

Neimann, Stefanie; Schmitz, Hendrik

Conference Paper

Honey, why don't you see a doctor? Spousal impact on health behavior

Beiträge zur Jahrestagung des Vereins für Socialpolitik 2010: Ökonomie der Familie - Session: Economic Aspects of Health, No. B18-V3

Provided in Cooperation with:

Verein für Socialpolitik / German Economic Association

Suggested Citation: Neimann, Stefanie; Schmitz, Hendrik (2010) : Honey, why don't you see a doctor? Spousal impact on health behavior, Beiträge zur Jahrestagung des Vereins für Socialpolitik 2010: Ökonomie der Familie - Session: Economic Aspects of Health, No. B18-V3, Verein für Socialpolitik, Frankfurt a. M.

This Version is available at:

<https://hdl.handle.net/10419/37183>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

“Honey, why don’t you see a doctor?” – Spousal impact on health behavior

Stefanie Neimann* Hendrik Schmitz†

February 26, 2010

Abstract

Married individuals are usually found to be in better health than singles but it is not fully known why. Using data from the German Socio-Economic Panel we test one possible explanation, namely that two spouses encourage each other to a health-promoting behavior and monitor it. Therefore, we analyze the direct spousal impact on seeking medical advice, physical activity, and eating habits controlling for selection, positive assortative mating, and shared unobserved influences of the environment. While we find no causal effect regarding a health-conscious diet, the impact of the partner’s doing sports is substantial. Moreover, females affect their male spouses in seeking medical advice but not the other way around. The latter result may explain why men usually benefit more from marriages than women.

JEL Classification: C33, I12, J12

Keywords: Couples, health behavior, simultaneous equations models

*TU Dortmund, Ruhr Graduate School in Economics

†Corresponding author; Universität Duisburg-Essen and Ruhr Graduate School in Economics; Address: Universität Duisburg-Essen, Campus Essen, Fachbereich Wirtschaftswissenschaften, Lehrstuhl für Finanzwissenschaften, Universitätsstr. 12, 45117 Essen, Germany; Fax: +49(201) 183-3417, e-mail: Hendrik.Schmitz@wiwinf.uni-due.de - Financial support by the RGS Econ and the Leibnitz Association is gratefully acknowledged.

1 Introduction

A great deal of research in economics as well as medical sciences, psychology, and sociology consistently finds that married people live longer, and are healthier and happier than non-married individuals. For example, Blanchflower and Oswald (2004) estimate that the effect of being married on happiness is equal to an extra income of \$100,000 a year. Moreover, men seem to benefit more from marriage than women. For example, comparing death rates from 16 developed countries Hu and Goldman (1990) find that the relative mortality rates of unmarried men compared to married range from 1.6 to 3 with an average of 2. For women, the ratio is on average 1.5, with only Taiwan and Japan having rates above 2.

This phenomenon can to some extent be explained by selection of healthier individuals into marriage. Nevertheless, despite methodological weaknesses that can be found in the existing literature (Ribar, 2004), there is evidence that it cannot be solely attributed to selection (see, e.g., Lillard and Panis, 1996; Brockmann and Klein, 2004). Marriage itself seems to be health-promoting but it is not fully understood how. Some see the emotional support as a key factor (see, e.g., Berkman, 1995), another explanation can be a higher real income for married individuals (by using economies of scale and specialization gains) which in turn improves the health status (Trovato and Lauris, 1989).¹

In this paper, we analyze another factor that could further explain why couples are in better health than singles: spouses encourage each other to a health-promoting behavior and keep an eye on it. Family health production models (e.g. by Jacobson, 2000 or Wilson, 2002) predict that spouses monitor each other's health since they care about each other, and because they depend on each other's wage earnings and housework capacity. Hazardous behavior leads to a reduction in the family's income and, therefore, all family members have an incentive to keep each other in good health, in particular the breadwinner's status.

In our opinion, own health behavior is a good proxy for motivation and control efforts towards the partner. Therefore, a positive correlation in the spouse's health activities would support theoretical predictions. However, this correlation might result from other factors than the causal influence of the spouse (see Manski, 1995; Wilson, 2002). First, two spouses share an environment that may induce both to engage in healthy behavior. For instance, they receive the same information about health risks from their environment, or they get reminders from the same doctor for preventive check-ups. Another explanation for spousal similarity is positive as-

¹See Wilson and Oswald (2005) for a survey of the longitudinal evidence how marriage affects physical and psychological health.

sortative mating. That is, individuals tend to marry a person who has the same preferences and characteristics, in this case a healthy or unhealthy lifestyle. There is clear evidence that spouses have similar characteristics and behave similarly (see e.g. Nielsen and Svarer, 2006 for assortative mating in education and Jenkins and Osberg, 2005 concerning leisure activities). With respect to health, Clark and Etilé (2006) find that positive assortative mating is the only relevant factor for the observed correlation in spouses' smoking behavior.

To our knowledge, no study has ever investigated direct spousal effects on health-improving behavior. Health economists have largely neglected the marriage-health relationship, whereas the sociological, psychological, and medical literature has focused on differences in mortality rates and physical health between married and non-married people. Nevertheless, there are two studies analyzing the individual's perception concerning the spousal impact on own health. Umberson (1992) uses data from a US panel survey which directly asked the respondents how often anyone had reminded him or her to do anything to protect the health and who had done it. She finds that marriage is in fact associated with more efforts to control health, and that the wife is more likely to be the controller of the husband than vice versa. She concludes that therefore men benefit more from marriage than women. Markey et al. (2007) use interview data from US couples and show that both, men and women report experiencing more positive than negative health influences from their partners. Most important are the effects on eating habits and physical activity. In addition, they find a significant impact on the probability to seek medical help. However, both studies are based on cross-sectional data, and they do not account for spousal interdependencies.

Given the enormous challenges health care systems in all industrialized countries are faced with, it becomes increasingly important to get a better understanding why some groups in a society have a higher probability to get certain diseases than others. A great potential to contain health care expenditures consists in reducing the incidence of wide-spread diseases like cardiovascular disease or diabetes which can effectively be prevented by health-promoting behavior. In order to design optimal programs to enhance the health-conscious behavior of individuals, it is essential to get to know more about how family members affect each other in that respect, in particular, given the increase in single households in recent years.

Our aim is to analyze whether the partner's health behavior has any direct impact on own health activities. Our indicators are the probability to go to the doctor within a period of three months, to do sports at least once a week, and to follow a health-conscious diet. Thus, we estimate the probability to observe a certain behavior as a

function of the spouse's behavior and various own characteristics like health status or health insurance patterns. As a benchmark we use OLS. However, in order to rule out biases in the partner's direct effect due to shared (unobserved) environmental factors and correlated (unobserved) preferences we further estimate simultaneous equations models incorporating fixed effects. Furthermore, since individuals with a healthy lifestyle might have a higher probability to be in a relationship, we address this potential bias by including sample selection corrections.

The database is the German Socioeconomic Panel (SOEP) from 1995 to 2008. For all three indicators, the probability of a health-improving behavior is positively correlated with the spouse's behavior even after controlling for various socio-economic factors. Simultaneous equations models with fixed effects show, however, that positive assortative mating and the shared environment can largely explain this correlation. Nevertheless, we also find evidence for a causal effect of the partner's behavior but not for all types of health activities. Doing sports is largely influenced by the partner's behavior for both, men and women. In contrast, following a healthy diet does not affect eating habits of the partner significantly. As regards seeking medical advice, we find a gender-specific difference: women induce their partner to go to the doctor but not vice versa. The last result can explain the common finding that men benefit more from marriage than women. Moreover, since the male breadwinner model is still prevalent in Germany, it confirms the theoretical prediction that the main earner's health status is more relevant for the family.

The paper proceeds as follows: Section 2 reviews theoretical foundations and previous empirical studies of spousal behavior. Section 3 explains the empirical strategy and data used, while Section 4 reports the estimation results. Section 5 concludes.

2 Theoretical background and previous empirical results

In the following, we briefly discuss potential explanations for the observed correlation in spouses' health behavior. These include a shared environment, assortative mating, and a direct spousal influence.

2.1 Shared environment and assortative mating

The first argument that may account for the correlation is that a married couple usually lives together in the same environment. For example, an infectious disease

can be the reason that both spouses have to go to the doctor. Moreover, spouses largely receive the same information about health risks which may result in similar incentives for a medical check-up or for doing sports. They are also likely to have the same health insurance, and to see the same physicians. Consequently, they may be exposed to the same physician-induced demand (if there is any) that might lead to a higher probability of visiting the doctor for both spouses. In summary, there are several health-related environmental factors that may affect both spouses at the same time. Some of them are observed and can be controlled for by the researcher like health status or type of health insurance. The unobserved factors are captured by the time-variant error terms in the wife's and husband's estimation equations that are allowed to be correlated.

The interrelationship between two spouses' health behavior may also result from assortative mating. The term is mainly determined by Gary Becker's theory of marriage that provides a theoretical framework for the analysis of family's decision-making (Becker, 1973, 1981). Positive assortative mating means that individuals tend to marry a person who has the same attitudes and characteristics. Thus, it is very likely that two individuals match if they have the same preference for a health-conscious behavior. Since these preferences are usually unobserved, we could misleadingly interpret a correlation in their activities as causal influence from the spouse even though it is due to assortative mating.

There is already a great deal of evidence showing that assortative mating is relevant. Concerning health issues, Clark and Etilé (2006) examine which factors induce the observed correlation in spouses' cigarette smoking behavior. They conclude that the correlation in smoking can be fully attributed to positive assortative mating. We control for this potential bias in our analysis by including individual-specific fixed effects.

2.2 Spousal influence: The family as health producer

Studies of health demand are usually based on the model of Grossman (1972). He first interprets health as human capital stock that, on the one hand, is subject to depreciation and, on the other hand, determines the total amount of time an individual can use for earning money and producing commodities. Investments in own health consist of own time and market goods like medical services as input factors. Health is demanded by the consumer for two reasons. First, it directly enters the utility function, i.e. sick days are a source of disutility (health as consumption commodity). Second, it determines total time available for market and non-market

activities (health as investment commodity). First-order optimality condition for gross investment requires that the present value of marginal investment costs must equal the present value of marginal benefits.

Jacobson (2000) is the first who analyzes a Grossman model from a family perspective. She interprets the family as producer of health rather than the individual. That is, each family member is the producer of own health and the health of other family members.² Moreover, not only own income and wealth but earnings of all family members can be used in the production of health. As with investments in own health, each individual receives investment and consumption benefits from investments in the spouse's health. Investment benefits arise because improved health will decrease future time spent sick and increase family time available for market work. Moreover, the health status may also affect the wage rate. Both aspects should lead to a higher family income and hence, higher consumption and investment possibilities for both spouses. Consumption benefits result if an individual derives direct utility from the spouse's health, i.e. he or she cares about the mate's well-being. Following Becker (1973), she assumes that all family members have common preferences, i.e. a joint utility function. Her main result is that the family will not try to equalize marginal benefits and marginal costs of health capital for each family member. They will rather invest in health until the ratio of marginal (lifetime) utility of health to the effective price of health is equal for all family members. They will not try to equalize the amount of health capital between the two spouses. For example, the one whose wage income is more sensitive to differences in health will enjoy higher investments.

Bolin et al. (2001, 2002) extend Jacobson's model by explicitly allowing for conflicting preferences. They also regard the family as producer of health but assume that spouses are Nash-bargainers or act strategically. Their results support Jacobson's findings: Both spouses invest in own and the other spouse's health. Moreover, the one with the higher wage will receive higher investments in health capital by the family.

Wilson (2002) also combines Becker's theory of marriage and Grossman's health capital model. However, he develops a simple two-period life-cycle model about health capital formation within a marriage that emphasizes the role of marital sorting. He neither assumes a joint utility function nor does he explicitly model a bargaining process. The individual utility functions of the two spouses are linked because utility directly depends on the spouse's health and indirectly via the family's budget constraint since the health status affects the wage income. His main implication is

²In the following, we neglect the model's implication for child health.

that the spouses' health states are positively correlated because of assortative mating, shared lifestyle and environmental risk factors as well as direct health effects. Examples for direct spousal influences are infectious diseases or stress induced by the illness of the partner. Wilson (2002) tests his hypotheses by regressing individual's and spouse's characteristics and health behavior indicators (smoking, drinking, exercise) on the individual's health status. He finds that the effect of spouse's characteristics and behavior are in general small and statistically insignificant. However, his analysis is based on cross-sectional data and does not account for endogeneity problems. Moreover, he focuses on health status, not health behavior.

Concerning the partner's impact on health behavior, there are, to our knowledge, only two empirical studies. Both analyze the individual's feelings about the spouse's influence and control efforts. Umberson (1992) uses data from a US panel survey where interviewees were directly asked how often anyone had monitored his or her health behavior and who had done this. She shows that married people are more likely to be subject to health control efforts, and the wife is more likely to be the controller of the husband than vice versa. She argues that the latter can explain why men usually gain more from marriage than women.

Using interview data from 105 US couples, Markey et al. (2007) also analyze individuals' perception concerning the spousal impact on their health. Both, men and women report experiencing more positive than negative health influences from their partners. The effects are highest for eating habits and physical activity, nevertheless, they also find a significant impact on the probability to go to the doctor. Both studies use cross-sectional data and do not consider spousal interdependencies.

3 Empirical strategy

3.1 Methodology

We want to estimate the spousal impact on health behavior as measured by the probability of seeing a doctor, doing sports at least once a week, and following a health-conscious diet. We capture the spousal's attitude towards preventive behavior by his/her observed behavior.

We therefore estimate the following equations for males (m) and females (f):

$$y_{mt} = \alpha_m y_{ft} + x'_{mt} \beta_m + c_m + \epsilon_{mt} \tag{1}$$

$$y_{ft} = \alpha_f y_{mt} + x'_{ft} \beta_f + c_f + \epsilon_{ft} \tag{2}$$

where y_{mt} and y_{ft} are binary indicators of the health behavior of both spouses at time t , x_{mt} and x_{ft} are vectors of socio-economic variables, c_m and c_f are time-invariant unobserved effects, and ϵ_{mt} and ϵ_{ft} are time-varying error terms. We are particularly interested in α_m and α_f that measure the effect of the spouse's on own health behavior. In principle, (1) and (2) could be estimated separately (e.g. by OLS). However, it is very likely that the time-varying error terms are correlated due to the shared environment as outlined in Section 2.1. For instance, spouses receive the same information about health risks, potentially affecting their behavior at the same time due to the same exogenous shocks. This would lead to biased estimates in the single equation setting. Therefore, we use a simultaneous equations model, estimated by two-stage least squares (2SLS), to solve this problem. Identification is not a problem here since the x_{it} mainly contain person-specific variables. That is, when estimating equation (1) by 2SLS, we use the complete list of x_{ft} as instruments for y_{ft} (and vice versa when estimating equation (2)).

Although our indicators of health behavior are binary variables, we estimate linear models, that is, OLS as a benchmark and 2SLS to control for the simultaneity bias. While a probit seems to be more appropriate at first sight, the linear model has the important advantage of allowing to include a fixed effect which is potentially correlated with the explanatory variables.³ We assume that unobserved individual frailty or time-constant preferences for a healthy lifestyle affect own health behavior. Moreover, it is very likely that spouses with similar preferences match. Consequently, the unobserved preferences of both partners are potentially correlated and, thus, also c_m and y_{ft} (and vice versa). Therefore, we estimate a fixed effects-2SLS (FE-2SLS) to rule out biases due to assortative mating.

Obviously, we can only include couples in our analysis and cannot consider singles. This might impose a selection problem. It is well known that married individuals are in better health than comparable singles, either due to the positive impact of marriage or due to selection of healthy individuals into marriage (or both). The econometric challenge is to include a sample selection correction into a panel data model that already accounts for fixed effects and endogenous explanatory variables. We follow the approach proposed by Semikyna and Wooldridge (2005) which was also used by Jaeckle and Himmler (2010). Therefore, we outline the method only briefly and refer to Semikyna and Wooldridge (2005) or Jaeckle and Himmler (2010) for a more detailed description. First, we estimate the selection equation which is represented as in Mundlak (1978), Chamberlain (1984), or Wooldridge (1995) to

³Also see Angrist (2001) who makes a case for using 2SLS even if the dependent variable is binary when the parameter of interest is a causal effect.

account for fixed effects

$$s_{mt} = z'_{mt}\theta_{1m} + \bar{z}'_m\theta_{2m} + \nu_{mt} \quad (3)$$

$$s_{ft} = z'_{ft}\theta_{1f} + \bar{z}'_f\theta_{2f} + \nu_{ft} \quad (4)$$

where s_{mt} is the indicator of having a spouse (binary variable), z'_{mt} is a superset of x'_{mt} , and \bar{z}'_m are the individual means of the z'_{mt} . The instruments we include in z'_{mt} , i.e., the variables that are assumed to affect the likelihood of having a partner but not the health behavior are a complete set of dummy variables for all 16 German federal states and indicators for the degree of agglomeration of the individual's hometown. We distinguish between agglomerated, urbanized, and rural areas with the latter as reference category. These variables should also reflect regional differences in males-females ratios and, thus, the possibilities to find a spouse.⁴ Similar instruments were used by Clark and Etilé (2006).

Equations (3) and (4) are estimated separately for each year by probit regression models. The results are used to calculate inverse Mills ratios, λ_{mt} and λ_{ft} . The final estimation equations - where we again use the Mundlak-approach to express the fixed effect as a linear projection onto time averages of the explanatory variables and an error-term - are

$$y_{mt} = \alpha_m \hat{y}_{ft} + \alpha_{0m} \bar{\hat{y}}_f + x'_{mt} \beta_m + \bar{x}'_m \beta_{0m} + \xi_m \hat{\lambda}_{mt} + r_{mt} \quad (5)$$

$$y_{ft} = \alpha_f \hat{y}_{mt} + \alpha_{0f} \bar{\hat{y}}_m + x'_{ft} \beta_f + \bar{x}'_f \beta_{0f} + \xi_f \hat{\lambda}_{ft} + r_{ft} \quad (6)$$

where \hat{y}_{ft} are the predicted values of y_{ft} from the first stage regression, $\bar{\hat{y}}_f$ are the individual means of the \hat{y}_{ft} , and \bar{x}'_m are the individual means of x'_{mt} . Standard errors (clustered on individual level) are estimated by bootstrapping the entire procedure 500 times, thus taking into account that the inverse Mills ratio and the endogenous variables in (5) and (6) are predicted values from auxiliary regressions.

3.2 Data

The database for the empirical analysis is the German Socioeconomic Panel (SOEP), which started in 1984 in West Germany and was extended to include East Germany in June 1990. There were several refreshments resulting in a sample size of more

⁴No further restrictions on the correlation between ϵ_{mt} and ν_{ms} , $s \neq t$ have to be imposed, as well as on the correlation between ν_{mt} and ν_{ms} , $s \neq t$. See Jaeckle and Himmler (2010), Semikyna and Wooldridge (2005), or Dustmann and Rochina-Barrachina (2007) for a further discussion about the underlying assumptions.

than 20,000 adult individuals living in about 11,000 households that participated in the SOEP survey in 2008 (see, e.g., Wagner et al., 2007 for more details).⁵

Table 1: Availability of Variables

Year	Doctor Visit	Weekly Sport	Healthy Diet
1995	x	x	
1996	x	x	
1997	x	x	
1998	x	x	
1999	x	x	
2000	x		
2001	x	x	
2002	x		
2003	x	x	
2004	x		x
2005	x	x	
2006	x		x
2007	x	x	
2008	x	x	x

We use data from 1995-2008 because the self-rated health status that we include as a control variable is not available before. However, our three indicators of health behavior are not asked each year (see Table 1 for their availability in the SOEP). Although the SOEP asks for the total number of doctor visits within the previous three months, we only use the binary information of having had at least one visit. The major reason is to use this variable as a proxy for prophylactic behavior. Although we do not have explicit information on preventive doctor visits, we assume that, conditional on the individual's health and insurance status, people who care more about their own health are also more likely to see a doctor. This effect can better be captured by the 0/1-decision than by the total number of visits in a quarter. Usually, one interprets the observed number of doctor visits as a result of a two-stage decision-making process with the patient deciding about the first doctor visit (first stage) and the doctor - maybe together with the patient - deciding about the number of recalls, given at least one visit (second stage). Since the second stage also captures supply-side factors like physician-induced demand, we focus on the first stage where the individual has full control (Manning et al., 1981).

⁵The data used in this paper were extracted using the Add-On package PanelWhiz v2.0 (Nov 2007) for Stata. PanelWhiz was written by Dr. John P. Haisken-DeNew (john@panelwhiz.eu). The PanelWhiz generated DO file to retrieve the SOEP data used here and any Panelwhiz Plugins are available upon request. Any data or computational errors in this paper are our own. Haisken-DeNew and Hahn (2006) describe PanelWhiz in detail.

The question about the frequency of exercises was asked in most of the years. We consider doing sports at least once a week as engaging in healthy behavior. Following a health-conscious diet was only asked in 2004, 2006, and 2008. This binary variable takes on the value one when the extent to which the respondent follows a health conscious-diet is “much” or “very much” and a zero in case of “not so much” and “not at all”.

Table 2 displays mean values of all three variables for males and females that live together with a partner compared to singles. We do not distinguish between married and unmarried but consider all couples where the two spouses live in the same household.⁶ In total, we observe up to 13,277 couples with up to 85,791 couple-year observations. Since not each wave contains information on doing exercises and being on a healthy diet, the number of observations is smaller in these cases. The raw data do not give clear evidence that individuals who have a relationship behave in a healthier way than singles. For instance, single men are less likely to go to the doctor and to follow a healthy diet. However, their probability for doing sports is higher. In contrast, while women generally exhibit a healthier lifestyle than men, a large difference between singles and women with partners can only be found for eating habits. Single women are less likely to follow a healthy diet but, similar to men, have a slightly higher probability of being engaged in sport activities. However, there is no difference in their likelihood of seeking medical help.

Table 2: Sample means of health variables

Males	Doctor visit		Weekly sport		Healthy diet	
	cohab.	single	cohab.	single	cohab.	single
Mean	0.646	0.551	0.267	0.409	0.433	0.333
Person-year	85,791	32,977	55,334	21,245	20,091	7,761
Individuals	13,277	7,104	12,033	6,378	8,668	3,970
Women	Doctor visit		Weekly sport		Healthy diet	
	cohab.	single	cohab.	single	cohab.	single
Mean	0.753	0.754	0.286	0.308	0.622	0.539
Person-year	85,791	41,317	55,334	26,655	20,091	9,971
Individuals	13,277	8,420	12,033	7,607	8,668	4,914

Source: SOEP, own calculations

⁶Therefore, if we sometimes use the terms “husband” and “wife” we nevertheless refer to married and unmarried spouses in our sample.

In our estimations, we control for an extensive set of factors that are also very likely to affect health behavior.⁷ As health status indicators, we include the self-rated health status (dummies for “very good”, “good”, “bad”, and “very bad”, with “satisfactory” being the reference category), a dummy whether the individual had a hospital visit last year, and the degree of handicap. Furthermore, we distinguish between privately and publicly insured. As socio-economic factors we consider age, being a foreigner, years of education, number of children living in the household, whether the household lives in West Germany, and the household’s log equivalence income. Concerning labor market behavior, we differentiate between full- and part-time employed, and unemployed, as well as between blue- and white-collar workers, self-employed, and whether the individual works in the health sector. We also include year dummies.

4 Results

Table 3 reports the estimation results for all three health indicators. It shows the different effects when using a simple OLS approach, OLS incorporating fixed effects (FE), two-stage least squares with fixed effects (FE-2SLS), and the FE-2SLS-model controlling for selection. For the sake of brevity, we only report the coefficients for the spousal behavior. Full estimation results are reported in Tables A2-A7 in Appendix A2. Note that each cell in the table results from a separate regression. Moreover, since we estimate linear probability models, the estimated coefficients are marginal effects.⁸

The first column shows the spousal effect if we do not control for simultaneous exogenous shocks, assortative mating, and selection. We find a strong association between spouses’ health behaviors. The likelihood of seeing a doctor in a period of three months is 16 (13) percentage points higher for men (women) if their partner also sees one. Even stronger are the results for physical activity and eating habits: the likelihood increases by 31 to 37 percentage points if the partner also engages in healthy behavior. As discussed before, these effects cannot be interpreted as causal but they indicate strong interdependencies.

Column (2) displays the results if we take assortative mating into account. For all indicators and for both sexes we find that it largely contributes to the high inter-

⁷See Appendix A1 for summary statistics.

⁸We do not report the results of the single probit regressions for the inverse Mills ratios. They are available upon request. In almost all of these 54 regressions the instruments are highly jointly significant.

Table 3: Coefficients of spouse's health behavior

Men					
Health indicator	OLS	FE	FE-2SLS	FE-2SLS Sel.	N
Doctor visit spouse	0.157*** (0.005)	0.099*** (0.004)	0.065** (0.027)	0.064** (0.030)	85,791
Weekly sports spouse	0.308*** (0.007)	0.188*** (0.004)	0.199** (0.090)	0.195* (0.102)	55,334
Healthy diet spouse	0.373*** (0.007)	0.258*** (0.009)	0.198 (0.156)	0.192 (0.150)	20,091

Women					
Health indicator	OLS	FE	FE-2SLS	FE-2SLS Sel.	N
Doctor visit spouse	0.129*** (0.004)	0.083*** (0.003)	-0.028 (0.020)	-0.029 (0.021)	85,791
Weekly sports spouse	0.314*** (0.007)	0.213*** (0.005)	0.349*** (0.074)	0.343*** (0.083)	55,334
Healthy diet spouse	0.365*** (0.007)	0.259*** (0.009)	0.158 (0.116)	0.159 (0.123)	20,091

1) Standard errors in parentheses, clustered by individuals. Bootstrapped standard errors in selection models.

2) * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

3) Full estimation results in Tables A2-A7 in Appendix A2.

spousal correlation. For example, concerning men's doing weekly sports the effect of the spouse reduces from 31 to 19 percentage points, for women's healthy diet from 37 to 26 percentage points. Thus, positive assortative mating can explain the correlation to a large extent. Nevertheless, the effects of the spouse remain significant and substantial in all cases.

The third column shows the coefficients if we estimate the two equations simultaneously, thus allowing for correlated error terms. The effects of the shared environment on health behavior are important but the sign is not clear. Concerning doctor visits and a healthy diet, the spousal impact further decreases indicating that the shared environment positively contributes to the inter-spousal correlation. For instance, an infectious disease might induce both to seek medical help. For physical activity, we find the opposite: there are time-varying factors that cause both partners *not* to take exercise regularly. Again, an infectious disease could be an explanation here. Moreover, it can be seen that assortative mating and the shared environment seem to fully explain the correlation in eating habits. For both, men and women, the effect of the partner becomes insignificant. Thus, the spouse does not influence the individual's eating behavior. There are several possible explanations for this finding. Most likely, the result mirrors that employed partners usually do not have lunch (and dinner) together but with their colleagues. Therefore, there are only limited possibilities for the partners to monitor and affect each other's eating habits. However, the result also suffers from the short panel that is available for this variable. In particular, since the FE estimation removes all couples that do not change their behavior within the three years, less identifying observations remain. Thus, the still sizeable coefficients indicate that there might be direct effects but they are imprecisely estimated.

For the probability to go to the doctor and to take exercise, however, we do find causal effects of the spouse even after controlling for selection. Column (4) shows the coefficients if we additionally consider that there are unobservable factors that have an effect on health behavior and on the probability to be in a relationship.

Regarding sports, we find huge positive effects of both spouses on the partner's physical activity, with an even stronger effect of males' behavior on their partner. Namely, the husband's behavior increases the wife's probability by 34 percentage points, whereas the men's probability raises by 20 percentage points. However, the size of the effect probably also reflects the preference of couples to spend their spare time together since doing sports is a leisure activity. Concerning doctor visits, we find a gender-specific difference. Women induce their partner to go to the doctor (the probability increases by 6 percentage points) but not vice versa. The reason

for this might be that women already have a high likelihood to see the doctor in Germany. Moreover, visits to the gynecologist are included in the dependent variable which typically lead to regular doctor consultations. However, given that the male breadwinner model is still prevalent in Germany, husband's health status is also more important for the family from the economic point of view. Thus, our findings are in line with theoretical predictions by, e.g., Jacobson (2000).

A comparison of columns (3) and (4) makes clear that a potential selection bias is not severe in our case. The coefficients differ only slightly by the inclusion of the inverse Mills ratio. Nevertheless, Table 4 shows the effects of these ratios on health behavior. Note again that each cell in the table results from a separate regression. With the exception of women's eating behavior, we cannot reject that selection matters in our estimations. Remarkably, there seems to be positive and negative selection. If we neglect the insignificant result we find that women who are more likely to be in a relationship have also a higher probability to follow a healthy lifestyle. However, for men, the effects are mixed: men with a higher probability to find a partner are more likely to seek medical help but are less likely to do sports regularly and to follow a healthy diet.

Table 4: Coefficients of inverse Mills ratio

Health indicator	Males		Women	
Doctor visit	0.023*	(0.014)	0.028**	(0.013)
Weekly sport	-0.035**	(0.018)	0.054***	(0.016)
Healthy diet	-0.050*	(0.030)	-0.020	(0.030)

1) Bootstrapped standard errors in parentheses.

2) * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

5 Conclusion

Family health production models predict that spouses monitor each other's health since they care about each other and depend economically on each other. Hazardous behavior leads to a reduction in the family's income and therefore, all family members have an incentive to keep each other in good health, in particular the breadwinner's status. These monitoring efforts can also explain a phenomenon that is widely acknowledged but not yet fully understood in the literature, namely that married individuals are healthier and live longer than unmarried people.

Using a large German household panel data set we analyze whether the partner's health activities have any causal effect on own health behavior. We use the spouse's health behavior as proxy for encouragement and control efforts. As health indicators, we define the decision to see the doctor within a period of three months, to do sports at least once week, and to follow a health-conscious diet. For all three measures we find a high inter-spousal correlation. However, assortative mating and the shared environment could also explain these patterns. Moreover, there might be selection into a relationship that is connected with health behavior which in turn would bias the results. Therefore, we estimate a simultaneous equations model with individual fixed effects and further control for a selection bias by including inverse Mills ratios.

In fact, unobservables matter. For instance, the correlation in eating habits can be fully explained by assortative mating and the shared environment. However, regarding physical activity we also find a strong causal effect of the partner's behavior for both sexes. Men and women induce each other to take exercise. Concerning doctor visits, we find gender-specific differences. Women have a positive influence on the men's behavior but not vice versa. Given that a typical German household consists of a male principal earner, our results are in line with theoretical predictions where breadwinners seem to benefit more.

References

- Angrist, J. D. (2001). Estimations of limited dependent variable models with dummy endogenous regressors: Simple strategies for empirical practice. *Journal of Business and Economic Statistics*, 19(1):2–16.
- Becker, G. S. (1973). A theory of marriage: Part I. *Journal of Political Economy*, 81(4):813–846.
- Becker, G. S. (1981). *A Treatise on the Family*. Harvard University Press.
- Berkman, L. F. (1995). The role of social relations in health promotion. *Psychosomatic Medicine*, 57:245–254.
- Blanchflower, D. G. and Oswald, A. J. (2004). Well-being over time in Britain and USA. *Journal of Public Economics*, 88(7-8):1359–1386.
- Bolin, K., Jacobson, L., and Lindgren, B. (2001). The family as the health producer - when spouses are Nash-bargainers. *Journal of Health Economics*, 20(3):349–362.
- Bolin, K., Jacobson, L., and Lindgren, B. (2002). The family as the health producer - when spouses act strategically. *Journal of Health Economics*, 21(3):475–495.
- Brockmann, H. and Klein, T. (2004). Love and death in Germany: The marital biography and its effect on mortality. *Journal of Marriage and the Family*, 66(3):567–581.
- Chamberlain, G. (1984). Panel data. In Griliches, Z. and Intriligator, M. D., editors, *Handbook of Econometrics*, volume 2, pages 1247–1318.
- Clark, A. E. and Etilé, F. (2006). Don't give up on me baby: Spousal correlation in smoking behaviour. *Journal of Health Economics*, 25(5):958–978.
- Dustmann, C. and Rochina-Barrachina, M. E. (2007). Selection correction in panel data models: An application to the estimation of females' wage equations. *Econometrics Journal*, 10(2):263–293.
- Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of Political Economy*, 80:223–255.
- Haisken-DeNew, J. P. and Hahn, M. (2006). Panelwhiz: A flexible modularized stata interface for accessing large-scale panel data sets.
- Hu, Y. and Goldman, N. (1990). Mortality differentials by marital status: An international comparison. *Demography*, 27(2):233–250.

- Jacobson, L. (2000). The family as producer of health - an extended Grossman model. *Journal of Health Economics*, 19(5):611–637.
- Jaeckle, R. and Himmler, O. (2010). Health and wages - panel data estimates considering selection and endogeneity. *Journal of Human Resources*, forthcoming.
- Jenkins, S. P. and Osberg, L. (2005). Nobody to play with? The implications of leisure coordination. In Hamermesh, D. and Pfann, G., editors, *The Economics of Time Use*, pages 113–145. Elsevier Science B.V.
- Lillard, L. A. and Panis, C. W. (1996). Marital status and mortality: The role of health. *Demography*, 33(3):313–327.
- Manning, W., Morris, C., and Newhouse, J. (1981). A two-part model of the demand for medical care: Preliminary results from the health insurance study. In van der Gaag, J. and Perlman, M., editors, *Economics and health economics*.
- Manski, C. F. (1995). *Identification problems in the social sciences*. Harvard University Press.
- Markey, C. N., Markey, P. M., and Gray, H. F. (2007). Romantic relationships and health: An examination of individuals’ perceptions of their romantic partners’ influences on their health. *Sex Roles*, 57:435–445.
- Mundlak, Y. (1978). On the pooling of time series and cross section data. *Econometrica*, 46(1):69–85.
- Nielsen, H. S. and Svarer, M. (2006). Educational homogamy: Preferences or opportunities? *IZA Discussion Paper No. 2271*.
- Ribar, D. C. (2004). What do social scientists know about the benefits of marriage? A review of quantitative methodologies. *IZA Discussion Paper No. 998*.
- Semikyna, A. and Wooldridge, J. M. (2005). Estimating Panel Data Models in the Presence of Endogeneity and Selection: Theory and Application. *Working paper*.
- Trovato, F. and Lauris, G. (1989). Marital status and mortality in canada: 1951–1981. *Journal of Marriage and the Family*, 51(4):907–922.
- Umberson, D. (1992). Gender, marital status and the social control of health behavior. *Social Science & Medicine*, 34(8):907–917.
- Wagner, G. G., Frick, J. R., and Schupp, J. (2007). The german socio-economic panel study (soep): Scope, evolution, and enhancements. *Journal of Applied Social Science (Schmollers Jahrbuch)*, 127(1):139–169.

- Wilson, C. M. and Oswald, A. J. (2005). How does marriage affect physical and psychological health? A survey of the longitudinal evidence. *IZA Discussion Paper No. 1619*.
- Wilson, S. E. (2002). The health capital of families: An investigation of the inter-spousal correlation in health status. *Social Science & Medicine*, 55:1157–1172.
- Wooldridge, J. M. (1995). Selection corrections for panel data models under conditional mean independence assumptions. *Journal of Econometrics*, 68(1):115–132.

Appendix

A1 Descriptive statistics

Table A1: Sample means of control variables

	Men	Women
Private insurance	0.157	0.094
Age \leq 25	0.018	0.042
26 \leq Age \leq 35	0.155	0.185
36 \leq Age \leq 45	0.240	0.251
46 \leq Age \leq 55	0.210	0.213
56 \leq Age \leq 65	0.198	0.176
66 \leq Age \leq 75	0.133	0.106
Degree of handicap	8.025	5.266
Foreign	0.099	0.096
Children in household	0.379	0.379
West	0.748	0.748
Full-time	0.637	0.257
Part-time	0.016	0.210
Unemployed	0.065	0.066
Blue-collar	0.266	0.115
White-collar	0.252	0.330
Self-employed	0.089	0.045
Log. equiv. HH-income	7.269	7.269
Health job	0.015	0.058
Years of education	12.190	11.707
SAH very good	0.074	0.072
SAH good	0.411	0.407
SAH bad	0.128	0.141
SAH very bad	0.035	0.032
Hospital visit last year	0.109	0.134
Year = 1996	0.051	0.051
Year = 1997	0.050	0.050
Year = 1998	0.054	0.054
Year = 1999	0.054	0.054
Year = 2000	0.093	0.093
Year = 2001	0.084	0.084
Year = 2002	0.091	0.091
Year = 2003	0.085	0.085
Year = 2004	0.081	0.081
Year = 2005	0.077	0.077
Year = 2006	0.082	0.082
Year = 2007	0.076	0.076
Year = 2008	0.071	0.071
Observations	85,791	85,791

Means are exemplarily taken from the doctor visits-sample.

A2 Full estimation results

Table A2: Coefficients of men's doctor visits

	OLS		FE		FE-2SLS		FE-2SLS Sel.	
Doctor visit sp.	0.16***	(0.01)	0.10***	(0.00)	0.07**	(0.03)	0.06**	(0.03)
Private insur.	-0.04***	(0.01)	-0.03***	(0.01)	-0.03***	(0.01)	-0.03**	(0.01)
Age \leq 25	-0.10***	(0.02)	0.02	(0.03)	0.02	(0.03)	0.02	(0.03)
26 \leq Age \leq 35	-0.11***	(0.01)	-0.024	(0.03)	-0.03	(0.03)	-0.03	(0.02)
36 \leq Age \leq 45	-0.12***	(0.01)	-0.05**	(0.02)	-0.05**	(0.02)	-0.05**	(0.02)
46 \leq Age \leq 55	-0.10***	(0.01)	-0.06***	(0.02)	-0.06***	(0.02)	-0.06***	(0.02)
56 \leq Age \leq 65	-0.04***	(0.01)	-0.03*	(0.02)	-0.03*	(0.02)	-0.03**	(0.01)
66 \leq Age \leq 75	-0.00	(0.01)	-0.01	(0.01)	-0.02	(0.01)	-0.02	(0.01)
Deg. of handicap	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Foreign	0.01	(0.01)	-0.02	(0.02)	-0.02	(0.02)	-0.02	(0.03)
Kids in HH	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)
West	-0.02***	(0.01)	-0.06**	(0.03)	-0.06**	(0.03)	-0.06	(0.04)
Full Time	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)
Part Time	0.03	(0.02)	-0.01	(0.02)	-0.01	(0.02)	-0.01	(0.02)
Unemployed	-0.04***	(0.01)	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)
Blue collar	-0.07***	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)
White Collar	-0.05***	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)
Self-employed	-0.13***	(0.01)	-0.10***	(0.01)	-0.11***	(0.01)	-0.11***	(0.02)
Log. eq. HH-inc.	0.05***	(0.01)	0.01**	(0.01)	0.01**	(0.01)	0.01**	(0.01)
Health Job	-0.10***	(0.02)	0.05	(0.03)	0.05	(0.03)	0.05	(0.04)
Years of educ.	0.01***	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
SAH very good	-0.28***	(0.01)	-0.21***	(0.01)	-0.21***	(0.01)	-0.21***	(0.01)
SAH good	-0.14***	(0.01)	-0.11***	(0.00)	-0.11***	(0.00)	-0.11***	(0.01)
SAH bad	0.12***	(0.01)	0.11***	(0.01)	0.11***	(0.01)	0.11***	(0.01)
SAH very bad	0.11***	(0.01)	0.12***	(0.01)	0.12***	(0.01)	0.12***	(0.01)
Hosp. visits	0.12***	(0.00)	0.08***	(0.01)	0.08***	(0.01)	0.08***	(0.01)
Inv. Mills							0.02*	(0.01)
Constant	0.29***	(0.04)	0.58***	(0.06)	0.61***	(0.07)	0.06	(0.06)
Year dummies	yes		yes		yes		yes	
Observations	85,791		85,791		85,791		118,768	

1) Standard errors in parentheses; bootstrapped standard errors in selection models.

2) * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

3) SAH=self-rated health status.

Table A3: Coefficients of women's doctor visits

	OLS		FE		FE-2SLS		FE-2SLS Sel.	
Doctor visit sp.	0.13***	(0.00)	0.08***	(0.00)	-0.03	(0.02)	-0.03	(0.02)
Private insur.	-0.02**	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)
Age \leq 25	0.00	(0.01)	-0.00	(0.03)	-0.00	(0.03)	-0.00	(0.03)
26 \leq Age \leq 35	-0.02	(0.01)	-0.03	(0.03)	-0.04	(0.03)	-0.04*	(0.02)
36 \leq Age \leq 45	-0.06***	(0.01)	-0.06***	(0.02)	-0.07***	(0.02)	-0.07***	(0.02)
46 \leq Age \leq 55	-0.07***	(0.01)	-0.07***	(0.02)	-0.07***	(0.02)	-0.08***	(0.02)
56 \leq Age \leq 65	-0.04***	(0.01)	-0.03*	(0.02)	-0.04**	(0.02)	-0.04***	(0.01)
66 \leq Age \leq 75	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)
Deg. of handicap	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Foreign	0.04***	(0.01)	0.04*	(0.02)	0.04*	(0.02)	0.04	(0.03)
Kids in HH	-0.01	(0.01)	-0.00	(0.01)	-0.00	(0.01)	-0.00	(0.01)
West	-0.03***	(0.01)	0.06**	(0.03)	0.06**	(0.03)	0.06*	(0.03)
Full Time	-0.02***	(0.01)	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)
Part Time	0.01	(0.01)	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)
Unemployed	-0.03***	(0.01)	-0.00	(0.01)	-0.01	(0.01)	-0.01	(0.01)
Blue collar	-0.05***	(0.01)	-0.03***	(0.01)	-0.03***	(0.01)	-0.03***	(0.01)
White Collar	-0.00	(0.01)	-0.02**	(0.01)	-0.02**	(0.01)	-0.02**	(0.01)
Self-employed	-0.06***	(0.01)	-0.04***	(0.01)	-0.04***	(0.01)	-0.04**	(0.01)
Log. eq. HH-inc.	0.06***	(0.01)	0.01*	(0.01)	0.01*	(0.01)	0.01	(0.01)
Health Job	-0.04***	(0.01)	-0.00	(0.01)	-0.00	(0.01)	-0.00	(0.01)
Years of educ.	0.01***	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
SAH very good	-0.22***	(0.01)	-0.16***	(0.01)	-0.17***	(0.01)	-0.17***	(0.01)
SAH good	-0.12***	(0.00)	-0.09***	(0.00)	-0.09***	(0.00)	-0.09***	(0.00)
SAH bad	0.10***	(0.00)	0.07***	(0.01)	0.07***	(0.01)	0.07***	(0.00)
SAH very bad	0.10***	(0.01)	0.10***	(0.01)	0.10***	(0.01)	0.10***	(0.01)
Hosp. visits	0.08***	(0.00)	0.04***	(0.00)	0.05***	(0.00)	0.05***	(0.00)
Inv. Mills							0.03**	(0.01)
Constant	0.31***	(0.04)	0.67***	(0.06)	0.75***	(0.06)	0.00	(0.08)
Year dummies	yes		yes		yes		yes	
Observations	85,791		85,791		85,791		127,108	

1) Standard errors in parentheses; bootstrapped standard errors in selection models.

2) * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

3) SAH=self-rated health status.

Table A4: Coefficients of men's doing weekly sport

	OLS	FE	FE-2SLS	FE-2SLS Sel.
Weekly sport sp.	0.31*** (0.01)	0.19*** (0.00)	0.20** (0.09)	0.20* (0.10)
Private insur.	0.02** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.03** (0.01)
Age \leq 25	0.24*** (0.02)	-0.02 (0.03)	-0.02 (0.03)	-0.02 (0.03)
26 \leq Age \leq 35	0.17*** (0.02)	-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.03)
36 \leq Age \leq 45	0.15*** (0.01)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)
46 \leq Age \leq 55	0.10*** (0.01)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)
56 \leq Age \leq 65	0.08*** (0.01)	-0.03* (0.02)	-0.03* (0.02)	-0.03* (0.02)
66 \leq Age \leq 75	0.06*** (0.01)	-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)
Deg. of handicap	-0.00 (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Foreign	-0.01 (0.01)	0.06** (0.02)	0.05** (0.02)	0.05* (0.03)
Kids in HH	-0.02*** (0.01)	-0.02*** (0.01)	-0.02** (0.01)	-0.02** (0.01)
West	0.05*** (0.01)	0.03 (0.03)	0.03 (0.03)	0.03 (0.04)
Full Time	0.04** (0.01)	-0.05*** (0.01)	-0.05*** (0.01)	-0.05*** (0.01)
Part Time	0.08*** (0.02)	-0.04** (0.02)	-0.04** (0.02)	-0.04** (0.02)
Unemployed	-0.04*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)
Blue collar	-0.11*** (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)
White Collar	-0.07*** (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Self-employed	-0.12*** (0.02)	-0.02 (0.01)	-0.02 (0.01)	-0.02 (0.02)
Log. eq. HH-inc.	0.06*** (0.01)	0.01* (0.01)	0.01 (0.01)	0.01 (0.01)
Health Job	-0.03 (0.03)	0.05 (0.03)	0.05 (0.03)	0.05 (0.05)
Years of educ.	0.02*** (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
SAH very good	0.10*** (0.01)	0.04*** (0.01)	0.04*** (0.01)	0.04*** (0.01)
SAH good	0.04*** (0.01)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
SAH bad	-0.05*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)
SAH very bad	-0.09*** (0.01)	-0.04*** (0.01)	-0.04*** (0.01)	-0.04*** (0.01)
Hosp. visits	0.02*** (0.01)	0.01** (0.01)	0.01** (0.01)	0.01** (0.01)
Inv. Mills				-0.04** (0.03)
Constant	-0.53*** (0.05)	0.20*** (0.06)	0.20*** (0.06)	-0.53*** (0.08)
Year dummies	yes	yes	yes	yes
Observations	55,334	55,334	55,334	118,768

1) Standard errors in parentheses; bootstrapped standard errors in selection models.

2) * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

3) SAH=self-rated health status.

Table A5: Coefficients of women's doing weekly sport

	OLS	FE	FE-2SLS	FE-2SLS Sel.
Weekly sport sp.	0.31*** (0.01)	0.21*** (0.01)	0.35*** (0.07)	0.34*** (0.08)
Private insur.	0.03** (0.01)	0.03** (0.01)	0.03* (0.01)	0.03 (0.02)
Age \leq 25	0.09*** (0.02)	0.07** (0.03)	0.07** (0.03)	0.07** (0.03)
26 \leq Age \leq 35	0.12*** (0.02)	0.06** (0.03)	0.06** (0.03)	0.06** (0.03)
36 \leq Age \leq 45	0.15*** (0.01)	0.08*** (0.03)	0.08*** (0.03)	0.08*** (0.03)
46 \leq Age \leq 55	0.13*** (0.01)	0.08*** (0.02)	0.08*** (0.02)	0.08*** (0.02)
56 \leq Age \leq 65	0.13*** (0.01)	0.08*** (0.02)	0.08*** (0.02)	0.08*** (0.02)
66 \leq Age \leq 75	0.09*** (0.01)	0.07*** (0.02)	0.07*** (0.02)	0.07*** (0.02)
Deg. of handicap	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Foreign	-0.10*** (0.01)	0.03 (0.02)	0.02 (0.02)	0.02 (0.02)
Kids in HH	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)
West	0.07*** (0.01)	0.08*** (0.03)	0.08*** (0.03)	0.08** (0.04)
Full Time	-0.09*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)
Part Time	-0.04*** (0.01)	-0.02** (0.01)	-0.02** (0.01)	-0.02* (0.01)
Unemployed	-0.02*** (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Blue collar	0.00 (0.01)	0.02** (0.01)	0.02* (0.01)	0.02 (0.01)
White Collar	0.07*** (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Self-employed	0.05*** (0.02)	-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.02)
Log. eq. HH-inc.	0.09*** (0.01)	0.02*** (0.01)	0.02*** (0.01)	0.02*** (0.01)
Health Job	-0.00 (0.01)	-0.00 (0.01)	0.00 (0.01)	0.00 (0.02)
Years of educ.	0.02*** (0.00)	0.01 (0.00)	0.01* (0.00)	0.01 (0.00)
SAH very good	0.09*** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.03*** (0.01)
SAH good	0.04*** (0.01)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
SAH bad	-0.03*** (0.01)	-0.01** (0.01)	-0.01* (0.01)	-0.01* (0.01)
SAH very bad	-0.07*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)
Hosp. visits	-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.01)	-0.00 (0.01)
Inv. Mills				0.05*** (0.02)
Constant	-0.80*** (0.05)	-0.14** (0.07)	-0.18** (0.07)	-1.04*** (0.10)
Year dummies	yes	yes	yes	yes
Observations	55,334	55,334	55,334	127,108

1) Standard errors in parentheses; bootstrapped standard errors in selection models.

2) * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

3) SAH=self-rated health status.

Table A6: Coefficients of men's following healthy diet

	OLS		FE		FE-2SLS		FE-2SLS Sel.	
Healthy diet sp.	0.37***	(0.01)	0.26***	(0.01)	0.20	(0.16)	0.19	(0.15)
Private insur.	0.02*	(0.01)	0.01	(0.03)	0.01	(0.03)	0.01	(0.03)
Age \leq 25	-0.27***	(0.03)	0.08	(0.08)	0.08	(0.08)	0.08	(0.08)
26 \leq Age \leq 35	-0.22***	(0.02)	0.07	(0.06)	0.06	(0.06)	0.06	(0.06)
36 \leq Age \leq 45	-0.18***	(0.02)	0.07	(0.05)	0.07	(0.05)	0.07	(0.05)
46 \leq Age \leq 55	-0.16***	(0.02)	0.08*	(0.04)	0.08*	(0.04)	0.08*	(0.05)
56 \leq Age \leq 65	-0.09***	(0.02)	0.08**	(0.04)	0.08**	(0.04)	0.08**	(0.04)
66 \leq Age \leq 75	-0.04**	(0.02)	0.08***	(0.03)	0.08***	(0.03)	0.08**	(0.03)
Deg. of handicap	0.00***	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
Foreign	0.04***	(0.02)	-0.05	(0.07)	-0.04	(0.07)	-0.04	(0.07)
Kids in HH	0.01	(0.01)	0.02	(0.02)	0.014	(0.02)	0.01	(0.02)
West	0.01	(0.01)	0.08	(0.09)	0.08	(0.09)	0.08	(0.08)
Full Time	-0.07***	(0.02)	-0.06**	(0.03)	-0.06**	(0.03)	-0.06**	(0.03)
Part Time	-0.01	(0.03)	-0.02	(0.04)	-0.03	(0.04)	-0.03	(0.04)
Unemployed	-0.06***	(0.02)	-0.01	(0.02)	-0.01	(0.02)	-0.01	(0.02)
Blue collar	-0.02	(0.02)	0.00	(0.03)	-0.00	(0.03)	-0.00	(0.03)
White Collar	-0.02	(0.02)	-0.01	(0.03)	-0.00	(0.03)	-0.00	(0.03)
Self-employed	-0.01	(0.02)	0.06*	(0.03)	0.06*	(0.03)	0.06*	(0.03)
Log eq. HH-inc.	-0.00	(0.01)	-0.02	(0.02)	-0.023	(0.02)	-0.02	(0.02)
Health Job	-0.02	(0.03)	0.09	(0.08)	0.09	(0.08)	0.09	(0.08)
Years of educ.	0.01***	(0.00)	-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)
SAH very good	0.14***	(0.02)	0.06***	(0.02)	0.06***	(0.02)	0.06***	(0.02)
SAH good	0.05***	(0.01)	0.02**	(0.01)	0.02**	(0.01)	0.02**	(0.01)
SAH bad	0.03**	(0.01)	0.04***	(0.01)	0.04***	(0.01)	0.04***	(0.01)
SAH very bad	0.09***	(0.02)	0.11***	(0.02)	0.11***	(0.03)	0.11***	(0.03)
Hosp. visits	0.03***	(0.01)	0.03***	(0.01)	0.03***	(0.01)	0.03***	(0.01)
Inv. Mills							-0.05*	(0.03)
Constant	0.23***	(0.07)	0.39*	(0.20)	0.43*	(0.23)	0.31***	(0.09)
Year dummies	yes		yes		yes		yes	
Observations	20,091		20,091		20,091		118,768	

1) Standard errors in parentheses; bootstrapped standard errors in selection models.

2) * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

3) SAH=self-rated health status.

Table A7: Coefficients of women's following healthy diet

	OLS		FE		FE-2SLS		FE-2SLS Sel.	
Healthy diet sp.	0.37***	(0.01)	0.26***	(0.01)	0.16	(0.12)	0.16	(0.12)
Private insur.	0.01	(0.01)	0.08**	(0.03)	0.09**	(0.04)	0.09***	(0.03)
Age \leq 25	-0.09***	(0.03)	0.04	(0.07)	0.05	(0.07)	0.05	(0.07)
26 \leq Age \leq 35	-0.05**	(0.02)	0.04	(0.06)	0.05	(0.06)	0.05	(0.06)
36 \leq Age \leq 45	-0.03	(0.02)	0.08	(0.05)	0.08	(0.05)	0.08*	(0.05)
46 \leq Age \leq 55	-0.00	(0.02)	0.04	(0.05)	0.05	(0.05)	0.05	(0.05)
56 \leq Age \leq 65	-0.00	(0.02)	0.03	(0.04)	0.04	(0.04)	0.04	(0.04)
66 \leq Age \leq 75	0.01	(0.02)	0.01	(0.04)	0.02	(0.04)	0.02	(0.04)
Deg. of handicap	0.00***	(0.00)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
Foreign	-0.04**	(0.02)	0.08	(0.07)	0.08	(0.07)	0.08	(0.07)
Kids in HH	0.03**	(0.01)	-0.02	(0.02)	-0.02	(0.02)	-0.02	(0.02)
West	-0.00	(0.01)	0.09	(0.09)	0.10	(0.09)	0.10	(0.10)
Full Time	-0.09***	(0.01)	-0.03	(0.02)	-0.03	(0.02)	-0.03	(0.02)
Part Time	-0.03**	(0.01)	-0.02	(0.02)	-0.02	(0.02)	-0.02	(0.02)
Unemployed	-0.06***	(0.02)	0.02	(0.02)	0.02	(0.02)	0.02	(0.02)
Blue collar	-0.04***	(0.02)	-0.01	(0.02)	-0.01	(0.02)	-0.01	(0.03)
White Collar	0.01	(0.01)	0.01	(0.02)	0.00	(0.02)	0.01	(0.02)
Self-employed	0.06***	(0.02)	-0.03	(0.03)	-0.02	(0.03)	-0.02	(0.03)
Log. eq. HH-inc.	0.05***	(0.01)	0.01	(0.02)	0.01	(0.02)	0.01	(0.02)
Health Job	0.05***	(0.02)	0.02	(0.03)	0.02	(0.03)	0.02	(0.04)
Years of educ.	0.02***	(0.00)	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)
SAH very good	0.100***	(0.01)	0.06***	(0.02)	0.06***	(0.02)	0.06***	(0.02)
SAH good	0.05***	(0.01)	0.02*	(0.01)	0.02**	(0.01)	0.02*	(0.01)
SAH bad	0.02*	(0.01)	0.03**	(0.01)	0.02*	(0.01)	0.02*	(0.01)
SAH very bad	0.03	(0.02)	0.04*	(0.03)	0.04	(0.03)	0.04	(0.03)
Hosp. visits	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)
Inv. Mills							-0.02	(0.03)
Constant	-0.13**	(0.07)	0.29	(0.21)	0.36	(0.23)	-0.07	(0.14)
Year dummies	yes		yes		yes		yes	
Observations	20,091		20,091		20,091		127,108	

1) Standard errors in parentheses; bootstrapped standard errors in selection models.

2) * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

3) SAH=self-rated health status.