

12 Slipping into poverty: effects on mental and physical health

-
- ▶ The strong cross-sectional correlation of poverty and health decreases in a longitudinal perspective
 - ▶ Slipping into poverty has (at least) a short-term impact on mental health but not on physical health
 - ▶ Mental health is more strongly associated with material deprivation than with income poverty, both in a cross-sectional and in a longitudinal perspective
 - ▶ To reduce poverty-related inequalities in (mental) health, policies should not only consider income but a more broadly concept of poverty
-

12.1 Poverty and health

Financial resources are an important factor for social inclusion but also for many other parts of life. A lack of income and wealth is associated with adverse life circumstances of which poor health is one of the more serious issues. This relation between low levels of wealth and income and poor health is well documented (e.g. Mackenbach et al. 2005, Braveman et al. 2010). The relationship appears quite strong in analyses using cross-sectional data whereas it diminishes considerably in a longitudinal perspective (Jones & Wildmann 2008, Gunasekara et al. 2011). Nevertheless, studies with longitudinal design which assess mental health (see McKenzie et al. 2014) as well as subjective physical health (see Gunasekara et al. 2013) report a moderate short-term impact of slipping into poverty.

In addition, previous studies have shown that in particular poverty measures that are not based on income correlate with health (e.g. Adena & Myck 2014). Relative income poverty – measured by own income in relation to a society's income distribution – is an indicator for financial resources. However, also wealth and individual living standard (i.e. consumption habits) are relevant for the economic condition and its perception. Therefore, the concept of material deprivation can be useful to catch poverty more broadly (see chapter 4 in this volume).

There are several explanations for the relationship between income and health. On the one hand it is claimed that higher income results in better health due to the possibility to afford a healthier lifestyle (in particular food and accommodation). On the other hand reverse causality is possible, i.e. healthy persons are more likely to perform better in the labour market and hence have a higher income. Another

explanation is that income and health are connected indirectly. Socioeconomic, cultural, or biological background variables might affect both income and health, mediated through, for example, career opportunities and health behaviour (such as diet, smoking, physical activity, and use of medical care).

This study compares the poverty-health-link in cross-sectional and longitudinal data. While cross-sectional analyses inform us about the correlation of health and being poor, causal inference rests on rather strong assumptions, even when controlling for observable possible confounders. Longitudinal analyses offer the advantage to effectively control for all unobserved characteristics of individuals stable over time. Exploiting the longitudinal information of the SHARE data with appropriate methods to assess the poverty effect on health thus in general increases the confidence in a causal interpretation of the found effect. An additional feature of this study is the use of an objective health measure. Since studies using such measures are rare, this may also lead to new insights into the relationship of poverty and health.

To identify the causal effect of poverty on health it is further necessary to rule out the possibility of reverse causality. Partly this can be achieved by conducting the analyses with a sample that consists of retired persons only. In doing so, it is possible to rule out that changes in health affect the individual income. If estimates based on the full and the reduced sample are similar, this might serve as an indication of the relative unimportance of such a pathway and strengthen the causal interpretation of the found effect. Still, there can be financial consequences that come along with illness so that the state of health does not influence income but expenditures.

12.2 Data and methods

Cross-sectional analyses in this chapter use data from SHARE Wave 5 (release 0). In addition, waves 2 and 4 of SHARE are used for longitudinal analyses on the effects on mental and physical health of slipping into and out of poverty in old age, as information on poverty status is only partly available for waves 1 and 3. Poland did not participate in SHARE Wave 5 but is included in the longitudinal analyses with its previous waves. Luxembourg is included in the cross-sectional analyses only as it participated for the first time in SHARE Wave 5. For all other countries two or three waves are available, with a maximum time span of seven years. Therefore, the effects of changes in poverty status using longitudinal methods are considered as short-term effects, compared to effects that evolve over the whole life course.

To get an impression of the dimension of poverty and its relationship to health, descriptive (cross-sectional) statistics of the SHARE Wave 5 data are shown in the next two sections. Afterwards, to compare the effects of poverty on health in cross-sectional and longitudinal models, results from linear regression (OLS) and fixed-effects regression models are contrasted. Models were computed in a four-step procedure. First, a bivariate OLS regression was calculated. In the second step the country in which respondents live was added as a control. The third OLS model additionally controlled for other important factors of health: age, gender, partner in household, household pay rent, employment status, and education. In the last step fixed-effects models were used to reveal the effects of *changes* in poverty status. Age, partner in household, paying rent, and employment status are included as controls in these models. By using the fixed-effects-method time-constant unobserved heterogeneity is eliminated. Only within-individual changes contribute to the analysis. In addition, to address the issue of possible reverse causality, the same analyses were conducted on a smaller sample consisting of retired persons only.

12.3 Measures of poverty

Two common definitions of poverty are used here to classify households into poor and non-poor. First, households are classified on the basis of their equalised income compared to the poverty threshold (60 % median income) reported by EUROSTAT and the Israel Central Bureau of Statistics for the relevant year and country (*income poverty*). Second, households are considered as poor if the household respondent reported that the household is able to make ends meet with “some” or “great difficulty” (*material deprivation*). In contrast to income poverty, material deprivation covers not only income but also spending. While the material deprivation index introduced in this volume might be less endogenous with regard to self-reported health measures than making ends meet and therefore more appropriate for the analyses (see chapter 2 in this volume), it has also been shown to strongly correlate to the latter (see chapter 5 in this volume). Since in this chapter also longitudinal analyses were conducted, and the new deprivation index can only be computed for wave 5, making ends meet is used as indicator of material deprivation instead.

Figure 12.1 shows the share of households in SHARE Wave 5 considered as poor according to the definitions of income poverty as well as material deprivation. In most countries the rate of material deprivation is higher than the rate of income poverty. Only in Denmark, Switzerland, and Austria the share of income

poor households is higher than the share of material deprived households. A high level of households reporting material deprivation appears in Southern and Eastern European countries: Spain, Italy, Estonia, Czech Republic, Slovenia, and Israel. Rates of income poverty are markedly lower in these countries but still high compared to other countries. What is particularly noticeable is the huge difference of about 40 percentage points between the two poverty indicators in Estonia and Israel.

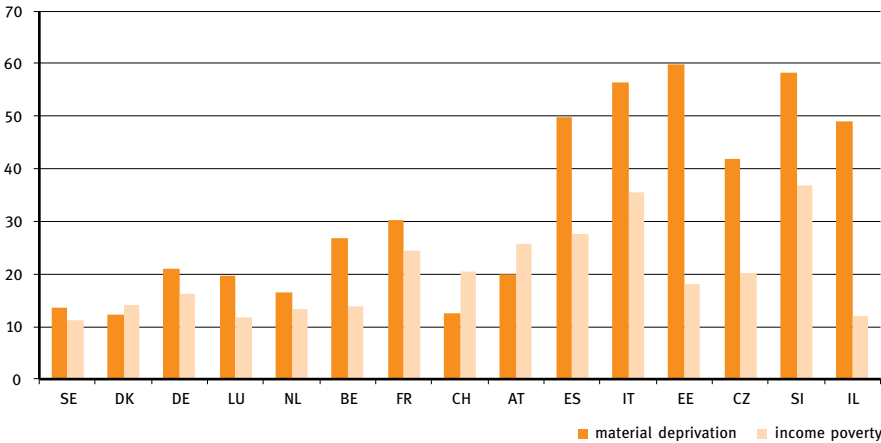


Figure 12.1: Percentages of poor households by country and poverty measure

Notes: 22,340 observations, unweighted

Source: SHARE Wave 5 release 0

12.4 Measures of health

Two different measures of health are used as outcome variables. First, grip strength is used as an objective indicator for physical health. Reduction in hand-grip strength has been shown to predict morbidity, disability, as well as mortality (e.g. Gale et al. 2007, Sasaki et al. 2007). It is measured by using a handheld dynamometer that reports strength in kilograms. Second, the “Euro-D” scale, which is the sum of depression symptoms ranging from 0 to 12, provides a measure for mental health. Items that contribute to the scale are for example sadness, death wish, irritability, and loneliness.

Figure 12.2 presents means of grip strength for poor and non-poor over all countries. Lowest levels of grip strength are found in France, Spain, Italy, and Israel. These findings are in line with results of previous waves of SHARE that indicate on

average lower grip strength for Southern European countries than for Northern-continental European countries, even with controlling for sociodemographic characteristics and socioeconomic status (Andersen-Ranberg et al. 2009). In every country, on average the non-poor perform better in grip strength than the poor, regardless of which poverty indicator is used. The differences between poor and non-poor are significant (95 %) for most countries. In Spain there is a significant difference in the

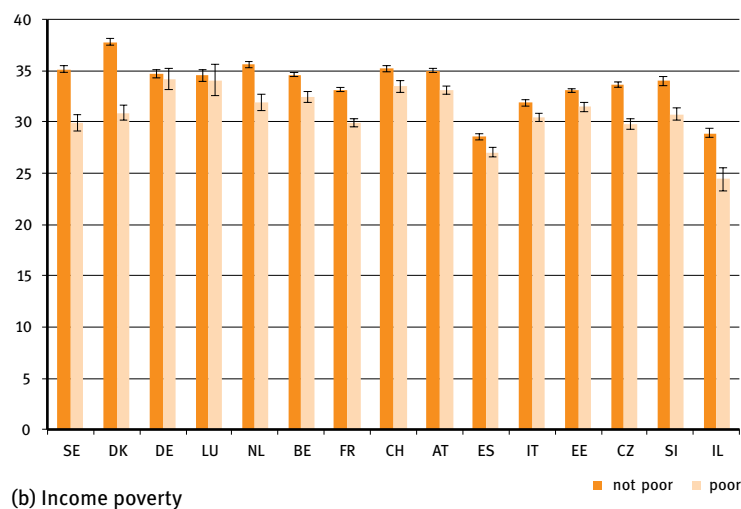
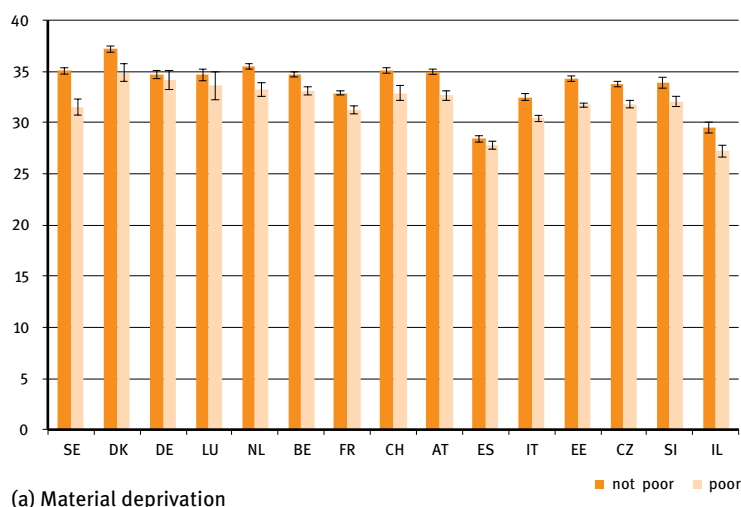


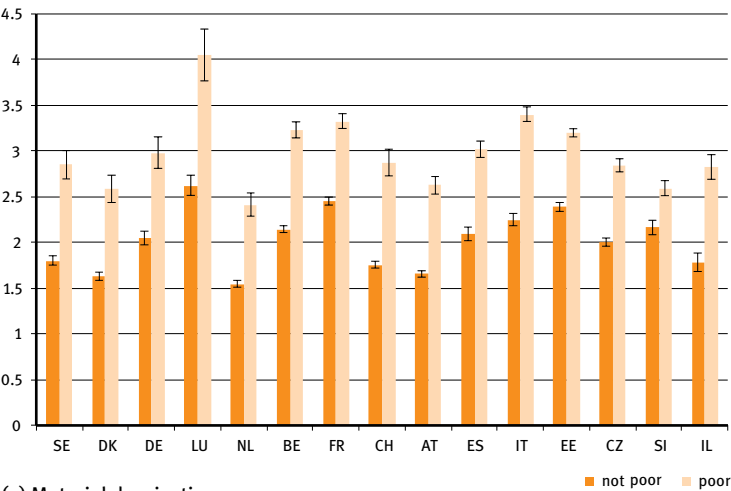
Figure 12.2: Mean of grip strength by country and poverty status

Notes: 30,044 observations, unweighted, brackets denote standard errors

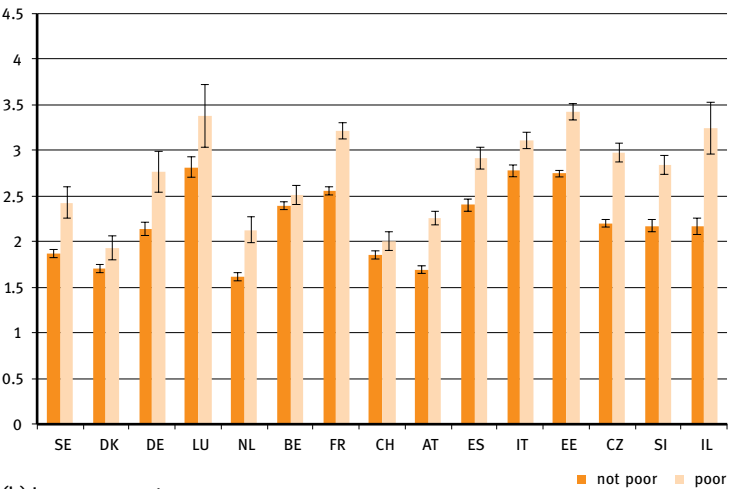
Source: SHARE Wave 5 release 0

level of grip strength only if poverty is defined by income. No significant differences at all show up in Germany and Luxembourg. In addition, it is striking that the gap in grip strength between poor and non-poor in Denmark is small when stratifying by material deprivation but huge when stratifying by income poverty.

Figure 12.3 shows the mean scores on the Euro-D scale of the poor and non-poor by country. Analysed countries differ considerably in the level of mental health, e.g. in Denmark, the Netherlands, Switzerland, and Austria the average



(a) Material deprivation



(b) Income poverty

Figure 12.3: Mean of Euro-D scale by country and poverty status

Notes: 30,044 observations, unweighted, brackets denote standard errors

Source: SHARE Wave 5 release 0

number of depression symptoms is relative low whereas compared to these countries in Luxembourg the Euro-D score is on average about one point higher. Also in the mental health measure the poor are worse off compared to the non-poor in every country. Differences in mental health are significant in every country by using the material deprivation indicator. Stratified by income poverty the depression gap between poor and non-poor is smaller but still existent except for Denmark, Luxembourg, Belgium, and Switzerland.

12.5 Multivariate analysis

Turning to the findings from the multivariate regression analyses, Figure 12.4a presents the marginal effects of income poverty and material deprivation on grip strength. The first bar indicates the bivariate correlation obtained from a cross-sectional OLS regression. The average effect over all countries is -2.88 and -2.99 for material deprivation and income poverty, respectively. When controlling for country the detrimental effect of poverty decreases significantly. Additionally controlling for observed sociodemographic characteristics and other possible confounders in the third model decreases the correlation of poverty and grip strength even more. Finally, the last bar shows the marginal effect of poverty using fixed-effects regression analysis with up to three waves of SHARE. Neither material deprivation nor income poverty show a significant effect on grip strength.

Similar patterns show for mental health, displayed in Figure 12.4b. Both, material deprivation and income poverty have a strong correlation with the Euro-D scale in OLS-regressions and a smaller effect in fixed-effects models. In longitudinal analyses the marginal effects of poverty are small (0.13 and 0.08), however, the effects remain significant. Compared to grip strength, the two poverty measures do not equally correlate with mental health. The marginal effects of material deprivation are about double – or even higher – as the effects of income poverty.

All models have been also estimated with retired persons only (not shown). The effect of poverty measures on health indicators is somewhat weaker in the cross-sectional regressions. However, results in the fixed-effects models are basically the same compared to the full sample. This finding can be seen as indicator of the absence of a substantive bias due to causality running from health to income.

It is noteworthy that results from the cross-sectional models, both on physical and mental health, are very similar when the index introduced in chapter 4 is used as measure of material deprivation instead of making ends meet. Thus, making ends meet seems an appropriate proxy for material deprivation in the absence of more elaborate measures.

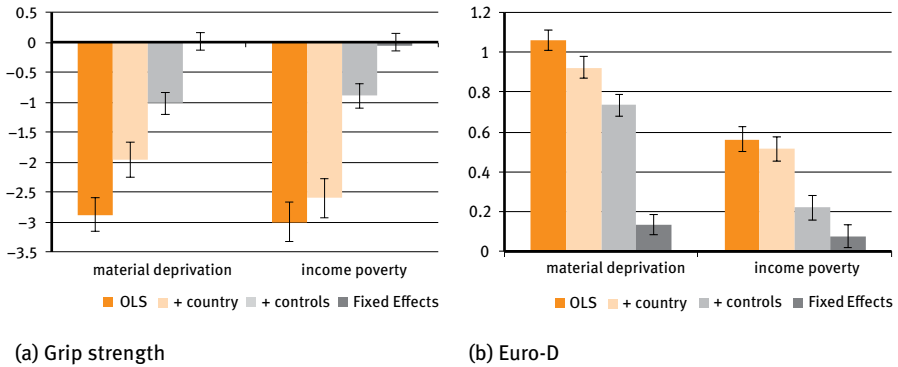


Figure 12.4: Marginal effects of poverty measures on grip strength and Euro-D in linear regressions and fixed-effects models

Notes: OLS models: 30,044 observations. Fixed-effects models: 67,045 observations for 29,630 individuals. Bars show marginal effects with 95 % confidence intervals.

Source: SHARE Wave 2 release 2.6.0, Wave 4 release 1.1.1, Wave 5 release 0

12.6 Discussion

This study showed that the relatively strong bivariate correlation of poverty and health diminishes when more controls are included in the analysis. By using fixed-effects regression to effectively control for time-constant unobservable confounders the detrimental effect of poverty is even weaker compared to multivariate OLS models. Longitudinal analyses indicate that there are detrimental short-term effects of slipping into poverty on mental health. However, changes in poverty status seem not to be related to changes in grip strength.

Confirming previous studies, material deprivation is more strongly correlated with health outcomes than is income poverty. This is especially true for mental health. Therefore, to reduce poverty-related inequalities in mental health, policies should not only consider income but a more broadly concept of poverty.

There are considerable differences in the magnitude of effects derived from cross-sectional versus longitudinal models. This pattern tells us that although short-term effects are relatively weak, there may be mechanisms at work that lead to poor health of materially deprived people over a longer period, probably over the whole life course. Long-term effects as well as other individual characteristics that are connected to poverty are more important for explaining health status than short-term changes in poverty status. Obviously, this is especially true for grip strength, which is a relatively constant measure compared to mental health which is more susceptible to short-term changes.

The question of causality is not completely clear, though. Theory and empirical evidence suggest that income and health are interdependent. While this problem cannot be finally solved here, the presented estimates based on fixed-effects regression models (and restricted to a sample of retired) hint to inflated results in previous cross-sectional research. Results show that changes in both poverty indicators correlate with mental health but not with grip strength. Since physical health is influenced by many factors (e.g. genetic endowments), especially for older people, this seems plausible. The very similar results of the retirement-sample compared to the whole sample give some hint that reverse causality (i.e. health influences income) does not seem to matter much for people age 50 and older who are at the end of their occupational career or beyond. This mechanism may however be more relevant in earlier phases of life. Moreover, reverse causality may still occur with regard to health-related expenditures.

References

- Adena, Maja, Myck, Michal (2014): "Poverty and transitions in health in later life". In: *Social Science & Medicine* 116, p. 202–210.
- Andersen-Ranberg, Karen, Petersen, Inge, Frederiksen, Henrik, Mackenbach, Johan, Christensen, Kaare (2009): "Cross-national differences in grip strength among 50+ year-old Europeans: results from the SHARE study". In: *European Journal of Ageing* 6. No. 3, p. 227–236.
- Braveman, Paula, Cubbin, Catherine, Egerter, Susan, Williams, David, Pamuk, Elsie (2010): "Socioeconomic disparities in health in the United States: what the patterns tell us". In: *American Journal of Public Health* 100. No. S1, p. S186–S196.
- Gale, Catharine, Martyn, Christopher, Cooper, Cyrus, Sayer, Avan (2007): "Grip strength, body composition, and mortality". In: *International Journal of Epidemiology* 36. No. 1, p. 228–235.
- Gunasekara, Fiona, Carter, Kristie, Crampton, Peter, Blakely, Tony (2013): "Income and individual deprivation as predictors of health over time". In: *International Journal of Public Health* 58. No. 4, p. 501–511.
- Gunasekara, Fiona, Carter, Kristie, Blakely, Tony (2011): "Change in income and change in self-rated health: systematic review of studies using repeated measures to control for confounding bias". In: *Social Science & Medicine* 72, p. 193–201.
- Jones, Andrew M., Wildmann, John (2008): "Health, income and relative deprivation: evidence from the BHPS". In: *Journal of Health Economics* 27, p. 308–324.
- Mackenbach, Johan, Martikainen, Pekka, Looman, Caspar, Dalstra, Jetty, Kunst, Anton, Lahelma, Eero (2005): "The shape of the relationship between income and self-assessed health: an international study". In: *International Journal of Epidemiology* 34. No. 2, p. 286–293.
- Mckenzie, Sarah, Gunasekara, Fiona, Richardson, Ken, Carter, Kristie (2014): "Do changes in socioeconomic factors lead to changes in mental health? Findings from three waves of a population based panel study". In: *Journal of Epidemiology & Community Health* 68, p. 253–260.
- Sasaki, Hideo, Kasagi, Fumiyoshi, Yamada, Michiko, Fujita, Shoichiro (2007): "Grip strength predicts cause-specific mortality in middle-aged and elderly persons". In: *The American Journal of Medicine* 120. No. 4, p. 337–342.

