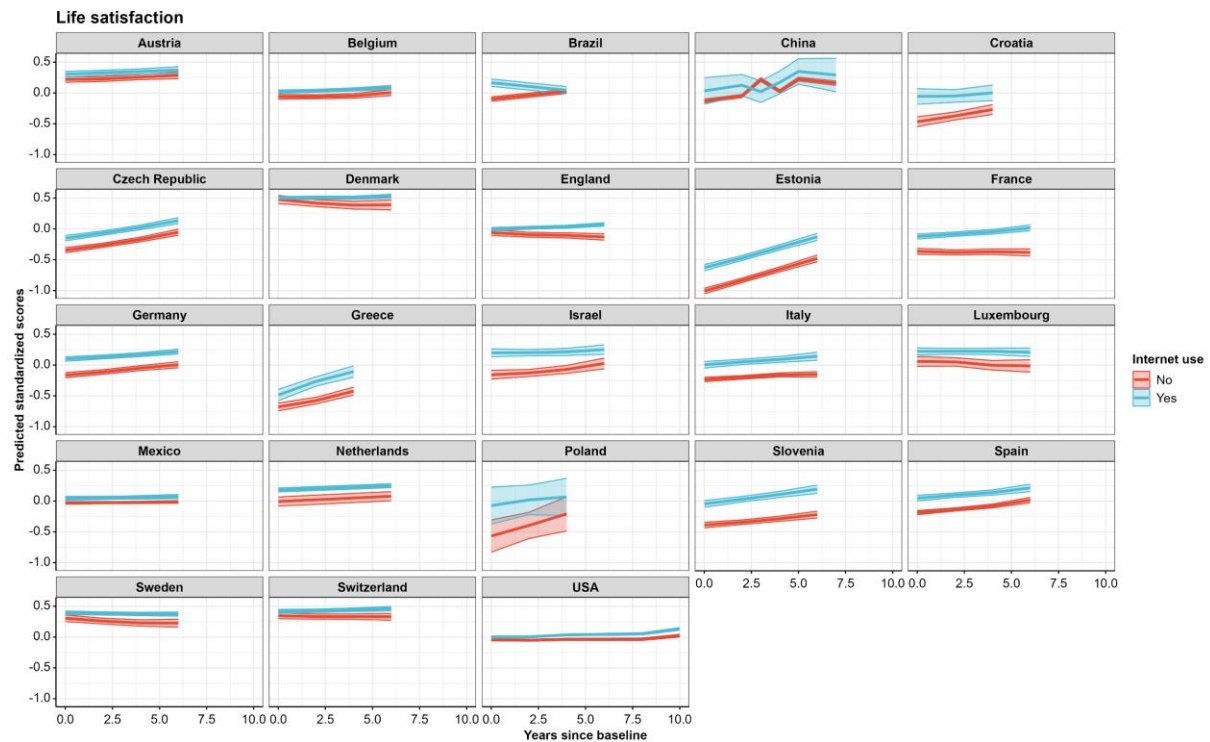
To investigate the potential bidirectional association between mental health and Internet use, we performed estimating equation models (geepack package) with an exchangeable working correlation and each of three health indicators as the independent variable. Internet use was modeled as a binomial outcome with a logit link function. Among the participants aged  $\geq 50$  years at baseline, we excluded those who had missing information on Internet use and three outcomes at baseline, without the reassessment of Internet use at any follow-up surveys, had been diagnosed with memory-related diseases or psychological disorders at baseline, or had missing values on baseline covariates to generate analytic samples ( $n=90,417$  from 23 countries).



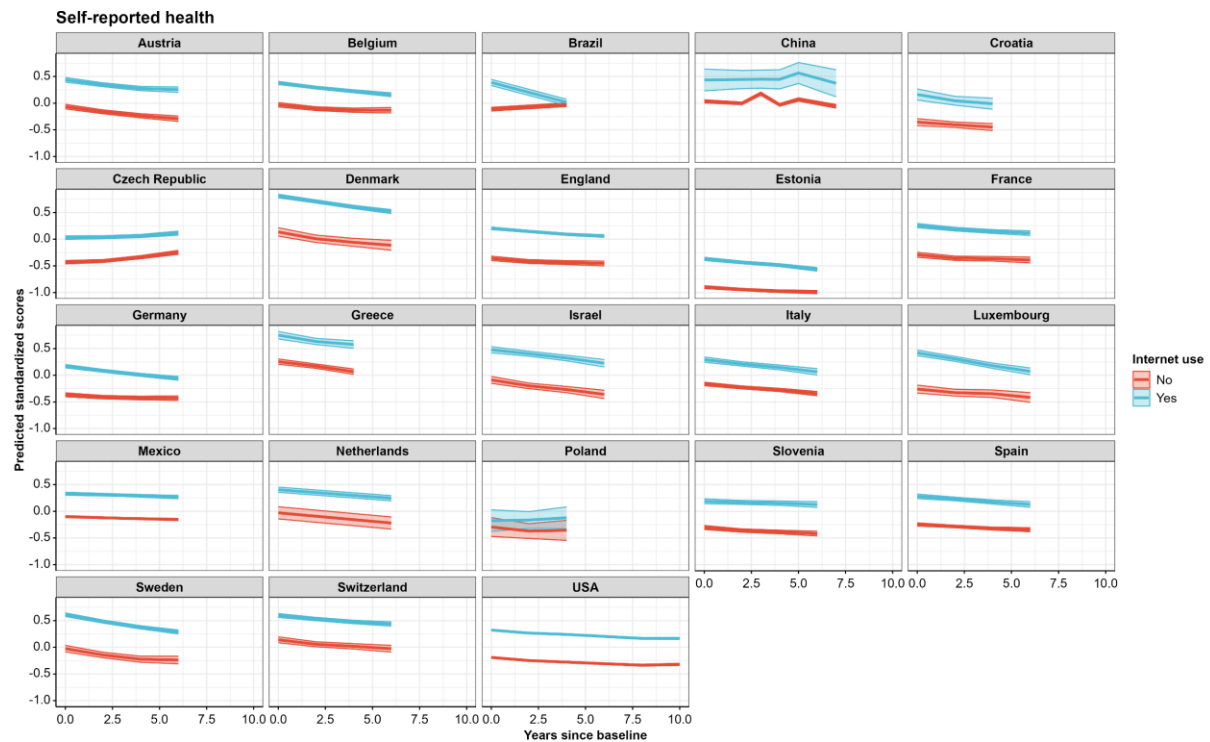
**Supplementary Fig.1:** Associations of Internet use with self-reported health ( $n=87,559$  from 23 countries). Data are presented as the AME coefficients with 95% CIs. The AME for each country (blue square) was separately estimated by the linear mixed model adjusted for age, gender, marital status, household size, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and IADL. The overall AME (green diamond) was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. The between-study heterogeneity was assessed using statistics  $\tau^2$ ,  $I^2$ , and  $H^2$ , and tested by Cochran's  $Q$  test where  $Q \sim \chi^2_{22}$ . The exact  $P$  values of the Cochran's  $Q$  test was  $2.0 \times 10^{-7}$ . We used the two-sided  $Z$ -test to test whether the true effect size  $\theta$  is zero. The exact  $P$  values of the  $Z$ -test was  $< 2.2 \times 10^{-16}$ . AME = average marginal effect, CI = confidence interval, ADL = activities of daily living, IADL = instrumental activities of daily living.



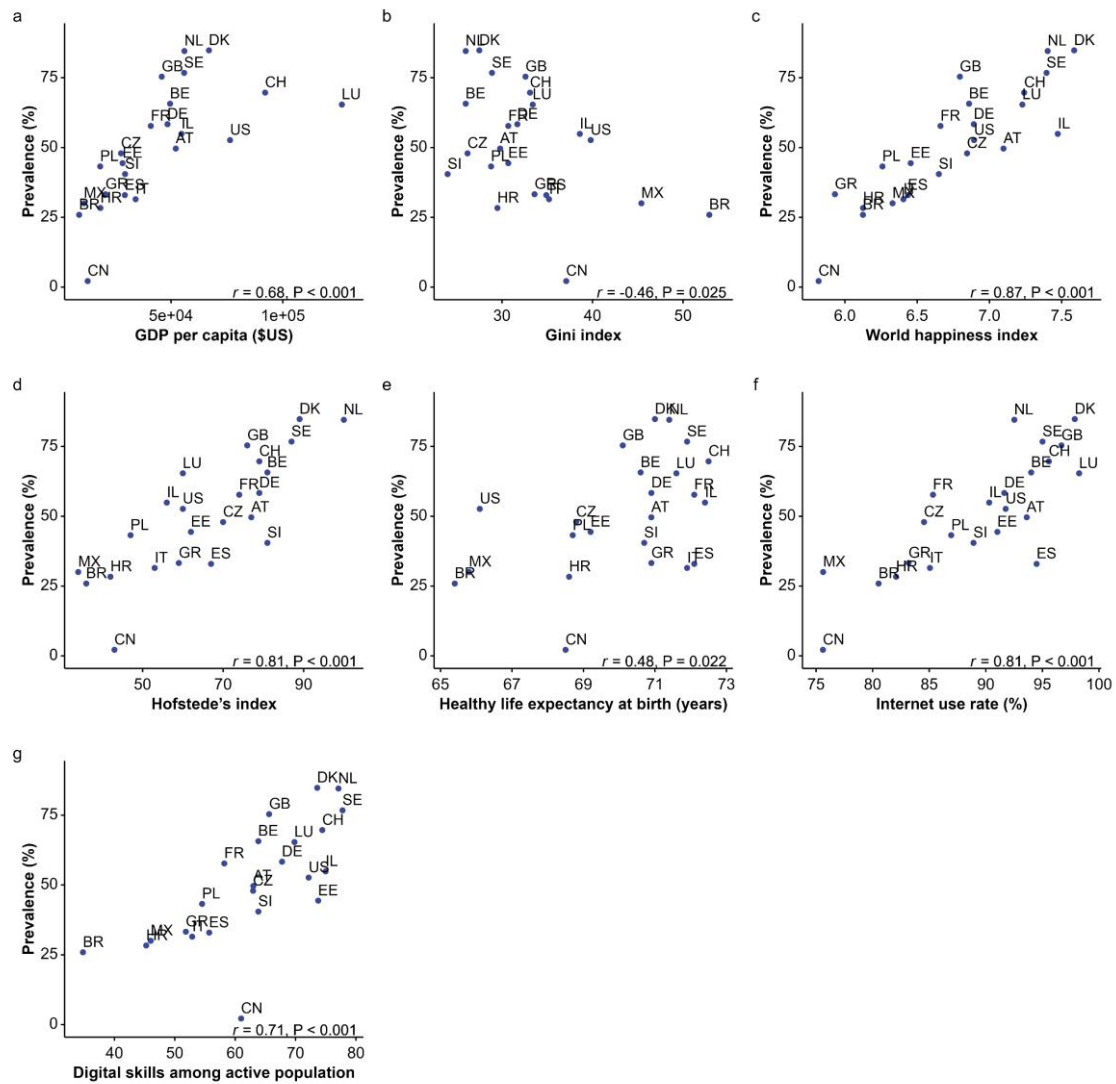
**Supplementary Fig.2:** Predicted standardized scores for depressive symptoms over time by baseline Internet use. Data are presented as the average adjusted predictions with 95% CIs by Internet use and years since baseline. The prediction was calculated using the linear mixed model adjusted for age, gender, marital status, household size, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and IADL, shown as equation (2). CI = confidence interval, ADL = activities of daily living, IADL = instrumental activities of daily living.



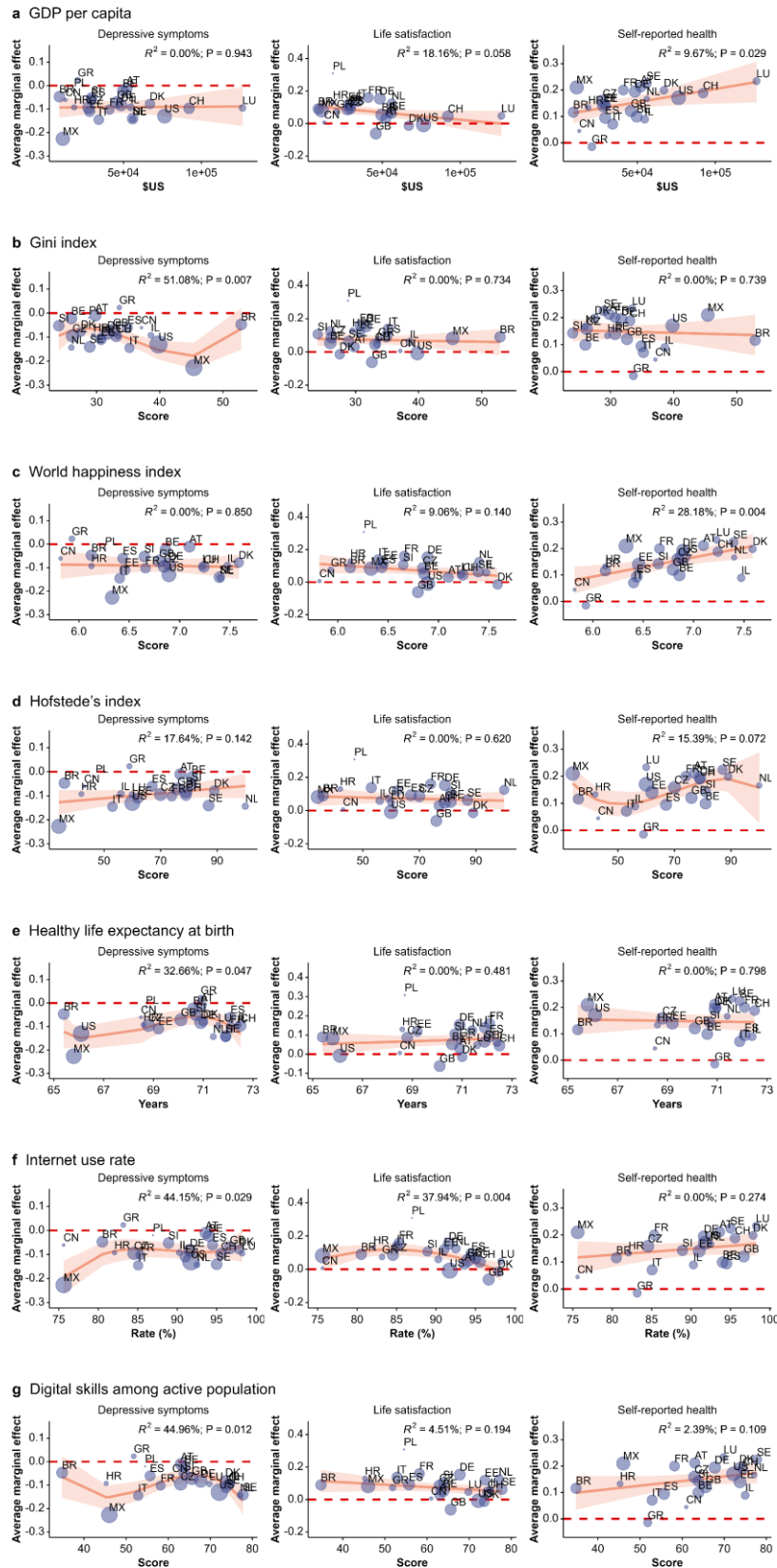
**Supplementary Fig.3:** Predicted standardized scores for life satisfaction over time by baseline Internet use. Data are presented as the average adjusted predictions with 95% CIs by Internet use and years since baseline. The prediction was calculated using the linear mixed model adjusted for age, gender, marital status, household size, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and IADL, shown as equation (2). CI = confidence interval, ADL = activities of daily living, IADL = instrumental activities of daily living.



**Supplementary Fig.4:** Predicted standardized scores for self-reported health over time by baseline Internet use. Data are presented as the average adjusted predictions with 95% CIs by Internet use and years since baseline. The prediction was calculated using the linear mixed model adjusted for age, gender, marital status, household size, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and IADL, shown as equation (2). CI = confidence interval, ADL = activities of daily living, IADL = instrumental activities of daily living.

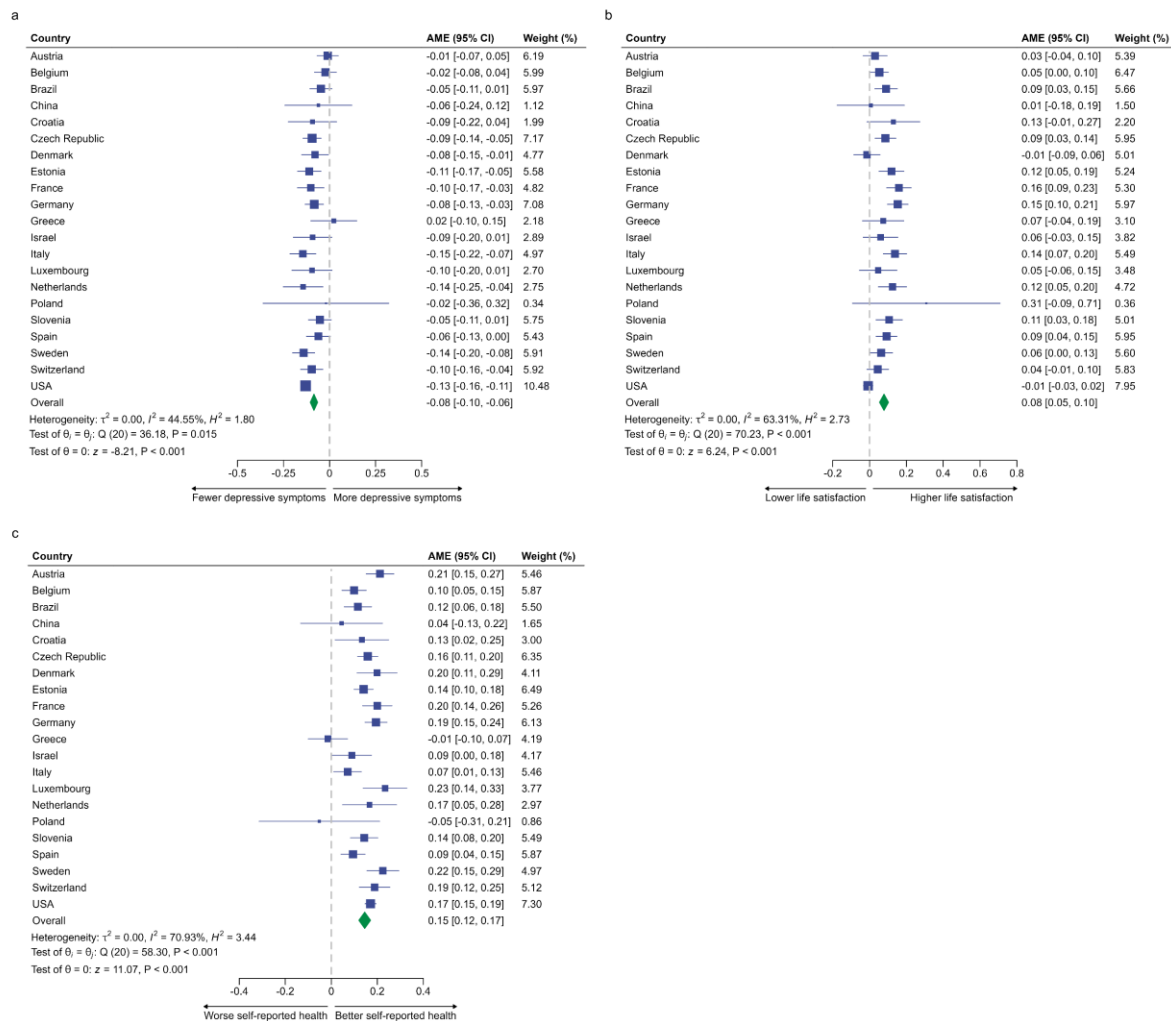


**Supplementary Fig.5:** Pearson correlations (two-sided) between Internet use prevalence among adults aged  $\geq 50$  years and country-level factors, including GDP per capita (a), Gini index (b), world happiness index (c), Hofstede's index (d), healthy life expectancy at birth (e), Internet use rate (f), and digital skills among active population (g). The exact  $P$  values were  $3.2 \times 10^{-4}$  for panel (a), 0.025 for panel (b),  $5.1 \times 10^{-8}$  for panel (c),  $3.5 \times 10^{-6}$  for panel (d), 0.022 for panel (e),  $2.4 \times 10^{-6}$  for panel (f), and  $1.3 \times 10^{-4}$  for panel (g). GDP = gross domestic product, AT = Austria, BE = Belgium, BR = Brazil, CN = China, HR = Croatia, CZ = Czech Republic, DK = Denmark, GB = England, EE = Estonia, FR = France, DE = Germany, GR = Greece, IL = Israel, IT = Italy, LU = Luxembourg, MX = Mexico, NL = Netherlands, PL = Poland, SI = Slovenia, ES = Spain, SE = Sweden, CH = Switzerland, and US = United States.

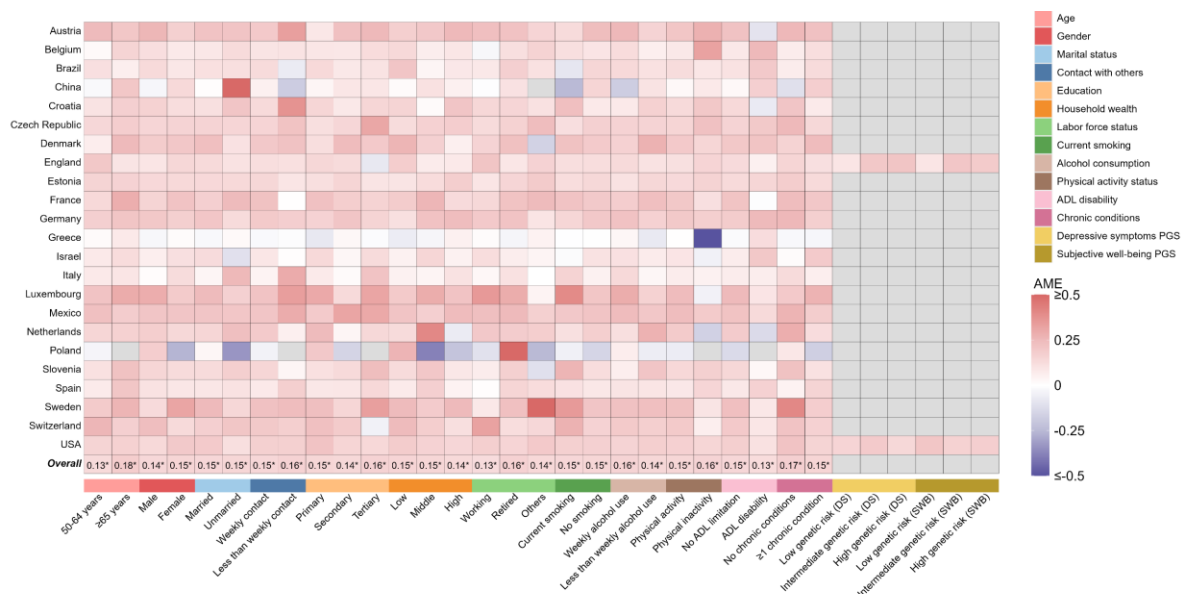


**Supplementary Fig.6:** Bubble plot with fitted meta regression line of the average marginal effect for three mental health outcomes and country-level factors, including GDP per capita (a), Gini index (b), world happiness index (c), Hofstede's index (d), healthy life expectancy at birth (e), Internet use rate (f), and digital skills among active population (g). Data are

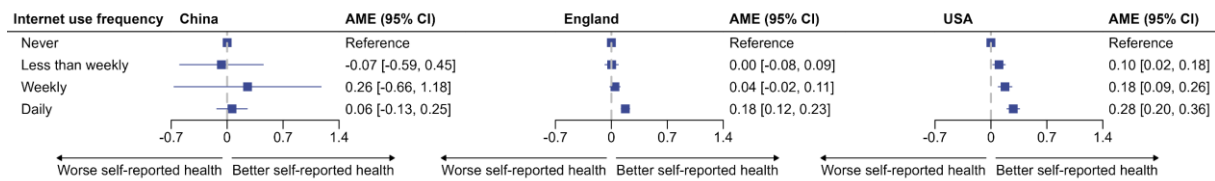
267 presented as the average marginal effects (bubbles), 95% confidence intervals (shaded area),  
268 and the linear prediction (orange line). Red dashed line at zero represents the reference line.  
269 The  $R^2$  quantifies the proportion of heterogeneity that can be accounted for by each country-  
270 level factor. The  $P$  value indicates whether the average marginal effect was associated with  
271 each country-level factor. AT = Austria, BE = Belgium, BR = Brazil, CN = China, HR =  
272 Croatia, CZ = Czech Republic, DK = Denmark, GB = England, EE = Estonia, FR = France,  
273 DE = Germany, GR = Greece, IL = Israel, IT = Italy, LU = Luxembourg, MX = Mexico, NL  
274 = Netherlands, PL = Poland, SI = Slovenia, ES = Spain, SE = Sweden, CH = Switzerland,  
275 and US = United States.



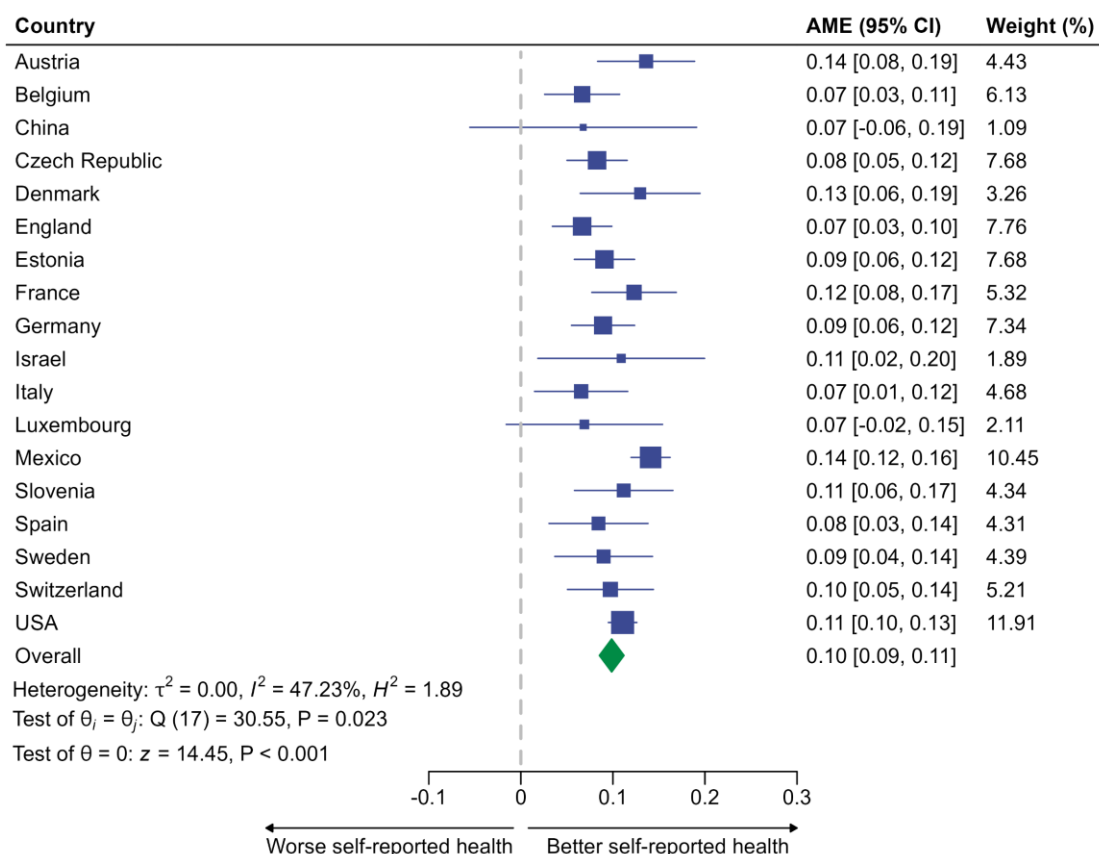
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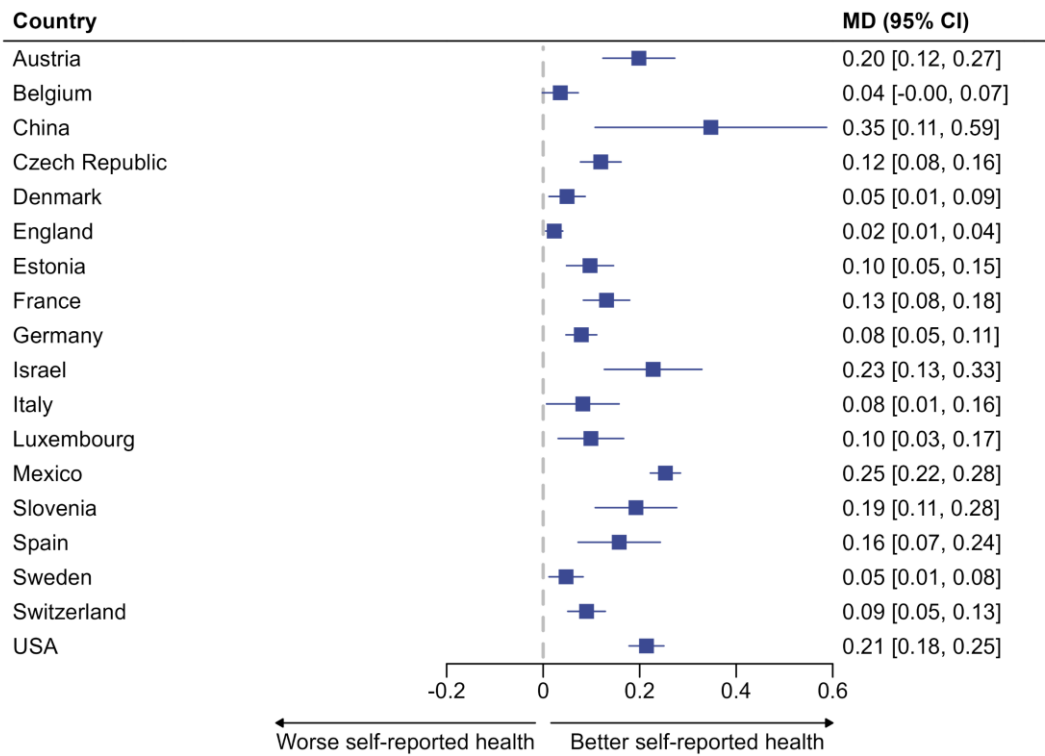
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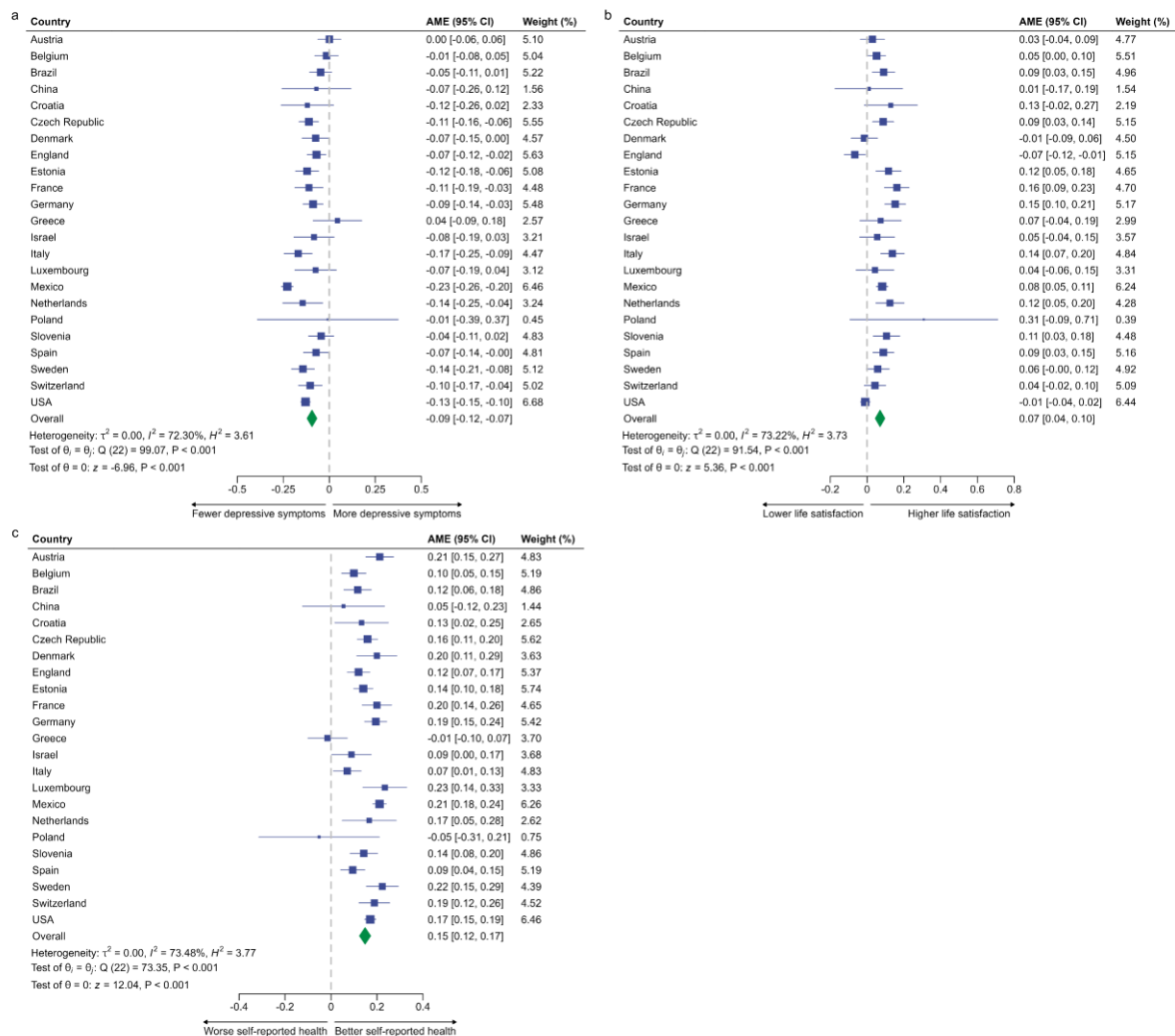
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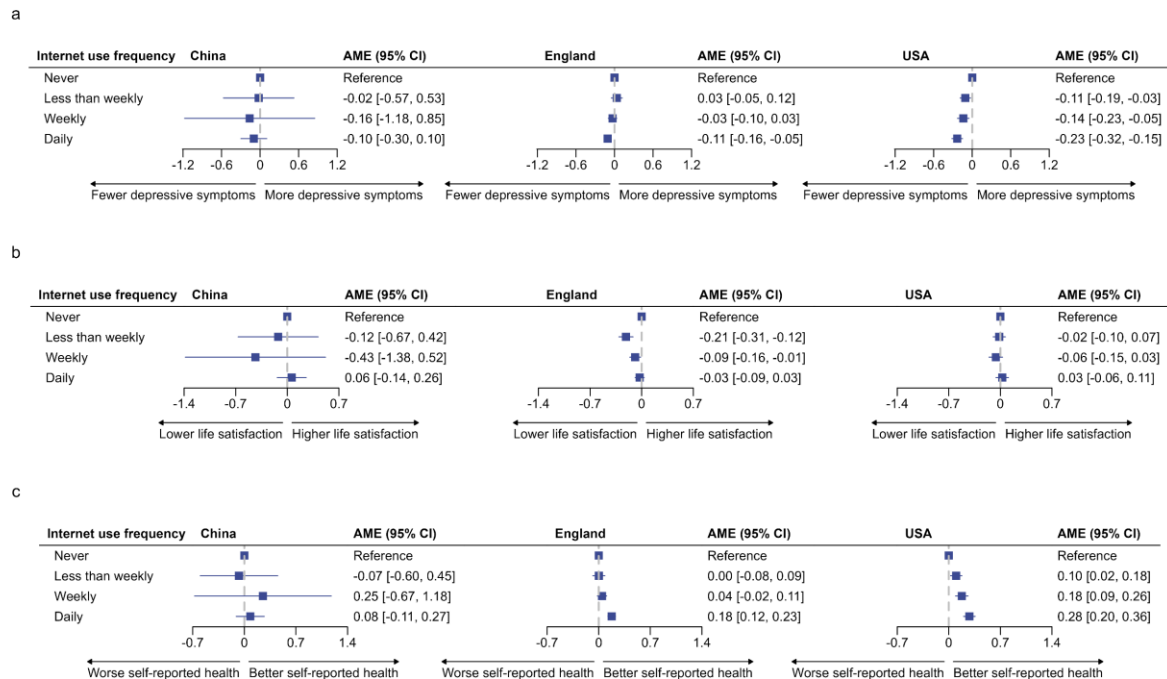
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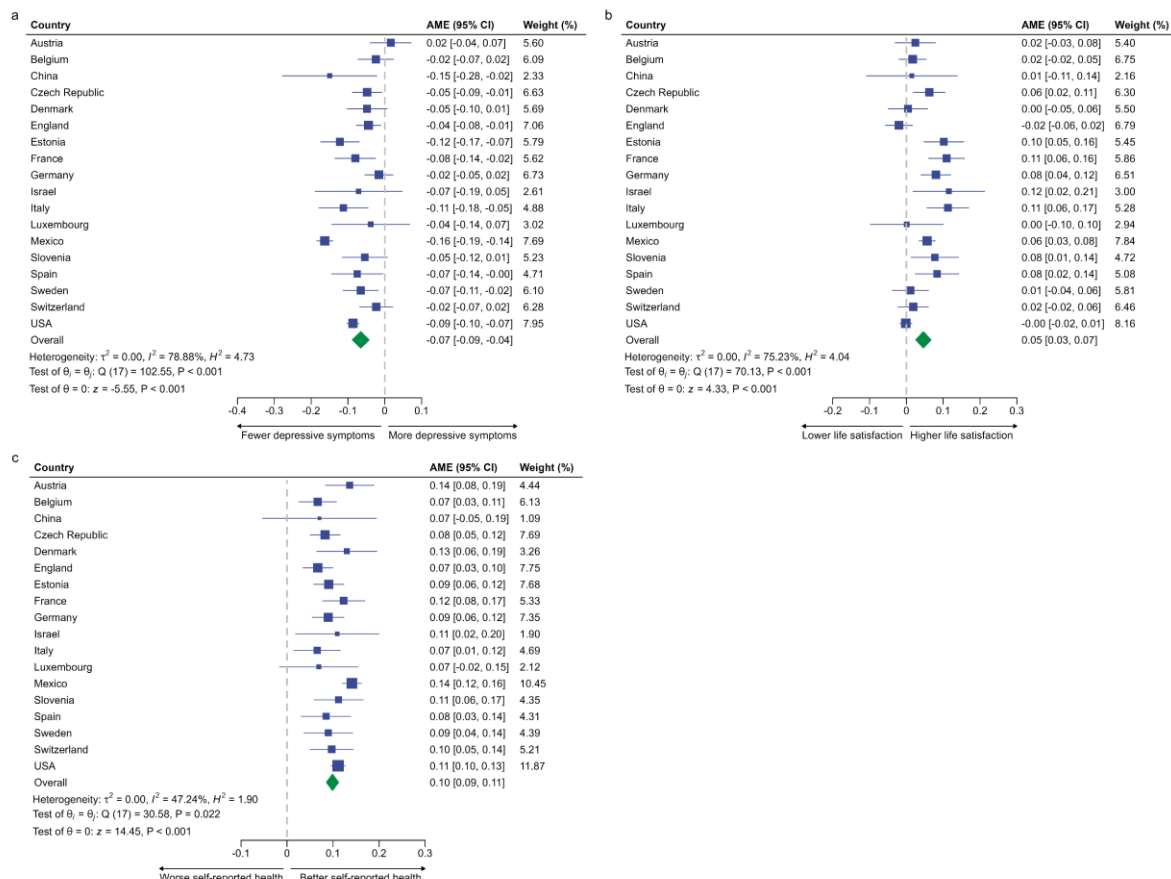
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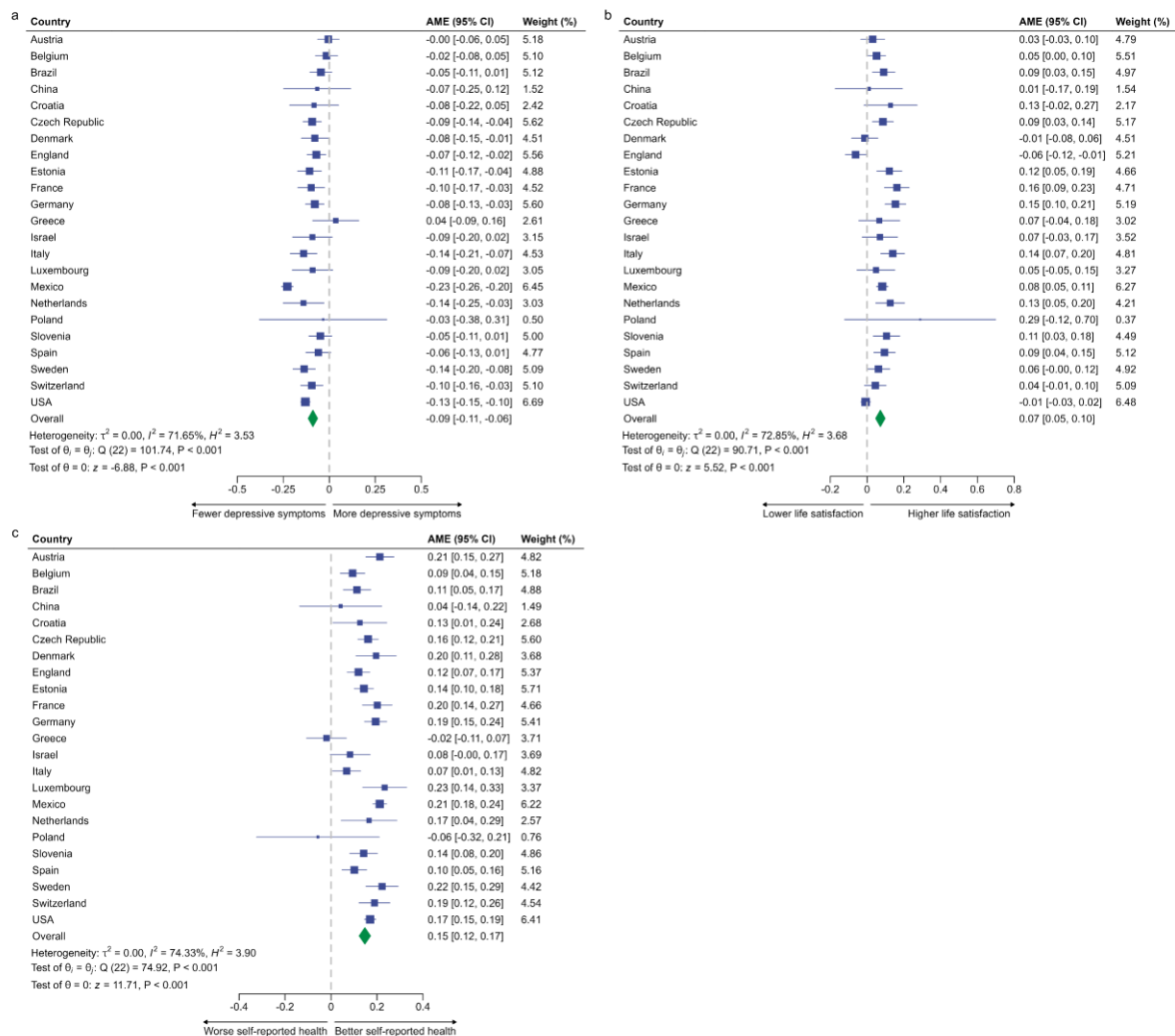
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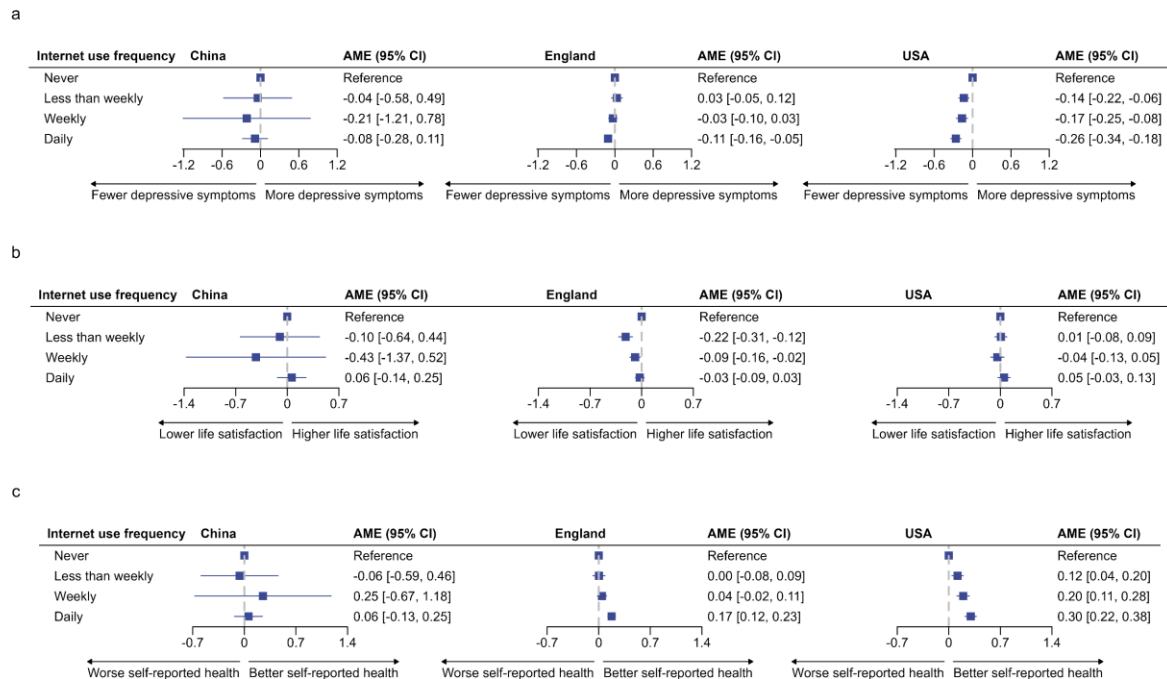
**Supplementary Fig.13:** Associations of Internet use frequency with depressive symptoms (a), life satisfaction (b), and self-reported health (c) using complete cases ( $n=15,363$  from 3 countries). Data are presented as the AME with 95% CIs. The AME for each country was separately estimated by the linear mixed model adjusted for age, gender, marital status, household size, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and IADL. AME = average marginal effect, CI = confidence interval, ADL = activities of daily living, IADL = instrumental activities of daily living.



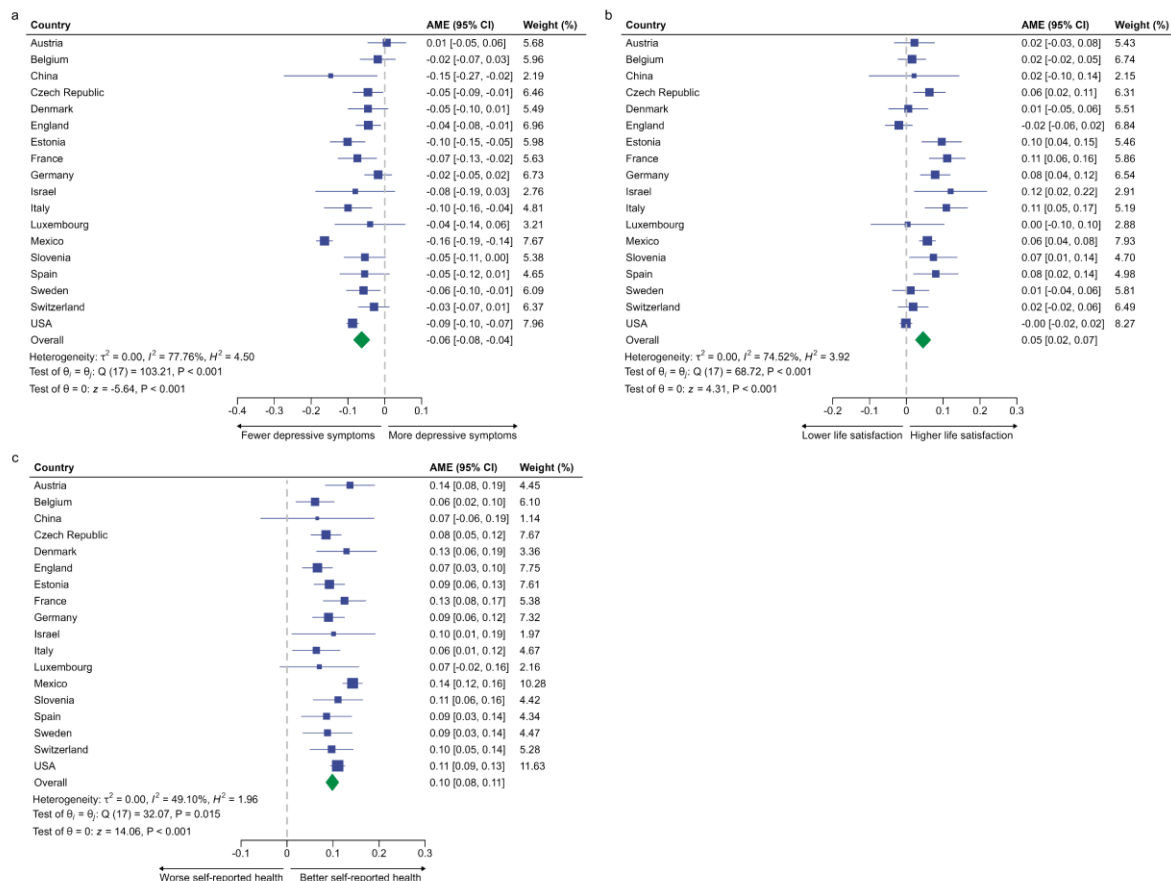
**Supplementary Fig.14:** Associations of cumulative Internet use with depressive symptoms (a), life satisfaction (b), and self-reported health (c) using complete cases ( $n=50,644$  from 18 countries). Data are presented as the AME with 95% CIs. The AME for each country (blue square) was separately estimated by the linear mixed model adjusted for age, gender, marital status, household size, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and IADL. The overall AME (green diamond) was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. The between-study heterogeneity was assessed using statistics  $\tau^2$ ,  $I^2$ , and  $H^2$ , and tested by Cochran's  $Q$  test where  $Q \sim \chi^2_{17}$ . The exact  $P$  values of the Cochran's  $Q$  test were  $3.0 \times 10^{-14}$  for panel (a),  $2.0 \times 10^{-8}$  for panel (b), and 0.022 for panel (c). We used the two-sided  $Z$ -test to test whether the true effect size  $\theta$  is zero. The exact  $P$  values of the  $Z$ -test were  $2.9 \times 10^{-8}$  for panel (a),  $1.5 \times 10^{-5}$  for panel (b), and  $<2.2 \times 10^{-16}$  for panel (c). AME = average marginal effect, CI = confidence interval, ADL = activities of daily living, IADL = instrumental activities of daily living.



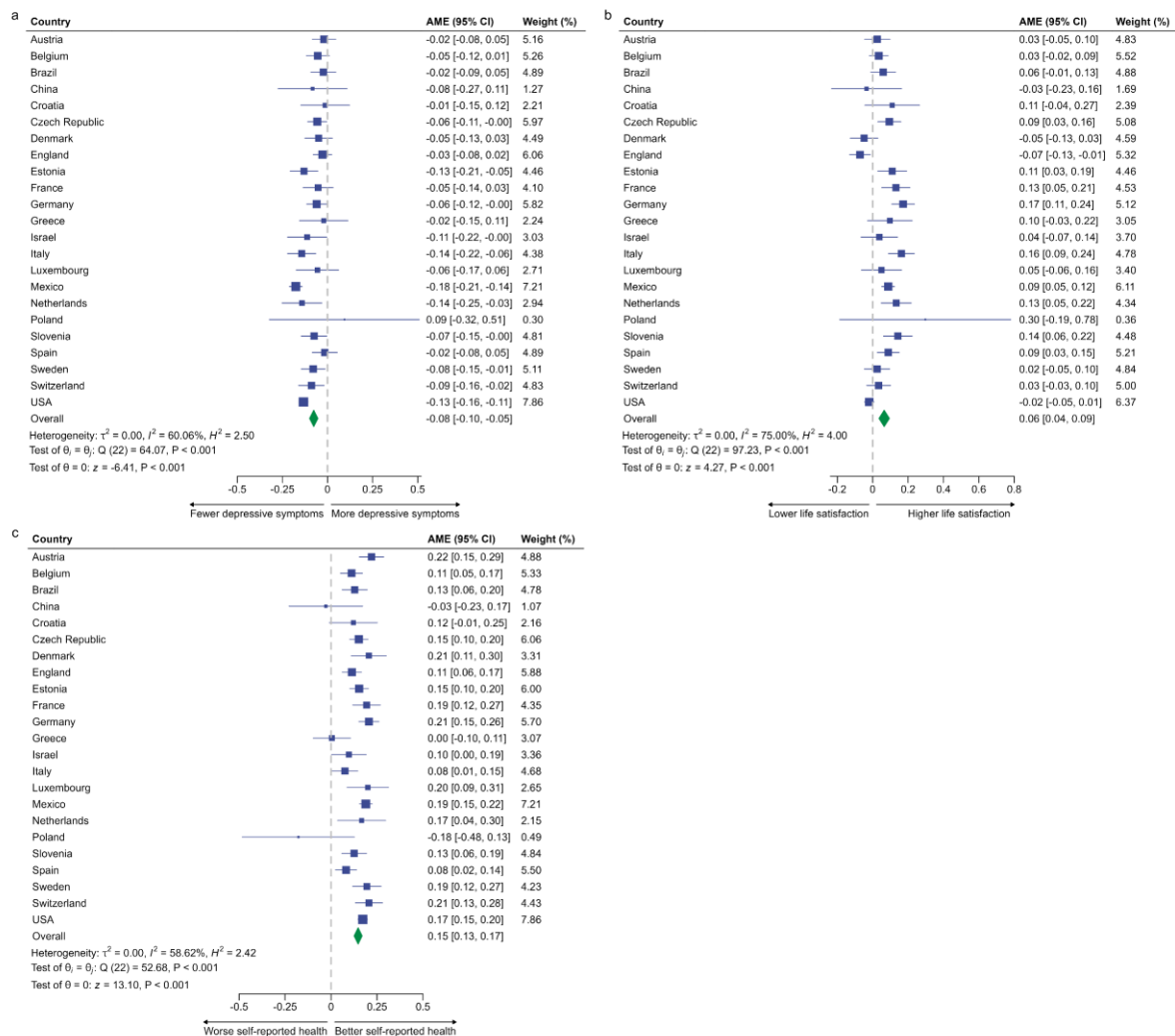
**Supplementary Fig.15:** Associations of Internet use with depressive symptoms (a), life satisfaction (b), and self-reported health (c) using the inverse probability weights of attrition ( $n=87,559$  from 23 countries). Data are presented as the AME with 95% CIs. The AME for each country (blue square) was separately estimated by the linear mixed model adjusted for age, gender, marital status, household size, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and IADL. The overall AME (green diamond) was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. The between-study heterogeneity was assessed using statistics  $\tau^2$ ,  $I^2$ , and  $H^2$ , and tested by Cochran's  $Q$  test where  $Q \sim \chi^2_{22}$ . The exact  $P$  values of the Cochran's  $Q$  test were  $3.2 \times 10^{-12}$  for panel (a),  $2.6 \times 10^{-10}$  for panel (b), and  $1.1 \times 10^{-7}$  for panel (c). We used the two-sided  $Z$ -test to test whether the true effect size  $\theta$  is zero. The exact  $P$  values of the  $Z$ -test were  $5.9 \times 10^{-12}$  for panel (a),  $3.3 \times 10^{-8}$  for panel (b), and  $<2.2 \times 10^{-16}$  for panel (c). AME = average marginal effect, CI = confidence interval, ADL = activities of daily living, IADL = instrumental activities of daily living.



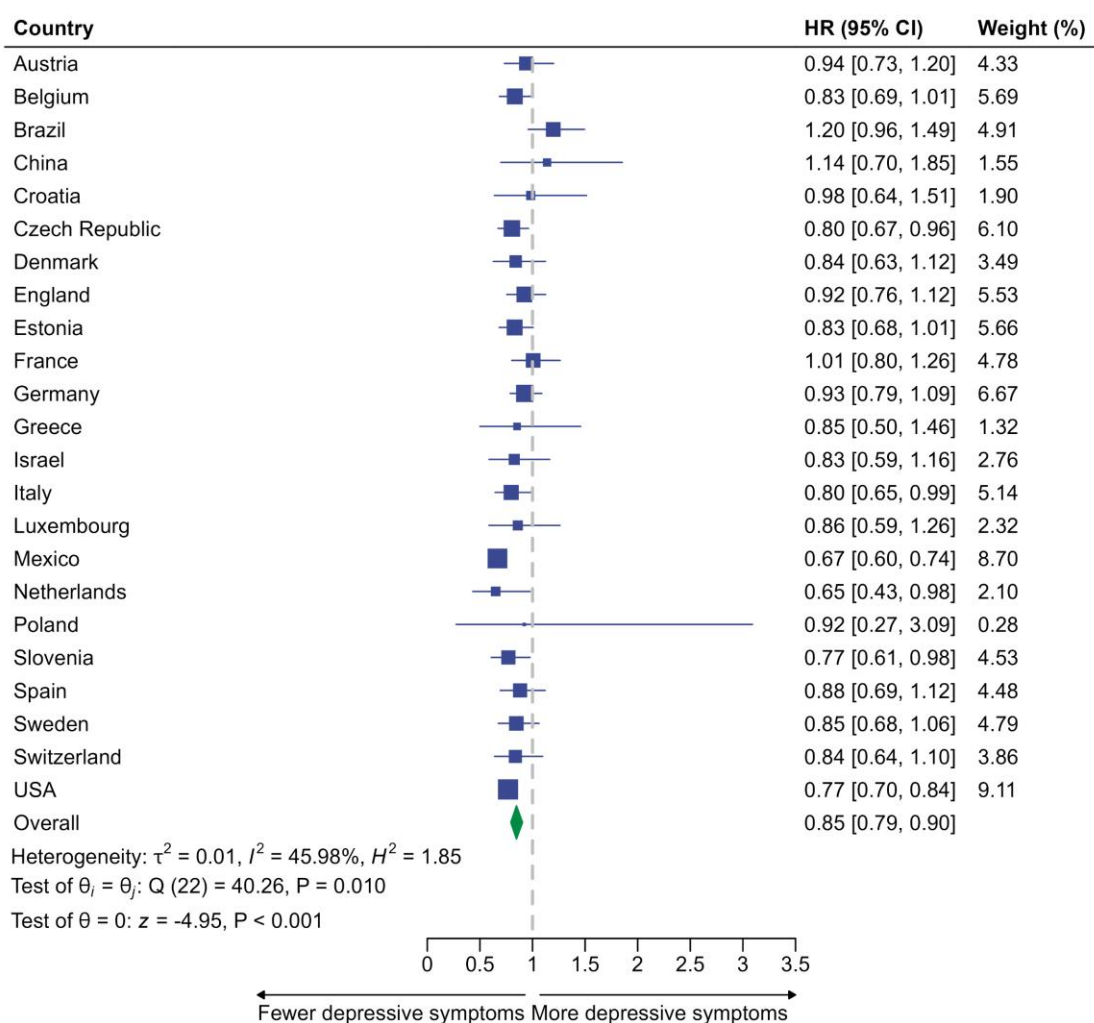
**Supplementary Fig.16:** Associations of Internet use frequency with depressive symptoms (a), life satisfaction (b), and self-reported health (c) using the inverse probability weights of attrition ( $n=15,363$  from 3 countries). Data are presented as the AME with 95% CIs. The AME for each country (blue square) was separately estimated by the linear mixed model adjusted for age, gender, marital status, household size, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and IADL. AME = average marginal effect, CI = confidence interval, ADL = activities of daily living, IADL = instrumental activities of daily living.



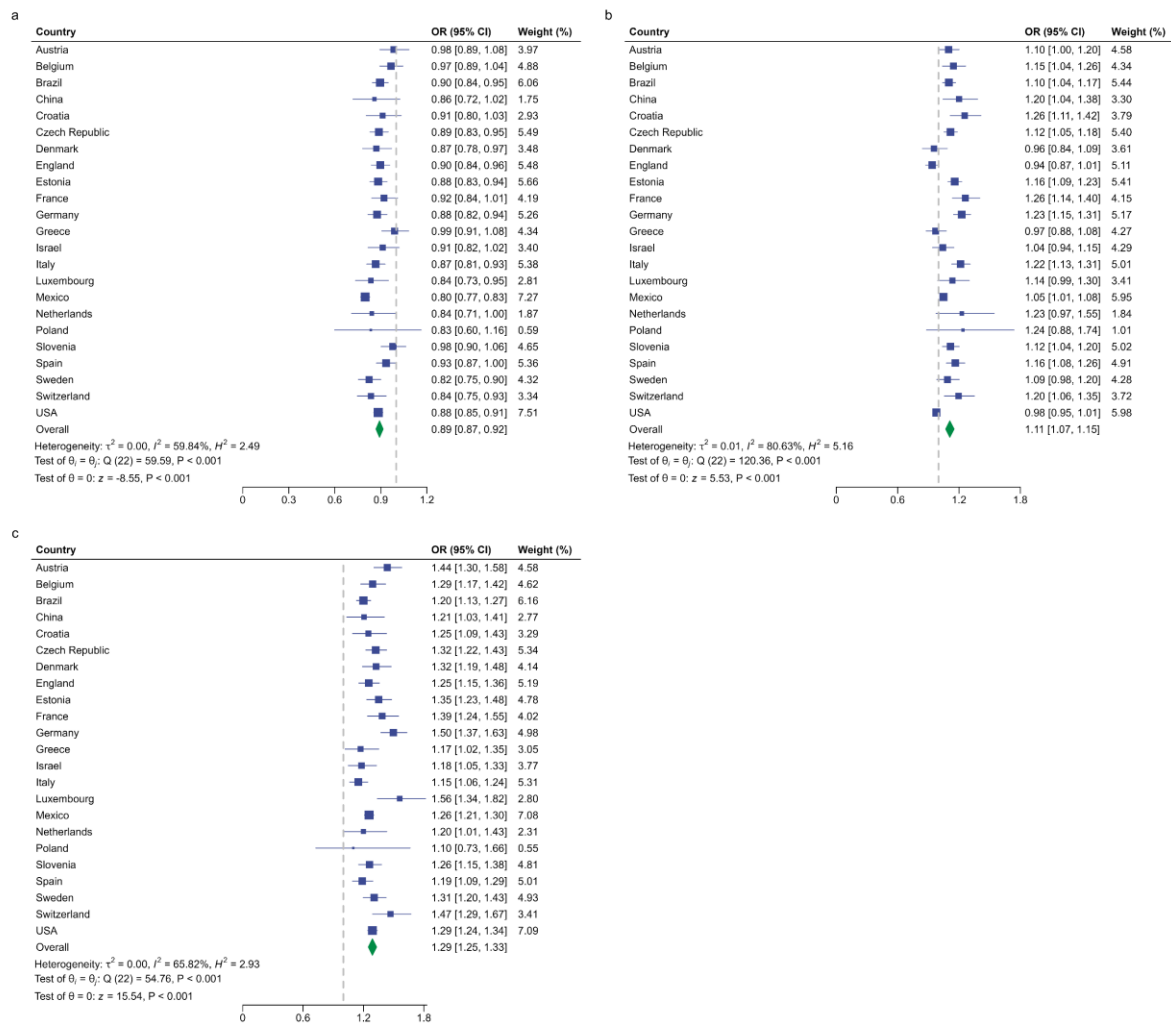
**Supplementary Fig.17:** Associations of cumulative Internet use with depressive symptoms (a), life satisfaction (b), and self-reported health (c) using the inverse probability weights of attrition ( $n=50,644$  from 18 countries). Data are presented as the AME with 95% CIs. The AME for each country (blue square) was separately estimated by the linear mixed model adjusted for age, gender, marital status, household size, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and IADL. The overall AME (green diamond) was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. The between-study heterogeneity was assessed using statistics  $\tau^2$ ,  $I^2$ , and  $H^2$ , and tested by Cochran's  $Q$  test where  $Q \sim \chi^2_{17}$ . The exact  $P$  values of the Cochran's  $Q$  test were  $2.3 \times 10^{-14}$  for panel (a),  $3.6 \times 10^{-8}$  for panel (b), and 0.015 for panel (c). We used the two-sided  $Z$ -test to test whether the true effect size  $\theta$  is zero. The exact  $P$  values of the  $Z$ -test were  $1.7 \times 10^{-8}$  for panel (a),  $1.6 \times 10^{-5}$  for panel (b), and  $<2.2 \times 10^{-16}$  for panel (c). AME = average marginal effect, CI = confidence interval, ADL = activities of daily living, IADL = instrumental activities of daily living.



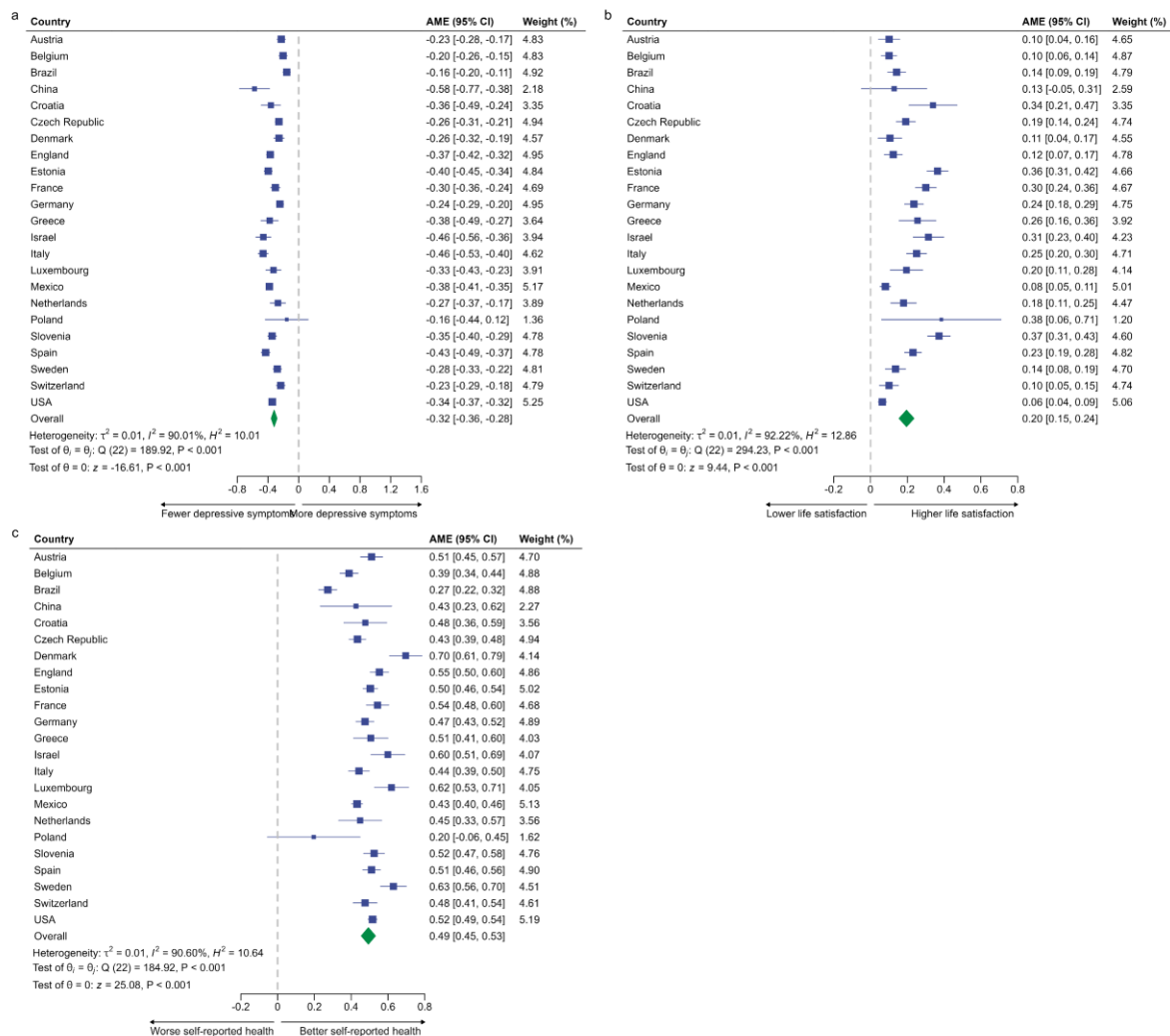
**Supplementary Fig.18:** Associations of Internet use with depressive symptoms (a), life satisfaction (b), and self-reported health (c) among participants without depression at baseline ( $n=69,370$  from 23 countries). Data are presented as the AME with 95% CIs. The AME for each country (blue square) was separately estimated by the linear mixed model adjusted for age, gender, marital status, household size, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and IADL. The overall AME (green diamond) was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. The between-study heterogeneity was assessed using statistics  $\tau^2$ ,  $I^2$ , and  $H^2$ , and tested by Cochran's  $Q$  test where  $Q \sim \chi^2_{22}$ . The exact  $P$  values of the Cochran's  $Q$  test were  $5.5 \times 10^{-6}$  for panel (a),  $2.0 \times 10^{-11}$  for panel (b), and  $2.5 \times 10^{-4}$  for panel (c). We used the two-sided  $Z$ -test to test whether the true effect size  $\theta$  is zero. The exact  $P$  values of the  $Z$ -test were  $1.5 \times 10^{-10}$  for panel (a),  $2.0 \times 10^{-5}$  for panel (b), and  $<2.2 \times 10^{-16}$  for panel (c). AME = average marginal effect, CI = confidence interval, ADL = activities of daily living, IADL = instrumental activities of daily living.



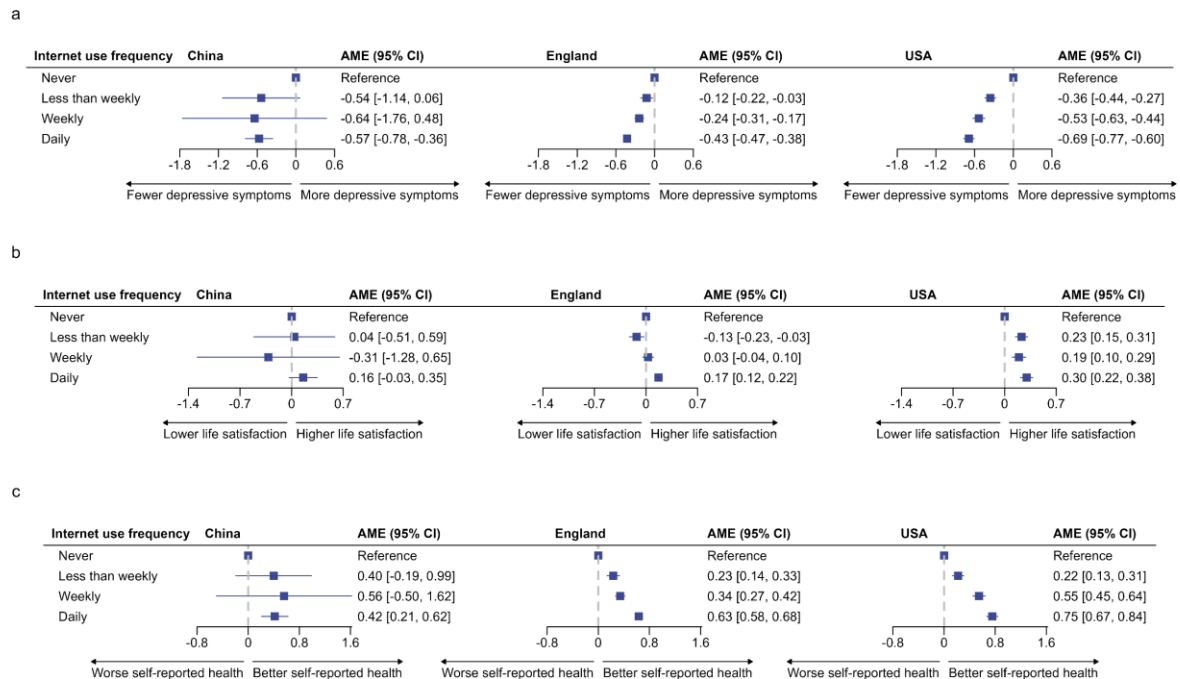
**Supplementary Fig.19:** Associations of Internet use with incident depression ( $n=69,370$  from 23 countries). Data are presented as the HRs with 95% CIs. The HR for each country (blue square) was separately estimated by the Cox proportional hazards model adjusted for age, gender, marital status, household size, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and IADL. The overall HR (green diamond) was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. The between-study heterogeneity was assessed using statistics  $\tau^2$ ,  $I^2$ , and  $H^2$ , and tested by Cochran's  $Q$  test where  $Q \sim \chi^2_{22}$ . The exact  $P$  values of the Cochran's  $Q$  test was 0.010. We used the two-sided  $Z$ -test to test whether the true effect size  $\theta$  is zero. The exact  $P$  values of the  $Z$ -test was  $7.2 \times 10^{-7}$ . HR = hazard ratio, CI = confidence interval, ADL = activities of daily living, IADL = instrumental activities of daily living.



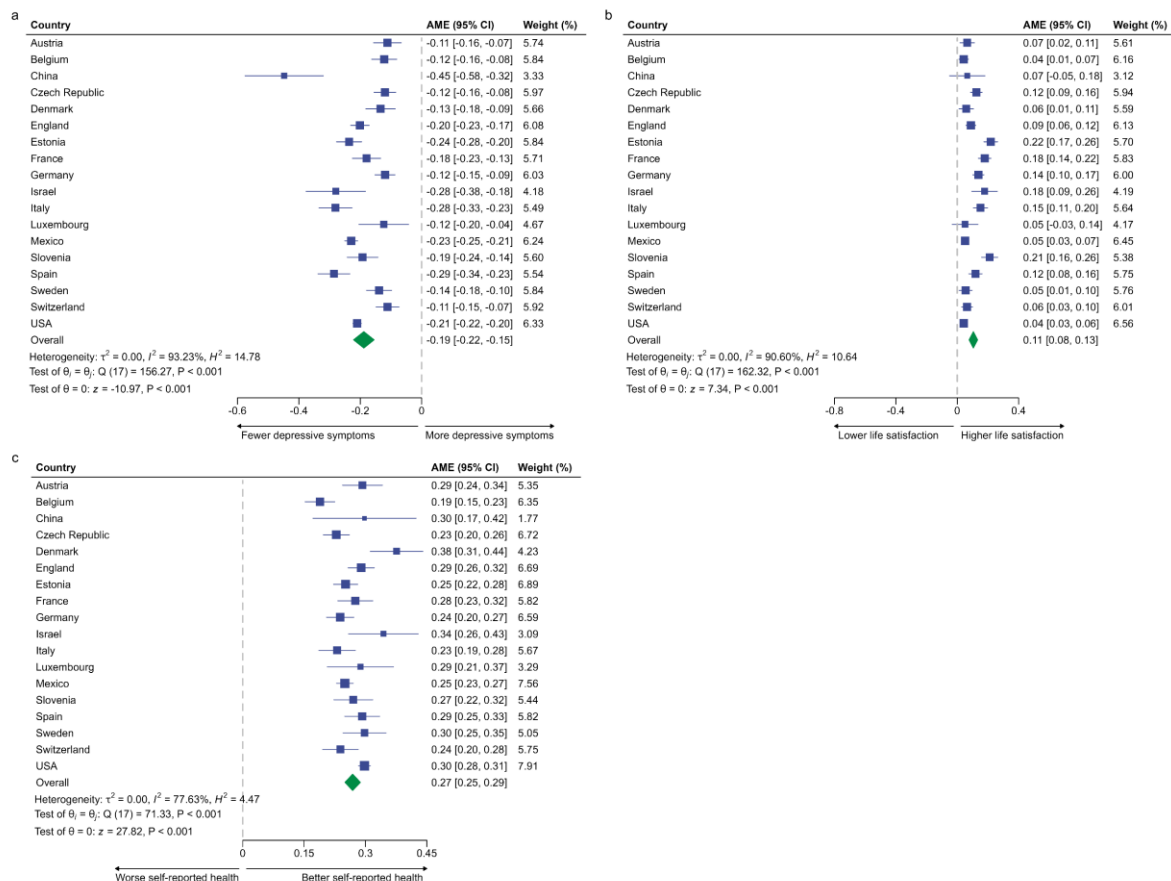
**Supplementary Fig.20:** Associations of depressive symptoms (a), life satisfaction (b), and self-reported health (c) with Internet use ( $n=90,417$  from 23 countries). Data are presented as the ORs with 95% CIs. The OR for each country (blue square) was separately estimated by the generalized estimating equation model adjusted for age, gender, marital status, household size, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and IADL. The overall OR (green diamond) was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. The between-study heterogeneity was assessed using statistics  $\tau^2$ ,  $I^2$ , and  $H^2$ , and tested by Cochran's  $Q$  test where  $Q \sim \chi^2_{22}$ . The exact  $P$  values of the Cochran's  $Q$  test were  $2.6 \times 10^{-5}$  for panel (a),  $1.5 \times 10^{-15}$  for panel (b), and  $1.3 \times 10^{-4}$  for panel (c). We used the two-sided  $Z$ -test to test whether the true effect size  $\theta$  is zero. The exact  $P$  values of the  $Z$ -test were  $<2.2 \times 10^{-16}$  for panel (a),  $3.3 \times 10^{-8}$  for panel (b), and  $<2.2 \times 10^{-16}$  for panel (c). OR = odds ratio, CI = confidence interval, ADL = activities of daily living, IADL = instrumental activities of daily living.



**Supplementary Fig.21:** Unadjusted associations of Internet use with depressive symptoms (a), life satisfaction (b), and self-reported health (c) ( $n=87,559$  from 23 countries). Data are presented as the AME with 95% CIs. The AME for each country (blue square) was separately estimated by the linear mixed model. The overall AME (green diamond) was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. The between-study heterogeneity was assessed using statistics  $\tau^2$ ,  $I^2$ , and  $H^2$ , and tested by Cochran's  $Q$  test where  $Q \sim \chi^2_{22}$ . The exact  $P$  values of the Cochran's  $Q$  test were  $<2.2 \times 10^{-16}$  for panel (a),  $<2.2 \times 10^{-16}$  for panel (b), and  $<2.2 \times 10^{-16}$  for panel (c). We used the two-sided  $Z$ -test to test whether the true effect size  $\theta$  is zero. The exact  $P$  values of the  $Z$ -test were  $<2.2 \times 10^{-16}$  for panel (a),  $<2.2 \times 10^{-16}$  for panel (b), and  $<2.2 \times 10^{-16}$  for panel (c). AME = average marginal effect, CI = confidence interval.



**Supplementary Fig.22:** Unadjusted associations of Internet use frequency with depressive symptoms (a), life satisfaction (b), and self-reported health (c) ( $n=15,363$  from 3 countries). Data are presented as the AME with 95% CIs. The AME for each country (blue square) was separately estimated by the linear mixed model. AME = average marginal effect, CI = confidence interval.



**Supplementary Fig.23:** Unadjusted associations of cumulative Internet use with depressive symptoms (a), life satisfaction (b), and self-reported health (c) ( $n=50,644$  from 18 countries). Data are presented as the AME with 95% CIs. The AME for each country (blue square) was separately estimated by the linear mixed model. The overall AME (green diamond) was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. The between-study heterogeneity was assessed using statistics  $\tau^2$ ,  $I^2$ , and  $H^2$ , and tested by Cochran's  $Q$  test where  $Q \sim \chi^2_{17}$ . The exact  $P$  values of the Cochran's  $Q$  test were  $<2.2 \times 10^{-16}$  for panel (a),  $<2.2 \times 10^{-16}$  for panel (b), and  $1.3 \times 10^{-8}$  for panel (c). We used the two-sided  $Z$ -test to test whether the true effect size  $\theta$  is zero. The exact  $P$  values of the  $Z$ -test were  $<2.2 \times 10^{-16}$  for panel (a),  $2.1 \times 10^{-13}$  for panel (b), and  $<2.2 \times 10^{-16}$  for panel (c). AME = average marginal effect, CI = confidence interval.

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**Supplementary Table 1.** Baseline characteristics of the population for Internet use and mental health study by countries.

| Characteristics <sup>1</sup> | Austria<br>(N=2,587) | Belgium<br>(N=3,702) | Brazil<br>(N=4,174) | China<br>(N=3,002) | Croatia<br>(N=907) | Czech Republic<br>(N=3,715) | Denmark<br>(N=3,027) | England<br>(N=5,775) | Estonia<br>(N=3,791) | France<br>(N=2,483) | Germany<br>(N=3,719) | Greece<br>(N=1,365) |
|------------------------------|----------------------|----------------------|---------------------|--------------------|--------------------|-----------------------------|----------------------|----------------------|----------------------|---------------------|----------------------|---------------------|
| Survey year, median          | 2013                 | 2013                 | 2015                | 2011               | 2015               | 2013                        | 2013                 | 2012                 | 2013                 | 2013                | 2013                 | 2015                |
| Depression                   | 378 (14.6%)          | 795 (21.5%)          | 1,172 (28.1%)       | 1,410 (47.0%)      | 231 (25.5%)        | 780 (21.0%)                 | 403 (13.3%)          | 479 (8.3%)           | 1,136 (30.0%)        | 613 (24.7%)         | 719 (19.3%)          | 445 (32.6%)         |
| Age, years                   | 66.6 (9.0)           | 64.8 (9.9)           | 62.2 (9.4)          | 60.9 (7.4)         | 64.2 (8.4)         | 66.0 (8.4)                  | 63.9 (9.5)           | 66.0 (8.9)           | 66.7 (9.5)           | 66.2 (9.9)          | 64.1 (9.4)           | 62.8 (9.5)          |
| Male                         | 1,096 (42.4%)        | 1,782 (48.1%)        | 2,218 (53.1%)       | 1,439 (47.9%)      | 407 (44.9%)        | 1,573 (42.3%)               | 1,425 (47.1%)        | 2,706 (46.9%)        | 1,444 (38.1%)        | 1,190 (47.9%)       | 1,850 (49.7%)        | 641 (47.0%)         |
| Unmarried                    | 830 (32.1%)          | 961 (26.0%)          | 1,567 (37.5%)       | 388 (12.9%)        | 166 (18.3%)        | 1,019 (27.4%)               | 592 (19.6%)          | 1,376 (23.8%)        | 1,201 (31.7%)        | 694 (28.0%)         | 688 (18.5%)          | 298 (21.8%)         |
| Household size               | 2.0 (0.9)            | 2.1 (0.9)            | 3.1 (1.6)           | 3.3 (1.8)          | 2.5 (1.3)          | 2.1 (1.0)                   | 2.0 (0.8)            | 2.1 (0.8)            | 2.0 (0.9)            | 2.0 (0.9)           | 2.1 (0.8)            | 2.4 (1.0)           |
| Weekly contact               | 2,237 (86.5%)        | 3,236 (87.4%)        | 3,214 (77.0%)       | 2,719 (90.6%)      | 837 (92.3%)        | 3,398 (91.5%)               | 2,702 (89.3%)        | 5,489 (95.0%)        | 3,216 (84.8%)        | 2,163 (87.1%)       | 3,153 (84.8%)        | 1,265 (92.7%)       |
| Education                    |                      |                      |                     |                    |                    |                             |                      |                      |                      |                     |                      |                     |
| Primary                      | 589 (22.8%)          | 1,363 (36.8%)        | 3,044 (72.9%)       | 2,675 (89.1%)      | 526 (58.0%)        | 1,355 (36.5%)               | 502 (16.6%)          | 1,416 (24.5%)        | 986 (26.0%)          | 966 (38.9%)         | 390 (10.5%)          | 646 (47.3%)         |
| Secondary                    | 1,316 (50.9%)        | 996 (26.9%)          | 875 (21.0%)         | 272 (9.1%)         | 227 (25.0%)        | 1,819 (49.0%)               | 1,177 (38.9%)        | 3,098 (53.6%)        | 1,887 (49.8%)        | 916 (36.9%)         | 2,121 (57.0%)        | 388 (28.4%)         |
| Tertiary                     | 682 (26.4%)          | 1,343 (36.3%)        | 255 (6.1%)          | 55 (1.8%)          | 154 (17.0%)        | 541 (14.6%)                 | 1,348 (44.5%)        | 1,261 (21.8%)        | 918 (24.2%)          | 601 (24.2%)         | 1,208 (32.5%)        | 331 (24.2%)         |
| Household wealth             |                      |                      |                     |                    |                    |                             |                      |                      |                      |                     |                      |                     |
| Low                          | 863 (33.4%)          | 1,234 (33.3%)        | 1,044 (33.4%)       | 751 (33.4%)        | 303 (33.4%)        | 1,239 (33.4%)               | 1,009 (33.3%)        | 1,925 (33.3%)        | 1,264 (33.3%)        | 828 (33.3%)         | 1,240 (33.3%)        | 455 (33.3%)         |
| Middle                       | 862 (33.3%)          | 1,234 (33.3%)        | 1,043 (33.3%)       | 750 (33.3%)        | 302 (33.3%)        | 1,238 (33.3%)               | 1,009 (33.3%)        | 1,925 (33.3%)        | 1,264 (33.3%)        | 828 (33.3%)         | 1,240 (33.3%)        | 455 (33.3%)         |
| High                         | 862 (33.3%)          | 1,234 (33.3%)        | 1,043 (33.3%)       | 750 (33.3%)        | 302 (33.3%)        | 1,238 (33.3%)               | 1,009 (33.3%)        | 1,925 (33.3%)        | 1,263 (33.3%)        | 827 (33.3%)         | 1,239 (33.3%)        | 455 (33.3%)         |
| Labor force status           |                      |                      |                     |                    |                    |                             |                      |                      |                      |                     |                      |                     |
| Working                      | 479 (18.5%)          | 1,151 (31.1%)        | 1,523 (36.5%)       | 1,871 (62.3%)      | 175 (19.3%)        | 796 (21.4%)                 | 1,407 (46.5%)        | 1,999 (34.6%)        | 1,343 (35.4%)        | 678 (27.3%)         | 1,402 (37.7%)        | 403 (29.5%)         |
| Retired                      | 1,821 (70.4%)        | 1,937 (52.3%)        | 1,375 (32.9%)       | 1,074 (35.8%)      | 554 (61.1%)        | 2,752 (74.1%)               | 1,425 (47.1%)        | 3,342 (57.9%)        | 2,186 (57.7%)        | 1,608 (64.8%)       | 1,905 (51.2%)        | 558 (40.9%)         |
| Others                       | 287 (11.1%)          | 614 (16.6%)          | 1,276 (30.6%)       | 57 (1.9%)          | 178 (19.6%)        | 167 (4.5%)                  | 195 (6.4%)           | 434 (7.5%)           | 262 (6.9%)           | 197 (7.9%)          | 412 (11.1%)          | 404 (29.6%)         |
| Current smoking              | 494 (19.1%)          | 637 (17.2%)          | 745 (17.8%)         | 918 (30.6%)        | 210 (23.2%)        | 879 (23.7%)                 | 563 (18.6%)          | 581 (10.1%)          | 691 (18.2%)          | 409 (16.5%)         | 707 (19.0%)          | 401 (29.4%)         |
| Weekly alcohol use           | 1,382 (53.4%)        | 2,406 (65.0%)        | 902 (21.6%)         | 573 (19.1%)        | 365 (40.2%)        | 1,567 (42.2%)               | 2,172 (71.8%)        | 3,925 (68.0%)        | 759 (20.0%)          | 1,553 (62.5%)       | 1,992 (53.6%)        | 722 (52.9%)         |
| Physical inactivity          | 178 (6.9%)           | 281 (7.6%)           | 1,384 (33.2%)       | 1,043 (34.7%)      | 48 (5.3%)          | 304 (8.2%)                  | 106 (3.5%)           | 671 (11.6%)          | 316 (8.3%)           | 169 (6.8%)          | 200 (5.4%)           | 96 (7.0%)           |
| Number of chronic conditions | 1.2 (1.2)            | 1.2 (1.1)            | 1.0 (1.0)           | 1.0 (1.0)          | 1.0 (1.0)          | 1.5 (1.2)                   | 1.1 (1.1)            | 1.2 (1.1)            | 1.5 (1.3)            | 1.3 (1.2)           | 1.2 (1.1)            | 0.8 (0.9)           |
| ADL disability               | 161 (6.2%)           | 360 (9.7%)           | 518 (12.4%)         | 501 (16.7%)        | 54 (6.0%)          | 328 (8.8%)                  | 166 (5.5%)           | 732 (12.7%)          | 446 (11.8%)          | 201 (8.1%)          | 250 (6.7%)           | 55 (4.0%)           |
| IADL                         | 0.2 (0.6)            | 0.2 (0.6)            | 0.5 (1.0)           | 0.4 (0.9)          | 0.1 (0.5)          | 0.2 (0.6)                   | 0.1 (0.5)            | 0.2 (0.6)            | 0.2 (0.7)            | 0.1 (0.5)           | 0.1 (0.5)            | 0.1 (0.5)           |

<sup>1</sup>Data are presented as Mean (standard deviation) or Frequency (%), unless otherwise indicated.

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ADL = activities of daily living, IADL = instrumental activities of daily living.

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**Supplementary Table 1.** (continued).

| Characteristics <sup>1</sup> | Israel<br>(N=1,288) | Italy<br>(N=3,316) | Luxembourg<br>(N=1,164) | Mexico<br>(N=12,093) | Netherlands<br>(N=1,502) | Poland<br>(N=118) | Slovenia<br>(N=2,589) | Spain<br>(N=3,734) | Sweden<br>(N=3,233) | Switzerland<br>(N=2,278) | USA<br>(N=17,997) |
|------------------------------|---------------------|--------------------|-------------------------|----------------------|--------------------------|-------------------|-----------------------|--------------------|---------------------|--------------------------|-------------------|
| Survey year, median          | 2013                | 2013               | 2013                    | 2012                 | 2013                     | 2015              | 2013                  | 2013               | 2013                | 2013                     | 2008              |
| Depression                   | 271 (21.0%)         | 976 (29.4%)        | 256 (22.0%)             | 3,803 (31.4%)        | 198 (13.2%)              | 34 (28.8%)        | 524 (20.2%)           | 803 (21.5%)        | 494 (15.3%)         | 319 (14.0%)              | 1,950 (10.8%)     |
| Age, years                   | 65.8 (8.7)          | 65.3 (9.1)         | 63.1 (8.6)              | 64.1 (8.9)           | 64.4 (8.0)               | 56.4 (6.8)        | 65.5 (9.2)            | 66.6 (9.8)         | 67.9 (8.8)          | 66.2 (9.4)               | 63.7 (10.2)       |
| Male                         | 553 (42.9%)         | 1,591 (48.0%)      | 562 (48.3%)             | 5,072 (41.9%)        | 697 (46.4%)              | 58 (49.2%)        | 1,118 (43.2%)         | 1,837 (49.2%)      | 1,541 (47.7%)       | 1,076 (47.2%)            | 8,084 (44.9%)     |
| Unmarried                    | 207 (16.1%)         | 541 (16.3%)        | 206 (17.7%)             | 3,563 (29.5%)        | 249 (16.6%)              | 19 (16.1%)        | 552 (21.3%)           | 590 (15.8%)        | 672 (20.8%)         | 500 (21.9%)              | 5,966 (33.1%)     |
| Household size               | 2.4 (1.2)           | 2.5 (1.1)          | 2.4 (1.1)               | 3.0 (2.2)            | 2.0 (0.7)                | 2.9 (1.5)         | 2.4 (1.1)             | 2.4 (1.0)          | 1.9 (0.6)           | 2.1 (0.8)                | 2.4 (1.3)         |
| Weekly contact               | 1,224 (95.0%)       | 3,028 (91.3%)      | 929 (79.8%)             | 11,718 (96.9%)       | 1,292 (86.0%)            | 115 (97.5%)       | 2,432 (93.9%)         | 3,205 (85.8%)      | 2,860 (88.5%)       | 1,843 (80.9%)            | 16,678 (92.7%)    |
| Education                    |                     |                    |                         |                      |                          |                   |                       |                    |                     |                          |                   |
| Primary                      | 370 (28.7%)         | 2,277 (68.7%)      | 456 (39.2%)             | 10,384 (85.9%)       | 583 (38.8%)              | 20 (16.9%)        | 756 (29.2%)           | 2,874 (77.0%)      | 1,125 (34.8%)       | 419 (18.4%)              | 3,090 (17.2%)     |
| Secondary                    | 445 (34.5%)         | 744 (22.4%)        | 474 (40.7%)             | 420 (3.5%)           | 419 (27.9%)              | 83 (70.3%)        | 1,355 (52.3%)         | 419 (11.2%)        | 1,078 (33.3%)       | 1,460 (64.1%)            | 10,607 (58.9%)    |
| Tertiary                     | 473 (36.7%)         | 295 (8.9%)         | 234 (20.1%)             | 1,289 (10.7%)        | 500 (33.3%)              | 15 (12.7%)        | 478 (18.5%)           | 441 (11.8%)        | 1,030 (31.9%)       | 399 (17.5%)              | 4,300 (23.9%)     |
| Household wealth             |                     |                    |                         |                      |                          |                   |                       |                    |                     |                          |                   |
| Low                          | 430 (33.4%)         | 1,106 (33.4%)      | 388 (33.3%)             | 4,031 (33.3%)        | 501 (33.4%)              | 40 (33.9%)        | 863 (33.3%)           | 1,245 (33.3%)      | 1,078 (33.3%)       | 760 (33.4%)              | 5,999 (33.3%)     |
| Middle                       | 429 (33.3%)         | 1,105 (33.3%)      | 388 (33.3%)             | 4,031 (33.3%)        | 501 (33.4%)              | 39 (33.1%)        | 863 (33.3%)           | 1,245 (33.3%)      | 1,078 (33.3%)       | 759 (33.3%)              | 5,999 (33.3%)     |
| High                         | 429 (33.3%)         | 1,105 (33.3%)      | 388 (33.3%)             | 4,031 (33.3%)        | 500 (33.3%)              | 39 (33.1%)        | 863 (33.3%)           | 1,244 (33.3%)      | 1,077 (33.3%)       | 759 (33.3%)              | 5,999 (33.3%)     |
| Labor force status           |                     |                    |                         |                      |                          |                   |                       |                    |                     |                          |                   |
| Working                      | 518 (40.2%)         | 818 (24.7%)        | 329 (28.3%)             | 4,621 (38.2%)        | 520 (34.6%)              | 68 (57.6%)        | 449 (17.3%)           | 967 (25.9%)        | 1,071 (33.1%)       | 899 (39.5%)              | 7,798 (43.3%)     |
| Retired                      | 563 (43.7%)         | 1,743 (52.6%)      | 566 (48.6%)             | 1,521 (12.6%)        | 720 (47.9%)              | 23 (19.5%)        | 1,862 (71.9%)         | 1,714 (45.9%)      | 2,078 (64.3%)       | 1,175 (51.6%)            | 8,115 (45.1%)     |
| Others                       | 207 (16.1%)         | 755 (22.8%)        | 269 (23.1%)             | 5,951 (49.2%)        | 262 (17.4%)              | 27 (22.9%)        | 278 (10.7%)           | 1,053 (28.2%)      | 84 (2.6%)           | 204 (9.0%)               | 2,084 (11.6%)     |
| Current smoking              | 184 (14.3%)         | 570 (17.2%)        | 179 (15.4%)             | 1,455 (12.0%)        | 217 (14.4%)              | 40 (33.9%)        | 386 (14.9%)           | 506 (13.6%)        | 389 (12.0%)         | 488 (21.4%)              | 2,748 (15.3%)     |
| Weekly alcohol use           | 182 (14.1%)         | 1,357 (40.9%)      | 738 (63.4%)             | 1,970 (16.3%)        | 1,074 (71.5%)            | 55 (46.6%)        | 1,122 (43.3%)         | 1,448 (38.8%)      | 1,823 (56.4%)       | 1,541 (67.6%)            | 7,304 (40.6%)     |
| Physical inactivity          | 177 (13.7%)         | 512 (15.4%)        | 58 (5.0%)               | 7,216 (59.7%)        | 47 (3.1%)                | 6 (5.1%)          | 221 (8.5%)            | 392 (10.5%)        | 90 (2.8%)           | 113 (5.0%)               | 2,500 (13.9%)     |
| Number of chronic conditions | 1.3 (1.3)           | 1.2 (1.2)          | 1.1 (1.1)               | 1.2 (1.1)            | 1.0 (1.0)                | 0.9 (1.0)         | 1.0 (1.0)             | 1.1 (1.1)          | 1.1 (1.1)           | 1.0 (1.0)                | 1.6 (1.2)         |
| ADL disability               | 78 (6.1%)           | 256 (7.7%)         | 85 (7.3%)               | 1,797 (14.9%)        | 59 (3.9%)                | 9 (7.6%)          | 168 (6.5%)            | 210 (5.6%)         | 157 (4.9%)          | 86 (3.8%)                | 2,094 (11.6%)     |
| IADL                         | 0.3 (0.8)           | 0.2 (0.7)          | 0.1 (0.5)               | 0.1 (0.5)            | 0.1 (0.4)                | 0.1 (0.4)         | 0.1 (0.5)             | 0.1 (0.6)          | 0.1 (0.4)           | 0.1 (0.3)                | 0.1 (0.5)         |

<sup>1</sup>Data are presented as Mean (standard deviation) or Frequency (%), unless otherwise indicated.

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ADL = activities of daily living, IADL = instrumental activities of daily living.

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**Supplementary Table 2.** Baseline characteristics of the population for cumulative Internet use and mental health study by countries.

| Characteristics <sup>1</sup>  | Austria<br>(N=1,135) | Belgium<br>(N=1,788) | China<br>(N=2,443) | Czech Republic<br>(N=2,055) | Denmark<br>(N=1,920) | England<br>(N=4,556) | Estonia<br>(N=1,807) | France<br>(N=1,457) | Germany<br>(N=2,335) | Israel<br>(N=469) | Italy<br>(N=1,626) | Luxembourg<br>(N=460) |
|-------------------------------|----------------------|----------------------|--------------------|-----------------------------|----------------------|----------------------|----------------------|---------------------|----------------------|-------------------|--------------------|-----------------------|
| Cumulative Internet use, wave |                      |                      |                    |                             |                      |                      |                      |                     |                      |                   |                    |                       |
| 0                             | 515 (45.4%)          | 566 (31.7%)          | 2,363 (96.7%)      | 861 (41.9%)                 | 192 (10.0%)          | 815 (17.9%)          | 839 (46.4%)          | 491 (33.7%)         | 770 (33.0%)          | 160 (34.1%)       | 1,046 (64.3%)      | 110 (23.9%)           |
| 1                             | 107 (9.4%)           | 116 (6.5%)           | 52 (2.1%)          | 221 (10.8%)                 | 110 (5.7%)           | 228 (5.0%)           | 205 (11.3%)          | 111 (7.6%)          | 214 (9.2%)           | 88 (18.8%)        | 176 (10.8%)        | 41 (8.9%)             |
| 2                             | 513 (45.2%)          | 1,106 (61.9%)        | 28 (1.1%)          | 973 (47.3%)                 | 1,618 (84.3%)        | 3,513 (77.1%)        | 763 (42.2%)          | 855 (58.7%)         | 1,351 (57.9%)        | 221 (47.1%)       | 404 (24.8%)        | 309 (67.2%)           |
| Age, years                    | 66.8 (8.3)           | 65.7 (9.2)           | 60.5 (7.1)         | 65.7 (7.6)                  | 64.5 (8.8)           | 65.5 (8.4)           | 66.4 (8.5)           | 65.9 (8.8)          | 64.0 (8.7)           | 65.7 (8.0)        | 66.0 (8.5)         | 62.7 (8.0)            |
| Male                          | 441 (38.9%)          | 857 (47.9%)          | 1,168 (47.8%)      | 835 (40.6%)                 | 903 (47.0%)          | 2,128 (46.7%)        | 609 (33.7%)          | 702 (48.2%)         | 1,162 (49.8%)        | 199 (42.4%)       | 775 (47.7%)        | 221 (48.0%)           |
| Unmarried                     | 357 (31.5%)          | 437 (24.4%)          | 271 (11.1%)        | 538 (26.2%)                 | 373 (19.4%)          | 1,026 (22.5%)        | 576 (31.9%)          | 389 (26.7%)         | 419 (17.9%)          | 72 (15.4%)        | 241 (14.8%)        | 82 (17.8%)            |
| Household size                | 2.0 (0.9)            | 2.1 (0.9)            | 3.4 (1.8)          | 2.1 (0.9)                   | 2.0 (0.7)            | 2.1 (0.8)            | 2.0 (0.9)            | 2.0 (0.8)           | 2.1 (0.8)            | 2.3 (1.1)         | 2.5 (1.0)          | 2.4 (1.1)             |
| Weekly contact                | 996 (87.8%)          | 1,574 (88.0%)        | 2,216 (90.7%)      | 1,917 (93.3%)               | 1,702 (88.6%)        | 4,328 (95.0%)        | 1,568 (86.8%)        | 1,267 (87.0%)       | 1,986 (85.1%)        | 443 (94.5%)       | 1,495 (91.9%)      | 362 (78.7%)           |
| Education                     |                      |                      |                    |                             |                      |                      |                      |                     |                      |                   |                    |                       |
| Primary                       | 254 (22.4%)          | 683 (38.2%)          | 2,192 (89.7%)      | 746 (36.3%)                 | 286 (14.9%)          | 1,007 (22.1%)        | 402 (22.2%)          | 516 (35.4%)         | 209 (9.0%)           | 150 (32.0%)       | 1,131 (69.6%)      | 156 (33.9%)           |
| Secondary                     | 596 (52.5%)          | 486 (27.2%)          | 211 (8.6%)         | 991 (48.2%)                 | 766 (39.9%)          | 2,492 (54.7%)        | 944 (52.2%)          | 557 (38.2%)         | 1,298 (55.6%)        | 159 (33.9%)       | 359 (22.1%)        | 192 (41.7%)           |
| Tertiary                      | 285 (25.1%)          | 619 (34.6%)          | 40 (1.6%)          | 318 (15.5%)                 | 868 (45.2%)          | 1,057 (23.2%)        | 461 (25.5%)          | 384 (26.4%)         | 828 (35.5%)          | 160 (34.1%)       | 136 (8.4%)         | 112 (24.3%)           |
| Household wealth              |                      |                      |                    |                             |                      |                      |                      |                     |                      |                   |                    |                       |
| Low                           | 379 (33.4%)          | 596 (33.3%)          | 611 (33.4%)        | 685 (33.3%)                 | 640 (33.3%)          | 1,519 (33.3%)        | 603 (33.4%)          | 486 (33.4%)         | 779 (33.4%)          | 157 (33.5%)       | 542 (33.3%)        | 154 (33.5%)           |
| Middle                        | 378 (33.3%)          | 596 (33.3%)          | 611 (33.4%)        | 685 (33.3%)                 | 640 (33.3%)          | 1,519 (33.3%)        | 602 (33.3%)          | 486 (33.4%)         | 778 (33.3%)          | 156 (33.3%)       | 542 (33.3%)        | 153 (33.3%)           |
| High                          | 378 (33.3%)          | 596 (33.3%)          | 610 (33.3%)        | 685 (33.3%)                 | 640 (33.3%)          | 1,518 (33.3%)        | 602 (33.3%)          | 485 (33.3%)         | 778 (33.3%)          | 156 (33.3%)       | 542 (33.3%)        | 153 (33.3%)           |
| Labor force status            |                      |                      |                    |                             |                      |                      |                      |                     |                      |                   |                    |                       |
| Working                       | 179 (15.8%)          | 478 (26.7%)          | 1,578 (64.6%)      | 443 (21.6%)                 | 863 (44.9%)          | 1,633 (35.8%)        | 650 (36.0%)          | 387 (26.6%)         | 871 (37.3%)          | 197 (42.0%)       | 348 (21.4%)        | 134 (29.1%)           |
| Retired                       | 837 (73.7%)          | 1,017 (56.9%)        | 824 (33.7%)        | 1,551 (75.5%)               | 954 (49.7%)          | 2,587 (56.8%)        | 1,044 (57.8%)        | 967 (66.4%)         | 1,221 (52.3%)        | 198 (42.2%)       | 928 (57.1%)        | 229 (49.8%)           |
| Others                        | 119 (10.5%)          | 293 (16.4%)          | 41 (1.7%)          | 61 (3.0%)                   | 103 (5.4%)           | 336 (7.4%)           | 113 (6.3%)           | 103 (7.1%)          | 243 (10.4%)          | 74 (15.8%)        | 350 (21.5%)        | 97 (21.1%)            |
| Current smoking               | 192 (16.9%)          | 278 (15.5%)          | 744 (30.5%)        | 438 (21.3%)                 | 332 (17.3%)          | 423 (9.3%)           | 310 (17.2%)          | 211 (14.5%)         | 413 (17.7%)          | 73 (15.6%)        | 260 (16.0%)        | 57 (12.4%)            |
| Weekly alcohol use            | 608 (53.6%)          | 1,162 (65.0%)        | 465 (19.0%)        | 866 (42.1%)                 | 1,401 (73.0%)        | 3,164 (69.4%)        | 320 (17.7%)          | 923 (63.3%)         | 1,275 (54.6%)        | 72 (15.4%)        | 686 (42.2%)        | 287 (62.4%)           |
| Physical inactivity           | 54 (4.8%)            | 113 (6.3%)           | 815 (33.4%)        | 118 (5.7%)                  | 49 (2.6%)            | 449 (9.9%)           | 142 (7.9%)           | 69 (4.7%)           | 104 (4.5%)           | 68 (14.5%)        | 224 (13.8%)        | 20 (4.3%)             |
| Number of chronic conditions  | 1.2 (1.1)            | 1.2 (1.1)            | 0.9 (1.0)          | 1.4 (1.2)                   | 1.1 (1.1)            | 1.1 (1.1)            | 1.5 (1.2)            | 1.3 (1.1)           | 1.2 (1.1)            | 1.2 (1.2)         | 1.4 (1.2)          | 1.1 (1.0)             |
| ADL disability                | 53 (4.7%)            | 141 (7.9%)           | 385 (15.8%)        | 140 (6.8%)                  | 93 (4.8%)            | 508 (11.2%)          | 184 (10.2%)          | 95 (6.5%)           | 126 (5.4%)           | 24 (5.1%)         | 115 (7.1%)         | 25 (5.4%)             |
| IADL                          | 0.1 (0.5)            | 0.1 (0.5)            | 0.4 (0.9)          | 0.1 (0.4)                   | 0.1 (0.4)            | 0.2 (0.5)            | 0.2 (0.6)            | 0.1 (0.4)           | 0.1 (0.4)            | 0.2 (0.8)         | 0.1 (0.6)          | 0.1 (0.4)             |

<sup>1</sup>Data are presented as Mean (standard deviation) or Frequency (%).

ADL = activities of daily living, IADL = instrumental activities of daily living.

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497 **Supplementary Table 2.** (continued).

| Characteristics <sup>1</sup>  | Mexico<br>(N=8,664) | Slovenia<br>(N=1,013) | Spain<br>(N=1,514) | Sweden<br>(N=2,001) | Switzerland<br>(N=1,551) | USA<br>(N=13,850) |
|-------------------------------|---------------------|-----------------------|--------------------|---------------------|--------------------------|-------------------|
| Cumulative Internet use, wave |                     |                       |                    |                     |                          |                   |
| 0                             | 5,015 (57.9%)       | 527 (52.0%)           | 911 (60.2%)        | 312 (15.6%)         | 368 (23.7%)              | 5,900 (42.6%)     |
| 1                             | 1,512 (17.5%)       | 98 (9.7%)             | 200 (13.2%)        | 130 (6.5%)          | 113 (7.3%)               | 1,568 (11.3%)     |
| 2                             | 2,137 (24.7%)       | 388 (38.3%)           | 403 (26.6%)        | 1,559 (77.9%)       | 1,070 (69.0%)            | 6,382 (46.1%)     |
| Age, years                    | 63.5 (8.3)          | 65.0 (8.8)            | 67.1 (9.4)         | 67.7 (8.1)          | 65.8 (8.8)               | 64.7 (9.8)        |
| Male                          | 3,523 (40.7%)       | 415 (41.0%)           | 765 (50.5%)        | 940 (47.0%)         | 734 (47.3%)              | 6,088 (44.0%)     |
| Unmarried                     | 2,439 (28.2%)       | 234 (23.1%)           | 264 (17.4%)        | 423 (21.1%)         | 363 (23.4%)              | 4,443 (32.1%)     |
| Household size                | 3.0 (2.2)           | 2.4 (1.1)             | 2.4 (1.0)          | 1.9 (0.6)           | 2.0 (0.8)                | 2.3 (1.3)         |
| Weekly contact                | 8,411 (97.1%)       | 947 (93.5%)           | 1,325 (87.5%)      | 1,750 (87.5%)       | 1,265 (81.6%)            | 12,730 (93.0%)    |
| Education                     |                     |                       |                    |                     |                          |                   |
| Primary                       | 7,534 (87.0%)       | 257 (25.4%)           | 1,161 (76.7%)      | 675 (33.7%)         | 295 (19.0%)              | 2,376 (17.2%)     |
| Secondary                     | 291 (3.4%)          | 545 (53.8%)           | 163 (10.8%)        | 666 (33.3%)         | 975 (62.9%)              | 8,184 (59.1%)     |
| Tertiary                      | 839 (9.7%)          | 211 (20.8%)           | 190 (12.5%)        | 660 (33.0%)         | 281 (18.1%)              | 3,290 (23.8%)     |
| Household wealth              |                     |                       |                    |                     |                          |                   |
| Low                           | 2,888 (33.3%)       | 338 (33.4%)           | 505 (33.4%)        | 667 (33.3%)         | 517 (33.3%)              | 4,617 (33.3%)     |
| Middle                        | 2,888 (33.3%)       | 338 (33.4%)           | 505 (33.4%)        | 667 (33.3%)         | 517 (33.3%)              | 4,617 (33.3%)     |
| High                          | 2,888 (33.3%)       | 337 (33.3%)           | 504 (33.3%)        | 667 (33.3%)         | 517 (33.3%)              | 4,616 (33.3%)     |
| Labor force status            |                     |                       |                    |                     |                          |                   |
| Working                       | 3,332 (38.5%)       | 175 (17.3%)           | 353 (23.3%)        | 650 (32.5%)         | 626 (40.4%)              | 5,589 (40.4%)     |
| Retired                       | 1,039 (12.0%)       | 739 (73.0%)           | 709 (46.8%)        | 1,299 (64.9%)       | 783 (50.5%)              | 6,760 (48.8%)     |
| Others                        | 4,293 (49.5%)       | 99 (9.8%)             | 452 (29.9%)        | 52 (2.6%)           | 142 (9.2%)               | 1,501 (10.8%)     |
| Current smoking               | 1,041 (12.0%)       | 142 (14.0%)           | 200 (13.2%)        | 218 (10.9%)         | 323 (20.8%)              | 1,947 (14.1%)     |
| Weekly alcohol use            | 1,438 (16.6%)       | 399 (39.4%)           | 615 (40.6%)        | 1,168 (58.4%)       | 1,053 (67.9%)            | 5,461 (39.4%)     |
| Physical inactivity           | 5,084 (58.7%)       | 84 (8.3%)             | 168 (11.1%)        | 41 (2.0%)           | 55 (3.5%)                | 1,818 (13.1%)     |
| Number of chronic conditions  | 1.2 (1.1)           | 1.0 (1.0)             | 1.2 (1.1)          | 1.1 (1.1)           | 1.0 (1.0)                | 1.6 (1.2)         |
| ADL disability                | 1,215 (14.0%)       | 45 (4.4%)             | 84 (5.5%)          | 84 (4.2%)           | 39 (2.5%)                | 1,495 (10.8%)     |
| IADL                          | 0.1 (0.4)           | 0.1 (0.4)             | 0.1 (0.6)          | 0.1 (0.3)           | 0.1 (0.3)                | 0.1 (0.4)         |

498 <sup>1</sup>Data are presented as Mean (standard deviation) or Frequency (%).

499 ADL = activities of daily living, IADL = instrumental activities of daily living.

**Supplementary Table 3.** Baseline characteristics of the population for Internet use frequency and mental health study by countries.

| Characteristics <sup>1</sup> | China<br>(N=3,002) | England<br>(N=5,775) | USA<br>(N=6,586) |
|------------------------------|--------------------|----------------------|------------------|
| Internet use frequency       |                    |                      |                  |
| Never                        | 2,937 (97.8%)      | 1,422 (24.6%)        | 400 (6.1%)       |
| Less than weekly             | 7 (0.2%)           | 333 (5.8%)           | 2,466 (37.4%)    |
| Weekly                       | 2 (0.1%)           | 747 (12.9%)          | 884 (13.4%)      |
| Daily                        | 56 (1.9%)          | 3,273 (56.7%)        | 2,836 (43.1%)    |
| Age, years                   | 60.9 (7.4)         | 66.0 (8.9)           | 64.9 (10.1)      |
| Male                         | 1,439 (47.9%)      | 2,706 (46.9%)        | 2,861 (43.4%)    |
| Unmarried                    | 388 (12.9%)        | 1,376 (23.8%)        | 2,121 (32.2%)    |
| Household size               | 3.3 (1.8)          | 2.1 (0.8)            | 2.3 (1.2)        |
| Weekly contact               | 2,719 (90.6%)      | 5,489 (95.0%)        | 6,428 (97.6%)    |
| Education                    |                    |                      |                  |
| Primary                      | 2,675 (89.1%)      | 1,416 (24.5%)        | 1,026 (15.6%)    |
| Secondary                    | 272 (9.1%)         | 3,098 (53.6%)        | 3,928 (59.6%)    |
| Tertiary                     | 55 (1.8%)          | 1,261 (21.8%)        | 1,632 (24.8%)    |
| Household wealth             |                    |                      |                  |
| Low                          | 1,001 (33.3%)      | 1,925 (33.3%)        | 2,196 (33.3%)    |
| Middle                       | 1,001 (33.3%)      | 1,925 (33.3%)        | 2,195 (33.3%)    |
| High                         | 1,000 (33.3%)      | 1,925 (33.3%)        | 2,195 (33.3%)    |
| Labor force status           |                    |                      |                  |
| Working                      | 1,871 (62.3%)      | 1,999 (34.6%)        | 2,551 (38.7%)    |
| Retired                      | 1,074 (35.8%)      | 3,342 (57.9%)        | 3,312 (50.3%)    |
| Others                       | 57 (1.9%)          | 434 (7.5%)           | 723 (11.0%)      |
| Current smoking              | 918 (30.6%)        | 581 (10.1%)          | 933 (14.2%)      |
| Weekly alcohol use           | 573 (19.1%)        | 3,925 (68.0%)        | 2,617 (39.7%)    |
| Physical inactivity          | 1,043 (34.7%)      | 671 (11.6%)          | 906 (13.8%)      |
| Number of chronic conditions | 1.0 (1.0)          | 1.2 (1.1)            | 1.6 (1.2)        |
| ADL disability               | 501 (16.7%)        | 732 (12.7%)          | 754 (11.4%)      |
| IADL                         | 0.4 (0.9)          | 0.2 (0.6)            | 0.1 (0.5)        |

<sup>1</sup>Data are presented as Mean (standard deviation) or Frequency (%).

ADL = activities of daily living, IADL = instrumental activities of daily living.

**Supplementary Table 4.** Baseline characteristics of the population for Internet use, genetic risk, and mental health study by countries.

| Characteristics <sup>1</sup>               | England<br>(N=3,049) | USA<br>(N=10,404) |
|--------------------------------------------|----------------------|-------------------|
| Internet use                               | 2,217 (72.7%)        | 5,516 (53.0%)     |
| Polygenic scores for depressive symptoms   |                      |                   |
| Low                                        | 610 (20.0%)          | 2,081 (20.0%)     |
| Intermediate                               | 609 (20.0%)          | 2,080 (20.0%)     |
| High                                       | 1,830 (60.0%)        | 6,243 (60.0%)     |
| Polygenic scores for subjective well-being |                      |                   |
| Low                                        | 609 (20.0%)          | 2,080 (20.0%)     |
| Intermediate                               | 610 (20.0%)          | 2,081 (20.0%)     |
| High                                       | 1,830 (60.0%)        | 6,243 (60.0%)     |
| Age, years                                 | 68.8 (7.9)           | 66.4 (10.2)       |
| Male                                       | 1,464 (48.0%)        | 4,598 (44.2%)     |
| Unmarried                                  | 772 (25.3%)          | 3,338 (32.1%)     |
| Household size                             | 1.9 (0.7)            | 2.2 (1.1)         |
| Weekly contact                             | 2,905 (95.3%)        | 9,697 (93.2%)     |
| Education                                  |                      |                   |
| Primary                                    | 817 (26.8%)          | 1,370 (13.2%)     |
| Secondary                                  | 1,640 (53.8%)        | 6,439 (61.9%)     |
| Tertiary                                   | 592 (19.4%)          | 2,595 (24.9%)     |
| Household wealth                           |                      |                   |
| Low                                        | 1,017 (33.4%)        | 3,468 (33.3%)     |
| Middle                                     | 1,016 (33.3%)        | 3,468 (33.3%)     |
| High                                       | 1,016 (33.3%)        | 3,468 (33.3%)     |
| Labor force status                         |                      |                   |
| Working                                    | 705 (23.1%)          | 3,785 (36.4%)     |
| Retired                                    | 2,160 (70.8%)        | 5,691 (54.7%)     |
| Others                                     | 184 (6.0%)           | 928 (8.9%)        |
| Current smoking                            | 263 (8.6%)           | 1,385 (13.3%)     |
| Weekly alcohol use                         | 2,080 (68.2%)        | 4,268 (41.0%)     |
| Physical inactivity                        | 348 (11.4%)          | 1,435 (13.8%)     |
| Number of chronic conditions               | 1.3 (1.1)            | 1.7 (1.3)         |
| ADL disability                             | 391 (12.8%)          | 1,107 (10.6%)     |
| IADL                                       | 0.2 (0.6)            | 0.1 (0.4)         |

<sup>1</sup>Data are presented as Mean (standard deviation) or Frequency (%).

ADL = activities of daily living, IADL = instrumental activities of daily living.

508 **Supplementary Table 5.** Baseline characteristics of the analytic samples for Internet use and mental health study and the entire populations from the original dataset by cohorts.

| Characteristics <sup>1</sup>                       | HRS                                   |                                       |                                | ELSA                                   |                                        |                             | SHARE                                 |                                       |                             | CHARLS                               |                                      |                             | MHAS                                     |                                          |                             | ELSI                                  |                                       |                             |
|----------------------------------------------------|---------------------------------------|---------------------------------------|--------------------------------|----------------------------------------|----------------------------------------|-----------------------------|---------------------------------------|---------------------------------------|-----------------------------|--------------------------------------|--------------------------------------|-----------------------------|------------------------------------------|------------------------------------------|-----------------------------|---------------------------------------|---------------------------------------|-----------------------------|
|                                                    | Analytic<br>(N=17,997)                | Original<br>(N=29,718)                | <i>P</i><br>value <sup>3</sup> | Analytic<br>(N=5,775)                  | Original<br>(N=12,758)                 | <i>P</i><br>value           | Analytic<br>(N=44,518)                | Original<br>(N=109,340)               | <i>P</i><br>value           | Analytic<br>(N=3,002)                | Original<br>(N=25,586)               | <i>P</i><br>value           | Analytic<br>(N=12,093)                   | Original<br>(N=21,709)                   | <i>P</i><br>value           | Analytic<br>(N=4,174)                 | Original<br>(N=9,949)                 | <i>P</i><br>value           |
| Internet use                                       | 9,476 (52.7%)                         | 14,611 (49.9%)                        | 3.3<br>× 10 <sup>-9</sup>      | 4,353 (75.4%)                          | 7,737 (74.5%)                          | 0.223                       | 24,239 (54.4%)                        | 42,764 (48.8%)                        | <2.2 ×<br>10 <sup>-16</sup> | 65 (2.2%)                            | 1,500 (5.9%)                         | <2.2 ×<br>10 <sup>-16</sup> | 3,631 (30.0%)                            | 7,692 (35.6%)                            | 2.2<br>× 10 <sup>-16</sup>  | 1,081 (25.9%)                         | 2,215 (22.3%)                         | 3.4<br>× 10 <sup>-6</sup>   |
| Age, years                                         | 63.7 (10.2)                           | 63.1 (11.8)                           | <2.2 ×<br>10 <sup>-16</sup>    | 66.0 (8.9)                             | 64.6 (10.8)                            | <2.2 ×<br>10 <sup>-16</sup> | 65.5 (9.3)                            | 65.9 (10.4)                           | 2.9<br>× 10 <sup>-7</sup>   | 60.9 (7.4)                           | 56.6 (10.6)                          | <2.2 ×<br>10 <sup>-16</sup> | 64.1 (8.9)                               | 61.5 (11.1)                              | 2.2<br>× 10 <sup>-16</sup>  | 62.2 (9.4)                            | 63.7 (10.1)                           | 9.5<br>× 10 <sup>-14</sup>  |
| Male                                               | 8,084 (44.9%)                         | 12,658 (42.6%)                        | 6.9<br>× 10 <sup>-7</sup>      | 2,706 (46.9%)                          | 5,730 (44.9%)                          | 0.014                       | 20,441 (45.9%)                        | 47,977 (43.9%)                        | 3.0<br>× 10 <sup>-13</sup>  | 1,439 (47.9%)                        | 12,334 (48.2%)                       | 0.766                       | 5,072 (41.9%)                            | 9,303 (42.9%)                            | 0.104                       | 2,218 (53.1%)                         | 4,303 (43.3%)                         | <2.2 ×<br>10 <sup>-16</sup> |
| Unmarried                                          | 5,966 (33.1%)                         | 10,117 (34.1%)                        | 0.041                          | 1,376 (23.8%)                          | 3,471 (27.2%)                          | 1.2<br>× 10 <sup>-6</sup>   | 9,985 (22.4%)                         | 27,389 (25.1%)                        | <2.2 ×<br>10 <sup>-16</sup> | 388 (12.9%)                          | 2,901 (11.3%)                        | 0.010                       | 3,563 (29.5%)                            | 5,948 (27.4%)                            | 5.2<br>× 10 <sup>-5</sup>   | 1,567 (37.5%)                         | 4,220 (42.4%)                         | 7.7<br>× 10 <sup>-8</sup>   |
| Household size                                     | 2.4 (1.3)                             | 2.4 (1.4)                             | 0.079                          | 2.1 (0.8)                              | 2.2 (1.0)                              | 2.4<br>× 10 <sup>-5</sup>   | 2.2 (1.0)                             | 2.2 (1.0)                             | 0.004                       | 3.3 (1.8)                            | 3.5 (1.7)                            | 4.4<br>× 10 <sup>-13</sup>  | 3.0 (2.2)                                | 2.8 (2.1)                                | 2.0<br>× 10 <sup>-4</sup>   | 3.1 (1.6)                             | 3.0 (1.6)                             | 0.211                       |
| Weekly contact                                     | 16,678 (92.7%)                        | 26,703 (91.3%)                        | 1.6<br>× 10 <sup>-7</sup>      | 5,489 (95.0%)                          | 10,886 (92.6%)                         | 1.4<br>× 10 <sup>-9</sup>   | 39,135 (87.9%)                        | 81,030 (74.3%)                        | <2.2 ×<br>10 <sup>-16</sup> | 2,719 (90.6%)                        | 23,481 (91.9%)                       | 0.011                       | 11,718 (96.9%)                           | 20,931 (96.4%)                           | 0.019                       | 3,214 (77.0%)                         | 7,270 (73.1%)                         | 1.6<br>× 10 <sup>-6</sup>   |
| Education                                          |                                       |                                       | 4.5<br>× 10 <sup>-14</sup>     |                                        |                                        | 1.2<br>× 10 <sup>-6</sup>   |                                       |                                       | <2.2 ×<br>10 <sup>-16</sup> |                                      |                                      | 2.8<br>× 10 <sup>-5</sup>   |                                          |                                          | 2.2<br>× 10 <sup>-16</sup>  |                                       |                                       | 0.009                       |
| Primary                                            | 3,090 (17.2%)                         | 5,891 (19.8%)                         |                                | 1,416 (24.5%)                          | 3,254 (28.1%)                          |                             | 16,203 (36.4%)                        | 43,124 (39.4%)                        |                             | 2,675 (89.1%)                        | 22,028 (86.2%)                       |                             | 10,384 (85.9%)                           | 17,663 (82.6%)                           |                             | 3,044 (72.9%)                         | 7,435 (75.2%)                         |                             |
| Secondary                                          | 10,607 (58.9%)                        | 17,294 (58.2%)                        |                                | 3,098 (53.6%)                          | 5,995 (51.8%)                          |                             | 17,324 (38.9%)                        | 42,864 (39.2%)                        |                             | 272 (9.1%)                           | 2,795 (10.9%)                        |                             | 420 (3.5%)                               | 672 (3.1%)                               |                             | 875 (21.0%)                           | 1,854 (18.8%)                         |                             |
| Tertiary                                           | 4,300 (23.9%)                         | 6,526 (22.0%)                         |                                | 1,261 (21.8%)                          | 2,315 (20.0%)                          |                             | 10,991 (24.7%)                        | 23,352 (21.4%)                        |                             | 55 (1.8%)                            | 719 (2.8%)                           |                             | 1,289 (10.7%)                            | 3,055 (14.3%)                            |                             | 255 (6.1%)                            | 596 (6.0%)                            |                             |
| Household wealth <sup>2</sup> ,<br>median (Q1, Q3) | 164,000.0<br>(30,000.0,<br>485,000.0) | 128,000.0<br>(14,000.0,<br>411,875.0) | <2.2 ×<br>10 <sup>-16</sup>    | 274,553.0<br>(155,500.0,<br>470,502.0) | 242,500.0<br>(128,750.0,<br>429,002.5) | <2.2 ×<br>10 <sup>-16</sup> | 183,815.6<br>(64,200.0,<br>384,545.4) | 154,121.6<br>(47,896.5,<br>336,000.0) | <2.2 ×<br>10 <sup>-16</sup> | 58,360.0<br>(12,625.0,<br>161,862.5) | 65,800.0<br>(14,862.5,<br>186,250.0) | 0.001                       | 515,000.0<br>(180,000.0,<br>1,102,421.5) | 508,690.6<br>(155,000.0,<br>1,115,819.5) | 0.093                       | 150,000.0<br>(25,000.0,<br>267,500.0) | 127,500.0<br>(25,000.0,<br>262,500.0) | 0.247                       |
| Labor force status                                 |                                       |                                       | <2.2 ×<br>10 <sup>-16</sup>    |                                        |                                        | <2.2 ×<br>10 <sup>-16</sup> |                                       |                                       | <2.2 ×<br>10 <sup>-16</sup> |                                      |                                      | 3.4<br>× 10 <sup>-10</sup>  |                                          |                                          | <2.2 ×<br>10 <sup>-16</sup> |                                       |                                       | 7.7<br>× 10 <sup>-14</sup>  |
| Working                                            | 7,798 (43.3%)                         | 12,018 (40.4%)                        |                                | 1,999 (34.6%)                          | 5,007 (39.4%)                          |                             | 13,473 (30.3%)                        | 30,008 (28.3%)                        |                             | 1,871 (62.3%)                        | 16,428 (67.5%)                       |                             | 4,621 (38.2%)                            | 9,309 (43.0%)                            |                             | 1,523 (36.5%)                         | 2,961 (29.8%)                         |                             |
| Retired                                            | 8,115 (45.1%)                         | 13,150 (44.2%)                        |                                | 3,342 (57.9%)                          | 6,256 (49.3%)                          |                             | 25,190 (56.6%)                        | 59,644 (56.2%)                        |                             | 1,074 (35.8%)                        | 7,304 (30.0%)                        |                             | 1,521 (12.6%)                            | 2,263 (10.5%)                            |                             | 1,375 (32.9%)                         | 3,597 (36.2%)                         |                             |
| Others                                             | 2,084 (11.6%)                         | 4,550 (15.3%)                         |                                | 434 (7.5%)                             | 1,434 (11.3%)                          |                             | 5,855 (13.2%)                         | 16,523 (15.6%)                        |                             | 57 (1.9%)                            | 607 (2.5%)                           |                             | 5,951 (49.2%)                            | 10,068 (46.5%)                           |                             | 1,276 (30.6%)                         | 3,373 (34.0%)                         |                             |
| Current smoking                                    | 2,748 (15.3%)                         | 5,223 (17.7%)                         | 1.0<br>× 10 <sup>-11</sup>     | 581 (10.1%)                            | 1,657 (13.0%)                          | 1.4<br>× 10 <sup>-8</sup>   | 7,950 (17.9%)                         | 14,656 (18.4%)                        | 0.010                       | 918 (30.6%)                          | 7,143 (29.1%)                        | 0.084                       | 1,455 (12.0%)                            | 2,762 (12.7%)                            | 0.062                       | 745 (17.8%)                           | 1,669 (16.8%)                         | 0.130                       |
| Weekly alcohol use                                 | 7,304 (40.6%)                         | 11,240 (37.9%)                        | 4.5<br>× 10 <sup>-9</sup>      | 3,925 (68.0%)                          | 6,646 (64.7%)                          | 2.6<br>× 10 <sup>-5</sup>   | 22,258 (50.0%)                        | 40,815 (46.5%)                        | <2.2 ×<br>10 <sup>-16</sup> | 573 (19.1%)                          | 4,254 (17.7%)                        | 0.068                       | 1,970 (16.3%)                            | 3,902 (18.1%)                            | 3.8<br>× 10 <sup>-5</sup>   | 902 (21.6%)                           | 1,619 (16.3%)                         | 5.7<br>× 10 <sup>-14</sup>  |
| Physical inactivity                                | 2,500 (13.9%)                         | 5,640 (19.0%)                         | <2.2 ×<br>10 <sup>-16</sup>    | 671 (11.6%)                            | 2,277 (17.9%)                          | <2.2 ×<br>10 <sup>-16</sup> | 3,314 (7.4%)                          | 10,664 (12.1%)                        | <2.2 ×<br>10 <sup>-16</sup> | 1,043 (34.7%)                        | 3,540 (34.3%)                        | 0.659                       | 7,216 (59.7%)                            | 11,917 (59.3%)                           | 0.476                       | 1,384 (33.2%)                         | 3,945 (40.0%)                         | 2.5<br>× 10 <sup>-14</sup>  |
| Number of chronic<br>conditions                    | 1.6 (1.2)                             | 1.7 (1.4)                             | <2.2 ×<br>10 <sup>-16</sup>    | 1.2 (1.1)                              | 1.2 (1.2)                              | 0.574                       | 1.2 (1.1)                             | 1.3 (1.2)                             | 7.0<br>× 10 <sup>-15</sup>  | 1.0 (1.0)                            | 0.8 (1.0)                            | <2.2 ×<br>10 <sup>-16</sup> | 1.2 (1.1)                                | 1.1 (1.1)                                | <2.2 ×<br>10 <sup>-16</sup> | 1.0 (1.0)                             | 1.2 (1.1)                             | <2.2 ×<br>10 <sup>-16</sup> |

|                |               |               |                          |             |               |                          |              |                |                          |             |               |       |               |               |       |             |               |                          |
|----------------|---------------|---------------|--------------------------|-------------|---------------|--------------------------|--------------|----------------|--------------------------|-------------|---------------|-------|---------------|---------------|-------|-------------|---------------|--------------------------|
| IADL           | 0.1 (0.5)     | 0.3 (0.9)     | <2.2 × 10 <sup>-16</sup> | 0.2 (0.6)   | 0.4 (1.0)     | <2.2 × 10 <sup>-16</sup> | 0.1 (0.6)    | 0.3 (1.0)      | <2.2 × 10 <sup>-16</sup> | 0.4 (0.9)   | 0.4 (1.0)     | 0.981 | 0.1 (0.5)     | 0.1 (0.5)     | 0.825 | 0.5 (1.0)   | 0.7 (1.2)     | <2.2 × 10 <sup>-16</sup> |
| ADL disability | 2,094 (11.6%) | 5,200 (17.6%) | <2.2 × 10 <sup>-16</sup> | 732 (12.7%) | 2,141 (16.8%) | 7.6 × 10 <sup>-13</sup>  | 3,129 (7.0%) | 12,634 (11.6%) | <2.2 × 10 <sup>-16</sup> | 501 (16.7%) | 3,694 (15.2%) | 0.029 | 1,797 (14.9%) | 3,427 (15.8%) | 0.019 | 518 (12.4%) | 1,669 (16.8%) | 5.9 × 10 <sup>-11</sup>  |

<sup>1</sup>Data are presented as Mean (standard deviation) or Frequency (%), unless otherwise indicated.

<sup>2</sup>Household wealth is presented in local currencies: dollars in HRS, pounds in ELSA, Euros in SHARE, Yuan in CHARLS, pesos in MHAS, and Brazilian real in ELSI.

<sup>3</sup>*P* value was derived from the chi-square test for categorical variables or two-sided Mann–Whitney U test for continuous variables.

Health and Retirement Study = HRS, English Longitudinal Study on Ageing = ELSA, Survey of Health, Ageing and Retirement in Europe = SHARE, China Health and Retirement Longitudinal Study = CHARLS, Mexican Health and Aging Study = MHAS, Brazilian Longitudinal Study of

Aging = ELSI, Q1 = quartile 1, Q3 = quartile 3, ADL = activities of daily living, IADL = instrumental activities of daily living.

**Supplementary Table 6:** Associations of Internet use with depressive symptoms by age, gender, marital status, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and genetic risks assessed by PGS for depressive symptoms and subjective well-being.

| Country        | Age                      |                          |          | Gender                   |                          |          | Marital status           |                          |          | Contact with others      |                          |          | Education                |                          |                          |          | Household wealth         |                          |                          |          | Labor force status       |                          |                          |          |
|----------------|--------------------------|--------------------------|----------|--------------------------|--------------------------|----------|--------------------------|--------------------------|----------|--------------------------|--------------------------|----------|--------------------------|--------------------------|--------------------------|----------|--------------------------|--------------------------|--------------------------|----------|--------------------------|--------------------------|--------------------------|----------|
|                | 50-64 years              | ≥65 years                | <i>P</i> | Male                     | Female                   | <i>P</i> | Married                  | Unmarried                | <i>P</i> | Weekly contact           | Less than weekly contact | <i>P</i> | Primary                  | Secondary                | Tertiary                 | <i>P</i> | Low                      | Middle                   | High                     | <i>P</i> | Working                  | Retired                  | Others                   | <i>P</i> |
| Austria        | -0.02<br>[-0.11, 0.07]   | -0.02<br>[-0.10, 0.06]   |          | -0.00<br>[-0.09, 0.08]   | -0.01<br>[-0.10, 0.07]   |          | -0.02<br>[-0.09, 0.05]   | 0.02<br>[-0.09, 0.14]    |          | 0.00<br>[-0.06, 0.06]    | -0.06<br>[-0.22, 0.10]   |          | 0.04<br>[-0.13, 0.20]    | 0.01<br>[-0.06, 0.08]    | -0.12<br>[-0.24, -0.01]* |          | -0.01<br>[-0.12, 0.10]   | -0.02<br>[-0.12, 0.08]   | -0.00<br>[-0.10, 0.10]   |          | -0.06<br>[-0.21, 0.09]   | 0.00<br>[-0.07, 0.07]    | -0.03<br>[-0.26, 0.20]   |          |
| Belgium        | 0.03<br>[-0.06, 0.13]    | -0.02<br>[-0.10, 0.06]   |          | -0.06<br>[-0.15, 0.02]   | 0.01<br>[-0.07, 0.10]    |          | -0.00<br>[-0.07, 0.06]   | -0.05<br>[-0.17, 0.07]   |          | -0.02<br>[-0.08, 0.04]   | -0.04<br>[-0.22, 0.13]   |          | -0.04<br>[-0.13, 0.06]   | 0.08<br>[-0.03, 0.19]    | -0.11<br>[-0.23, 0.00]   |          | -0.06<br>[-0.16, 0.05]   | -0.00<br>[-0.11, 0.10]   | -0.01<br>[-0.11, 0.10]   |          | -0.05<br>[-0.19, 0.09]   | -0.03<br>[-0.10, 0.05]   | 0.00<br>[-0.15, 0.16]    |          |
| Brazil         | -0.07<br>[-0.14, 0.00]   | 0.04<br>[-0.09, 0.16]    |          | -0.13<br>[-0.21, -0.05]* | 0.06<br>[-0.04, 0.15]    |          | -0.01<br>[-0.09, 0.06]   | -0.12<br>[-0.22, -0.01]* |          | -0.06<br>[-0.12, 0.00]   | 0.11<br>[-0.12, 0.33]    |          | -0.07<br>[-0.15, 0.01]   | -0.04<br>[-0.14, 0.05]   | 0.16<br>[-0.05, 0.38]    |          | -0.09<br>[-0.23, 0.05]   | 0.01<br>[-0.11, 0.12]    | -0.00<br>[-0.11, 0.11]   |          | -0.09<br>[-0.18, -0.01]* | -0.01<br>[-0.12, 0.11]   | 0.01<br>[-0.11, 0.13]    |          |
| China          | 0.04<br>[-0.17, 0.24]    | -0.35<br>[-0.76, 0.06]   |          | -0.01<br>[-0.23, 0.21]   | -0.09<br>[-0.40, 0.22]   |          | -0.02<br>[-0.21, 0.16]   | -0.79<br>[-1.70, 0.12]   |          | -0.06<br>[-0.25, 0.12]   | 0.23<br>[-0.80, 1.26]    |          | 0.01<br>[-0.28, 0.30]    | -0.09<br>[-0.36, 0.18]   | -0.16<br>[-0.42, 0.11]   |          | -0.08<br>[-0.83, 0.67]   | 0.05<br>[-0.41, 0.50]    | -0.13<br>[-0.31, 0.06]   |          | 0.11<br>[-0.16, 0.37]    | -0.20<br>[-0.45, 0.05]   | NA                       |          |
| Croatia        | -0.04<br>[-0.19, 0.11]   | -0.20<br>[-0.45, 0.05]   |          | -0.08<br>[-0.26, 0.09]   | -0.09<br>[-0.28, 0.10]   |          | -0.08<br>[-0.22, 0.05]   | -0.17<br>[-0.54, 0.21]   |          | -0.08<br>[-0.22, 0.06]   | -0.50<br>[-1.17, 0.17]   |          | -0.13<br>[-0.34, 0.09]   | -0.08<br>[-0.27, 0.12]   | -0.04<br>[-0.31, 0.23]   |          | -0.09<br>[-0.36, 0.18]   | -0.09<br>[-0.34, 0.15]   | -0.10<br>[-0.29, 0.09]   |          | -0.21<br>[-0.46, 0.04]   | -0.08<br>[-0.25, 0.10]   | -0.16<br>[-0.51, 0.19]   |          |
| Czech Republic | -0.08<br>[-0.15, -0.01]* | -0.12<br>[-0.18, -0.05]* |          | -0.04<br>[-0.10, 0.03]   | -0.14<br>[-0.21, -0.06]* |          | -0.09<br>[-0.14, -0.03]* | -0.13<br>[-0.24, -0.01]* |          | -0.10<br>[-0.15, -0.05]* | -0.07<br>[-0.26, 0.11]   |          | -0.05<br>[-0.14, 0.05]   | -0.11<br>[-0.18, -0.05]* | -0.12<br>[-0.27, 0.02]   |          | -0.12<br>[-0.22, -0.02]* | -0.04<br>[-0.12, 0.04]   | -0.12<br>[-0.20, -0.03]* |          | -0.05<br>[-0.15, 0.06]   | -0.10<br>[-0.16, -0.04]* | 0.01<br>[-0.27, 0.30]    |          |
| Denmark        | -0.11<br>[-0.25, 0.04]   | -0.07<br>[-0.15, 0.02]   |          | -0.11<br>[-0.21, -0.02]* | -0.05<br>[-0.16, 0.06]   |          | -0.08<br>[-0.17, 0.00]   | -0.07<br>[-0.21, 0.07]   |          | -0.06<br>[-0.14, 0.02]   | -0.19<br>[-0.38, 0.01]   |          | -0.04<br>[-0.19, 0.10]   | -0.08<br>[-0.19, 0.02]   | -0.09<br>[-0.26, 0.08]   |          | -0.04<br>[-0.14, 0.07]   | -0.16<br>[-0.30, -0.02]* | -0.06<br>[-0.21, 0.08]   |          | -0.21<br>[-0.38, -0.04]* | -0.05<br>[-0.14, 0.03]   | 0.05<br>[-0.27, 0.37]    |          |
| England        | -0.15<br>[-0.24, -0.06]* | -0.04<br>[-0.10, 0.03]   |          | -0.04<br>[-0.10, 0.03]   | -0.10<br>[-0.17, -0.02]* |          | -0.07<br>[-0.13, -0.02]* | -0.06<br>[-0.18, 0.06]   |          | -0.06<br>[-0.11, -0.01]* | -0.25<br>[-0.51, 0.01]   |          | -0.09<br>[-0.18, 0.01]   | -0.04<br>[-0.11, 0.03]   | -0.23<br>[-0.41, -0.06]* |          | -0.11<br>[-0.21, -0.02]* | -0.05<br>[-0.13, 0.03]   | 0.01<br>[-0.08, 0.10]    |          | -0.06<br>[-0.16, 0.05]   | -0.04<br>[-0.10, 0.02]   | -0.22<br>[-0.41, -0.02]* |          |
| Estonia        | -0.12<br>[-0.21, -0.04]* | -0.13<br>[-0.21, -0.04]* |          | -0.13<br>[-0.22, -0.04]* | -0.10<br>[-0.18, -0.01]* |          | -0.10<br>[-0.17, -0.03]* | -0.14<br>[-0.27, -0.01]* |          | -0.10<br>[-0.17, -0.04]* | -0.13<br>[-0.31, 0.05]   |          | -0.15<br>[-0.31, 0.01]   | -0.12<br>[-0.20, -0.04]* | -0.06<br>[-0.18, 0.06]   |          | -0.07<br>[-0.19, 0.05]   | -0.11<br>[-0.21, -0.01]* | -0.14<br>[-0.24, -0.04]* |          | -0.06<br>[-0.16, 0.04]   | -0.13<br>[-0.21, -0.05]* | -0.10<br>[-0.31, 0.10]   |          |
| France         | -0.07<br>[-0.17, 0.03]   | -0.17<br>[-0.27, -0.07]* |          | -0.01<br>[-0.11, 0.09]   | -0.19<br>[-0.29, -0.08]* |          | -0.11<br>[-0.20, -0.02]* | -0.07<br>[-0.22, 0.07]   |          | -0.11<br>[-0.18, -0.03]* | -0.07<br>[-0.28, 0.15]   |          | -0.07<br>[-0.19, 0.05]   | -0.13<br>[-0.24, -0.02]* | -0.11<br>[-0.28, 0.07]   |          | -0.07<br>[-0.20, 0.05]   | -0.12<br>[-0.24, -0.00]* | -0.11<br>[-0.25, 0.02]   |          | -0.10<br>[-0.24, 0.04]   | -0.10<br>[-0.19, -0.01]* | -0.17<br>[-0.46, 0.13]   |          |
| Germany        | -0.09<br>[-0.16, -0.02]* | -0.06<br>[-0.13, 0.01]   |          | -0.10<br>[-0.16, -0.03]* | -0.07<br>[-0.15, 0.01]   |          | -0.06<br>[-0.12, -0.01]* | -0.16<br>[-0.29, -0.03]* |          | -0.07<br>[-0.12, -0.01]* | -0.14<br>[-0.27, -0.01]* |          | -0.05<br>[-0.26, 0.16]   | -0.11<br>[-0.18, -0.05]* | -0.00<br>[-0.09, 0.09]   |          | -0.09<br>[-0.18, 0.01]   | -0.02<br>[-0.11, 0.07]   | -0.14<br>[-0.23, -0.05]* |          | -0.09<br>[-0.18, -0.00]* | -0.04<br>[-0.10, 0.03]   | -0.22<br>[-0.39, -0.05]* |          |
| Greece         | 0.00<br>[-0.12, 0.12]    | -0.18<br>[-0.51, 0.15]   |          | 0.02<br>[-0.15, 0.18]    | 0.03<br>[-0.15, 0.22]    |          | 0.04<br>[-0.09, 0.17]    | -0.08<br>[-0.40, 0.25]   |          | 0.08<br>[-0.05, 0.21]    | -0.60<br>[-1.15, -0.05]* |          | -0.05<br>[-0.33, 0.22]   | -0.01<br>[-0.19, 0.18]   | 0.05<br>[-0.12, 0.23]    |          | 0.14<br>[-0.11, 0.39]    | -0.11<br>[-0.34, 0.12]   | 0.02<br>[-0.15, 0.20]    |          | -0.10<br>[-0.28, 0.07]   | 0.15<br>[-0.06, 0.37]    | 0.00<br>[-0.26, 0.26]    |          |
| Israel         | 0.00<br>[-0.14, 0.15]    | -0.16<br>[-0.30, -0.02]* |          | -0.06<br>[-0.20, 0.08]   | -0.11<br>[-0.26, 0.05]   |          | -0.10<br>[-0.20, 0.01]   | -0.12<br>[-0.40, 0.17]   |          | -0.08<br>[-0.19, 0.02]   | -0.11<br>[-0.81, 0.58]   |          | -0.24<br>[-0.45, -0.02]* | 0.01<br>[-0.15, 0.17]    | -0.11<br>[-0.29, 0.08]   |          | -0.03<br>[-0.21, 0.15]   | -0.13<br>[-0.31, 0.05]   | -0.10<br>[-0.28, 0.07]   |          | 0.01<br>[-0.13, 0.15]    | -0.18<br>[-0.33, -0.03]* | -0.07<br>[-0.40, 0.25]   |          |
| Italy          | -0.15<br>[-0.24, -0.07]* | -0.13<br>[-0.26, -0.01]* |          | -0.15<br>[-0.24, -0.06]* | -0.15<br>[-0.26, -0.03]* |          | -0.11<br>[-0.18, -0.04]* | -0.35<br>[-0.56, -0.14]* |          | -0.14<br>[-0.21, -0.06]* | -0.20<br>[-0.48, 0.08]   |          | -0.20<br>[-0.29, -0.10]* | -0.09<br>[-0.21, 0.03]   | -0.17<br>[-0.38, 0.04]   |          | -0.14<br>[-0.28, 0.00]   | -0.24<br>[-0.36, -0.11]* | -0.06<br>[-0.17, 0.05]   |          | -0.11<br>[-0.22, 0.00]   | -0.12<br>[-0.22, -0.03]* | -0.26<br>[-0.45, -0.06]* |          |
| Luxembourg     | -0.01<br>[-0.16, 0.13]   | -0.21<br>[-0.38, -0.05]* |          | -0.11<br>[-0.26, 0.03]   | -0.10<br>[-0.26, 0.06]   |          | -0.13<br>[-0.25, -0.01]* | 0.14<br>[-0.14, 0.42]    |          | -0.12<br>[-0.25, 0.00]   | -0.04<br>[-0.26, 0.17]   |          | -0.11<br>[-0.27, 0.05]   | -0.08<br>[-0.24, 0.09]   | -0.05<br>[-0.38, 0.28]   |          | -0.05<br>[-0.23, 0.12]   | -0.04<br>[-0.23, 0.14]   | -0.23<br>[-0.43, -0.04]* |          | -0.12<br>[-0.37, 0.12]   | -0.14<br>[-0.29, 0.00]   | 0.06<br>[-0.16, 0.28]    |          |
| Mexico         | -0.23<br>[-0.27, -0.19]* | -0.21<br>[-0.26, -0.17]* |          | -0.17<br>[-0.21, -0.13]* | -0.26<br>[-0.31, -0.22]* |          | -0.22<br>[-0.26, -0.19]* | -0.22<br>[-0.29, -0.16]* |          | -0.23<br>[-0.26, -0.20]* | 0.01<br>[-0.32, 0.34]    |          | -0.24<br>[-0.28, -0.21]* | -0.16<br>[-0.29, -0.02]* | -0.12<br>[-0.20, -0.04]* |          | -0.22<br>[-0.28, -0.15]* | -0.23<br>[-0.28, -0.18]* | -0.23<br>[-0.28, -0.18]* |          | -0.22<br>[-0.27, -0.17]* | -0.22<br>[-0.29, -0.14]* | -0.23<br>[-0.28, -0.18]* |          |
| Netherlands    | -0.14<br>[-0.37, 0.08]   | -0.14<br>[-0.26, -0.02]* |          | -0.15<br>[-0.31, 0.01]   | -0.12<br>[-0.26, 0.03]   |          | -0.15<br>[-0.27, -0.03]* | -0.14<br>[-0.40, 0.13]   |          | -0.17<br>[-0.29, -0.06]* | 0.02<br>[-0.27, 0.31]    |          | -0.07<br>[-0.22, 0.07]   | -0.24<br>[-0.48, 0.00]   | -0.25<br>[-0.54, 0.04]   |          | -0.20<br>[-0.38, -0.02]* | -0.03<br>[-0.21, 0.16]   | -0.15<br>[-0.36, 0.06]   |          | -0.19<br>[-0.49, 0.12]   | -0.13<br>[-0.26, 0.00]   | -0.14<br>[-0.43, 0.14]   |          |
| Poland         | -0.03<br>[-0.35, 0.29]   | NA                       |          | -0.09<br>[-0.53, 0.34]   | 0.15<br>[-0.46, 0.77]    |          | -0.11<br>[-0.46, 0.25]   | 1.54<br>[-3.39, 6.47]    |          | -0.01<br>[-0.35, 0.34]   | NA                       |          | -0.65<br>[-3.84, 2.54]   | 0.04<br>[-0.31, 0.39]    | NA                       |          | -0.22<br>[-0.83, 0.38]   | 0.22<br>[-0.57, 1.01]    | 0.21<br>[-0.37, 0.80]    |          | 0.00<br>[-0.42, 0.43]    | -1.29<br>[-4.67, 2.09]   | -0.21<br>[-1.28, 0.86]   |          |
| Slovenia       | -0.06<br>[-0.14, 0.02]   | -0.09<br>[-0.19, 0.01]   |          | -0.07<br>[-0.15, 0.01]   | -0.04<br>[-0.13, 0.06]   |          | -0.06<br>[-0.12, 0.01]   | -0.03<br>[-0.21, 0.15]   |          | -0.05<br>[-0.11, 0.02]   | -0.17<br>[-0.47, 0.13]   |          | 0.03<br>[-0.16, 0.22]    | -0.07<br>[-0.15, 0.00]   | -0.12<br>[-0.26, 0.02]   |          | -0.09<br>[-0.22, 0.04]   | -0.06<br>[-0.17, 0.05]   | 0.01<br>[-0.09, 0.10]    |          | -0.01<br>[-0.15, 0.14]   | -0.05<br>[-0.13, 0.02]   | -0.05<br>[-0.36, 0.25]   |          |
| Spain          | -0.04<br>[-0.12, 0.04]   | -0.16<br>[-0.27, -0.04]* |          | -0.09<br>[-0.17, -0.01]* | -0.03<br>[-0.14, 0.08]   |          | -0.05<br>[-0.12, 0.02]   | -0.14<br>[-0.34, 0.06]   |          | -0.06<br>[-0.14, 0.01]   | -0.05<br>[-0.21, 0.12]   |          | -0.03<br>[-0.11, 0.06]   | -0.19<br>[-0.34, -0.04]* | -0.14<br>[-0.31, 0.03]   |          | -0.10<br>[-0.24, 0.04]   | -0.09<br>[-0.21, 0.03]   | -0.04<br>[-0.13, 0.06]   |          | -0.05<br>[-0.15, 0.05]   | -0.09<br>[-0.19, 0.02]   | -0.05<br>[-0.20, 0.10]   |          |
| Sweden         | -0.15<br>[-0.29, -0.01]* | -0.17<br>[-0.23, -0.10]* |          | -0.08<br>[-0.16, -0.00]* | -0.20<br>[-0.29, -0.11]* |          | -0.14<br>[-0.20, -0.07]* | -0.15<br>[-0.29, -0.01]* |          | -0.12<br>[-0.18, -0.05]* | -0.22<br>[-0.38, -0.06]* |          | -0.12<br>[-0.21, -0.03]* | -0.13<br>[-0.24, -0.03]* | -0.18<br>[-0.33, -0.04]* |          | -0.19<br>[-0.29, -0.10]* | -0.13<br>[-0.23, -0.02]* | -0.07<br>[-0.18, 0.05]   |          | -0.01<br>[-0.16, 0.13]   | -0.14<br>[-0.21, -0.07]* | -0.47<br>[-1.04, 0.10]   |          |
| Switzerland    | -0.06<br>[-0.16, 0.04]   | -0.12<br>[-0.19, -0.04]* |          | -0.12<br>[-0.21, -0.04]* | -0.06<br>[-0.15, 0.02]   |          | -0.11<br>[-0.18, -0.04]* | -0.04<br>[-0.17, 0.09]   |          | -0.10<br>[-0.17, -0.04]* | -0.08<br>[-0.21, 0.06]   |          | -0.09<br>[-0.24, 0.05]   | -0.08<br>[-0.15, -0.01]* | -0.13<br>[-0.34, 0.07]   |          | -0.09<br>[-0.20, 0.01]   | -0.13<br>[-0.24, -0.02]* | -0.05<br>[-0.16, 0.05]   |          | -0.13<br>[-0.25, -0.01]* | -0.04<br>[-0.12, 0.04]   | -0.17<br>[-0.38, 0.03]   |          |
| USA            | -0.14<br>[-0.17, -0.10]* | -0.11<br>[-0.15, -0.08]* |          | -0.12<br>[-0.16, -0.09]* | -0.14<br>[-0.17, -0.10]* |          | -0.13<br>[-0.16, -0.10]* | -0.13<br>[-0.18, -0.08]* |          | -0.13<br>[-0.15, -0.10]* | -0.19<br>[-0.29, -0.08]* |          | -0.14<br>[-0.24, -0.04]* | -0.13<br>[-0.16, -0.10]* | -0.11<br>[-0.16, -0.06]* |          | -0.18<br>[-0.23, -0.12]* | -0.13<br>[-0.17, -0.09]* | -0.07<br>[-0.11, -0.04]* |          | -0.15<br>[-0.19, -0.12]* | -0.10<br>[-0.14, -0.07]* | -0.16<br>[-0.25, -0.07]* |          |
| Overall        | -0.08<br>[-0.12, -0.05]* | -0.11<br>[-0.14, -0.08]* | 0.259    | -0.09<br>[-0.11, -0.07]* | -0.09<br>[-0.13, -0.06]* | 0.770    | -0.09<br>[-0.11, -0.06]* | -0.11<br>[-0.15, -0.08]* | 0.278    | -0.09<br>[-0.11, -0.06]* | -0.12<br>[-0.16, -0.07]* | 0.389    | -0.10<br>[-0.13, -0.06]* | -0.08<br>[-0.11, -0.06]* | -0.10<br>[-0.13, -0.07]* | 0.677    | -0.11<br>[-0.14, -0.08]* | -0.09<br>[-0.13, -0.06]* | -0.08<br>[-0.11, -0.04]* | 0.502    | -0.10<br>[-0.13, -0.06]* | -0.08<br>[-0.11, -0.06]* | -0.11<br>[-0.17, -0.06]* | 0.402    |

Note: The average marginal effect with 95% confidence intervals for each country was separately estimated by the linear mixed model adjusted for all covariates (not including genetic risks) except the stratification variable. \* indicates statistical significance. The overall average marginal effect was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. Effect sizes were missing because the model failed to converge with the limited sample size of subpopulations in China and Poland, as well as the genetic data is not available in all countries except for England and USA. The two-sided Z-test was used to test whether the true effect size for each covariate except for genetic risk group is zero. Multivariate Wald test was used to test whether the interaction term between Internet use and genetic risk group improved model fit<sup>22,23</sup>. ADL = activities of daily living, PGS = polygenic scores, DS = depressive symptoms, SWB = subjective well-being.

Supplementary Table 6: (continued).

| Country        | Current smoking          |                          |          | Alcohol consumption      |                              |          | Physical activity status |                          |          | ADL disability           |                          |          | Chronic conditions       |                          |          | Depressive symptoms PGS  |                                |                          |          | Subjective well-being PGS |                                 |                          |          |
|----------------|--------------------------|--------------------------|----------|--------------------------|------------------------------|----------|--------------------------|--------------------------|----------|--------------------------|--------------------------|----------|--------------------------|--------------------------|----------|--------------------------|--------------------------------|--------------------------|----------|---------------------------|---------------------------------|--------------------------|----------|
|                | Current smoking          | No smoking               | <i>P</i> | Weekly alcohol use       | Less than weekly alcohol use | <i>P</i> | Physical inactivity      | Physical activity        | <i>P</i> | ADL disability           | No ADL limitation        | <i>P</i> | ≥1 chronic condition     | No chronic conditions    | <i>P</i> | Low genetic risk (DS)    | Intermediate genetic risk (DS) | High genetic risk (DS)   | <i>P</i> | Low genetic risk (SWB)    | Intermediate genetic risk (SWB) | High genetic risk (SWB)  | <i>P</i> |
| Austria        | 0.03<br>[-0.11, 0.16]    | -0.02<br>[-0.09, 0.04]   |          | -0.02<br>[-0.10, 0.05]   | -0.02<br>[-0.11, 0.08]       |          | -0.26<br>[-0.55, 0.03]   | 0.00<br>[-0.06, 0.06]    |          | 0.06<br>[-0.30, 0.43]    | -0.01<br>[-0.07, 0.05]   |          | -0.02<br>[-0.09, 0.06]   | -0.03<br>[-0.13, 0.07]   |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Belgium        | 0.02<br>[-0.14, 0.18]    | -0.03<br>[-0.09, 0.03]   |          | -0.05<br>[-0.13, 0.02]   | 0.01<br>[-0.09, 0.12]        |          | -0.04<br>[-0.33, 0.26]   | -0.02<br>[-0.09, 0.04]   |          | -0.10<br>[-0.33, 0.12]   | -0.02<br>[-0.08, 0.04]   |          | -0.02<br>[-0.09, 0.05]   | -0.03<br>[-0.14, 0.07]   |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Brazil         | -0.03<br>[-0.19, 0.13]   | -0.05<br>[-0.11, 0.02]   |          | -0.12<br>[-0.24, -0.00]* | -0.02<br>[-0.09, 0.05]       |          | -0.04<br>[-0.16, 0.07]   | -0.05<br>[-0.12, 0.02]   |          | -0.03<br>[-0.24, 0.19]   | -0.05<br>[-0.11, 0.01]   |          | -0.04<br>[-0.12, 0.03]   | -0.05<br>[-0.15, 0.04]   |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| China          | 0.16<br>[-0.19, 0.51]    | -0.13<br>[-0.35, 0.08]   |          | 0.12<br>[-0.28, 0.53]    | -0.09<br>[-0.30, 0.11]       |          | -0.04<br>[-0.32, 0.23]   | -0.08<br>[-0.32, 0.16]   |          | 0.07<br>[-1.92, 2.06]    | -0.07<br>[-0.25, 0.11]   |          | -0.20<br>[-0.49, 0.09]   | 0.01<br>[-0.21, 0.24]    |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Croatia        | -0.09<br>[-0.33, 0.14]   | -0.07<br>[-0.22, 0.09]   |          | -0.07<br>[-0.26, 0.12]   | -0.11<br>[-0.28, 0.07]       |          | -0.23<br>[-1.29, 0.84]   | -0.09<br>[-0.22, 0.04]   |          | 0.56<br>[-0.41, 1.53]    | -0.10<br>[-0.23, 0.03]   |          | -0.08<br>[-0.26, 0.10]   | -0.13<br>[-0.31, 0.06]   |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Czech Republic | -0.05<br>[-0.15, 0.06]   | -0.11<br>[-0.17, -0.05]* |          | -0.07<br>[-0.14, 0.00]   | -0.12<br>[-0.19, -0.05]*     |          | -0.23<br>[-0.49, 0.03]   | -0.08<br>[-0.13, -0.03]* |          | -0.32<br>[-0.54, -0.10]* | -0.08<br>[-0.13, -0.03]* |          | -0.11<br>[-0.16, -0.05]* | -0.06<br>[-0.16, 0.03]   |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Denmark        | -0.05<br>[-0.21, 0.11]   | -0.09<br>[-0.17, -0.01]* |          | -0.08<br>[-0.17, 0.00]   | -0.08<br>[-0.22, 0.06]       |          | -0.01<br>[-0.45, 0.44]   | -0.09<br>[-0.16, -0.01]* |          | -0.18<br>[-0.48, 0.13]   | -0.07<br>[-0.15, 0.01]   |          | -0.09<br>[-0.17, -0.00]* | -0.06<br>[-0.20, 0.07]   |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| England        | -0.21<br>[-0.39, -0.04]* | -0.05<br>[-0.10, 0.00]   |          | -0.02<br>[-0.08, 0.04]   | -0.15<br>[-0.24, -0.06]*     |          | -0.13<br>[-0.30, 0.04]   | -0.06<br>[-0.11, -0.00]* |          | -0.06<br>[-0.23, 0.10]   | -0.07<br>[-0.12, -0.02]* |          | -0.04<br>[-0.10, 0.02]   | -0.17<br>[-0.26, -0.08]* |          | -0.09<br>[-0.24, 0.05]   | -0.11<br>[-0.20, -0.03]*       | -0.23<br>[-0.38, -0.07]* | 0.444    | -0.13<br>[-0.27, 0.01]    | -0.12<br>[-0.20, -0.03]*        | -0.18<br>[-0.33, -0.03]* | 0.568    |
| Estonia        | -0.22<br>[-0.35, -0.09]* | -0.08<br>[-0.15, -0.01]* |          | -0.12<br>[-0.26, 0.01]   | -0.10<br>[-0.18, -0.03]*     |          | -0.24<br>[-0.53, 0.05]   | -0.10<br>[-0.17, -0.04]* |          | -0.10<br>[-0.35, 0.07]   | -0.10<br>[-0.16, -0.04]* |          | -0.14<br>[-0.21, -0.06]* | -0.07<br>[-0.18, 0.04]   |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| France         | -0.09<br>[-0.27, 0.10]   | -0.11<br>[-0.19, -0.03]* |          | -0.11<br>[-0.20, -0.03]* | -0.10<br>[-0.23, 0.02]       |          | -0.20<br>[-0.59, 0.19]   | -0.09<br>[-0.17, -0.02]* |          | -0.39<br>[-0.70, -0.07]* | -0.08<br>[-0.15, -0.01]* |          | -0.15<br>[-0.24, -0.06]* | 0.00<br>[-0.12, 0.13]    |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Germany        | -0.13<br>[-0.26, -0.01]* | -0.07<br>[-0.12, -0.01]* |          | -0.09<br>[-0.15, -0.02]* | -0.08<br>[-0.15, -0.00]*     |          | -0.22<br>[-0.51, 0.06]   | -0.08<br>[-0.13, -0.02]* |          | -0.08<br>[-0.55, -0.06]* | -0.07<br>[-0.12, -0.01]* |          | -0.07<br>[-0.14, -0.01]* | -0.11<br>[-0.20, -0.02]* |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Greece         | 0.08<br>[-0.11, 0.27]    | -0.02<br>[-0.18, 0.14]   |          | -0.03<br>[-0.18, 0.13]   | 0.10<br>[-0.10, 0.30]        |          | 0.84<br>[-0.07, 1.76]    | -0.00<br>[-0.13, 0.12]   |          | 0.86<br>[-0.67, 2.39]    | 0.01<br>[-0.11, 0.14]    |          | 0.07<br>[-0.14, 0.28]    | -0.00<br>[-0.15, 0.15]   |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Israel         | 0.01<br>[-0.26, 0.27]    | -0.11<br>[-0.23, 0.01]   |          | -0.06<br>[-0.34, 0.22]   | -0.09<br>[-0.20, 0.02]       |          | -0.07<br>[-0.42, 0.27]   | -0.09<br>[-0.20, 0.02]   |          | -0.64<br>[-1.26, -0.03]* | -0.06<br>[-0.16, 0.05]   |          | -0.17<br>[-0.31, -0.02]* | 0.01<br>[-0.13, 0.15]    |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Italy          | -0.16<br>[-0.32, -0.01]* | -0.14<br>[-0.22, -0.06]* |          | -0.14<br>[-0.25, -0.03]* | -0.17<br>[-0.26, -0.07]*     |          | -0.16<br>[-0.41, 0.10]   | -0.14<br>[-0.21, -0.07]* |          | -0.49<br>[-0.90, -0.09]* | -0.12<br>[-0.19, -0.05]* |          | -0.15<br>[-0.25, -0.05]* | -0.16<br>[-0.26, -0.06]* |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Luxembourg     | -0.04<br>[-0.31, 0.24]   | -0.11<br>[-0.23, 0.01]   |          | -0.09<br>[-0.22, 0.04]   | -0.12<br>[-0.29, 0.06]       |          | 0.49<br>[-0.32, 1.29]    | -0.11<br>[-0.22, 0.01]   |          | -0.34<br>[-0.83, 0.15]   | -0.08<br>[-0.18, 0.03]   |          | -0.12<br>[-0.26, 0.01]   | -0.05<br>[-0.23, 0.13]   |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Mexico         | -0.15<br>[-0.25, -0.06]* | -0.24<br>[-0.27, -0.20]* |          | -0.21<br>[-0.28, -0.15]* | -0.23<br>[-0.26, -0.19]*     |          | -0.22<br>[-0.26, -0.18]* | -0.23<br>[-0.28, -0.18]* |          | -0.23<br>[-0.33, -0.14]* | -0.22<br>[-0.26, -0.19]* |          | -0.25<br>[-0.29, -0.21]* | -0.18<br>[-0.23, -0.12]* |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Netherlands    | -0.23<br>[-0.51, 0.06]   | -0.13<br>[-0.25, -0.01]* |          | 0.00<br>[-0.14, 0.14]    | -0.37<br>[-0.56, -0.19]*     |          | -0.39<br>[-1.35, 0.57]   | -0.14<br>[-0.25, -0.04]* |          | 0.41<br>[-0.35, 1.17]    | -0.16<br>[-0.27, -0.05]* |          | -0.11<br>[-0.25, 0.03]   | -0.26<br>[-0.43, -0.08]* |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Poland         | -0.42<br>[-1.05, 0.21]   | 0.52<br>[0.01, 1.03]     |          | -0.24<br>[-0.74, 0.27]   | 0.14<br>[-0.38, 0.66]        |          | NA                       | 0.02<br>[-0.32, 0.37]    |          | NA                       | 0.05<br>[-0.32, 0.43]    |          | 0.20<br>[-0.24, 0.63]    | -0.04<br>[-0.74, 0.65]   |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Slovenia       | -0.15<br>[-0.31, 0.01]   | -0.03<br>[-0.10, 0.04]   |          | -0.02<br>[-0.10, 0.07]   | -0.08<br>[-0.17, 0.01]       |          | -0.13<br>[-0.44, 0.19]   | -0.05<br>[-0.11, 0.02]   |          | -0.12<br>[-0.48, 0.25]   | -0.06<br>[-0.12, 0.01]   |          | -0.08<br>[-0.16, 0.01]   | -0.04<br>[-0.13, 0.06]   |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Spain          | -0.05<br>[-0.21, 0.11]   | -0.06<br>[-0.13, 0.01]   |          | -0.02<br>[-0.11, 0.06]   | -0.09<br>[-0.18, 0.00]       |          | -0.22<br>[-0.51, 0.06]   | -0.05<br>[-0.11, 0.02]   |          | -0.03<br>[-0.48, 0.41]   | -0.06<br>[-0.12, 0.01]   |          | -0.06<br>[-0.15, 0.04]   | -0.09<br>[-0.17, -0.01]* |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Sweden         | -0.28<br>[-0.45, -0.10]* | -0.12<br>[-0.19, -0.06]* |          | -0.10<br>[-0.19, -0.02]* | -0.18<br>[-0.27, -0.09]*     |          | -0.81<br>[-1.28, -0.33]* | -0.11<br>[-0.18, -0.05]* |          | -0.03<br>[-0.32, 0.26]   | -0.14<br>[-0.20, -0.08]* |          | -0.14<br>[-0.22, -0.07]* | -0.11<br>[-0.21, -0.01]* |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| Switzerland    | -0.01<br>[-0.14, 0.12]   | -0.12<br>[-0.19, -0.05]* |          | -0.09<br>[-0.17, -0.02]* | -0.10<br>[-0.21, 0.00]       |          | -0.05<br>[-0.39, 0.29]   | -0.10<br>[-0.16, -0.04]* |          | -0.20<br>[-0.64, 0.24]   | -0.09<br>[-0.15, -0.03]* |          | -0.11<br>[-0.19, -0.03]* | -0.07<br>[-0.17, 0.03]   |          | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |
| USA            | -0.15<br>[-0.22, -0.07]* | -0.13<br>[-0.15, -0.10]* |          | -0.12<br>[-0.16, -0.08]* | -0.14<br>[-0.17, -0.10]*     |          | -0.14<br>[-0.22, -0.05]* | -0.13<br>[-0.15, -0.10]* |          | -0.11<br>[-0.21, -0.01]* | -0.13<br>[-0.16, -0.11]* |          | -0.13<br>[-0.16, -0.10]* | -0.15<br>[-0.20, -0.10]* |          | -0.20<br>[-0.27, -0.13]* | -0.15<br>[-0.19, -0.11]*       | -0.13<br>[-0.21, -0.05]* | 0.764    | -0.17<br>[-0.24, -0.10]*  | -0.15<br>[-0.19, -0.11]*        | -0.17<br>[-0.24, -0.09]* | 0.723    |
| Overall        | -0.10<br>[-0.13, -0.06]* | -0.09<br>[-0.12, -0.07]* | 0.893    | -0.08<br>[-0.11, -0.06]* | -0.11<br>[-0.14, -0.08]*     | 0.190    | -0.16<br>[-0.21, -0.10]* | -0.09<br>[-0.11, -0.06]* | 0.014    | -0.16<br>[-0.22, -0.10]* | -0.09<br>[-0.11, -0.06]* | 0.021    | -0.10<br>[-0.13, -0.07]* | -0.09<br>[-0.12, -0.06]* | 0.592    | NA                       | NA                             | NA                       |          | NA                        | NA                              | NA                       |          |

Note: The average marginal effect with 95% confidence intervals for each country was separately estimated by the linear mixed model adjusted for all covariates (not including genetic risks) except the stratification variable. \* indicates statistical significance. The overall average marginal effect was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. Effect sizes were missing because the model failed to converge with the limited sample size of subpopulations in China and Poland, as well as the genetic data is not available in all countries except for England and USA. The two-sided Z-test was used to test whether the true effect size for each covariate except for genetic risk group is zero. Multivariate Wald test was used to test whether the interaction term between Internet use and genetic risk group improved model fit<sup>22,23</sup>. ADL = activities of daily living, PGS = polygenic scores, DS = depressive symptoms, SWB = subjective well-being.

**Supplementary Table 7:** Associations of Internet use with life satisfaction by age, gender, marital status, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and genetic risks assessed by PGS for depressive symptoms and subjective well-being.

| Country        | Age                    |                          |          | Gender                   |                        |          | Marital status         |                          |          | Contact with others      |                          |          | Education                |                        |                        |          | Household wealth       |                        |                        |          | Labor force status     |                        |                        |          |
|----------------|------------------------|--------------------------|----------|--------------------------|------------------------|----------|------------------------|--------------------------|----------|--------------------------|--------------------------|----------|--------------------------|------------------------|------------------------|----------|------------------------|------------------------|------------------------|----------|------------------------|------------------------|------------------------|----------|
|                | 50-64 years            | ≥65 years                | <i>P</i> | Male                     | Female                 | <i>P</i> | Married                | Unmarried                | <i>P</i> | Weekly contact           | Less than weekly contact | <i>P</i> | Primary                  | Secondary              | Tertiary               | <i>P</i> | Low                    | Middle                 | High                   | <i>P</i> | Working                | Retired                | Others                 | <i>P</i> |
| Austria        | 0.02<br>[-0.07, 0.12]  | -0.01<br>[-0.10, 0.08]   |          | 0.05<br>[-0.05, 0.14]    | 0.02<br>[-0.08, 0.11]  |          | 0.05<br>[-0.03, 0.12]  | -0.01<br>[-0.14, 0.12]   |          | -0.00<br>[-0.07, 0.06]   | 0.25<br>[0.05, 0.45]*    |          | 0.12<br>[-0.05, 0.29]    | -0.02<br>[-0.11, 0.06] | 0.12<br>[-0.03, 0.26]  |          | 0.10<br>[-0.03, 0.24]  | -0.04<br>[-0.15, 0.06] | 0.04<br>[-0.06, 0.15]  |          | 0.03<br>[-0.13, 0.19]  | 0.03<br>[-0.05, 0.11]  | 0.06<br>[-0.15, 0.27]  |          |
| Belgium        | 0.01<br>[-0.07, 0.08]  | 0.03<br>[-0.03, 0.10]    |          | 0.09<br>[0.01, 0.16]*    | 0.02<br>[-0.05, 0.09]  |          | 0.03<br>[-0.03, 0.08]  | 0.11<br>[0.00, 0.22]*    |          | 0.04<br>[-0.02, 0.09]    | 0.18<br>[0.03, 0.32]*    |          | 0.04<br>[-0.03, 0.12]    | 0.03<br>[-0.06, 0.12]  | 0.11<br>[0.01, 0.20]*  |          | 0.10<br>[0.01, 0.19]*  | 0.01<br>[-0.07, 0.09]  | 0.06<br>[-0.03, 0.14]  |          | -0.11<br>[-0.22, 0.01] | 0.07<br>[0.01, 0.13]*  | 0.16<br>[0.03, 0.29]*  |          |
| Brazil         | 0.11<br>[0.04, 0.18]*  | -0.04<br>[-0.16, 0.09]   |          | 0.11<br>[0.02, 0.19]*    | 0.07<br>[-0.02, 0.17]  |          | 0.09<br>[0.01, 0.16]*  | 0.10<br>[-0.00, 0.21]    |          | 0.08<br>[0.02, 0.14]*    | 0.22<br>[-0.03, 0.47]    |          | 0.12<br>[0.03, 0.21]*    | 0.06<br>[-0.03, 0.15]  | 0.03<br>[-0.19, 0.25]  |          | 0.05<br>[-0.10, 0.19]  | 0.15<br>[0.03, 0.26]*  | 0.02<br>[-0.08, 0.12]  |          | 0.07<br>[-0.01, 0.16]  | 0.05<br>[-0.07, 0.17]  | 0.14<br>[0.01, 0.26]*  |          |
| China          | -0.04<br>[-0.25, 0.17] | 0.07<br>[-0.33, 0.48]    |          | -0.00<br>[-0.23, 0.23]   | 0.06<br>[-0.25, 0.36]  |          | -0.02<br>[-0.20, 0.17] | 0.28<br>[-0.66, 1.21]    |          | 0.03<br>[-0.16, 0.21]    | -0.75<br>[-1.73, 0.22]   |          | -0.12<br>[-0.41, 0.16]   | 0.05<br>[-0.24, 0.34]  | 0.41<br>[-0.03, 0.86]  |          | -0.31<br>[-1.01, 0.39] | -0.10<br>[-0.55, 0.35] | 0.08<br>[-0.12, 0.29]  |          | -0.14<br>[-0.41, 0.13] | 0.13<br>[-0.12, 0.38]  | NA                     |          |
| Croatia        | 0.09<br>[-0.08, 0.26]  | 0.16<br>[-0.11, 0.42]    |          | 0.18<br>[-0.03, 0.40]    | 0.06<br>[-0.13, 0.26]  |          | 0.10<br>[-0.05, 0.25]  | 0.31<br>[-0.11, 0.73]    |          | 0.11<br>[-0.04, 0.25]    | 0.99<br>[0.22, 1.77]*    |          | 0.15<br>[-0.09, 0.39]    | 0.11<br>[-0.13, 0.35]  | 0.10<br>[-0.17, 0.38]  |          | 0.28<br>[-0.05, 0.60]  | 0.03<br>[-0.21, 0.28]  | 0.13<br>[-0.07, 0.33]  |          | 0.30<br>[0.00, 0.61]*  | 0.06<br>[-0.12, 0.25]  | 0.20<br>[-0.19, 0.58]  |          |
| Czech Republic | 0.07<br>[-0.01, 0.16]  | 0.06<br>[-0.01, 0.14]    |          | 0.06<br>[-0.02, 0.14]    | 0.11<br>[0.03, 0.19]*  |          | 0.08<br>[0.01, 0.14]*  | 0.12<br>[-0.01, 0.25]    |          | 0.09<br>[0.03, 0.15]*    | 0.09<br>[-0.13, 0.31]    |          | 0.02<br>[-0.08, 0.12]    | 0.12<br>[0.05, 0.20]*  | 0.10<br>[-0.07, 0.28]  |          | 0.07<br>[-0.04, 0.17]  | 0.09<br>[-0.00, 0.19]  | 0.09<br>[-0.00, 0.18]  |          | 0.09<br>[-0.03, 0.22]  | 0.09<br>[0.03, 0.16]*  | 0.02<br>[-0.29, 0.32]  |          |
| Denmark        | 0.01<br>[-0.13, 0.15]  | -0.05<br>[-0.13, 0.04]   |          | 0.02<br>[-0.08, 0.13]    | -0.05<br>[-0.15, 0.05] |          | 0.02<br>[-0.06, 0.10]  | -0.11<br>[-0.28, 0.05]   |          | -0.02<br>[-0.10, 0.06]   | -0.01<br>[-0.24, 0.23]   |          | -0.15<br>[-0.29, -0.01]* | 0.03<br>[-0.08, 0.13]  | 0.03<br>[-0.13, 0.19]  |          | -0.04<br>[-0.15, 0.08] | 0.04<br>[-0.09, 0.17]  | -0.03<br>[-0.17, 0.12] |          | -0.02<br>[-0.19, 0.14] | 0.03<br>[-0.11, 0.06]  | -0.04<br>[-0.38, 0.31] |          |
| England        | -0.05<br>[-0.15, 0.06] | -0.06<br>[-0.13, -0.00]* |          | -0.09<br>[-0.17, -0.01]* | -0.04<br>[-0.12, 0.04] |          | -0.03<br>[-0.09, 0.03] | -0.13<br>[-0.25, -0.01]* |          | -0.06<br>[-0.12, -0.01]* | -0.07<br>[-0.35, 0.22]   |          | -0.09<br>[-0.18, 0.01]   | -0.03<br>[-0.11, 0.05] | -0.05<br>[-0.26, 0.16] |          | -0.03<br>[-0.12, 0.06] | -0.09<br>[-0.19, 0.00] | -0.05<br>[-0.16, 0.06] |          | -0.06<br>[-0.18, 0.06] | -0.06<br>[-0.13, 0.00] | -0.08<br>[-0.29, 0.13] |          |
| Estonia        | 0.16<br>[0.07, 0.25]*  | 0.04<br>[-0.06, 0.13]    |          | 0.15<br>[0.05, 0.26]*    | 0.09<br>[-0.00, 0.17]  |          | 0.10<br>[0.03, 0.18]*  | 0.14<br>[0.00, 0.28]*    |          | 0.09<br>[0.02, 0.16]*    | 0.27<br>[0.08, 0.46]*    |          | 0.06<br>[-0.13, 0.25]    | 0.11<br>[0.03, 0.20]*  | 0.13<br>[0.00, 0.26]*  |          | 0.11<br>[-0.03, 0.24]  | 0.08<br>[-0.03, 0.20]  | 0.14<br>[0.03, 0.25]*  |          | 0.07<br>[-0.04, 0.17]  | 0.12<br>[0.03, 0.22]*  | 0.28<br>[0.01, 0.54]*  |          |
| France         | 0.14<br>[0.05, 0.24]*  | 0.17<br>[0.08, 0.26]*    |          | 0.13<br>[0.04, 0.23]*    | 0.19<br>[0.09, 0.28]*  |          | 0.22<br>[0.14, 0.29]*  | 0.01<br>[-0.13, 0.15]    |          | 0.17<br>[0.10, 0.24]*    | 0.10<br>[-0.11, 0.31]    |          | 0.17<br>[0.06, 0.29]*    | 0.20<br>[0.10, 0.30]*  | -0.02<br>[-0.19, 0.14] |          | 0.08<br>[-0.05, 0.21]  | 0.22<br>[0.12, 0.33]*  | 0.17<br>[0.06, 0.28]*  |          | 0.08<br>[-0.07, 0.22]  | 0.18<br>[0.10, 0.26]*  | 0.43<br>[0.16, 0.70]*  |          |
| Germany        | 0.12<br>[0.04, 0.20]*  | 0.13<br>[0.05, 0.21]*    |          | 0.20<br>[0.12, 0.28]*    | 0.08<br>[0.00, 0.16]*  |          | 0.15<br>[0.09, 0.21]*  | 0.15<br>[-0.01, 0.31]    |          | 0.15<br>[0.09, 0.21]*    | 0.17<br>[0.00, 0.34]*    |          | 0.01<br>[-0.23, 0.25]    | 0.18<br>[0.11, 0.25]*  | 0.11<br>[0.01, 0.21]*  |          | 0.17<br>[0.06, 0.28]*  | 0.15<br>[0.06, 0.24]*  | 0.11<br>[0.02, 0.21]*  |          | 0.13<br>[0.04, 0.23]*  | 0.16<br>[0.08, 0.23]*  | 0.16<br>[-0.03, 0.35]  |          |
| Greece         | 0.05<br>[-0.06, 0.17]  | 0.22<br>[-0.06, 0.51]    |          | 0.11<br>[-0.04, 0.26]    | 0.05<br>[-0.12, 0.22]  |          | 0.04<br>[-0.08, 0.16]  | 0.18<br>[-0.11, 0.47]    |          | 0.03<br>[-0.08, 0.15]    | 0.44<br>[0.00, 0.89]     |          | 0.00<br>[-0.24, 0.24]    | -0.00<br>[-0.17, 0.17] | 0.19<br>[0.01, 0.38]*  |          | 0.07<br>[-0.16, 0.31]  | 0.26<br>[0.06, 0.46]*  | -0.01<br>[-0.16, 0.15] |          | 0.07<br>[-0.08, 0.23]  | 0.15<br>[-0.05, 0.35]  | 0.03<br>[-0.21, 0.28]  |          |
| Israel         | -0.05<br>[-0.17, 0.07] | 0.16<br>[0.01, 0.30]*    |          | 0.02<br>[-0.13, 0.16]    | 0.09<br>[-0.04, 0.21]  |          | 0.10<br>[0.00, 0.20]*  | -0.12<br>[-0.40, 0.17]   |          | 0.06<br>[-0.04, 0.16]    | -0.13<br>[-0.69, 0.42]   |          | 0.01<br>[-0.19, 0.20]    | 0.05<br>[-0.09, 0.19]  | 0.08<br>[-0.09, 0.25]  |          | -0.04<br>[-0.20, 0.13] | 0.00<br>[-0.16, 0.17]  | 0.20<br>[0.04, 0.36]*  |          | -0.01<br>[-0.14, 0.12] | 0.16<br>[0.01, 0.31]*  | 0.03<br>[-0.26, 0.32]  |          |
| Italy          | 0.13<br>[0.06, 0.21]*  | 0.13<br>[0.02, 0.24]*    |          | 0.15<br>[0.07, 0.23]*    | 0.12<br>[0.02, 0.22]*  |          | 0.14<br>[0.07, 0.20]*  | 0.14<br>[-0.07, 0.35]    |          | 0.13<br>[0.06, 0.20]*    | 0.20<br>[-0.04, 0.44]    |          | 0.15<br>[0.06, 0.23]*    | 0.15<br>[0.05, 0.25]*  | 0.06<br>[-0.13, 0.26]  |          | 0.21<br>[0.08, 0.34]*  | 0.09<br>[-0.02, 0.20]  | 0.13<br>[0.03, 0.22]*  |          | 0.06<br>[-0.04, 0.16]  | 0.17<br>[0.08, 0.26]*  | 0.15<br>[-0.02, 0.33]  |          |
| Luxembourg     | 0.01<br>[-0.13, 0.14]  | 0.17<br>[0.02, 0.32]*    |          | 0.06<br>[-0.09, 0.21]    | 0.04<br>[-0.10, 0.19]  |          | 0.12<br>[0.01, 0.23]*  | -0.46<br>[-0.75, -0.17]* |          | 0.05<br>[-0.07, 0.16]    | 0.10<br>[-0.11, 0.30]    |          | 0.10<br>[-0.05, 0.26]    | -0.05<br>[-0.21, 0.11] | 0.30<br>[-0.02, 0.62]  |          | 0.17<br>[-0.01, 0.35]  | -0.12<br>[-0.30, 0.07] | 0.08<br>[-0.09, 0.26]  |          | 0.19<br>[-0.02, 0.41]  | 0.12<br>[-0.03, 0.26]  | -0.15<br>[-0.38, 0.07] |          |
| Mexico         | 0.08<br>[0.04, 0.12]*  | 0.08<br>[0.03, 0.13]*    |          | 0.07<br>[0.02, 0.11]*    | 0.09<br>[0.05, 0.13]*  |          | 0.07<br>[0.04, 0.11]*  | 0.09<br>[0.02, 0.15]*    |          | 0.08<br>[0.05, 0.12]*    | -0.26<br>[-0.66, 0.14]   |          | 0.08<br>[0.04, 0.11]*    | 0.04<br>[-0.12, 0.20]  | 0.15<br>[0.05, 0.25]*  |          | 0.08<br>[0.01, 0.14]*  | 0.11<br>[0.06, 0.16]*  | 0.06<br>[0.01, 0.11]*  |          | 0.09<br>[0.04, 0.14]*  | 0.06<br>[-0.01, 0.14]  | 0.09<br>[0.04, 0.14]*  |          |
| Netherlands    | 0.17<br>[0.01, 0.33]*  | 0.10<br>[0.01, 0.19]*    |          | 0.19<br>[0.07, 0.31]*    | 0.07<br>[-0.02, 0.17]  |          | 0.11<br>[0.02, 0.19]*  | 0.22<br>[0.04, 0.41]*    |          | 0.10<br>[0.02, 0.19]*    | 0.20<br>[0.00, 0.41]*    |          | 0.13<br>[0.03, 0.23]*    | 0.12<br>[-0.04, 0.28]  | 0.09<br>[-0.13, 0.31]  |          | 0.12<br>[-0.01, 0.25]  | 0.11<br>[-0.01, 0.24]  | 0.15<br>[-0.01, 0.31]  |          | 0.19<br>[-0.03, 0.40]  | 0.13<br>[0.04, 0.23]*  | 0.12<br>[-0.08, 0.32]  |          |
| Poland         | 0.29<br>[-0.09, 0.67]  | NA                       |          | 0.12<br>[-0.42, 0.66]    | 0.40<br>[-0.26, 1.06]  |          | 0.21<br>[-0.20, 0.62]  | 0.88<br>[-5.26, 7.01]    |          | 0.28<br>[-0.12, 0.68]    | NA                       |          | 0.03<br>[-3.70, 3.77]    | 0.37<br>[-0.03, 0.76]  | NA                     |          | 0.19<br>[-0.53, 0.92]  | 0.22<br>[-0.68, 1.12]  | 0.19<br>[-0.45, 0.84]  |          | -0.06<br>[-0.53, 0.40] | 1.83<br>[-1.94, 5.60]  | 0.79<br>[-0.13, 1.70]  |          |
| Slovenia       | 0.10<br>[0.00, 0.19]*  | 0.09<br>[-0.02, 0.20]    |          | 0.08<br>[-0.02, 0.18]    | 0.10<br>[0.00, 0.20]*  |          | 0.09<br>[0.01, 0.16]*  | 0.14<br>[-0.06, 0.34]    |          | 0.11<br>[0.04, 0.19]*    | -0.05<br>[-0.40, 0.30]   |          | 0.11<br>[-0.10, 0.32]    | 0.10<br>[0.01, 0.18]*  | 0.20<br>[0.04, 0.36]*  |          | 0.16<br>[0.01, 0.31]*  | 0.12<br>[-0.00, 0.24]  | 0.04<br>[-0.07, 0.15]  |          | 0.02<br>[-0.15, 0.19]  | 0.11<br>[0.03, 0.19]*  | 0.15<br>[-0.16, 0.46]  |          |
| Spain          | 0.06<br>[-0.01, 0.12]  | 0.16<br>[0.06, 0.25]*    |          | 0.13<br>[0.06, 0.21]*    | 0.05<br>[-0.03, 0.14]  |          | 0.08<br>[0.02, 0.14]*  | 0.15<br>[-0.02, 0.32]    |          | 0.09<br>[0.03, 0.15]*    | 0.10<br>[-0.04, 0.25]    |          | 0.10<br>[0.03, 0.16]*    | 0.17<br>[0.03, 0.30]*  | -0.03<br>[-0.19, 0.12] |          | 0.05<br>[-0.07, 0.17]  | 0.12<br>[0.02, 0.22]*  | 0.11<br>[0.02, 0.19]*  |          | -0.02<br>[-0.11, 0.06] | 0.14<br>[0.05, 0.23]*  | 0.19<br>[0.07, 0.31]*  |          |
| Sweden         | 0.10<br>[-0.04, 0.24]  | 0.06<br>[-0.01, 0.12]    |          | -0.01<br>[-0.09, 0.08]   | 0.13<br>[0.04, 0.22]*  |          | 0.07<br>[0.00, 0.14]*  | 0.01<br>[-0.14, 0.16]    |          | 0.05<br>[-0.01, 0.12]    | 0.04<br>[-0.13, 0.22]    |          | 0.02<br>[-0.08, 0.11]    | 0.06<br>[-0.05, 0.17]  | 0.15<br>[0.01, 0.29]*  |          | 0.16<br>[0.06, 0.27]*  | 0.01<br>[-0.10, 0.12]  | -0.05<br>[-0.16, 0.07] |          | -0.01<br>[-0.16, 0.14] | 0.05<br>[-0.02, 0.12]  | 0.74<br>[0.09, 1.38]*  |          |
| Switzerland    | -0.01<br>[-0.11, 0.09] | 0.02<br>[-0.05, 0.09]    |          | 0.10<br>[0.01, 0.18]*    | -0.01<br>[-0.09, 0.08] |          | 0.02<br>[-0.04, 0.09]  | 0.11<br>[-0.02, 0.24]    |          | 0.03<br>[-0.03, 0.10]    | 0.12<br>[-0.03, 0.26]    |          | 0.08<br>[-0.05, 0.22]    | 0.03<br>[-0.04, 0.10]  | 0.03<br>[-0.16, 0.23]  |          | 0.05<br>[-0.05, 0.15]  | 0.13<br>[0.03, 0.23]*  | -0.06<br>[-0.16, 0.04] |          | 0.06<br>[-0.05, 0.17]  | 0.04<br>[-0.04, 0.12]  | -0.02<br>[-0.22, 0.17] |          |
| USA            | -0.03<br>[-0.06, 0.01] | 0.00<br>[-0.04, 0.04]    |          | -0.04<br>[-0.08, 0.00]   | 0.02<br>[-0.02, 0.05]  |          | 0.00<br>[-0.03, 0.03]  | -0.04<br>[-0.09, 0.01]   |          | -0.01<br>[-0.04, 0.02]   | -0.00<br>[-0.10, 0.10]   |          | 0.04<br>[-0.05, 0.12]    | -0.02<br>[-0.05, 0.01] | 0.02<br>[-0.03, 0.08]  |          | -0.04<br>[-0.09, 0.01] | -0.02<br>[-0.06, 0.03] | 0.03<br>[-0.01, 0.07]  |          | -0.03<br>[-0.07, 0.01] | 0.02<br>[-0.02, 0.05]  | -0.02<br>[-0.10, 0.06] |          |
| Overall        | 0.06<br>[0.03, 0.09]*  | 0.06<br>[0.03, 0.09]*    | 0.982    | 0.08<br>[0.04, 0.11]*    | 0.06<br>[0.04, 0.09]*  | 0.540    | 0.07<br>[0.05, 0.10]*  | 0.05<br>[0.00, 0.10]*    | 0.335    | 0.06<br>[0.04, 0.09]*    | 0.11<br>[0.06, 0.16]*    | 0.093    | 0.06<br>[0.03, 0.09]*    | 0.07<br>[0.03, 0.10]*  | 0.09<br>[0.05, 0.12]*  | 0.551    | 0.08<br>[0.04, 0.11]*  | 0.07<br>[0.03, 0.11]*  | 0.06<br>[0.03, 0.09]*  | 0.867    | 0.04<br>[0.00, 0.07]*  | 0.08<br>[0.05, 0.11]*  | 0.10<br>[0.05, 0.15]*  | 0.083    |

Note: The average marginal effect with 95% confidence intervals for each country was separately estimated by the linear mixed model adjusted for all covariates (not including genetic risks) except the stratification variable. \* indicates statistical significance. The overall average marginal effect was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. Effect sizes were missing because the model failed to converge with the limited sample size of subpopulations in China and Poland, as well as the genetic data is not available in all countries except for England and USA. The two-sided Z-test was used to test whether the true effect size for each covariate except for genetic risk group is zero. Multivariate Wald test was used to test whether the interaction term between Internet use and genetic risk group improved model fit<sup>22,23</sup>. ADL = activities of daily living, PGS = polygenic scores, DS = depressive symptoms, SWB = subjective well-being.

Supplementary Table 7: (continued).

| Country        | Current smoking        |                          |          | Alcohol consumption    |                              |          | Physical activity status |                          |          | ADL disability         |                        |          | Chronic conditions       |                        |          | Depressive symptoms PGS |                                |                        |          | Subjective well-being PGS |                                 |                         |          |
|----------------|------------------------|--------------------------|----------|------------------------|------------------------------|----------|--------------------------|--------------------------|----------|------------------------|------------------------|----------|--------------------------|------------------------|----------|-------------------------|--------------------------------|------------------------|----------|---------------------------|---------------------------------|-------------------------|----------|
|                | Current smoking        | No smoking               | <i>P</i> | Weekly alcohol use     | Less than weekly alcohol use | <i>P</i> | Physical inactivity      | Physical activity        | <i>P</i> | ADL disability         | No ADL limitation      | <i>P</i> | ≥1 chronic condition     | No chronic conditions  | <i>P</i> | Low genetic risk (DS)   | Intermediate genetic risk (DS) | High genetic risk (DS) | <i>P</i> | Low genetic risk (SWB)    | Intermediate genetic risk (SWB) | High genetic risk (SWB) | <i>P</i> |
| Austria        | 0.10<br>[-0.06, 0.26]  | 0.02<br>[-0.06, 0.09]    |          | -0.02<br>[-0.10, 0.07] | 0.10<br>[-0.00, 0.20]        |          | 0.28<br>[-0.07, 0.64]    | 0.01<br>[-0.05, 0.08]    |          | 0.00<br>[-0.40, 0.41]  | 0.02<br>[-0.05, 0.08]  |          | 0.02<br>[-0.06, 0.10]    | 0.09<br>[-0.03, 0.21]  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Belgium        | 0.11<br>[-0.03, 0.24]  | 0.04<br>[-0.01, 0.09]    |          | 0.07<br>[0.01, 0.13]*  | 0.03<br>[-0.05, 0.12]        |          | 0.26<br>[0.02, 0.50]*    | 0.04<br>[-0.01, 0.09]    |          | 0.27<br>[0.08, 0.47]*  | 0.03<br>[-0.02, 0.08]  |          | 0.09<br>[0.03, 0.15]*    | -0.03<br>[-0.12, 0.06] |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Brazil         | 0.06<br>[-0.10, 0.23]  | 0.09<br>[0.03, 0.16]*    |          | 0.08<br>[-0.03, 0.19]  | 0.09<br>[0.02, 0.16]*        |          | 0.09<br>[-0.02, 0.21]    | 0.09<br>[0.01, 0.16]*    |          | 0.21<br>[-0.03, 0.45]  | 0.08<br>[0.01, 0.14]*  |          | 0.10<br>[0.02, 0.18]*    | 0.08<br>[-0.02, 0.18]  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| China          | -0.12<br>[-0.48, 0.24] | 0.07<br>[-0.14, 0.28]    |          | -0.12<br>[-0.55, 0.31] | 0.06<br>[-0.14, 0.26]        |          | 0.04<br>[-0.24, 0.32]    | -0.02<br>[-0.26, 0.23]   |          | 0.42<br>[-1.48, 2.33]  | 0.00<br>[-0.18, 0.19]  |          | 0.09<br>[-0.19, 0.38]    | -0.06<br>[-0.31, 0.18] |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Croatia        | 0.08<br>[-0.22, 0.38]  | 0.12<br>[-0.04, 0.29]    |          | 0.24<br>[0.04, 0.44]*  | 0.05<br>[-0.15, 0.26]        |          | -0.02<br>[-1.40, 1.36]   | 0.14<br>[-0.00, 0.28]    |          | -0.55<br>[-1.88, 0.79] | 0.14<br>[0.00, 0.28]*  |          | 0.08<br>[-0.12, 0.28]    | 0.22<br>[0.01, 0.44]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Czech Republic | -0.01<br>[-0.13, 0.11] | 0.11<br>[0.05, 0.18]*    |          | 0.02<br>[-0.06, 0.10]  | 0.14<br>[0.06, 0.22]*        |          | 0.04<br>[-0.23, 0.31]    | 0.09<br>[0.03, 0.15]*    |          | 0.36<br>[0.12, 0.61]*  | 0.07<br>[0.01, 0.13]*  |          | 0.07<br>[0.00, 0.13]*    | 0.16<br>[0.04, 0.28]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Denmark        | -0.06<br>[-0.22, 0.11] | 0.00<br>[-0.08, 0.08]    |          | -0.01<br>[-0.09, 0.08] | -0.02<br>[-0.15, 0.11]       |          | -0.19<br>[-0.70, 0.32]   | -0.01<br>[-0.08, 0.06]   |          | -0.03<br>[-0.36, 0.31] | -0.01<br>[-0.08, 0.06] |          | -0.01<br>[-0.09, 0.08]   | -0.02<br>[-0.15, 0.12] |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| England        | 0.02<br>[-0.15, 0.19]  | -0.07<br>[-0.13, -0.01]* |          | -0.05<br>[-0.12, 0.02] | -0.07<br>[-0.16, 0.03]       |          | -0.06<br>[-0.22, 0.11]   | -0.06<br>[-0.12, -0.00]* |          | -0.08<br>[-0.25, 0.09] | -0.06<br>[-0.12, 0.00] |          | -0.08<br>[-0.14, -0.01]* | -0.02<br>[-0.13, 0.09] |          | 0.14<br>[-0.03, 0.31]   | -0.02<br>[-0.11, 0.08]         | 0.01<br>[-0.17, 0.19]  | 0.032    | 0.17<br>[0.02, 0.33]*     | -0.01<br>[-0.11, 0.08]          | -0.03<br>[-0.19, 0.14]  | 0.207    |
| Estonia        | 0.22<br>[0.06, 0.38]*  | 0.09<br>[0.01, 0.16]*    |          | 0.22<br>[0.08, 0.36]*  | 0.08<br>[0.00, 0.16]*        |          | 0.19<br>[-0.15, 0.52]    | 0.12<br>[0.05, 0.18]*    |          | 0.12<br>[0.07, 0.56]*  | 0.09<br>[0.02, 0.16]*  |          | 0.09<br>[0.05, 0.21]*    | 0.13<br>[-0.05, 0.22]  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| France         | 0.17<br>[-0.00, 0.35]  | 0.16<br>[0.09, 0.23]*    |          | 0.17<br>[0.09, 0.25]*  | 0.15<br>[0.03, 0.26]*        |          | 0.28<br>[-0.08, 0.64]    | 0.15<br>[0.08, 0.22]*    |          | 0.35<br>[0.07, 0.63]*  | 0.15<br>[0.08, 0.22]*  |          | 0.18<br>[0.10, 0.25]*    | 0.13<br>[-0.00, 0.26]  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Germany        | 0.13<br>[-0.01, 0.27]  | 0.14<br>[0.08, 0.20]*    |          | 0.20<br>[0.13, 0.28]*  | 0.10<br>[0.02, 0.19]*        |          | 0.25<br>[-0.08, 0.58]    | 0.15<br>[0.09, 0.20]*    |          | 0.36<br>[0.09, 0.64]*  | 0.15<br>[0.08, 0.19]*  |          | 0.17<br>[0.10, 0.24]*    | 0.12<br>[0.03, 0.22]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Greece         | 0.05<br>[-0.13, 0.22]  | 0.11<br>[-0.04, 0.25]    |          | 0.17<br>[0.03, 0.31]*  | -0.07<br>[-0.26, 0.12]       |          | -0.48<br>[-1.35, 0.39]   | 0.09<br>[-0.02, 0.20]    |          | -0.67<br>[-2.21, 0.88] | 0.08<br>[-0.03, 0.19]  |          | -0.00<br>[-0.19, 0.18]   | 0.12<br>[-0.02, 0.26]  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Israel         | 0.05<br>[-0.21, 0.31]  | 0.07<br>[-0.03, 0.17]    |          | -0.18<br>[-0.44, 0.08] | 0.07<br>[-0.03, 0.17]        |          | 0.18<br>[-0.20, 0.55]    | 0.04<br>[-0.06, 0.13]    |          | 0.02<br>[-0.63, 0.67]  | 0.05<br>[-0.04, 0.14]  |          | 0.12<br>[-0.00, 0.25]    | -0.03<br>[-0.16, 0.10] |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Italy          | 0.15<br>[0.00, 0.30]*  | 0.14<br>[0.07, 0.21]*    |          | 0.09<br>[-0.00, 0.19]  | 0.18<br>[0.09, 0.26]*        |          | 0.16<br>[-0.08, 0.40]    | 0.14<br>[0.09, 0.20]*    |          | 0.32<br>[-0.05, 0.70]  | 0.13<br>[0.07, 0.19]*  |          | 0.15<br>[0.06, 0.24]*    | 0.14<br>[0.05, 0.23]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Luxembourg     | -0.01<br>[-0.30, 0.29] | 0.06<br>[-0.05, 0.17]    |          | 0.05<br>[-0.07, 0.18]  | 0.05<br>[-0.13, 0.22]        |          | -0.27<br>[-1.11, 0.57]   | 0.06<br>[-0.04, 0.17]    |          | -0.04<br>[-0.59, 0.50] | 0.05<br>[-0.05, 0.15]  |          | 0.10<br>[-0.04, 0.23]    | -0.00<br>[-0.16, 0.16] |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Mexico         | 0.05<br>[-0.05, 0.14]  | 0.09<br>[0.05, 0.12]*    |          | 0.06<br>[-0.01, 0.13]  | 0.09<br>[0.05, 0.12]*        |          | 0.09<br>[0.05, 0.13]*    | 0.07<br>[0.02, 0.11]*    |          | 0.05<br>[-0.06, 0.15]  | 0.09<br>[0.05, 0.12]*  |          | 0.09<br>[0.05, 0.13]*    | 0.06<br>[0.01, 0.11]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Netherlands    | -0.01<br>[-0.23, 0.22] | 0.15<br>[0.07, 0.23]*    |          | 0.08<br>[-0.02, 0.17]  | 0.17<br>[0.04, 0.31]*        |          | 0.01<br>[-0.66, 0.69]    | 0.12<br>[0.04, 0.20]*    |          | -0.16<br>[-0.63, 0.31] | 0.13<br>[0.05, 0.21]*  |          | 0.10<br>[-0.00, 0.19]    | 0.18<br>[0.05, 0.31]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Poland         | 0.46<br>[-0.26, 1.19]  | 0.16<br>[-0.38, 0.70]    |          | -0.01<br>[-0.62, 0.60] | 0.41<br>[-0.22, 1.03]        |          | NA                       | 0.26<br>[-0.15, 0.67]    |          | NA                     | 0.33<br>[-0.11, 0.77]  |          | 0.21<br>[-0.34, 0.75]    | -0.34<br>[-0.99, 0.32] |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Slovenia       | 0.18<br>[0.00, 0.35]*  | 0.10<br>[0.02, 0.18]*    |          | 0.13<br>[0.02, 0.23]*  | 0.08<br>[-0.02, 0.18]        |          | 0.09<br>[-0.22, 0.41]    | 0.10<br>[0.03, 0.18]*    |          | 0.23<br>[-0.18, 0.64]  | 0.10<br>[0.03, 0.17]*  |          | 0.12<br>[0.02, 0.21]*    | 0.11<br>[-0.00, 0.22]  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Spain          | 0.06<br>[-0.08, 0.19]  | 0.10<br>[0.03, 0.16]*    |          | 0.10<br>[0.02, 0.18]*  | 0.09<br>[0.01, 0.17]*        |          | 0.04<br>[-0.22, 0.29]    | 0.10<br>[0.04, 0.15]*    |          | 0.08<br>[-0.35, 0.51]  | 0.09<br>[0.03, 0.15]*  |          | 0.11<br>[0.03, 0.18]*    | 0.09<br>[0.01, 0.17]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Sweden         | 0.02<br>[-0.16, 0.21]  | 0.07<br>[0.01, 0.14]*    |          | 0.07<br>[-0.02, 0.16]  | 0.07<br>[-0.02, 0.16]        |          | 0.26<br>[-0.31, 0.84]    | 0.06<br>[-0.01, 0.12]    |          | 0.02<br>[-0.31, 0.35]  | 0.06<br>[-0.00, 0.12]  |          | 0.03<br>[-0.04, 0.11]    | 0.13<br>[0.02, 0.25]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Switzerland    | -0.01<br>[-0.14, 0.13] | 0.06<br>[-0.01, 0.12]    |          | 0.07<br>[0.00, 0.15]*  | -0.01<br>[-0.12, 0.09]       |          | 0.15<br>[-0.16, 0.46]    | 0.03<br>[-0.03, 0.09]    |          | 0.26<br>[-0.11, 0.63]  | 0.03<br>[-0.03, 0.09]  |          | 0.07<br>[-0.01, 0.14]    | 0.00<br>[-0.09, 0.10]  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| USA            | -0.01<br>[-0.08, 0.06] | -0.01<br>[-0.03, 0.02]   |          | -0.02<br>[-0.06, 0.02] | -0.00<br>[-0.03, 0.03]       |          | -0.06<br>[-0.14, 0.02]   | -0.00<br>[-0.03, 0.02]   |          | 0.00<br>[-0.09, 0.09]  | -0.01<br>[-0.04, 0.02] |          | -0.01<br>[-0.04, 0.01]   | 0.02<br>[-0.03, 0.08]  |          | 0.02<br>[-0.06, 0.09]   | 0.06<br>[0.02, 0.10]*          | -0.02<br>[-0.10, 0.06] | 0.213    | 0.04<br>[-0.03, 0.11]     | 0.03<br>[-0.01, 0.07]           | 0.03<br>[-0.04, 0.10]   | 0.741    |
| Overall        | 0.06<br>[0.02, 0.09]*  | 0.07<br>[0.05, 0.10]*    | 0.565    | 0.07<br>[0.04, 0.10]*  | 0.07<br>[0.04, 0.10]*        | 0.995    | 0.07<br>[0.01, 0.13]*    | 0.07<br>[0.04, 0.09]*    | 0.962    | 0.14<br>[0.05, 0.22]*  | 0.07<br>[0.04, 0.09]*  | 0.151    | 0.08<br>[0.05, 0.11]*    | 0.07<br>[0.04, 0.10]*  | 0.819    | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |

Note: The average marginal effect with 95% confidence intervals for each country was separately estimated by the linear mixed model adjusted for all covariates (not including genetic risks) except the stratification variable. \* indicates statistical significance. The overall average marginal effect was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. Effect sizes were missing because the model failed to converge with the limited sample size of subpopulations in China and Poland, as well as the genetic data is not available in all countries except for England and USA. The two-sided Z-test was used to test whether the true effect size for each covariate except for genetic risk group is zero. Multivariate Wald test was used to test whether the interaction term between Internet use and genetic risk group improved model fit<sup>22,23</sup>. ADL = activities of daily living, PGS = polygenic scores, DS = depressive symptoms, SWB = subjective well-being.

**Supplementary Table 8:** Associations of Internet use with self-reported health by age, gender, marital status, contact with others, education, household wealth, labor force status, current smoking, alcohol consumption, physical activity, chronic conditions, ADL, and genetic risks assessed by PGS for depressive symptoms and subjective well-being.

| Country        | Age                    |                       |          | Gender                 |                        |          | Marital status         |                        |          | Contact with others    |                          |          | Education              |                        |                        |          | Household wealth       |                        |                        |          | Labor force status     |                        |                        |          |
|----------------|------------------------|-----------------------|----------|------------------------|------------------------|----------|------------------------|------------------------|----------|------------------------|--------------------------|----------|------------------------|------------------------|------------------------|----------|------------------------|------------------------|------------------------|----------|------------------------|------------------------|------------------------|----------|
|                | 50-64 years            | ≥65 years             | <i>P</i> | Male                   | Female                 | <i>P</i> | Married                | Unmarried              | <i>P</i> | Weekly contact         | Less than weekly contact | <i>P</i> | Primary                | Secondary              | Tertiary               | <i>P</i> | Low                    | Middle                 | High                   | <i>P</i> | Working                | Retired                | Others                 | <i>P</i> |
| Austria        | 0.25<br>[0.16, 0.34]*  | 0.20<br>[0.13, 0.28]* |          | 0.26<br>[0.17, 0.35]*  | 0.17<br>[0.09, 0.25]*  |          | 0.22<br>[0.14, 0.29]*  | 0.21<br>[0.10, 0.33]*  |          | 0.19<br>[0.13, 0.26]*  | 0.33<br>[0.16, 0.50]*    |          | 0.09<br>[-0.06, 0.23]  | 0.23<br>[0.15, 0.30]*  | 0.25<br>[0.12, 0.39]*  |          | 0.17<br>[0.07, 0.28]*  | 0.20<br>[0.10, 0.30]*  | 0.25<br>[0.15, 0.36]*  |          | 0.23<br>[0.07, 0.39]*  | 0.22<br>[0.15, 0.29]*  | 0.15<br>[-0.03, 0.34]  |          |
| Belgium        | 0.02<br>[-0.06, 0.10]  | 0.16<br>[0.09, 0.22]* |          | 0.12<br>[0.04, 0.20]*  | 0.08<br>[0.01, 0.15]*  |          | 0.09<br>[0.03, 0.15]*  | 0.13<br>[0.02, 0.23]*  |          | 0.10<br>[0.04, 0.16]*  | 0.10<br>[-0.04, 0.24]    |          | 0.09<br>[0.01, 0.16]*  | 0.09<br>[-0.01, 0.19]  | 0.13<br>[0.02, 0.23]*  |          | 0.14<br>[0.05, 0.23]*  | 0.07<br>[-0.02, 0.15]  | 0.09<br>[-0.01, 0.19]  |          | -0.03<br>[-0.16, 0.10] | 0.11<br>[0.05, 0.18]*  | 0.16<br>[0.04, 0.28]*  |          |
| Brazil         | 0.11<br>[0.05, 0.18]*  | 0.06<br>[-0.06, 0.18] |          | 0.13<br>[0.05, 0.22]*  | 0.09<br>[-0.00, 0.18]  |          | 0.11<br>[0.04, 0.18]*  | 0.12<br>[0.01, 0.22]*  |          | 0.13<br>[0.07, 0.19]*  | -0.07<br>[-0.30, 0.15]   |          | 0.14<br>[0.06, 0.22]*  | 0.08<br>[-0.02, 0.18]  | 0.10<br>[-0.13, 0.34]  |          | 0.21<br>[0.07, 0.35]*  | 0.04<br>[-0.08, 0.15]  | 0.08<br>[-0.02, 0.19]  |          | 0.08<br>[-0.00, 0.17]  | 0.17<br>[0.06, 0.29]*  | 0.11<br>[-0.01, 0.23]  |          |
| China          | -0.02<br>[-0.22, 0.18] | 0.20<br>[-0.19, 0.60] |          | -0.03<br>[-0.27, 0.20] | 0.14<br>[-0.14, 0.42]  |          | 0.01<br>[-0.18, 0.19]  | 0.64<br>[-0.19, 1.46]  |          | 0.05<br>[-0.13, 0.24]  | -0.19<br>[-1.13, 0.75]   |          | 0.03<br>[-0.24, 0.31]  | 0.09<br>[-0.21, 0.39]  | 0.09<br>[-0.43, 0.61]  |          | 0.02<br>[-0.67, 0.71]  | 0.11<br>[-0.34, 0.55]  | 0.06<br>[-0.15, 0.26]  |          | -0.01<br>[-0.27, 0.26] | 0.11<br>[-0.13, 0.35]  | NA                     |          |
| Croatia        | 0.10<br>[-0.05, 0.25]  | 0.17<br>[-0.02, 0.37] |          | 0.16<br>[-0.02, 0.34]  | 0.12<br>[-0.03, 0.28]  |          | 0.11<br>[-0.02, 0.24]  | 0.21<br>[-0.09, 0.51]  |          | 0.13<br>[0.01, 0.25]*  | 0.37<br>[-0.23, 0.98]    |          | 0.15<br>[-0.04, 0.34]  | 0.08<br>[-0.10, 0.27]  | 0.15<br>[-0.13, 0.42]  |          | 0.16<br>[-0.07, 0.39]  | 0.02<br>[-0.19, 0.22]  | 0.21<br>[0.02, 0.40]*  |          | 0.14<br>[-0.13, 0.42]  | 0.15<br>[-0.00, 0.30]  | 0.11<br>[-0.17, 0.39]  |          |
| Czech Republic | 0.14<br>[0.08, 0.21]*  | 0.18<br>[0.12, 0.24]* |          | 0.15<br>[0.08, 0.22]*  | 0.16<br>[0.10, 0.22]*  |          | 0.16<br>[0.11, 0.21]*  | 0.15<br>[0.06, 0.25]*  |          | 0.15<br>[0.11, 0.20]*  | 0.22<br>[0.06, 0.37]*    |          | 0.12<br>[0.04, 0.19]*  | 0.15<br>[0.09, 0.20]*  | 0.31<br>[0.15, 0.46]*  |          | 0.13<br>[0.05, 0.20]*  | 0.16<br>[0.09, 0.24]*  | 0.18<br>[0.10, 0.26]*  |          | 0.13<br>[0.03, 0.23]*  | 0.16<br>[0.11, 0.21]*  | 0.24<br>[0.00, 0.48]*  |          |
| Denmark        | 0.06<br>[-0.11, 0.24]  | 0.25<br>[0.14, 0.35]* |          | 0.18<br>[0.06, 0.31]*  | 0.20<br>[0.08, 0.32]*  |          | 0.23<br>[0.13, 0.33]*  | 0.11<br>[-0.06, 0.28]  |          | 0.20<br>[0.10, 0.29]*  | 0.22<br>[-0.03, 0.47]    |          | 0.12<br>[-0.04, 0.28]  | 0.24<br>[0.11, 0.37]*  | 0.19<br>[-0.00, 0.39]  |          | 0.27<br>[0.14, 0.39]*  | 0.17<br>[0.00, 0.33]*  | 0.06<br>[-0.13, 0.25]  |          | 0.16<br>[-0.05, 0.36]  | 0.23<br>[0.12, 0.33]*  | -0.16<br>[-0.52, 0.19] |          |
| England        | 0.20<br>[0.11, 0.29]*  | 0.10<br>[0.04, 0.15]* |          | 0.09<br>[0.02, 0.17]*  | 0.14<br>[0.08, 0.21]*  |          | 0.13<br>[0.08, 0.19]*  | 0.10<br>[0.01, 0.20]*  |          | 0.12<br>[0.07, 0.17]*  | 0.11<br>[-0.12, 0.34]    |          | 0.14<br>[0.07, 0.22]*  | 0.13<br>[0.06, 0.20]*  | -0.08<br>[-0.27, 0.10] |          | 0.18<br>[0.11, 0.26]*  | 0.07<br>[-0.01, 0.16]  | 0.08<br>[-0.03, 0.19]  |          | 0.21<br>[0.10, 0.32]*  | 0.09<br>[0.03, 0.15]*  | 0.16<br>[-0.01, 0.33]  |          |
| Estonia        | 0.16<br>[0.09, 0.22]*  | 0.16<br>[0.11, 0.21]* |          | 0.14<br>[0.08, 0.20]*  | 0.14<br>[0.08, 0.19]*  |          | 0.14<br>[0.09, 0.19]*  | 0.14<br>[0.06, 0.22]*  |          | 0.15<br>[0.10, 0.19]*  | 0.09<br>[-0.02, 0.20]    |          | 0.11<br>[0.02, 0.21]*  | 0.15<br>[0.10, 0.20]*  | 0.10<br>[0.00, 0.19]*  |          | 0.10<br>[0.02, 0.17]*  | 0.13<br>[0.06, 0.19]*  | 0.18<br>[0.10, 0.26]*  |          | 0.09<br>[0.02, 0.17]*  | 0.15<br>[0.10, 0.20]*  | 0.19<br>[0.03, 0.35]*  |          |
| France         | 0.14<br>[0.04, 0.23]*  | 0.29<br>[0.20, 0.37]* |          | 0.16<br>[0.06, 0.25]*  | 0.22<br>[0.13, 0.31]*  |          | 0.17<br>[0.10, 0.25]*  | 0.25<br>[0.12, 0.38]*  |          | 0.22<br>[0.15, 0.29]*  | 0.00<br>[-0.18, 0.19]    |          | 0.23<br>[0.13, 0.32]*  | 0.18<br>[0.08, 0.27]*  | 0.16<br>[-0.02, 0.34]  |          | 0.18<br>[0.08, 0.29]*  | 0.26<br>[0.16, 0.37]*  | 0.13<br>[0.01, 0.25]*  |          | 0.14<br>[0.00, 0.28]*  | 0.22<br>[0.14, 0.30]*  | 0.25<br>[0.02, 0.47]*  |          |
| Germany        | 0.17<br>[0.10, 0.24]*  | 0.21<br>[0.14, 0.28]* |          | 0.20<br>[0.13, 0.27]*  | 0.17<br>[0.11, 0.24]*  |          | 0.20<br>[0.15, 0.26]*  | 0.13<br>[0.01, 0.25]*  |          | 0.19<br>[0.14, 0.25]*  | 0.18<br>[0.05, 0.30]*    |          | 0.16<br>[0.00, 0.32]*  | 0.21<br>[0.15, 0.27]*  | 0.16<br>[0.06, 0.25]*  |          | 0.11<br>[0.03, 0.19]*  | 0.22<br>[0.14, 0.30]*  | 0.24<br>[0.15, 0.33]*  |          | 0.19<br>[0.11, 0.28]*  | 0.22<br>[0.15, 0.28]*  | 0.10<br>[-0.04, 0.23]  |          |
| Greece         | 0.02<br>[-0.08, 0.11]  | 0.08<br>[-0.12, 0.28] |          | -0.03<br>[-0.15, 0.09] | 0.01<br>[-0.11, 0.13]  |          | -0.03<br>[-0.12, 0.07] | 0.02<br>[-0.19, 0.23]  |          | -0.02<br>[-0.11, 0.07] | -0.01<br>[-0.36, 0.33]   |          | -0.08<br>[-0.26, 0.09] | 0.03<br>[-0.10, 0.16]  | -0.01<br>[-0.17, 0.14] |          | -0.07<br>[-0.24, 0.10] | -0.03<br>[-0.17, 0.11] | 0.05<br>[-0.08, 0.19]  |          | 0.02<br>[-0.12, 0.15]  | -0.04<br>[-0.19, 0.11] | 0.05<br>[-0.12, 0.21]  |          |
| Israel         | 0.08<br>[-0.05, 0.20]  | 0.13<br>[0.01, 0.24]* |          | 0.06<br>[-0.06, 0.19]  | 0.11<br>[-0.00, 0.23]  |          | 0.13<br>[0.04, 0.22]*  | -0.11<br>[-0.33, 0.11] |          | 0.09<br>[0.00, 0.18]*  | 0.01<br>[-0.50, 0.52]    |          | 0.14<br>[-0.05, 0.32]  | 0.03<br>[-0.09, 0.16]  | 0.13<br>[-0.03, 0.28]  |          | 0.05<br>[-0.08, 0.18]  | 0.15<br>[-0.01, 0.31]  | 0.05<br>[-0.12, 0.22]  |          | 0.12<br>[-0.02, 0.27]  | 0.07<br>[-0.06, 0.19]  | 0.04<br>[-0.22, 0.30]  |          |
| Italy          | 0.08<br>[0.00, 0.16]*  | 0.10<br>[-0.00, 0.19] |          | 0.01<br>[-0.07, 0.09]  | 0.13<br>[0.04, 0.22]*  |          | 0.04<br>[-0.03, 0.10]  | 0.25<br>[0.08, 0.43]*  |          | 0.04<br>[-0.02, 0.11]  | 0.30<br>[0.07, 0.52]*    |          | 0.08<br>[-0.00, 0.16]  | 0.02<br>[-0.09, 0.12]  | 0.22<br>[0.01, 0.42]*  |          | 0.05<br>[-0.06, 0.16]  | 0.04<br>[-0.07, 0.15]  | 0.10<br>[0.00, 0.20]*  |          | 0.03<br>[-0.07, 0.13]  | 0.11<br>[0.02, 0.19]*  | 0.00<br>[-0.15, 0.15]  |          |
| Luxembourg     | 0.22<br>[0.09, 0.34]*  | 0.29<br>[0.16, 0.43]* |          | 0.29<br>[0.15, 0.43]*  | 0.19<br>[0.06, 0.32]*  |          | 0.25<br>[0.14, 0.35]*  | 0.17<br>[-0.07, 0.41]  |          | 0.22<br>[0.11, 0.32]*  | 0.34<br>[0.13, 0.54]*    |          | 0.30<br>[0.17, 0.44]*  | 0.13<br>[-0.02, 0.28]  | 0.31<br>[-0.07, 0.70]  |          | 0.19<br>[0.04, 0.35]*  | 0.29<br>[0.14, 0.45]*  | 0.22<br>[0.02, 0.42]*  |          | 0.35<br>[0.13, 0.58]*  | 0.29<br>[0.17, 0.42]*  | 0.04<br>[-0.15, 0.24]  |          |
| Mexico         | 0.23<br>[0.19, 0.26]*  | 0.18<br>[0.13, 0.23]* |          | 0.21<br>[0.16, 0.26]*  | 0.21<br>[0.17, 0.25]*  |          | 0.21<br>[0.18, 0.24]*  | 0.21<br>[0.15, 0.26]*  |          | 0.21<br>[0.18, 0.24]*  | 0.29<br>[-0.01, 0.60]    |          | 0.19<br>[0.16, 0.22]*  | 0.32<br>[0.16, 0.47]*  | 0.30<br>[0.19, 0.41]*  |          | 0.21<br>[0.15, 0.27]*  | 0.17<br>[0.12, 0.22]*  | 0.24<br>[0.19, 0.29]*  |          | 0.23<br>[0.18, 0.28]*  | 0.25<br>[0.17, 0.34]*  | 0.17<br>[0.13, 0.21]*  |          |
| Netherlands    | 0.15<br>[-0.09, 0.39]  | 0.17<br>[0.03, 0.30]* |          | 0.18<br>[-0.01, 0.37]  | 0.14<br>[-0.01, 0.29]  |          | 0.15<br>[0.02, 0.28]*  | 0.23<br>[-0.04, 0.50]  |          | 0.19<br>[0.06, 0.32]*  | 0.06<br>[-0.24, 0.35]    |          | 0.24<br>[0.11, 0.38]*  | 0.04<br>[-0.23, 0.30]  | 0.14<br>[-0.22, 0.50]  |          | 0.13<br>[-0.05, 0.31]  | 0.41<br>[0.20, 0.61]*  | -0.07<br>[-0.32, 0.17] |          | 0.20<br>[-0.16, 0.55]  | 0.18<br>[0.04, 0.32]*  | 0.18<br>[-0.10, 0.46]  |          |
| Poland         | -0.04<br>[-0.29, 0.21] | NA                    |          | 0.18<br>[-0.16, 0.52]  | -0.26<br>[-0.66, 0.13] |          | 0.03<br>[-0.26, 0.33]  | -0.34<br>[-1.57, 0.90] |          | -0.05<br>[-0.31, 0.22] | NA                       |          | 0.20<br>[-1.41, 1.81]  | -0.16<br>[-0.44, 0.13] | NA                     |          | 0.27<br>[-0.23, 0.77]  | -0.39<br>[-0.95, 0.18] | -0.22<br>[-0.66, 0.23] |          | -0.11<br>[-0.43, 0.21] | 1.58<br>[0.02, 3.14]   | -0.25<br>[-1.09, 0.59] |          |
| Slovenia       | 0.11<br>[0.02, 0.19]*  | 0.22<br>[0.14, 0.30]* |          | 0.15<br>[0.06, 0.24]*  | 0.13<br>[0.05, 0.21]*  |          | 0.13<br>[0.06, 0.19]*  | 0.17<br>[0.03, 0.32]*  |          | 0.15<br>[0.09, 0.21]*  | 0.04<br>[-0.24, 0.31]    |          | 0.11<br>[-0.04, 0.26]  | 0.13<br>[0.06, 0.20]*  | 0.24<br>[0.06, 0.41]*  |          | 0.13<br>[0.02, 0.24]*  | 0.20<br>[0.10, 0.30]*  | 0.09<br>[-0.01, 0.19]  |          | 0.07<br>[-0.10, 0.24]  | 0.17<br>[0.10, 0.24]*  | -0.11<br>[-0.34, 0.12] |          |
| Spain          | 0.07<br>[0.01, 0.14]*  | 0.21<br>[0.12, 0.29]* |          | 0.10<br>[0.03, 0.17]*  | 0.09<br>[0.01, 0.17]*  |          | 0.09<br>[0.03, 0.15]*  | 0.10<br>[-0.04, 0.25]  |          | 0.08<br>[0.02, 0.14]*  | 0.17<br>[0.04, 0.31]*    |          | 0.09<br>[0.03, 0.15]*  | 0.09<br>[-0.04, 0.22]  | 0.14<br>[-0.02, 0.30]  |          | 0.07<br>[-0.03, 0.18]  | 0.17<br>[0.08, 0.26]*  | 0.05<br>[-0.04, 0.13]  |          | 0.01<br>[-0.08, 0.10]  | 0.15<br>[0.07, 0.24]*  | 0.13<br>[0.02, 0.23]*  |          |
| Sweden         | 0.19<br>[0.02, 0.36]*  | 0.27<br>[0.19, 0.34]* |          | 0.13<br>[0.03, 0.23]*  | 0.32<br>[0.22, 0.41]*  |          | 0.25<br>[0.17, 0.33]*  | 0.14<br>[-0.00, 0.29]  |          | 0.22<br>[0.15, 0.30]*  | 0.24<br>[0.06, 0.41]*    |          | 0.23<br>[0.14, 0.33]*  | 0.15<br>[0.02, 0.28]*  | 0.33<br>[0.16, 0.51]*  |          | 0.25<br>[0.14, 0.35]*  | 0.19<br>[0.07, 0.31]*  | 0.25<br>[0.11, 0.39]*  |          | 0.08<br>[-0.10, 0.26]  | 0.23<br>[0.15, 0.30]*  | 0.72<br>[0.10, 1.33]*  |          |
| Switzerland    | 0.26<br>[0.15, 0.38]*  | 0.17<br>[0.09, 0.25]* |          | 0.24<br>[0.13, 0.34]*  | 0.13<br>[0.05, 0.22]*  |          | 0.17<br>[0.10, 0.25]*  | 0.21<br>[0.06, 0.35]*  |          | 0.20<br>[0.12, 0.27]*  | 0.17<br>[0.03, 0.32]*    |          | 0.23<br>[0.10, 0.36]*  | 0.19<br>[0.11, 0.27]*  | -0.05<br>[-0.30, 0.20] |          | 0.25<br>[0.14, 0.35]*  | 0.18<br>[0.06, 0.29]*  | 0.12<br>[-0.01, 0.24]  |          | 0.33<br>[0.19, 0.46]*  | 0.12<br>[0.04, 0.21]*  | 0.14<br>[-0.05, 0.34]  |          |
| USA            | 0.16<br>[0.12, 0.19]*  | 0.17<br>[0.13, 0.20]* |          | 0.14<br>[0.10, 0.17]*  | 0.20<br>[0.16, 0.23]*  |          | 0.19<br>[0.16, 0.22]*  | 0.12<br>[0.07, 0.16]*  |          | 0.17<br>[0.15, 0.20]*  | 0.17<br>[0.08, 0.26]*    |          | 0.22<br>[0.14, 0.30]*  | 0.15<br>[0.12, 0.18]*  | 0.14<br>[0.08, 0.20]*  |          | 0.19<br>[0.14, 0.23]*  | 0.16<br>[0.12, 0.20]*  | 0.15<br>[0.11, 0.19]*  |          | 0.17<br>[0.14, 0.21]*  | 0.15<br>[0.12, 0.19]*  | 0.19<br>[0.12, 0.27]*  |          |
| Overall        | 0.13<br>[0.10, 0.16]*  | 0.18<br>[0.16, 0.21]* | 0.018    | 0.14<br>[0.11, 0.17]*  | 0.15<br>[0.13, 0.18]*  | 0.639    | 0.15<br>[0.12, 0.17]*  | 0.15<br>[0.12, 0.17]*  | 0.968    | 0.15<br>[0.12, 0.17]*  | 0.16<br>[0.12, 0.20]*    | 0.576    | 0.15<br>[0.12, 0.18]*  | 0.14<br>[0.12, 0.17]*  | 0.16<br>[0.12, 0.21]*  | 0.685    | 0.15<br>[0.13, 0.18]*  | 0.15<br>[0.12, 0.18]*  | 0.14<br>[0.11, 0.17]*  | 0.813    | 0.13<br>[0.09, 0.17]*  | 0.16<br>[0.14, 0.19]*  | 0.14<br>[0.11, 0.17]*  | 0.211    |

Note: The average marginal effect with 95% confidence intervals for each country was separately estimated by the linear mixed model adjusted for all covariates (not including genetic risks) except the stratification variable. \* indicates statistical significance. The overall average marginal effect was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. Effect sizes were missing because the model failed to converge with the limited sample size of subpopulations in China and Poland, as well as the genetic data is not available in all countries except for England and USA. The two-sided Z-test was used to test whether the true effect size for each covariate except for genetic risk group is zero. Multivariate Wald test was used to test whether the interaction term between Internet use and genetic risk group improved model fit<sup>22,23</sup>. ADL = activities of daily living, PGS = polygenic scores, DS = depressive symptoms, SWB = subjective well-being.

Supplementary Table 8: (continued).

| Country        | Current smoking        |                        |          | Alcohol consumption    |                              |          | Physical activity status |                        |          | ADL disability         |                        |          | Chronic conditions     |                        |          | Depressive symptoms PGS |                                |                        |          | Subjective well-being PGS |                                 |                         |          |
|----------------|------------------------|------------------------|----------|------------------------|------------------------------|----------|--------------------------|------------------------|----------|------------------------|------------------------|----------|------------------------|------------------------|----------|-------------------------|--------------------------------|------------------------|----------|---------------------------|---------------------------------|-------------------------|----------|
|                | Current smoking        | No smoking             | <i>P</i> | Weekly alcohol use     | Less than weekly alcohol use | <i>P</i> | Physical inactivity      | Physical activity      | <i>P</i> | ADL disability         | No ADL limitation      | <i>P</i> | ≥1 chronic condition   | No chronic conditions  | <i>P</i> | Low genetic risk (DS)   | Intermediate genetic risk (DS) | High genetic risk (DS) | <i>P</i> | Low genetic risk (SWB)    | Intermediate genetic risk (SWB) | High genetic risk (SWB) | <i>P</i> |
| Austria        | 0.13<br>[-0.01, 0.27]  | 0.24<br>[0.17, 0.30]*  |          | 0.26<br>[0.18, 0.34]*  | 0.16<br>[0.07, 0.25]*        |          | 0.28<br>[0.05, 0.51]*    | 0.21<br>[0.14, 0.27]*  |          | -0.10<br>[-0.34, 0.14] | 0.22<br>[0.16, 0.28]*  |          | 0.22<br>[0.15, 0.30]*  | 0.25<br>[0.14, 0.37]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Belgium        | 0.12<br>[-0.01, 0.25]  | 0.10<br>[0.04, 0.15]*  |          | 0.13<br>[0.06, 0.19]*  | 0.06<br>[-0.02, 0.15]        |          | 0.33<br>[0.12, 0.53]*    | 0.08<br>[0.03, 0.14]*  |          | 0.25<br>[0.09, 0.41]*  | 0.08<br>[0.03, 0.14]*  |          | 0.12<br>[0.06, 0.18]*  | 0.07<br>[-0.04, 0.18]  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Brazil         | -0.09<br>[-0.24, 0.07] | 0.15<br>[0.08, 0.21]*  |          | 0.14<br>[0.02, 0.25]*  | 0.11<br>[0.04, 0.18]*        |          | 0.09<br>[-0.02, 0.20]    | 0.13<br>[0.06, 0.20]*  |          | 0.20<br>[-0.03, 0.42]  | 0.10<br>[0.04, 0.17]*  |          | 0.13<br>[0.05, 0.20]*  | 0.07<br>[-0.03, 0.17]  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| China          | -0.25<br>[-0.61, 0.11] | 0.15<br>[-0.05, 0.36]  |          | -0.18<br>[-0.62, 0.25] | 0.10<br>[-0.09, 0.30]        |          | 0.08<br>[-0.19, 0.35]    | 0.02<br>[-0.21, 0.26]  |          | 0.17<br>[-1.42, 1.77]  | 0.02<br>[-0.16, 0.21]  |          | 0.18<br>[-0.09, 0.44]  | -0.11<br>[-0.36, 0.14] |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Croatia        | 0.23<br>[-0.02, 0.48]  | 0.08<br>[-0.05, 0.21]  |          | 0.08<br>[-0.10, 0.26]  | 0.17<br>[0.01, 0.32]*        |          | 0.20<br>[-0.47, 0.87]    | 0.13<br>[0.02, 0.25]*  |          | -0.07<br>[-0.75, 0.61] | 0.14<br>[0.02, 0.25]*  |          | 0.08<br>[-0.07, 0.22]  | 0.21<br>[0.01, 0.41]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Czech Republic | 0.12<br>[0.02, 0.21]*  | 0.17<br>[0.12, 0.22]*  |          | 0.16<br>[0.10, 0.23]*  | 0.16<br>[0.10, 0.22]*        |          | 0.22<br>[0.05, 0.40]*    | 0.15<br>[0.11, 0.20]*  |          | 0.20<br>[0.04, 0.35]*  | 0.16<br>[0.11, 0.20]*  |          | 0.14<br>[0.09, 0.19]*  | 0.25<br>[0.15, 0.35]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Denmark        | 0.22<br>[0.04, 0.41]*  | 0.19<br>[0.09, 0.29]*  |          | 0.16<br>[0.06, 0.27]*  | 0.28<br>[0.12, 0.43]*        |          | 0.15<br>[-0.26, 0.56]    | 0.28<br>[0.11, 0.28]*  |          | 0.21<br>[-0.09, 0.52]  | 0.20<br>[0.11, 0.29]*  |          | 0.24<br>[0.14, 0.35]*  | 0.16<br>[-0.02, 0.34]  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| England        | 0.12<br>[-0.02, 0.26]  | 0.12<br>[0.07, 0.17]*  |          | 0.13<br>[0.07, 0.20]*  | 0.11<br>[0.03, 0.18]*        |          | 0.15<br>[0.03, 0.28]*    | 0.11<br>[0.06, 0.17]*  |          | 0.05<br>[-0.07, 0.17]  | 0.13<br>[0.08, 0.19]*  |          | 0.11<br>[0.05, 0.17]*  | 0.15<br>[0.05, 0.25]*  |          | 0.09<br>[-0.06, 0.24]   | 0.20<br>[0.12, 0.28]*          | 0.21<br>[0.06, 0.36]*  | 0.390    | 0.09<br>[-0.06, 0.24]     | 0.21<br>[0.12, 0.29]*           | 0.19<br>[0.04, 0.34]*   | 0.333    |
| Estonia        | 0.12<br>[0.03, 0.22]*  | 0.14<br>[0.10, 0.19]*  |          | 0.11<br>[0.00, 0.21]*  | 0.14<br>[0.10, 0.19]*        |          | 0.16<br>[0.02, 0.30]*    | 0.14<br>[0.09, 0.18]*  |          | 0.15<br>[0.04, 0.25]*  | 0.13<br>[0.09, 0.18]*  |          | 0.13<br>[0.09, 0.18]*  | 0.18<br>[0.08, 0.28]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| France         | 0.22<br>[0.05, 0.38]*  | 0.20<br>[0.13, 0.26]*  |          | 0.18<br>[0.10, 0.26]*  | 0.23<br>[0.13, 0.33]*        |          | 0.11<br>[-0.16, 0.39]    | 0.20<br>[0.13, 0.27]*  |          | -0.01<br>[-0.22, 0.21] | 0.22<br>[0.15, 0.28]*  |          | 0.20<br>[0.12, 0.28]*  | 0.24<br>[0.11, 0.37]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Germany        | 0.15<br>[0.04, 0.25]*  | 0.20<br>[0.14, 0.25]*  |          | 0.22<br>[0.15, 0.29]*  | 0.17<br>[0.10, 0.23]*        |          | 0.18<br>[-0.06, 0.41]    | 0.20<br>[0.15, 0.24]*  |          | 0.20<br>[0.09, 0.41]*  | 0.19<br>[0.14, 0.24]*  |          | 0.25<br>[0.11, 0.23]*  | 0.16<br>[0.16, 0.35]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Greece         | -0.00<br>[-0.14, 0.14] | -0.00<br>[-0.11, 0.10] |          | 0.03<br>[-0.08, 0.14]  | -0.08<br>[-0.22, 0.06]       |          | -0.69<br>[-1.19, -0.19]* | 0.00<br>[-0.08, 0.09]  |          | 0.12<br>[-0.45, 0.70]  | -0.02<br>[-0.10, 0.07] |          | -0.03<br>[-0.18, 0.11] | -0.03<br>[-0.13, 0.08] |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Israel         | -0.02<br>[-0.26, 0.23] | 0.10<br>[0.01, 0.20]*  |          | 0.11<br>[-0.17, 0.39]  | 0.07<br>[-0.02, 0.16]        |          | -0.05<br>[-0.33, 0.23]   | 0.10<br>[0.01, 0.18]*  |          | 0.20<br>[-0.15, 0.55]  | 0.07<br>[-0.02, 0.15]  |          | 0.19<br>[0.08, 0.30]*  | 0.01<br>[-0.13, 0.16]  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Italy          | 0.16<br>[0.02, 0.30]*  | 0.05<br>[-0.02, 0.12]  |          | 0.14<br>[0.05, 0.23]*  | 0.03<br>[-0.05, 0.11]        |          | 0.05<br>[-0.14, 0.23]    | 0.07<br>[0.01, 0.13]*  |          | 0.06<br>[-0.25, 0.38]  | 0.07<br>[0.01, 0.13]*  |          | 0.06<br>[-0.02, 0.14]  | 0.13<br>[0.03, 0.23]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Luxembourg     | 0.40<br>[0.13, 0.67]*  | 0.21<br>[0.11, 0.31]*  |          | 0.29<br>[0.17, 0.42]*  | 0.16<br>[0.01, 0.31]*        |          | -0.05<br>[-0.71, 0.62]   | 0.24<br>[0.15, 0.34]*  |          | 0.10<br>[-0.21, 0.40]  | 0.25<br>[0.15, 0.35]*  |          | 0.27<br>[0.15, 0.39]*  | 0.19<br>[0.02, 0.37]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Mexico         | 0.20<br>[0.11, 0.29]*  | 0.21<br>[0.18, 0.24]*  |          | 0.24<br>[0.17, 0.32]*  | 0.20<br>[0.17, 0.23]*        |          | 0.19<br>[0.15, 0.23]*    | 0.24<br>[0.19, 0.29]*  |          | 0.13<br>[0.06, 0.21]*  | 0.22<br>[0.19, 0.25]*  |          | 0.18<br>[0.15, 0.22]*  | 0.27<br>[0.21, 0.33]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Netherlands    | 0.11<br>[-0.19, 0.41]  | 0.17<br>[0.04, 0.30]*  |          | 0.12<br>[-0.04, 0.27]  | 0.28<br>[0.10, 0.45]*        |          | -0.17<br>[-0.78, 0.45]   | 0.19<br>[0.07, 0.31]*  |          | -0.13<br>[-0.63, 0.36] | 0.19<br>[0.07, 0.31]*  |          | 0.12<br>[-0.01, 0.26]  | 0.29<br>[0.06, 0.51]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Poland         | -0.06<br>[-0.61, 0.50] | -0.15<br>[-0.50, 0.20] |          | 0.06<br>[-0.31, 0.44]  | -0.07<br>[-0.44, 0.31]       |          | NA                       | -0.07<br>[-0.34, 0.20] |          | NA                     | -0.13<br>[-0.42, 0.15] |          | -0.17<br>[-0.57, 0.22] | 0.09<br>[-0.38, 0.55]  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Slovenia       | 0.27<br>[0.11, 0.42]*  | 0.12<br>[0.06, 0.19]*  |          | 0.06<br>[-0.02, 0.15]  | 0.21<br>[0.13, 0.29]*        |          | 0.17<br>[-0.05, 0.39]    | 0.14<br>[0.08, 0.20]*  |          | 0.03<br>[-0.23, 0.29]  | 0.15<br>[0.08, 0.21]*  |          | 0.11<br>[0.03, 0.18]*  | 0.22<br>[0.12, 0.33]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Spain          | 0.11<br>[-0.03, 0.24]  | 0.09<br>[0.03, 0.15]*  |          | 0.10<br>[0.02, 0.18]*  | 0.09<br>[0.02, 0.16]*        |          | 0.15<br>[-0.04, 0.34]    | 0.08<br>[0.03, 0.14]*  |          | 0.16<br>[-0.11, 0.44]  | 0.08<br>[0.03, 0.14]*  |          | 0.08<br>[0.08, 0.23]*  | 0.05<br>[-0.04, 0.13]  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Sweden         | 0.35<br>[0.16, 0.54]*  | 0.21<br>[0.14, 0.28]*  |          | 0.22<br>[0.12, 0.32]*  | 0.23<br>[0.13, 0.33]*        |          | 0.10<br>[-0.34, 0.53]    | 0.23<br>[0.16, 0.30]*  |          | 0.09<br>[-0.17, 0.35]  | 0.23<br>[0.16, 0.30]*  |          | 0.18<br>[0.10, 0.26]*  | 0.41<br>[0.27, 0.55]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| Switzerland    | 0.28<br>[0.13, 0.42]*  | 0.16<br>[0.09, 0.24]*  |          | 0.19<br>[0.11, 0.27]*  | 0.17<br>[0.06, 0.29]*        |          | 0.06<br>[-0.26, 0.38]    | 0.19<br>[0.12, 0.26]*  |          | 0.09<br>[-0.25, 0.43]  | 0.19<br>[0.13, 0.26]*  |          | 0.16<br>[0.08, 0.25]*  | 0.22<br>[0.10, 0.33]*  |          | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |
| USA            | 0.17<br>[0.11, 0.23]*  | 0.17<br>[0.14, 0.20]*  |          | 0.16<br>[0.12, 0.20]*  | 0.17<br>[0.14, 0.21]*        |          | 0.15<br>[0.08, 0.22]*    | 0.17<br>[0.14, 0.19]*  |          | 0.11<br>[0.04, 0.18]*  | 0.17<br>[0.15, 0.20]*  |          | 0.16<br>[0.13, 0.18]*  | 0.22<br>[0.16, 0.27]*  |          | 0.15<br>[0.08, 0.22]*   | 0.19<br>[0.15, 0.23]*          | 0.14<br>[0.07, 0.21]*  | 0.382    | 0.21<br>[0.14, 0.28]*     | 0.16<br>[0.12, 0.20]*           | 0.18<br>[0.11, 0.25]*   | 0.235    |
| Overall        | 0.15<br>[0.11, 0.18]*  | 0.15<br>[0.13, 0.17]*  | 0.909    | 0.16<br>[0.13, 0.18]*  | 0.14<br>[0.12, 0.17]*        | 0.517    | 0.16<br>[0.12, 0.19]*    | 0.15<br>[0.12, 0.17]*  | 0.943    | 0.13<br>[0.09, 0.16]*  | 0.15<br>[0.12, 0.17]*  | 0.415    | 0.15<br>[0.13, 0.17]*  | 0.17<br>[0.13, 0.22]*  | 0.318    | NA                      | NA                             | NA                     |          | NA                        | NA                              | NA                      |          |

Note: The average marginal effect with 95% confidence intervals for each country was separately estimated by the linear mixed model adjusted for all covariates (not including genetic risks) except the stratification variable. \* indicates statistical significance. The overall average marginal effect was pooled using the random-effect meta-analysis with a restricted maximum likelihood estimator. Effect sizes were missing because the model failed to converge with the limited sample size of subpopulations in China and Poland, as well as the genetic data is not available in all countries except for England and USA. The two-sided Z-test was used to test whether the true effect size for each covariate except for genetic risk group is zero. Multivariate Wald test was used to test whether the interaction term between Internet use and genetic risk group improved model fit<sup>22,23</sup>. ADL = activities of daily living, PGS = polygenic scores, DS = depressive symptoms, SWB = subjective well-being.

**Supplementary Table 9:** Subgroup analyses by Internet use measures in the meta-analysis.

| Internet use measures | AME (95% CI)         | $I^2$ | $\tau^2$ | $H^2$ | $P_{subgroup}$ |
|-----------------------|----------------------|-------|----------|-------|----------------|
| Depressive symptoms   |                      |       |          |       | <0.001         |
| Binary                | -0.08 [-0.10, -0.06] | 44.55 | 0.001    | 1.803 |                |
| Frequency-based       | -0.07 [-0.12, -0.02] | 0.00  | 0.000    | 1.00  |                |
| Household-level       | -0.23 [-0.26, -0.20] | 0.00  | 0.000    | 1.00  |                |
| Life satisfaction     |                      |       |          |       | 0.029          |
| Binary                | 0.08 [0.05, 0.10]    | 63.31 | 0.002    | 2.726 |                |
| Frequency-based       | -0.06 [-0.12, -0.01] | 0.00  | 0.000    | 1.00  |                |
| Household-level       | 0.08 [0.05, 0.11]    | 0.00  | 0.000    | 1.00  |                |
| Self-reported health  |                      |       |          |       | 0.388          |
| Binary                | 0.15 [0.12, 0.17]    | 70.93 | 0.002    | 3.440 |                |
| Frequency-based       | 0.12 [0.07, 0.17]    | 0.00  | 0.000    | 1.00  |                |
| Household-level       | 0.21 [0.18, 0.24]    | 0.00  | 0.000    | 1.00  |                |

Note: Internet use measures were binary in HRS, SHARE, CHARLS, and ELSI, household-level in MHAS, and frequency-based in ELSA. AME = average marginal effect, CI = confidence interval, HRS = Health and Retirement Study, ELSA = English Longitudinal Study on Ageing, ELSI = Brazilian Longitudinal Study of Aging, SHARE = Survey of Health, Ageing and Retirement in Europe, CHARLS = China Health and Retirement Longitudinal Study, MHAS = Mexican Health and Aging Study.

| Variable                | Harmonized value         | Measurements in six studies                                                                                                                                                                                       |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
|-------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
|                         |                          | HRS                                                                                                                                                                                                               | ELSA                                                                                                                                                                                                                                                      | SHARE                                                                                                                                                                                                             | MHAS                                                                                                                                                          | CHARLS                                                                                                                                              | ELSI-Brazil                                                                                                                                   |
| Exposures               |                          |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
| Internet use            | Yes                      | Do you regularly use the World Wide Web, or the Internet, for sending and receiving e-mail or for any other purpose, such as making purchases, searching for information, or making travel reservations?<br>• Yes | On average, how often do you use the Internet or email?<br>• Every day, or almost every day<br>• At least once a week (but not every day)<br>• At least once a month (but not every week)<br>• At least once every 3 months<br>• Less than every 3 months | Do you regularly use the World Wide Web, or the Internet, for sending and receiving e-mail or for any other purpose, such as making purchases, searching for information, or making travel reservations?<br>• Yes | Do you have Internet access at home?<br>• Yes                                                                                                                 | Have you used the Internet in the past month? And how often have you used the Internet?<br>• Almost daily<br>• Almost every week<br>• Not regularly | In the past 12 months, have you used the computer, including the Internet?<br>• Yes                                                           |
|                         | No                       | • No                                                                                                                                                                                                              | • Never                                                                                                                                                                                                                                                   | • No                                                                                                                                                                                                              | • No                                                                                                                                                          | • Not used                                                                                                                                          | • No                                                                                                                                          |
| Internet use frequency  | Daily                    | How often you use a computer for e-mail, Internet or other tasks?<br>• Daily                                                                                                                                      | On average, how often do you use the Internet or email?<br>• Every day, or almost every day                                                                                                                                                               | Not available                                                                                                                                                                                                     | Not available                                                                                                                                                 | Have you used the Internet in the past month? And how often have you used the Internet?<br>Almost daily                                             | Not available                                                                                                                                 |
|                         | Weekly                   | • Several times a week<br>• Once a week                                                                                                                                                                           | • At least once a week (but not every day)                                                                                                                                                                                                                |                                                                                                                                                                                                                   |                                                                                                                                                               | • Almost every week                                                                                                                                 |                                                                                                                                               |
|                         | Less than weekly         | • Several times a month<br>• At least once a month<br>• Not in the last month                                                                                                                                     | • At least once a month (but not every week)<br>• At least once every 3 months<br>• Less than every 3 months                                                                                                                                              |                                                                                                                                                                                                                   |                                                                                                                                                               | • Not regularly                                                                                                                                     |                                                                                                                                               |
|                         | Never                    | • Never/Not relevant                                                                                                                                                                                              | • Never                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |                                                                                                                                                               | • Not used                                                                                                                                          |                                                                                                                                               |
| Cumulative Internet use | Continuous (0–2)         | The number of biennial waves where participants used the Internet during the first two consecutive waves.                                                                                                         |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     | Not available                                                                                                                                 |
| Outcomes                |                          |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
| Depressive symptoms     | Continuous               | Center for Epidemiologic Studies Depression Scale (CES-D) [8 items] (ranging 0–8)                                                                                                                                 | CES-D [8 items] (ranging 0–8)                                                                                                                                                                                                                             | EURO-D scale [12 items] (ranging 0–12)                                                                                                                                                                            | CES-D [9 items] (ranging 0–9)                                                                                                                                 | CES-D [10 items] (ranging 0–30)                                                                                                                     | CES-D [8 items] (ranging 0–8)                                                                                                                 |
| Depression              | Yes                      | CES-D score $\geq 4$ <sup>13</sup>                                                                                                                                                                                | CES-D score $\geq 4$ <sup>13</sup>                                                                                                                                                                                                                        | EURO-D score $\geq 4$ <sup>14</sup>                                                                                                                                                                               | CES-D score $\geq 5$ <sup>15</sup>                                                                                                                            | CES-D score $\geq 10$ <sup>16</sup>                                                                                                                 | CES-D score $\geq 4$ <sup>17</sup>                                                                                                            |
|                         | No                       | CES-D score <4                                                                                                                                                                                                    | CES-D score <4                                                                                                                                                                                                                                            | EURO-D score <4                                                                                                                                                                                                   | CES-D score >5                                                                                                                                                | CES-D score <10                                                                                                                                     | CES-D score <4                                                                                                                                |
| Self-reported health    | Continuous               | Would you say your health is excellent, very good, good, fair, or poor? (reversely coded)                                                                                                                         | Would you say your health is excellent, very good, good, fair, or poor? (reversely coded)                                                                                                                                                                 | Would you say your health is excellent, very good, good, fair, or poor? (reversely coded)                                                                                                                         | Would you say your health is excellent, very good, good, fair, or poor? (reversely coded)                                                                     | Would you say your health is very good, good, fair, poor or very poor? (reversely coded]                                                            | In general, how would you evaluate your health? Very good or excellent, good, regular, bad, and very bad? (reversely coded)                   |
| Life satisfaction       | Continuous               | How satisfied are you with your life as a whole? (5-point scale)                                                                                                                                                  | I am satisfied with my life. (7-point scale)                                                                                                                                                                                                              | How satisfied are you with your life? (10-point scale)                                                                                                                                                            | I am satisfied with life. (3-point scale)                                                                                                                     | How satisfied are you with your life-as-a-whole? (5-point scale)                                                                                    | How do you evaluate the level of overall satisfaction with your life? (10-point scale)                                                        |
| Covariates              |                          |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
| Age, years              | Continuous               | The respondent’s age                                                                                                                                                                                              |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
| Gender                  | Male                     | The respondent’s gender                                                                                                                                                                                           |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
|                         | Female                   |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
| Marital status          | Married                  | Married or partnered                                                                                                                                                                                              |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
|                         | Unmarried                | Separated, divorced, widowed, or never married                                                                                                                                                                    |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
| Household size          | Continuous               | Number of people living in the household                                                                                                                                                                          |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
| Contact with others     | Weekly contact           | Whether the respondent contacts with any of their children, parents, relatives, and friends either in person or by phone, mail, or e-mail at least once a week in the past year?<br>• Yes                         | Whether the respondent contacts with any of their children, relatives, and friends either in person or by phone, mail or e-mail, or by text at least once a week?<br>• Yes                                                                                | Whether the respondent contacts with any of their children and parents, either in person, by phone, mail, e-mail, sms or mms at least once a week?<br>• Yes                                                       | Whether the respondent contacts with any of their children, relatives, and friends, either in person, by mail, or by telephone at least once a week?<br>• Yes | Whether the respondent contacts with any of their parents in person, or children either in person, by mail or e-mail at least once a week?<br>• Yes | In the past 12 months, have you kept contact with other people by letters, telephone, email, and/or social networks on the Internet?<br>• Yes |
|                         | Less than weekly contact | • No                                                                                                                                                                                                              | • No                                                                                                                                                                                                                                                      | • No                                                                                                                                                                                                              | • No                                                                                                                                                          | • No                                                                                                                                                | • No                                                                                                                                          |
| Education               | Primary                  | Less than upper secondary education                                                                                                                                                                               |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
|                         | Secondary                | Upper secondary & vocational training                                                                                                                                                                             |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
|                         | Tertiary                 | Tertiary education                                                                                                                                                                                                |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
| Household wealth        | Low: tertile 1           | The sum of all wealth components (including residence, vehicles, saving accounts, etc.) minus other debts at the couple level (the respondent and spouse, if any) in local currencies.                            |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
|                         | Middle: tertile 2        |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |
|                         | High: tertile 3          |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                     |                                                                                                                                               |

|                                                |                              |                                                                                                                                                                                                                                       |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |
|------------------------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Labor force status                             | Working                      | Working full-time or part-time                                                                                                                                                                                                        | Employed or self-employed                                                                                                                                                                | Employed or self-employed                                                                                                                                                                | Working                                                                                                                                  | Agricultural employed, agricultural self-employed, non-agricultural employed, non-agricultural self-employed, or non-agricultural unpaid family business                                                                                                                                                         | Worked with a monetary compensation in the last month                                                                                                                 |
|                                                | Retired                      | Partly retired or retired                                                                                                                                                                                                             | Partly retired or retired                                                                                                                                                                | Retired                                                                                                                                                                                  | Retired                                                                                                                                  | Retired                                                                                                                                                                                                                                                                                                          | Retired                                                                                                                                                               |
|                                                | Others                       | Unemployed, disabled, or not in the labor force                                                                                                                                                                                       | Unemployed, disabled, or looking after home or family                                                                                                                                    | Unemployed, permanently sick or disabled, or homemaker                                                                                                                                   | Unemployed, disabled, or not in the labor force                                                                                          | Unemployed or never worked                                                                                                                                                                                                                                                                                       | Was temporarily away from his/her job, looking for a job, waiting to be called for a job that had already been accepted, housewife, boarder, or others                |
| Current smoking                                | Yes                          | Whether the respondent smokes now.                                                                                                                                                                                                    |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |
|                                                | No                           |                                                                                                                                                                                                                                       |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |
| Alcohol consumption                            | Less than weekly alcohol use | In the last three months, on average, how many days per week have you had any alcohol to drink?<br>• 0 day/week                                                                                                                       | The number of days the respondent reported having an alcoholic drink in the last seven days.<br>• 0 day                                                                                  | Whether the respondent drinks weekly or has had an alcoholic drink during the last 7 days.<br>• No                                                                                       | The number of days per week the respondent drinks.<br>• 0 day/week                                                                       | The highest frequency of drinking behavior during the last year that the respondent reports for any one of the three types of alcohol (i.e., white liquor, whisky, and others; beer; wine or rice wine).<br>• Less than once a month<br>• Once a month<br>• Two to three days a month<br>• Once or twice a month | In the last 3 months, how many days of the week did you drink any alcoholic beverage?<br>• 0 day                                                                      |
|                                                | Weekly alcohol use           | • 1–7 day/week                                                                                                                                                                                                                        | • 1–7 day                                                                                                                                                                                | • Yes                                                                                                                                                                                    | • 1–7 day/week                                                                                                                           | • Once a week<br>• Daily<br>• Twice a day<br>• More than twice a day                                                                                                                                                                                                                                             | • 1–7 day                                                                                                                                                             |
| Physical inactivity                            | No                           | Frequency of taking part in vigorous or moderate physical activity.<br>• One to three times a month<br>• Once a week<br>• More than once a week<br>• Every day                                                                        | Frequency of taking part in vigorous or moderate physical activity.<br>• One to three times a month<br>• Once a week<br>• More than once a week                                          |                                                                                                                                                                                          | Whether the respondent has participated in hard physical work on average during the last two years, three or more times a week.<br>• Yes | Number of days of vigorous or moderate physical activity for at least 10 minutes.<br>• 1–7 day                                                                                                                                                                                                                   | Number of days of vigorous or moderate physical activity for at least 10 minutes.<br>• 1–7 day                                                                        |
|                                                | Yes                          | Hardly ever or never taking part in vigorous and moderate physical activity                                                                                                                                                           |                                                                                                                                                                                          |                                                                                                                                                                                          | • No                                                                                                                                     | • 0 day                                                                                                                                                                                                                                                                                                          | • 0 day                                                                                                                                                               |
| Number of chronic conditions                   | Continuous                   | Total number of chronic conditions, including hypertension, diabetes, cancer, chronic lung disease, heart problems, stroke, and arthritis. All these chronic conditions were ascertained through self-reported physicians’ diagnoses. |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |
| ADL                                            | Yes                          | Difficulties with any activities of daily living (ADLs), including dressing, bathing, eating, getting in and out of bed, using the toilet, and walking across a room.                                                                 |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          | Difficulties with any activities of daily living (ADLs), including dressing, bathing, eating, getting in and out of bed, using the toilet, and controlling urination and defecation.                                                                                                                             | Difficulties with any activities of daily living (ADLs), including dressing, bathing, eating, getting in and out of bed, using the toilet, and walking across a room. |
|                                                | No                           | No difficulty with all ADLs.                                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |
| IADL                                           | Continuous                   | Number of limitations on instrumental activities of daily living (IADLs), including managing money, taking medications, shopping for groceries, preparing meals, and using the phone. (0–5)                                           | Number of limitations on IADLs, including managing money, taking medications, shopping for groceries, preparing meals, using the phone, and doing work around the house or garden. (0–6) | Number of limitations on IADLs, including managing money, taking medications, shopping for groceries, preparing meals, using the phone, and doing work around the house or garden. (0–6) | Number of limitations on IADLs, including managing money, taking medications, shopping for groceries, and preparing meals. (0–4)         | Number of limitations on IADLs, including managing money, taking medications, shopping for groceries, preparing meals, and cleaning house. (0–5)                                                                                                                                                                 | Number of limitations on IADLs, including managing money, taking medications, shopping for groceries, preparing meals, and using the phone. (0–5)                     |
| Country-level factors                          |                              |                                                                                                                                                                                                                                       |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |
| Gross domestic product per capita (2022), US\$ |                              |                                                                                                                                                                                                                                       |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |
| Gini index (2018–2021)                         |                              |                                                                                                                                                                                                                                       |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |
| World happiness index (2023)                   |                              |                                                                                                                                                                                                                                       |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |
| Hofstede’s index                               |                              |                                                                                                                                                                                                                                       |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |
| Healthy life expectancy at birth (2019), years |                              |                                                                                                                                                                                                                                       |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |
| Internet use rate (2021–2022)                  |                              |                                                                                                                                                                                                                                       |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |
| Digital skills among active population (2019)  |                              |                                                                                                                                                                                                                                       |                                                                                                                                                                                          |                                                                                                                                                                                          |                                                                                                                                          |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |

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