Health and income: a meta-analysis to explore cross-country, gender and age differences

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Background: Evidence of an effect of income on self-reported poor health (SRPH) is widely available in the literature. We compare this effect across age, different countries and between men and women using meta-analysis. Studies that report on an effect of income lack a homogenous effect size. To overcome this problem we propose a method to derive a homogenous effect size to enable us to compare the effect of income across groups. Methods: We take a meta-analytical approach to examine the effect of income on SRPH. The data consists of reported and calculated odds ratios as a measure of effect for SRPH outcomes across different income categories. Self-reported health outcomes are dichotomised into ‘good’ and ‘poor’. With least-squares techniques, we estimate the functional parameters that describe the log-linear association between income and SRPH. Subsequently, F-tests are performed to show variations between the groups. Results: The relationship between income and SRPH is log-linear for most countries but not significantly for Sweden and the Netherlands. Our results show significant differences in the effect of income between countries. We find that men require a higher income than women to achieve comparable SRPH outcomes, and that the effect of income depends on age. Conclusions: There is significant income related variation in SRPH between different countries even if the levels of income or the standards of living are comparable. For women income affects SRPH differently than for men. The effect of income on SRPH depends on the age of the individual respondent.

Keywords: age, country differences, gender, income, meta analysis, self-reported health

Introduction

Evidence of a relationship between health status and income is widely available.¹⁻⁶ Most studies use aggregate data and show a positive association with better health among the higher income groups. An extensive literature review on the income effects on health from studies using individual data shows that individual level studies are ambivalent about an income effect.⁷ The goal of this study is to summarize an overall effect of income on self-reported poor health (SRPH) using information from individual level studies in a meta-analysis. The individual level studies show different approaches to measurement and reporting procedures for the key variables: some simply report descriptive statistics, while others find proof of an effect using more advanced analytical techniques. Altogether, it is clear that these studies on health and income lack a homogenous effect size that is needed for a meta-analysis.⁸ Our data collection method consists of a systematic literature search on the topic of health and income and uses a framework for combining results of different types of analysis. The basic principle underlying our approach is to collect published information on SRPH occurrence across income groups that include reported odds ratios (ORs) as well as descriptive statistics that allow for the ex post calculation of ORs.

The database thus contains homogenous effect sizes for different countries. This allows for cross-country comparisons of SRPH across income categories. Some studies show that men and women perceive their health differently, while others do not.⁹,¹⁰ Therefore we compare SRPH outcomes across income categories between men and women. SRPH varies with age.¹¹ So, we also investigate the role of controlling for age.

Methods

Self-reported health is one of the most commonly employed indicators of overall individual health. It is an answer to the question ‘How is your health in general?’ often with five response categories ranging from ‘excellent’ to ‘bad/very poor’.

Because the topic addressed in this study is interdisciplinary, sources in medicine, health, psychology, social sciences and economics were included. The search covered the major bibliographic databases. The terms ‘income’ and ‘subjective health’ or ‘self-reported health’ or ‘self-reported poor health’ or ‘self-assessed health’ or ‘self-rated health’ were used to initially identify 196 titles.

Studies addressing health-using questionnaires that also measure depression, anxiety and stress as well as studies
addressing body weight or body mass, mortality, non-modifiable health and functional conditions in relation to income were excluded (dropping 90 articles). Reports using aggregated data and studies devoted to national, regional and neighbourhood level reporting on deprivation were excluded as well as purely descriptive and summarizing articles (dropping 79 articles). For inclusion in this study, 24 articles containing SRPH outcomes in relation to household income at the individual level were retained. They either reported ORs as effect size or provided descriptive statistics on frequencies of SRPH outcomes for specific income categories from which ex post ORs were calculated.

Data
To accommodate the requirement of a homogenous effect size on the one, and to fully exploit the information available in the literature on the relationship between income and health on the other hand, an adapted meta-analytical procedure is developed. The reported effect sizes are ORs for frequencies of SRPH across different income groups with the highest income category serving as reference category. All selected studies in the database used the self-reported health measure with five possible answers (excellent, very good, good, poor or bad/very poor). In this study the self-reported health outcomes per study were dichotomized into ‘good’ health (excellent, very good and good) and ‘poor’ health (poor and bad/very poor). The latter are collectively referred to as SRPH throughout the text.

In this article the measure of income is at the household level relative to the distribution across income quantiles. Some articles report more than one observation per income group. For example, one article reports on trends in socio-economic health inequalities in the Netherlands from 1981 to 1999 in six 3-year intervals with SRPH frequencies reported for income groups in quintiles for men and women separately.

These articles report at least one observation per income group per country while some studies report effect sizes for men and women separately. Dummy variables are added to the database to distinguish between studies that have controlled for certain socio-economic confounders such as sex and age.

Most studies categorize income on the basis of quartiles, quintiles or percentiles ($n = 24$). However, a number of studies use real household income in categories ($n = 10$). These were converted into percentiles based on the number of respondents in each reported category before adding to the database. This requires an extended method of the traditional OR statistic calculation that compares two groups in terms of relative odds that is best described as an extendable $2^x$ ($2 + x$) tables for the calculation of ORs for more than 2 categories with $x$ denoting the additional number of groups to be compared to the reference group.

The data consists of stratified effect sizes of SRPH per income group for men and women, for different countries, as well as for differences in reported ORs from studies that do and do not control for age. There is limited consistency in using controls, such as gender or age, in the various studies included in the data. In order to use the maximum amount of information available in the literature the various analyses do not allow multivariate estimation of different control variables simultaneously.

Statistical analysis
There are two ways in which income could be causally related to health: through a direct effect that determines the necessary needs for mere survival, and an indirect effect as the opportunity to control life circumstances. Recent studies provide evidence that socio-economic status (e.g. measured by income or relative income) predicts health and mortality. The functional form of the relationship between income and health is found to be partially causal and curve linear. We use least squares techniques to estimate the functional form parameters that describe the association between income and SRPH. In general, the relationship that describes the data for income and SRPH income most closely yields,

$$\ln(\text{OR}) = \alpha_0 + \alpha_1 \times y/100$$

(1)

with $\alpha_0$ indicating the parameter value for the intercept, $\alpha_1$ the parameter value for the slope, and $y$ represents income that is measured in percentiles, with the highest income standardized to 100, such that $y/100 \in [0; 1]$; $\alpha_0$ represents the difference in ln(OR) between the lowest ($y = 0$) and the highest ($y = 100$) income categories, averaged over all studies included in the analysis; $\alpha_1$ represents the strength of the linear relationship between ln(OR) and income. A steeper downward slope—$\alpha_1$ getting more negative—implies larger differences of SRPH outcomes between the reference group (highest income group) and preceding lower income groups. In the literature, this is referred to as the ‘effect’ size of income on self-reported health.

Due to the definition of the reference group the line described by equation (1) will go through the point with coordinates $[y/100, \ln(\text{OR})] = [1; 0]$ on the horizontal axis. Therefore, the following theoretical relationship holds $H_0$: $\alpha_0 + \alpha_1 = 0$. Deviations from log-linearity may be due to within-group unobserved heterogeneity, and will imply that no statistical support may be found for $H_0$.

Consequently, prior to each regression analysis we test the data for log-linearity with $H_0$: $\alpha_0 + \alpha_1 = 0$.

Model (1) is used to study possible differences of income effects on SRPH between men and women as well as between the different countries included in this study. The income effect of age on SRPH is investigated comparing two separate data sets: one data set contains all observations from studies that report ORs or SRPH ‘before’ having controlled for age. The other data set contains all observations from studies that report ORs ‘after’ having controlled for age (i.e. holding age constant). We use $F$-tests to analyse the three principle hypotheses.

Hypothesis on gender equality:
The effect of income on SRPH is the same for men and for women. These yields,

$$H_0: \frac{\alpha_1,\text{male}}{\alpha_1,\text{female}} = 1$$

(2)

Hypothesis on equanimity across countries:
The effect of income on SRPH is the same across countries. These yields,

$$H_0: \frac{\alpha_1,\text{country}(i)}{\alpha_1,\text{country}(j)} = 1, \quad i \neq j.$$  

(3)

Hypothesis on timelessness:
The age effect of income on SRPH is refutable. These yields,

$$H_0: \frac{\alpha_1,\text{NCA}}{\alpha_1,\text{CA}} = 1$$

(4)

and is computed on the basis of a comparison between observations with age held constant (CA) and observations without age held constant (NCA). All statistical tests were performed using STATA 10.0. Prior to regression analysis the consistency of the data was investigated using mean OR per study as dependent and the inverse of the sample size as the independent variable $(1/N)$.21
Results

No asymmetry in the funnel plot of \(1/N\) against the ORs was observed. Figure 1 provides a plot of all ORs per income category and shows the well-known inverse relationship between SRPH and income, such that the probability of SRPH decreases when income increases.

The \(F\)-test for \(H_0: \alpha_0 + \alpha_1 = 0\) yields 5.17 with a \(P\)-value of 0.023. From this, we conclude that we cannot reject \(H_0\) of log-linearity at a 5% level, but we can reject \(H_0\) at a 1% level. Table 1 presents the parameter values for each country represented in our data. \(F\)-tests of \(H_0\) show that the effect of income on SRPH is log-linear for most countries, except for the Netherlands where \(H_0\) can be rejected at a 5% level, but not at a 1% level, and for Sweden where \(H_0\) is rejected at a 1% level.

We find large country differences of effects of income for the various countries in our data set. For example, the effects of income on SRPH between the USA (\(\alpha_1 = -1.722\)) and Britain (\(\alpha_1 = -0.858\)) deviate substantially. The \(F\)-test for equality between the two countries (\(H_0: \alpha_1(\text{USA})/\alpha_1(\text{Britain}) = 1\)) yields 20.35 (\(P\)-value = 0.000) so that the null is rejected in favour of \(|\alpha_1(\text{USA})| > |\alpha_1(\text{Britain})|\). The ratio of the slopes describing the relationship between income and SRPH for US Americans and British citizens is \(-1.722\)\(-0.858 = 2.01\). This result must be interpreted as follows. SRPH refers to self-reported poor health.

Figure 1 Effect of income on self-reported poor health. Effect of income per category in percentiles on the probability of self-reported poor health

Table 1 Regression estimates (intercept and slope) for linear income effects on self-reported poor health for different countries

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept ((\alpha_0))</td>
<td>0.840</td>
<td>0.393</td>
<td>1.264</td>
<td>0.895</td>
<td>0.793</td>
<td>0.661</td>
<td>0.483</td>
<td>1.675</td>
<td>1.106</td>
<td>0.451</td>
<td>0.840</td>
<td>1.100</td>
<td>1.674</td>
</tr>
<tr>
<td>((0.030^a))</td>
<td>(0.134) ((0.327)^a)</td>
<td>(0.074) ((0.085)^a)</td>
<td>(0.051) ((0.074)^a)</td>
<td>(0.117) ((0.038)^a)</td>
<td>(0.239) ((0.067)^a)</td>
<td>(0.067) ((0.036)^a)</td>
<td>(0.096) ((0.042)^a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slope ((\alpha_1))</td>
<td>-0.858</td>
<td>-0.543</td>
<td>-1.231</td>
<td>-1.005</td>
<td>-0.881</td>
<td>-0.643</td>
<td>-0.731</td>
<td>-1.673</td>
<td>-1.190</td>
<td>-0.273</td>
<td>-0.885</td>
<td>-1.200</td>
<td>-1.722</td>
</tr>
<tr>
<td>((0.053))</td>
<td>(0.234) ((0.620)^a)</td>
<td>(0.129) ((0.148)^a)</td>
<td>(0.089) ((0.159)^a)</td>
<td>(0.204) ((0.066)^a)</td>
<td>(0.417) ((0.117)^a)</td>
<td>(0.063) ((0.172)^a)</td>
<td>(0.074)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(F)-test ((a))</td>
<td>0.37</td>
<td>1.25</td>
<td>0.01</td>
<td>2.22</td>
<td>1.08</td>
<td>0.13</td>
<td>5.70</td>
<td>0.00</td>
<td>4.87</td>
<td>0.55</td>
<td>0.45</td>
<td>7.41</td>
<td>0.52</td>
</tr>
<tr>
<td>(P)-value</td>
<td>0.54</td>
<td>0.28</td>
<td>0.94</td>
<td>0.16</td>
<td>0.32</td>
<td>0.72</td>
<td>0.063</td>
<td>0.99</td>
<td>0.031</td>
<td>0.49</td>
<td>0.55</td>
<td>0.007</td>
<td>0.64</td>
</tr>
<tr>
<td>(N)</td>
<td>196</td>
<td>16</td>
<td>17</td>
<td>16</td>
<td>16</td>
<td>117</td>
<td>7</td>
<td>20</td>
<td>70</td>
<td>8</td>
<td>5</td>
<td>205</td>
<td>84</td>
</tr>
<tr>
<td>RSS</td>
<td>9.19</td>
<td>0.96</td>
<td>9.85</td>
<td>0.29</td>
<td>0.38</td>
<td>8.39</td>
<td>0.06</td>
<td>1.20</td>
<td>1.66</td>
<td>0.65</td>
<td>0.02</td>
<td>13.640</td>
<td>17.06</td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.41</td>
<td>0.28</td>
<td>0.208</td>
<td>0.821</td>
<td>0.716</td>
<td>0.314</td>
<td>0.809</td>
<td>0.789</td>
<td>0.827</td>
<td>0.067</td>
<td>0.950</td>
<td>0.639</td>
<td>0.549</td>
</tr>
</tbody>
</table>

a: Standard Error in brackets
b: Testing for log-linearity

Bri, Britain; Bul, Bulgaria; Can, Canada; EGe, former East-Germany; Est, Estonia; Fin, Finland; Jap, Japan; Lat, Latvia; Neth, Netherlands; Rus, Russia; Sco, Scotland; Swe, Sweden; USA, USA; WGe, former West-Germany.

Similar comparisons can be made for other countries. For example, we can compare Scotland (\(\alpha_1 = -0.885\)) and England (\(\alpha_1 = -0.858\)). This renders a ratio of \(-0.885/\(-0.858 = 1.03\). Apparently SRPH is the same across income groups in Scotland and England. The \(F\)-test of \(H_0: \alpha_1(\text{Scotland})/\alpha_1(\text{Britain}) = 1\) yields 2.19 (\(P\)-value = 0.039) indicating identical probabilities for SRPH across income groups in Scotland and England.

In a third example we compare Russia (\(\alpha_1 = -0.273\)) to the US (\(\alpha_1 = -1.722\)). The ratio of the slopes yields 0.159 with an inverse of 6.31. This implies that in the US people earn 6.3 times more to report similar SRPH compared to people in Russia. The \(F\)-test of \(H_0: \alpha_1(\text{Russia})/\alpha_1(\text{US}) = 1\) yields 5.98 (\(P\)-value = 0.016) so that the null-hypothesis is rejected in favour of \(|\alpha_1(\text{Russia})| < |\alpha_1(\text{US})|\).

Finally, we compare former East Germany (\(\alpha_1 = -1.005\)) and West Germany (\(\alpha_1 = -0.777\)), and find a ratio of \(-1.005/-0.777 = 1.30\). The \(F\)-test of \(H_0: \alpha_1(\text{E-Germany})/\alpha_1(\text{W-Germany}) = 1\), however, yields 2.19 with a \(P\)-value of 0.159. This means that the people in former East Germany report the same SRPH as the people in former West Germany, despite an apparent ostensible 30% points income arrears at the lowest level of income in former East Germany. The null-hypothesis of equal health across income groups cannot be rejected.

Table 2 shows the results for comparing the income effects for men and women separately. \(F\)-tests of the null-hypotheses that the effect of income on SRPH can be described as in equation (1) for both men and women show that log-linearity is rejected for men at a 5% level but not at a 1% level, while for women the log-linear relationship between income and SRPH is not rejected. The slope parameter values are \(\alpha_1 = -0.110\) and \(\alpha_1 = -0.878\), respectively. The \(F\)-test of the null-hypothesis \(H_0: \alpha_1(\text{male})/\alpha_1(\text{female}) = 1\) yields 6.11 with \(P\)-value 0.014. The null-hypothesis is rejected in favour of \(|\alpha_1(\text{male})| > |\alpha_1(\text{female})|\). Men who report similar levels of SRPH as women dwell in higher income categories. The ratio of the slopes describing the relationship between income and SRPH for men and women (\(\alpha_1(\text{male})/\alpha_1(\text{female}) = (1.110)/(-0.878) = 1.26\) and is significantly different from one. Thus we find a large difference in income effect on SRPH between men and women. To obtain similar levels of SRPH men’s income is 26% point higher than that of women.

The data also includes effect sizes for the association between income and SRPH that have been controlled for age. Table 3 shows the results. The \(F\)-test of \(H_0: \alpha_1(\text{NCA})/\alpha_1(\text{CA}) = 1\) yields 26.03 (\(P\)-value = 0.000). The ratio between effect sizes that have not been controlled for age and that have been controlled for age yields \((\alpha_1(\text{NCA})/\alpha_1(\text{CA}) = (-1.291)/(-0.938) = 1.38\) and is significantly different from 1. This indicates that \(|\alpha_1(\text{NCA})| > |\alpha_1(\text{CA})|\) so that a significant effect of age is found.
on the income effect of SRPH. Controlling for age alone reduces the income effect on SRPH by 38% points.

Discussion

A report of the World Health Organisation’s Commission on Social Determinants of Health argues for a link between economic, social and physical well-being within and between countries.20 ‘The commission firmly draws the arrow of causality from impoverished environments to ill health, something that is clear to most of the world’s population’.22 A recent health vulnerability analysis identifies large sub-regional differences in health status and health vulnerability.23 One of the clearest messages from the literature is that health and wealth are mutually determined.19

Our study provides a quantitative analysis of results from studies that use individual data to examine the effect of income on SRPH. First, we show that the assembly of a data set that includes reported as well as ex post calculated probability effect sizes makes it possible to include more studies in the meta-analysis than otherwise would be possible. We confirm that a negative correlation between income and SRPH exists with the highest SRPH outcomes in the lowest incomes categories.

The relationship between income and SRPH is best described as log-linear. Such a model assumes a constant change in the proportion of incidence in SRPH outcomes across the income deciles. The slope of the log-linear relationship between income and SRPH indicates the strength of this relationship: a steeper downward or negative slope implies a large difference in SRPH outcomes between the reference group and preceding lower income groups. The parameters of the model are to be interpreted as the proportionate change in the incidence of SRPH by a proportionate change in income per group.

The shape of the relationship between income and SRPH has been much debated. But the majority of studies confirm the curve linear association.23–26 The issue of shape could be important. It may help to provide further insight to better understand the health returns of the direct effects of income across subgroups and time. Changes over time in both income and health distributions may mean that observations for the same country might be subject to a time-trend.22 This could help, for example, explaining the deviation from log-linearity at a 5% level for 2 out of the 13 countries in the data set, viz. Sweden and the Netherlands.

We have used effect size measures of the relationship between income and SRPH from 13 different countries. We report large country differences and the results show that the association between income and SRPH varies in strength per country. For example, compared to Britain, US citizens earn twice as much to obtain the same level of SRPH outcomes. A recent study confirms the observed discrepancy between health outcomes in England and the US.27 The observations for Scotland show equal SRPH outcomes over income compared to Britain. This is a surprising result given that Scotland reports more health inequality and more poverty than Britain.28 Comparing observations from the Russian Federation to those from the USA we find that individuals in the USA have an income that is at least six times higher to obtain comparable good health outcomes. This suggests that the level of income as well as the standard and cost of living are driving these results. A study on regional income inequality in Russia shows that a rise in income inequality does not affect men’s SRPH outcomes as long as the level of inequality is not big. When inequality levels increase the SRPH outcomes are negatively affected.29 Thus, we show that the effects of income on SRPH differ per country. In this study it is impossible to distinguish between direct and indirect effects of income. In any case, income is an issue in relation to SRPH because it is an indicator for something related to health.18 The results in this study clearly show an effect of income effect within each country. The strength of this effect differs per country.

In meta-analysis the possibility to control for differential item functioning is limited. It probably means something very different to have poor health in Bulgaria than in the USA. Our method of relative scaling of income must therefore be interpreted as ‘relative’ income differences comparisons. Moreover, if it is considered normative for a healthy person in one country to report ‘average’ health (three on the scale of five), this might have an effect on the estimated slope. It is precisely for this reason why we have chosen to dichotomize the measure of SRPH into good versus poor self-reported health.

Income could impact health both directly and indirectly. Different type of welfare systems have different health outcomes in relation to income.30 Other than differences in income characteristics countries are also distinct in terms of

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### Table 2 Regression estimates (intercept and slope) for linear effects of income on self-reported poor health for men and women

<table>
<thead>
<tr>
<th></th>
<th>All observations</th>
<th>Men</th>
<th>Women</th>
<th>F-test $H_0$: $\beta_{1,\text{male}} = 1$</th>
<th>$\beta_{1,\text{female}} = 1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept ($\beta_0$)</td>
<td>1.005 (0.024)*</td>
<td>1.043 (0.033)*</td>
<td>0.850 (0.039)*</td>
<td>F(1, 611) = 6.11; $P$-value 0.014</td>
<td>1.26 (0.034)*</td>
</tr>
<tr>
<td>Slope ($\beta_1$)</td>
<td>$-1.060 (0.041)^*$</td>
<td>$-1.110 (0.057)^*$</td>
<td>$-0.878 (0.043)^*$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RSS</td>
<td>92.968</td>
<td>23.817</td>
<td>28.840</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$N$</td>
<td>813</td>
<td>298</td>
<td>317</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.447</td>
<td>0.557</td>
<td>0.411</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### Table 3 Regression estimates for the linear effect of controlling for age on self-reported poor health in relation to income

<table>
<thead>
<tr>
<th></th>
<th>Not controlled for age (NCA)</th>
<th>Controlled for age (CA)</th>
<th>F-test $H_0$: $\beta_{1,\text{NCA}} = 1$</th>
<th>$\beta_{1,\text{CA}} = 1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept ($\beta_0$)</td>
<td>1.187 (0.041)*</td>
<td>0.909 (0.028)*</td>
<td>F(1, 809) = 26.03; $P$-value 0.000</td>
<td>1.38 (0.031)*</td>
</tr>
<tr>
<td>Slope ($\beta_1$)</td>
<td>$-1.291 (0.074)^*$</td>
<td>$-0.938 (0.049)^*$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RSS</td>
<td>32.249</td>
<td>56.857</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$N$</td>
<td>272</td>
<td>547</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.531</td>
<td>0.410</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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*a Standard Error in brackets

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their social policies, health services systems and other characteristics.33 Comparing country characteristics to understand the circumstances and thresholds for mere survival and participation and control may help to better understand the observed cross-country differences.

In this study we compare the income effect for men and women and find that men compared to women require a higher income to provide equivalent outcomes—given income women report better health. This is noteworthy since men and women consider the same factors when asked to judge their health.9 The difference in income related SRPH may be explained in relation to income related values and traditions. We use household income as the measure of income and given culture specific roles of men and women as contributors toward the household income it may be useful to consider these in the interpretation of SRPH outcomes in relation to direct and indirect income. Compared to men, women more often do well in the lower income groups. This triggers the idea of an effect of relative expected income differences relative to those of other women rather than to absolute earnings differences compare to men.32 So far only two studies have reported on the importance of direct income on SRPH outcomes for men.5

A comparative study of an income effect on SRPH between Britain and Finland shows that low-household income is related to poor health. After adjusting for socio-economic characteristics this income effect remains strong for men and weakens for British women whereas it disappears for Finish women.14 This finding shows a different effect of income on SRPH for women in Britain than in Finland. There are substantial inequalities in SRPH among men and women across countries, even if the levels of income are comparable.4 So the reported effect sizes are often considered as one of the explanatory determinants in multivariate models.36 The data in this study however are a multivariate model. This however is beyond the scope of this article.26

Household income measures are usually less common that individual income or wage data. It is likely that the income concept used in this article varies across studies. If this variation varies over time systematically by country it could bias the results. A time varying panel data analysis could control for this. This however is beyond the scope of this article.

We also scrutinized the consequences of controlling for age. It is the major demographic determinants for SRPH and is often considered as one of the explanatory determinants in multivariate models.36 The data in this study however are a colourful collection of observations. The reported effect sizes may have controlled for a varied collection of determinants of unobserved heterogeneity such as age and sex. The ex post observations in the data however have not been controlled for any confounding variables and we find that controlling for age explains 38% points of the observed income effect on SRPH.

Conflicts of interest: None declared.

Key points
- A comparative meta-analysis of the income effects on SRPH is not available in the literature.
- The strength of the effect of income on SRPH varies across countries, even if the levels of income are comparable.
- Income affects SRPH differently for men and women.
- The effect of income on SRPH depends on the age of the individual respondent.

References


