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Explaining socioeconomic inequalities in drug utilization for Sweden 2005-2006: Evidence from linked survey and register data

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Abstract

This study uses the Swedish register of prescribed drugs, merged with the Survey of Living Conditions (the ULF), to analyze the socioeconomic gradient in drug utilization. It finds a significant education gradient (but no income gradient) in individual drug utilization. Whereas the education gradient for men is quantitative in its orientation (education affects number of drugs used), the gradient for women is both quantitative and qualitative (education affects mean cost of drugs). For males, but not as clearly for females, the study finds that the education gradient is weaker for more health-related drugs but stronger for more expensive drugs. Our results indicate that the main reason for the education gradient in drug utilization is doctors' behaviour rather than compliance with medication and affordability of drugs.

JEL classification: D30, D31, I10, I12

Key words: health inequality, healthcare, drug utilization, income, education,

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Introduction

There are large disparities in health by socioeconomic status (SES) in Sweden and throughout the world (see for example; Nordin and Gerdtham, 2010; Baum and Ruhm, 2009; Buckley et al., 2004; Deaton and Paxton, 1998; Gerdtham and Johannesson 2000, 2002, 2004; Smith, 2004; van Doorslaer et al., 1997; Wagstaff and van Doorslaer, 2000; van Doorslaer and Koolman, 2004). Although the link between health and SES is not fully understood, it appears that SES health disparities might partly be caused by differences in access to adequate healthcare (Gerdtham and Trivedi, 2001; Morris, et al., 2005; Sutton, et al., 2002; van Doorslaer et al., 2004, 2006). Studies show, for example, that there is SES inequality in physician utilization and inpatient care in Sweden and other countries, and that the affluent account for the larger number of specialist visits in most OECD countries (Sutton et al, 2002; van Doorslaer, 2004).

Another healthcare aspect that might cause the SES-health gradient is differences in the availability and utilization of (medical) drugs. Non-compliance with medication is a major health-related problem (Larsen et al., 2009), and for most diseases only 50 percent of the patients seems to take their prescription drugs correctly (Morris and Schultz, 1992; WHO, 2003). Against this background, the objective of this study is to find out whether there is a positive association between SES and drug utilization in Sweden, i.e. if there is SES inequality in drug utilization.

The main explanation for a SES gradient in drug utilization is, of course, that health is the main predictor of drug utilization and health is (as acknowledged above) related to SES. In fact, such a negative correlation between drug utilization and SES has been established in a Swedish (ecological) study (Henricson et al., 1998). Therefore, it is fundamental to control for health, otherwise we would again just be estimating the familiar SES health gradient when using drug utilization as a proxy for health.

Given the health of the individual, there are three main explanations for a positive SES gradient in drug utilization, i) doctors proscribe more drugs to those with a high SES, ii) SES determines whether one can afford the prescribed drugs, or iii) SES is related to compliance with medication.

Focusing on the first explanation, one could come up with at least two reasons why doctors may prescribe more drugs to the well-off. It might be due to status, where doctors are more inclined to issue prescriptions to the well-off, but it could also be that the well-off have an information advantage compared to the poor and the less educated. For example, the well-off (and especially the high-educated) might make suggestions to their doctor concerning the use of a specific (or new) drug.

It is unlikely that affordability is the main explanation behind SES differences in drug utilization, since there is an individual maximum yearly payment of SEK 1,800 (around 200 euro) for medicines in Sweden. In addition, a recent study shows that compliance is not related to country-differences in sociodemographic and socioeconomic factors (Larsen et al., 2009). Still, young age, financial strain, low self-rated health, and low trust in the health care system do seem to affect compliance negatively (Johnell et al., 2006).

A positive association between women's education level and the use of hormone replacement therapy has been found for Sweden (Merlo et al, 2003). However, medical literature on the relationship between SES and drug utilization shows no consistency in results, possibly because of small and specific subpopulations (Nielsen et al., 2003). Another drawback of these studies is that they often use self-reported drug utilization (for example Furu (1997), and Nielsen et al. (2003)), a measure that is likely to be plagued with measurement errors.

We use the Swedish register of prescribed drugs, merged with the Survey of Living Conditions (the ULF), and register data from Statistics Sweden (LISA). Thus, with a rich

dataset containing dispensed drugs, health measures and SES indicators, we contribute key findings to both the healthcare inequality literature and the drug utilization literature.

We analyze the following measures (on a yearly basis); total public and individual cost of drugs, the individual number of drugs and the public and individual mean cost of drugs. With the total cost of drugs outcome we capture both quantitative and qualitative aspects of drug utilization. The other two outcomes disentangle the quantitative and qualitative aspects, i.e. with the number of drugs outcome we analyze whether there are quantitative differences in drug utilization, and with the mean cost of drugs we focus more on qualitative aspects in individual drug utilization. We relate these outcomes to the education level or the income of the individual. Because it is not feasible to have a full battery of health indicators, a (positive) health gradient in drug utilization is plausibly underestimated, though. For several reasons, drug inequality might vary with the type of drug and the motive for taking the drug. For example, inequality in drug utilization might be related to severity/acuteness of illness, side-effects, generic substitutes, compliance or cost of drug. Therefore, based on the ATC-classification system, we perform a detailed analysis of different types of drugs. We also try to explain the heterogeneity in results found for different drugs.

Data

We use the Swedish register of prescribed drugs¹ kept by the Centre for Epidemiology at the National Board of Health and Welfare (Socialstyrelsen). The register contains data on all dispensed prescriptions (not prescriptions actually issued by physicians) to the whole population of Sweden, and contains (among other things) information on dispensed item, date of prescribing and dispensing, amount, dosage, expenditure, reimbursement and prescriber's

¹ Over-the-counter (OTC) medications and drugs used in hospitals are not included in the register.

profession.² The drugs are classified according to the Anatomical Therapeutic Chemical (ATC) classification system.

Since the register of drugs includes patient identifiers (since 2005), we are able to merge the data with Statistics Sweden's Survey of Living Conditions (the ULF). The ULF is a survey of living conditions, and contains a random sample of adults between the ages 16 and 84. Interviews had been carried out annually between 1980 and 2006 and totally the ULF contains 119,019 individuals. Thus, for the two years 2005 and 2006 we have drug prescriptions dispensed for the sample included in the ULF. Restricting the data to those aged 25 or above, the sample contains 8,628 individuals. Due to missing information on BMI, we lose about 5 percent of the sample,³ and the final sample then consists of 8,138 individuals.

We analyze only drugs prescribed by a physician, which implies that dispensed drugs issued by, for example, a nurse or a dentist are excluded. Based on the drug register we construct three drug utilization measures; the number of different drugs dispensed,⁴ the total cost of drugs and the mean cost of drugs (total cost of drugs divided by number of drugs). The measures are on a yearly basis and the cost includes both the cost paid by the individual and the cost paid by the public (here the county council). The average number of drugs is 2.3 for males and 3.1 for women and the average cost of drugs is SEK 2,024 (about 200 euro) for males and SEK 2,044 for women (see Table 1). 43 percent of the men and 29 percent of the women are not dispensed any drugs. Thus, men collect a smaller number of drugs, but the costs are the same as for women.

Table 1 about here

² See Wettermark et al. (2007) for more information on the register.

³ We also lose 35 individuals because of missing values in the educational attainment variable.

⁴ That is, we do not take the yearly number of prescriptions dispensed or doses of a certain drug into account.

The Anatomical Therapeutic Chemical classification system⁵ divides drugs into different groups according to the organ or system upon which they act, and their chemical, pharmacological and therapeutic properties. Drugs are classified into groups at five levels. The first level divides the drugs into fourteen main groups. The second and third levels divide them into therapeutic subgroups. The fourth level is a therapeutic/pharmacological subgroup and the fifth level is the chemical substance. A problem with the ATC-classification system is that drugs may act on different organs/systems, in which case they are classified according to their main therapeutic use. We analyse each of the main groups (listed in Table 2)⁶ separately. To explain heterogeneity in results, finer subgroups of drugs (on the four-digit level of the ATC-classification) are also analyzed separately.

Table 2 about here

Statistics Sweden provides us with an annual disposable income measure. Since we use the logarithm of annual disposable income, we add a dummy variable for those with zero income (less than 1 percent of the sample). Our educational attainment variable is constructed according to SUN (Swedish Educational Terminology), the standard system for classifying education in Sweden into the following years of schooling; eight, nine, eleven, twelve, fourteen, sixteen and eighteen.

Our health variables are self-reported health, the five health-related dimensions (mobility, self-care, usual activities, pain/discomfort, anxiety/depression) in the EQ-5D,⁷ BMI and underweight. Self-reported health (low, medium and high self-reported health) and the responses in the health-related dimensions (except for self-care, they are recorded as three levels of severity) are included as a set of indicator variables. BMI is constructed according to

⁵It was first published in 1976 and it is controlled by the WHO Collaborating Centre for Drug Statistics Methodology (WHOCC).

⁶ Two main groups, P, Antiparasitic, insecticides and repellents products and, V, Various are exempted. These groups contain too few products to be analyzed separately.

⁷ Selected ULF survey interview questions identify similar dimensions of HRQoL as the generic instrument EQ-5D (see Islam et al. (2010) for further description).

the standard methodology, i.e. $\text{weight(kg)/height(m)}^2$. Since underweight is associated with certain diseases, we add a dummy variable for underweight (BMI below 18.5).

Results

First, we estimate the association between education/income and our three drug utilization outcomes (total cost of drugs, number of drugs, mean cost of drugs). The models are estimated separately for men and women. Second, some sensitivity tests of these results are performed. Third, we analyze the probability of dispensing each of the main drug types. Variations in the drug utilization-SES association are further explored on the four-digit level of the ATC-classification system.

The association between SES and drugs utilization

Table 3 sums up the results from Tables A1-A6 where we analyze each of the drug utilization measures separately. Therefore, we start with a short presentation of the main pattern in Tables A1-A6 before focusing on Table 3.

Tables A1-A6 start with estimating the baseline (OLS) correlations between the SES variables and the drug utilization outcomes (column (1), for education, and column (4), for income).⁸ Generally, the baseline gradients seem to be negative. For women the income gradient in Total cost of drugs and the income and educational gradient in Number of drugs are significant. For men we find a significantly negative income gradient in Number of drugs. However, when adding our health indicators in column (2) and column (5) in the respective tables, the SES gradients turn positive. When adding additional controls (civil status, children,

⁸ We only control for age (fixed effects) and year.

immigrant, second-generation immigrant and region) in column (3) and column (5) the SES gradients decrease somewhat, but tend to stay positive.⁹

Thus, the main message from Tables A1-A6 is that there is a positive SES gradient in drug utilization. However, when focusing on the specific SES estimates in the sum up in Table 3, we find that the SES gradient in drug utilization differs with both the SES variable and the drug utilization measure. In the panels A and B (the estimates from column (3) and column (5) in the Tables A1 to A6) we show the education and income gradients when including each SES variable separately in the model, and in panel C (the estimates from column (7) in Tables A1 to A6) the gradients from the pooled model, where both education and income are shown. From panel A and panel B we find that there is a significantly positive drug utilization gradient primarily for education. For men we find a significant education (and income) gradient in Number of drugs, and for women we find a significant education gradient in all drug utilization outcomes.

Table 3 about here

There is a clear pattern in the results. If we assume the total cost of drugs to be an overall measure of drug utilization, the measure may be disentangled into quantitative and qualitative aspects. The number of drugs captures the quantitative aspect of drug utilization, and the mean cost of drugs focuses on the qualitative aspects of individual drug utilization. Based on the above, there are gender differences in the quantitative/qualitative aspects of the education gradient in drug utilization, i.e. high-educated men seem to use a larger *number* of drugs than low-educated men, whereas high-educated women seem to use a larger *number* and more *expensive* drugs than low-educated women. Because high-educated men do not use more expensive drugs than low-educated men the aggregate drug measure, total cost of drugs, is positive but insignificant for men.

⁹ The income estimates might be hard to translate when including a dummy for those with no income, especially when the no income dummy turns up positive. However, the income estimates are only weakly affected by excluding the dummy, and the dummies are insignificant in the final specifications.

One of the reasons for a SES gradient in drug utilization is whether the prescribed drugs are affordable. Since the high-educated in general have a higher income than the low-educated, the explanation is accurate for education as well. However, if we add income to the model where we estimate the education effect, affordability should not cause the education gradient in drug utilization. Thus, when including both education and income in panel C to the model specification, we find that the education effects decrease only marginally, indicating that the education gradient is not caused by a lack of means. Moreover, the finding that the effect of women's education on the number of drugs becomes insignificant in the pooled model, suggests that the education gradient in drug utilization for women is mostly driven by the qualitative aspect. Here, we also find that the income effect on Number of drugs for males turns insignificant.

Sensitivity tests

We perform a series of tests to learn more about SES inequality in drug utilization. Since the well-off generally seem to be more prone to see a doctor when ill (van Doorslaer, 2004), the probability of getting a drug prescribed might also be higher for them. Therefore the SES gradient in drug utilization might partly be caused by a SES gradient in physician utilization. To test if this is the case, we add a variable measuring the number of doctoral visits in the last three months. The first three columns of Table 4, for men, and Table 5, for women, show the results when taking the number of doctoral visits into account. As expected, the number of doctoral visits affects drug utilization positively (for mean cost of drugs the estimate is insignificant). However, since the education gradients are almost unaffected by including the number of doctoral visits (compared with the estimates in Table 3), we can conclude that SES inequality in drug utilization is not caused by the fact that high-educated are more inclined to see a doctor.

So far the group that does not use any drugs is included in our analysis. Many of them are probably not likely to get a drug prescribed because they are healthy and not in contact with the health care system. We therefore assume the SES gradient to be larger in the sample including only those who are dispensed at least one drug. Columns (4) to (6) of Table 4 and Table 5 show the education and income gradients for this restricted sample. As assumed, the gradients show up larger here. Besides indicating that we in some sense underestimate SES inequality in drug utilization when using the total sample, this result again points out that affordability is less of an explanation for the SES gradient. Because the user pays (over a 12-month period) the first SEK 900 (about 100 euro), the cost of the first purchase is seldom discounted.¹⁰ Thus, if financial constraints are an important reason, SES inequality in drug utilization will be higher when including the group with no dispensed item, i.e. those who will have to pay the total cost of their next purchase.

There are drugs that are always free, and those which are never discounted. It might be that drug inequality is caused primarily by these specific drugs (doctors might be more restrictive in prescribing free drugs, and financial constraints might be particularly important for the never discounted drugs). Furthermore, since private doctors might prescribe more drugs (to the well-off), and having a private doctor is related to SES, the education gradient in drug utilization could run through the consumption of private healthcare. Both these assumptions are analyzed in column (7) to column (9) in Table 4 and Table 5, and are tested by including variables measuring the individual's share of drugs that are; i) free, ii) never discounted iii) prescribed by a private physician. Since these variables are valid only for users of drugs, the sample here consists of individuals with at least one drug. The tables show that drug consumption (number of drugs and total cost of drugs) is higher when an individual uses a large share of free drugs, and women seem to use more drugs when a large share is

¹⁰ Between SEK 900 and SEK 1,300 the user pays 50 percent of the cost, between SEK 1,300 and SEK 1,700 25 percent, and between SEK 1,700 and SEK 1,800 10 percent. Costs over SEK 1,800 are paid by the public sector.

prescribed by a private physician. However, neither of these factors affects the education gradient in drug utilization, and we can therefore conclude that our education gradient is robust with respect to these factors.

The socioeconomic gradient for different types of drugs

So far we have seen that there exists an association between drug utilization and education. Whether income affects drug utilization is more uncertain. However, because the motive for using a specific drug differs, the relationship with education might also vary with type of drug. Based on the ATC-classification system, we therefore also analyse: 1) the probability of dispensing each of the main drug types, and 2) the number of drugs utilized for each drug type (given that the individual consumes at least one drug of a certain type).¹¹ The second question aims at finding out whether the well-off are more prone to get multiple drugs of certain drug types.

The probability of dispensing each of the main drug types is analyzed in Table 6 for men and Table 7 for women. For men, we find significantly positive education gradients for the drug types; G (Genito-urinary system and sex hormones), H (Systemic hormonal preparations, excluding sex hormones and insulins), J (Antiinfectives for systemic use) and R (Respiratory system), and for women the education gradient is significantly positive for G.¹² In the case of drug type A (Alimentary tract and metabolism) the education gradient is significantly negative for men.

The results do differ, though, when we focus on the question of multiple use of a certain drug type. Table 8 for men and Table 9 for women contain analyses of the number of drugs for each drug type. We find significantly positive education gradients for the drug types J and

¹¹ We also analyze the total cost and mean cost of certain drug types. Probably due to the relatively few number of users of each drug type, these outcomes do not add much to our understanding of drug utilization (few of the gradients become significant).

¹² As for the earlier results, income is a weaker predictor than education.

M (Musculo-skeletal system) for men, and the drug types H and N (Nervous system) for women.

Thus, the association between drug utilization and SES varies considerably with drug type, and it seems as if the overall (positive) education gradient in drug utilization is primarily caused by certain drug types. Finding a pattern in the variation in gradients is difficult, but the lesson from this exercise is that we find that the specifics of a drug determine whether SES inequality takes place. Since SES inequality in multiple drug use (of a certain drug type) differs from SES inequality in getting a certain drug type prescribed, it also indicates that SES inequality is very much related to the specifics of the drug.

Table 7 and 8 about here

Explaining the variation in the education gradient for different drugs

In order to learn more about education inequality in drug utilization, the variation in results for different drug types needs to be explained. Thus, if we can explain the variation in the education gradient for different drugs, the mechanism behind the inequality might also unfold.

Since the main drug types are rather broad, and contain drugs that differ much in chemical substances, their side-effects, or which disease or organ they act upon etc, we prefer to analyze finer subgroups of drugs. By using the different drugs classified according to the four-digit level of the ATC-classification, we obtain a large number of different drugs. The drawback of using such a fine classification design is that, in many cases, the number of users of a certain drug type is very small, and therefore we analyze only those for which the share of users is at least 1.5 percent. Thus, we analyze the 36 most common types of drugs for men and the 28 most common drugs for women. Due to the small numbers of users, it is only possible to analyse the probability of dispensing each of the drug types here.

In a next step, i.e. after estimating the education gradients for the specific drugs, we estimate a second regression where the *education gradients* are our outcome variable. As our

explanatory variables we include Health importance¹³, Average cost of drug, Share prescribed by a private physician, and Share free of charge. The health importance variable is the increase in the R²-value when adding the health indicators to the probability model above. In column (1) in Table 10 we find the Health importance and Average Cost of drug variables to be significant predictors of the education gradient for men. The Health importance estimate is negative, indicating a smaller education gradient when the link between measured health and drug utilization is strong. Because the Average cost of drug-estimate is positive, education is a more important predictor of drug utilization for expensive drugs. For women, the estimates for Health importance and Average cost of drug in column (4) are smaller and insignificant, but the sign of the estimates is the same as for men. In column (2) for men and column (5) for women we add Share prescribed by a private physician. The results show that the education gradient is significantly larger when a large share of the drug is prescribed by a private physician. Since the Health importance estimate decreases when including the Share prescribed by a private physician variable, it indicates that private doctors often prescribe drugs that are weakly related to the health of the individual. From columns (3) and (6), we finally find that a large Share of free drugs do not affect the education gradient.

Table 9 about here

Conclusion

This study shows that SES health inequality might partly depend on an education gradient in drug utilization, but whereas education is a significant predictor of individual drug utilization, income is not. The variation in drug utilization between educational groups is not minor, and probably underestimated due to a lack of health indicators. For example; among users of drugs, women with a masters degree purchase (on a yearly basis) drugs for about SEK 350 (40 euro) more than women with a high school degree, and males with a masters degree

¹³ Health, according to the results in Tables 7 and 8, seems to be a more important predictor of drug use for the main drug types where the education gradients are significant.

purchase about 0.2 more drugs than men with a high school degree. Although the nature of the gradient is unidentified, our findings contribute to further understanding of the relationship between education and drug utilization.

Whereas high-educated women use both more drugs and more expensive drugs than low-educated women, high-educated men use more drugs, but not more expensive drugs, than low-educated men. Why there is no qualitative aspect in men's education gradient is uncertain, and somewhat peculiar, especially in view of the fact that there is a more pronounced quantitative aspect (number of drugs) for men than for women.

Since we use dispensed drugs instead of prescribed drugs, one of the main reasons for SES inequality in drug utilization is affordability. Several findings (besides the discounting of drugs in Sweden) indicate that this is not the main explanation, and that compliance with medication and doctor's behaviour are more plausible explanations for the education gradient. Although we cannot distinguish between these two explanation, our findings indicate that doctors are more inclined to prescribe drugs to the well-off. Since the education gradient seems to increase; i) when health is a weak predictor of drug utilization, ii) with cost of the drug and, iii) with prescriptions by private physicians, the doctor-patient interaction seems to be a part of the picture. Whereas compliance with medication and seeing a private physician might be correlated (they are both related to own behaviour), compliance as an explanation does not tally with the fact that the education gradient is larger for weakly health-related drugs and more expensive drugs. An example illustrates this point. For the drug Viagra the educational gradient is particularly large. Thus, high-educated men might get more Viagra prescribed than low-educated men, but given the prescription of Viagra there is no reason why low-educated men should not comply with the treatment.

It is quite obvious that the educational gradient varies with the type of drug. We have managed to touch upon this aspect, but more research is needed. Whereas the educational

gradient is related to side-effects of drug use, the risk of addiction (among others), is a factor to explore.

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Tables and figures

Table 1. Descriptive Statistics

	<i>Men</i>		<i>Women</i>	
	<i>Mean</i>	<i>St. Dev</i>	<i>Mean</i>	<i>St. Dev</i>
N	3,994		4,151	
Cost of drugs	2024.48	8943.08	2044.95	6308.14
Number of drugs	2.26	3.30	3.09	3.69
Mean cost of drugs	448.47	2413.29	436.48	2355.62
Schooling	11.58	2.54	11.64	2.48
Annual disposable household income	7.90	0.84	7.89	0.78
No income	0.01	0.07	0.00	0.05
Age	50.93	15.93	51.85	16.3
BMI	26.07	3.62	24.6	4.07
Underweight	0.00	0.06	0.02	0.14
High self-reported health	0.76	0.42	0.72	0.45
Medium self-reported health	0.18	0.39	0.22	0.41
Low self-reported health	0.05	0.22	0.06	0.24
Missing health	0.00	0.02	0.00	0.03
Norml mobility	0.93	0.26	0.88	0.32
Low mobility	0.07	0.26	0.12	0.32
Very low mobility	0.00	0.02	0.00	0.03
Normal self-care	0.99	0.09	0.98	0.13
Low self-care	0.01	0.09	0.02	0.13
Normal usual activities	0.77	0.42	0.71	0.45
Low usual activities	0.22	0.41	0.27	0.45
Very low usual activities	0.01	0.10	0.01	0.12
No pain	0.68	0.47	0.59	0.49
Severe pain	0.23	0.42	0.26	0.44
Very severe pain	0.10	0.29	0.15	0.35
No anxiety/depression	0.86	0.35	0.75	0.43
High anxiety/depression	0.11	0.31	0.19	0.39
Very high anxiety/depression	0.03	0.17	0.05	0.23
Year = 2005	0.44	0.50	0.45	0.50
Married	0.51	0.50	0.50	0.50
Cohabiting	0.21	0.41	0.20	0.40
Children	0.64	1.01	0.68	1.04
Immigrants	0.10	0.30	0.11	0.31
Second generation immigrant (2)	0.02	0.13	0.02	0.13
Second generation immigrant (1)	0.04	0.21	0.04	0.20
Northern	0.17	0.37	0.16	0.37
Southern	0.50	0.50	0.49	0.50
Gothenburg	0.09	0.29	0.11	0.31
Stockholm	0.19	0.39	0.20	0.40
Malmoe	0.05	0.23	0.04	0.21

Table 2. List of the main ATC drug types.

	Mean number of dispensed items	
	Men	Women
A Alimentary tract and metabolism	0.138	0.181
B Blood and blood forming organs	0.134	0.117
C Cardiovascular system	0.237	0.247
D Dermatologicals	0.073	0.088
G Genito-urinary system and sex hormones	0.061	0.167
H Systemic hormonal preparations, excluding sex hormones and insulins	0.041	0.116
J Antiinfectives for systemic use	0.156	0.247
L Antineoplastic and immunomodulating agents	0.019	0.022
M Musculo-skeletal system	0.137	0.178
N Nervous system	0.197	0.296
R Respiratory system	0.139	0.220
S Sensory organs	0.063	0.077

Table 3. Estimates of the association between SES and drug utilization (summary of Table A1 to Table A6).

	Men			Women		
	Total cost	N of drugs	Mean cost	Total cost	N of drugs	Mean cost
A						
Years of schooling	73.587 (60.299)	0.045 (0.018)**	-2.592 (16.772)	87.635 (43.775)**	0.035 (0.021)*	33.740 (16.973)**
B						
Logarithmic income	291.535 (293.966)	0.161 (0.090)*	5.939 (81.765)	144.652 (209.425)	0.098 (0.101)	58.512 (81.208)
C						
Years of schooling	64.485 (61.916)	0.040 (0.019)**	-2.904 (17.224)	84.650 (44.882)*	0.031 (0.022)	32.587 (17.404)*
Logarithmic income	221.171 (301.627)	0.118 (0.092)	9.108 (83.907)	55.597 (214.617)	0.065 (0.103)	24.229 (83.222)

Notes: Each column in each panel comes from a separate model. In the upper panels (A and B) the education and income gradients are estimated separately, and in panel C the gradients come from a pooled model. The model specifications are reported in Tables A1 to A6. Standard errors are shown below the coefficients.

Table 4. Sensitivity tests. Men.

	Main sample			Sample for those with at least one drug					
	Total cost	N of drugs	Mean cost	Total cost	N of drugs	Mean cost	Total cost	N of drugs	Mean cost
Years of schooling	61.600 (61.782)	0.037 (0.018)**	-3.103 (17.225)	101.048 (107.865)	0.063 (0.028)**	-8.287 (29.933)	94.736 (108.137)	0.064 (0.028)**	-10.774 (30.001)
Logarithmic income	191.964 (301.032)	0.086 (0.089)	7.100 (83.927)	315.400 (555.964)	0.012 (0.146)	10.000 (154.285)	329.363 (557.232)	0.028 (0.146)	12.885 (154.594)
Number of doctoral visits	482.886 (112.573)***	0.529 (0.033)***	33.202 (31.385)						
Share free							5,680.892 (2,962.475)*	1.640 (0.776)**	1,884.178 (821.887)**
Share with no discount							-963.895 (1,269.040)	-0.563 (0.332)*	-155.323 (352.073)
Shared issued by a private physician							377.536 (641.231)	-0.031 (0.168)	108.678 (177.898)
Observations	3,994	3,994	3,994	2,274	2,274	2,274	2,274	2,274	2,274
R-squared	0.09	0.41	0.03	0.08	0.31	0.04	0.08	0.31	0.04

Notes: In all models age fixed effects, year, marital status, children immigrant, second-generation immigrant, self-reported health, the set of health indicators, BMI and underweight are included. In the first three columns the entire sample is used and in the last six columns the sample is those with at least one dispensed drug. Standard errors are shown below the coefficients.

Table 5. Sensitivity tests. Women.

	Main sample			Sample for those with at least one drug					
	Total cost	N of drugs	Mean cost	Total cost	N of drugs	Mean cost	Total cost	N of drugs	Mean cost
Years of schooling	86.740 (44.376)*	0.032 (0.021)	35.915 (17.242)**	122.495 (62.330)**	0.050 (0.027)*	51.623 (24.416)**	121.350 (62.496)*	0.043 (0.027)	53.579 (24.493)**
Logarithmic income	-24.082 (134.062)	0.027 (0.064)	-65.627 (52.089)	-50.386 (192.916)	-0.023 (0.083)	-95.295 (75.568)	-41.938 (192.935)	-0.014 (0.083)	-95.175 (75.615)
Number of doctoral Visits	153.268 (51.519)***	0.244 (0.025)***	0.329 (20.017)						
Share free							6,120.495 (3,218.709)*	2.896 (1.383)**	746.325 (1,261.479)
Share with no discount							-1,239.321 (780.251)	-0.280 (0.335)	-392.776 (305.797)
Shared issued by a private physician							-29.950 (359.251)	0.454 (0.154)***	-160.799 (140.798)
Observations	4,146	4,146	4146	2,941	2,941	2941	2,941	2,941	2,941
R-squared	0.10	0.40	0.02	0.09	0.34	0.03	0.09	0.34	0.03

Notes: In all models age fixed effects, year, marital status, children immigrant, second-generation immigrant, self-reported health, the set of health indicators, BMI and underweight are included. In the first three columns the entire sample is used and in the last six columns the sample is those with at least one dispensed drug. Standard errors are shown below the coefficients.

Table 6. The probability of dispensing a certain drug type.

Men (n=3,994)	A	B	C	D	G	H
Years of schooling	-0.005 (0.002)**	-0.000 (0.002)	-0.001 (0.002)	0.003 (0.002)	0.009 (0.002)***	0.003 (0.001)**
R-squared	0.16	0.29	0.34	0.04	0.11	0.07
	J	L	M	N	R	S
Years of schooling	0.005 (0.002)*	0.000 (0.001)	0.001 (0.002)	0.003 (0.003)	0.006 (0.002)**	0.002 (0.002)
R-squared	0.05	0.07	0.07	0.19	0.07	0.06

Notes: In all models age fixed effects, year, marital status, children immigrant, second-generation immigrant, self-reported health, the set of health indicators, BMI and underweight are included. Standard errors are shown below the coefficients.

Table 7. The probability of dispensing a certain drug type.

Women (n=4,151)	A	B	C	D	G	H
Years of schooling	0.003 (0.003)	0.002 (0.002)	-0.002 (0.003)	0.001 (0.002)	0.006 (0.003)**	0.003 (0.002)
R-squared	0.20	0.27	0.33	0.05	0.06	0.08
	J	L	M	N	R	S
Years of schooling	0.002 (0.003)	0.001 (0.001)	0.000 (0.003)	-0.001 (0.003)	-0.002 (0.003)	0.003 (0.002)
R-squared	0.06	0.03	0.11	0.24	0.08	0.07

Notes: In all models age fixed effects, year, marital status, children immigrant, second-generation immigrant, self-reported health, the set of health indicators, BMI and underweight are included. Standard errors are shown below the coefficients.

Table 8. The number of dispensed drugs. Given that the individual consumes at least one drug of the drug type.

Men	A	B	C	D	G	H
Years of schooling	-0.006 (0.019)	0.013 (0.009)	-0.001 (0.020)	0.007 (0.020)	-0.006 (0.013)	-0.003 (0.014)
N	553	537	948	291	243	162
R-squared	0.23	0.20	0.21	0.35	0.33	0.42
	J	L	M	N	R	S
Years of schooling	0.027 (0.012)**	0.037 (0.047)	0.016 (0.009)*	-0.014 (0.019)	0.020 (0.022)	-0.004 (0.024)
N	624	74	548	786	554	253
R-squared	0.23	0.93	0.17	0.21	0.25	0.46

Notes: In all models age fixed effects, year, marital status, children immigrant, second-generation immigrant, self-reported health, the set of health indicators, BMI and underweight are included. Standard errors are shown below the coefficients.

Table 9. The number of dispensed drugs. Given that the individual consumes at least one drug of the drug type.

Women	A	B	C	D	G	H
Years of schooling	-0.002 (0.015)	-0.011 (0.010)	-0.025 (0.018)	0.001 (0.026)	0.012 (0.008)	0.015 (0.007)**
N	751	486	1,027	367	692	480
R-squared	0.15	0.26	0.24	0.24	0.13	0.21
	J	L	M	N	R	S
Years of schooling	0.012 (0.012)	0.019 (0.029)	0.009 (0.009)	0.031 (0.019)*	0.014 (0.019)	-0.006 (0.024)
N	1,024	90	738	1,227	912	321
R-squared	0.11	0.95	0.20	0.22	0.11	0.38

Notes: In all models age fixed effects, year, marital status, children immigrant, second-generation immigrant, self-reported health, the set of health indicators, BMI and underweight are included. Standard errors are shown below the coefficients.

Table 10. Explaining variation in the education gradient.

	Men			Women		
	(1)	(2)	(3)	(4)	(5)	(6)
Health importance	-0.025 (0.012)*	-0.014 (0.013)	-0.022 (0.013)*	-0.008 (0.012)	0.002 (0.012)	-0.011 (0.012)
Average cost of drug (in thousands)	0.000 (0.000)*	0.000 (0.000)**	0.000 (0.000)*	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Share prescribed by a private doctor		0.011 (0.007)*			0.013 (0.005)**	
Share free			0.001 (0.001)			-0.002 (0.002)
N	36	36	36	28	28	28
R-squared	0.19	0.26	0.20	0.03	0.26	0.08

Notes: The dependent variable is the educational gradient from 36, for men, and 28, for women, separate regressions. In these regressions the dependent variable is the probability of dispensing a certain drug (four-digit level of the ATC classification). The health importance variable is the increase in the R²-value when adding the health indicators to the first-stage model. Standard errors are shown below the coefficients.

Appendix

Table A1. Estimating the association between total costs of drugs and years of schooling and income.

Men (n=3,994)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Years of schooling	-22.176 (57.819)	69.331 (58.319)	73.587 (60.299)				64.485 (61.916)
Logarithmic income				-305.811 (237.485)	166.295 (242.196)	291.535 (293.966)	221.171 (301.627)
BMI		300.567 (267.779)	317.392 (268.753)		270.049 (267.735)	288.121 (268.555)	306.491 (269.131)
BMI ²		-3.972 (4.658)	-4.286 (4.677)		-3.536 (4.663)	-3.874 (4.678)	-4.106 (4.683)
Underweight		-790.772 (2,412.875)	-715.841 (2,420.669)		-826.584 (2,413.617)	-685.858 (2,422.804)	-648.056 (2,423.049)
High self-reported health		-2,845.658 (796.798)***	-2,893.193 (799.290)***		-2,860.436 (797.361)***	-2,908.353 (799.718)***	-2,913.239 (799.723)***
Medium self-reported health		-1,571.716 (753.426)**	-1,618.849 (755.417)**		-1,593.315 (753.659)**	-1,636.070 (755.589)**	-1,628.585 (755.615)**
Low mobility		1,222.502 (651.946)*	1,243.842 (653.612)*		1,206.451 (652.218)*	1,222.941 (653.753)*	1,237.186 (653.889)*
Very low mobility		10,663.136 (6,252.300)*	10,547.265 (6,269.506)*		10,721.751 (6,255.440)*	10,553.285 (6,270.698)*	10,555.479 (6,270.630)*
Low self-care		1,563.970 (1,936.507)	1,602.245 (1,939.500)		1,651.509 (1,937.993)	1,708.809 (1,940.642)	1,657.261 (1,941.252)
Low usual activities		-8.685 (484.220)	-5.280 (485.526)		-20.843 (485.031)	-5.128 (486.204)	20.982 (486.844)
Very low usual activities		1,525.820 (1,835.526)	1,430.189 (1,838.802)		1,485.542 (1,835.699)	1,393.240 (1,838.581)	1,447.847 (1,839.309)
Severe pain		1,528.234 (417.151)***	1,529.020 (417.625)***		1,526.579 (417.354)***	1,524.748 (417.799)***	1,519.467 (417.825)***
Very severe pain		1,260.185 (659.658)*	1,242.873 (660.566)*		1,262.374 (659.827)*	1,243.655 (660.732)*	1,240.029 (660.734)*
High anxiety/depression		691.099 (453.773)	705.824 (455.834)		713.624 (455.256)	723.983 (456.493)	720.031 (456.504)
Very high anxiety/depression		-160.405 (873.423)	-66.240 (881.646)		-126.255 (877.000)	-47.211 (883.219)	-32.365 (883.325)
Married			-61.147 (364.939)			-241.176 (416.762)	-217.830 (417.360)
Cohabiting			-279.923 (419.289)			-473.339 (458.101)	-427.234 (460.230)
Children			-39.097 (179.324)			-56.768 (180.044)	-53.300 (180.073)
Immigrant			-497.651 (470.147)			-392.367 (478.423)	-420.981 (479.206)
Second-gen imm. (2)			-679.598 (1,058.486)			-661.815 (1,059.554)	-649.843 (1,059.605)
Second-gen imm. (1)			201.124 (680.370)			237.143 (680.572)	216.772 (680.846)
Region	<i>no</i>	<i>no</i>	<i>yes</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>
R-squared	0.06	0.09	0.09	0.06	0.09	0.09	0.09

Notes: In all models age fixed effects and year are included. In columns (1) to (3) we estimate years of schooling effect on total costs of drugs, and in columns (4) to (6) we estimate the ln. income effect on total costs of drugs. In column (7) both years of schooling and ln. income are included in the model. Standard errors are shown below the coefficients.

Table A2. Estimating the association between total costs of drugs and years of schooling and income.

Women (n=4,151)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Years of schooling	16.672 (43.717)	97.556 (43.492)**	87.635 (43.775)**				84.650 (44.882)*
Logarithmic income				-356.787 (169.695)**	112.083 (170.163)	144.652 (209.425)	55.597 (214.617)
BMI		-123.398 (196.598)	-87.209 (196.939)		-143.799 (196.571)	-102.146 (196.920)	-89.386 (196.974)
BMI ²		2.230 (3.577)	1.659 (3.581)		2.510 (3.578)	1.863 (3.582)	1.719 (3.582)
Underweight		2,628.633 (734.529)***	2,705.863 (734.501)***		2,545.352 (733.990)***	2,633.989 (733.987)***	2,701.164 (734.619)***
High self-reported health		-1,362.402 (501.491)***	-1,461.063 (502.467)***		-1,342.292 (501.971)***	-1,436.910 (502.571)***	-1,481.849 (502.977)***
Medium self-reported health		-338.426 (469.214)	-397.027 (469.502)		-357.251 (470.040)	-407.232 (470.162)	-419.104 (470.056)
Low mobility		725.643 (380.187)*	745.839 (380.182)**		721.610 (380.746)*	738.071 (380.455)*	753.873 (380.428)**
Very low mobility		10,957.609 (3,054.985)***	10,879.323 (3,055.484)***		11,118.987 (3,056.280)***	11,020.350 (3,055.946)***	10,867.925 (3,056.051)***
Low self-care		1,907.319 (848.907)**	1,888.008 (848.182)**		1,900.269 (849.357)**	1,881.498 (848.594)**	1,902.554 (848.399)**
Low usual activities		507.290 (329.931)	461.720 (330.234)		499.661 (330.310)	460.770 (330.617)	462.272 (330.514)
Very low usual activities		776.741 (954.791)	716.906 (956.358)		799.879 (955.587)	763.661 (956.641)	726.460 (956.542)
Severe pain		693.787 (283.303)**	681.388 (283.182)**		702.995 (283.403)**	689.641 (283.267)**	680.100 (283.222)**
Very severe pain		1,322.952 (415.144)***	1,336.275 (414.833)***		1,322.497 (415.352)***	1,332.589 (415.031)***	1,334.813 (414.902)***
High anxiety/depression		434.301 (249.931)*	438.605 (251.009)*		440.924 (251.266)*	435.985 (251.447)*	443.385 (251.399)*
Very high anxiety/depression		661.475 (448.023)	684.606 (449.628)		698.168 (450.276)	701.319 (450.665)	708.736 (450.540)
Married			86.298 (236.378)			-20.693 (279.135)	39.424 (280.862)
Cohabiting			54.651 (296.900)			-55.984 (331.466)	7.739 (333.079)
Children			-291.833 (130.200)**			-305.246 (131.384)**	-296.490 (131.425)**
Immigrant			-659.276 (312.090)**			-600.747 (315.057)*	-626.027 (315.243)**
Second-gen imm. (2)			-387.522 (758.369)			-408.036 (758.882)	-384.815 (758.743)
Second-gen imm. (1)			-431.966 (482.377)			-424.710 (482.696)	-422.286 (482.545)
Region	<i>no</i>	<i>no</i>	<i>yes</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>Yes</i>
R-squared	0.04	0.09	0.10	0.04	0.09	0.10	0.10

Notes: In all models age fixed effects and year are included. In columns (1) to (3) we estimate years of schooling effect on total costs of drugs, and in columns (4) to (6) we estimate the ln. income effect on total costs of drugs. In column (7) both years of schooling and ln. income are included in the model. Standard errors are shown below the coefficients.

Table A3. Estimating the association between number of drugs utilized and years of schooling and income.

Men (n=3,994)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Years of schooling	-0.028 (0.019)	0.058 (0.018)***	0.045 (0.018)**				0.040 (0.019)**
Logarithmic income				-0.262 (0.079)***	0.161 (0.074)**	0.161 (0.090)*	0.118 (0.092)
BMI		0.076 (0.082)	0.081 (0.082)		0.049 (0.082)	0.064 (0.082)	0.075 (0.082)
BMI ²		0.000 (0.001)	0.000 (0.001)		0.001 (0.001)	0.001 (0.001)	0.000 (0.001)
Underweight		0.602 (0.739)	0.579 (0.740)		0.578 (0.739)	0.590 (0.741)	0.613 (0.741)
High self-reported health		-1.588 (0.244)***	-1.581 (0.244)***		-1.603 (0.244)***	-1.591 (0.245)***	-1.594 (0.244)***
Medium self-reported health		-0.435 (0.231)*	-0.431 (0.231)*		-0.454 (0.231)**	-0.443 (0.231)*	-0.438 (0.231)*
Low mobility		0.808 (0.200)***	0.813 (0.200)***		0.795 (0.200)***	0.797 (0.200)***	0.806 (0.200)***
Very low mobility		4.660 (1.915)**	4.861 (1.917)**		4.722 (1.916)**	4.857 (1.918)**	4.859 (1.917)**
Low self-care		1.482 (0.593)**	1.486 (0.593)**		1.562 (0.594)***	1.547 (0.593)***	1.515 (0.593)**
Low usual activities		0.547 (0.148)***	0.561 (0.148)***		0.541 (0.149)***	0.559 (0.149)***	0.575 (0.149)***
Very low usual activities		2.217 (0.562)***	2.215 (0.562)***		2.188 (0.562)***	2.189 (0.562)***	2.223 (0.562)***
Severe pain		0.739 (0.128)***	0.736 (0.128)***		0.736 (0.128)***	0.733 (0.128)***	0.730 (0.128)***
Very severe pain		1.010 (0.202)***	1.030 (0.202)***		1.012 (0.202)***	1.031 (0.202)***	1.029 (0.202)***
High anxiety/depression		0.017 (0.139)	0.015 (0.139)		0.039 (0.139)	0.024 (0.140)	0.022 (0.140)
Very high anxiety/depression		0.310 (0.267)	0.275 (0.270)		0.345 (0.269)	0.282 (0.270)	0.291 (0.270)
Married			0.115 (0.112)			0.014 (0.127)	0.029 (0.128)
Cohabiting			0.049 (0.128)			-0.061 (0.140)	-0.033 (0.141)
Children			-0.029 (0.055)			-0.040 (0.055)	-0.038 (0.055)
Immigrant			0.039 (0.144)			0.102 (0.146)	0.084 (0.146)
Second-gen imm. (2)			0.039 (0.324)			0.056 (0.324)	0.063 (0.324)
Second-gen imm. (1)			0.340 (0.208)			0.361 (0.208)*	0.348 (0.208)*
Region	<i>no</i>	<i>no</i>	<i>yes</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>
R-squared	0.23	0.37	0.37	0.24	0.37	0.37	0.37

Notes: In all models age fixed effects and year are included. In columns (1) to (3) we estimate years of schooling effect on total costs of drugs, and in columns (4) to (6) we estimate the ln. income effect on total costs of drugs. In column (7) both years of schooling and ln. income are included in the model. Standard errors are shown below the coefficients.

Table A4. Estimating the association between number of drugs utilized and years of schooling and income.

Women (n=4,151)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Years of schooling	-0.050 (0.023)**	0.047 (0.021)**	0.035 (0.021)*				0.031 (0.022)
Logarithmic income				-0.480 (0.089)***	0.009 (0.082)	0.098 (0.101)	0.065 (0.103)
BMI		0.104 (0.095)	0.136 (0.095)		0.094 (0.095)	0.128 (0.095)	0.133 (0.095)
BMI ²		-0.001 (0.002)	-0.002 (0.002)		-0.001 (0.002)	-0.001 (0.002)	-0.002 (0.002)
Underweight		0.303 (0.356)	0.374 (0.354)		0.257 (0.355)	0.342 (0.354)	0.367 (0.354)
High self-reported health		-1.995 (0.243)***	-2.054 (0.242)***		-1.996 (0.243)***	-2.065 (0.242)***	-2.081 (0.242)***
Medium self-reported health		-1.043 (0.227)***	-1.086 (0.227)***		-1.070 (0.227)***	-1.111 (0.227)***	-1.115 (0.227)***
Low mobility		0.650 (0.184)***	0.642 (0.183)***		0.647 (0.184)***	0.647 (0.183)***	0.652 (0.183)***
Very low mobility		5.732 (1.480)***	5.671 (1.474)***		5.774 (1.479)***	5.711 (1.473)***	5.655 (1.473)***
Low self-care		1.640 (0.411)***	1.655 (0.409)***		1.646 (0.411)***	1.666 (0.409)***	1.674 (0.409)***
Low usual activities		0.196 (0.160)	0.180 (0.159)		0.186 (0.160)	0.180 (0.159)	0.180 (0.159)
Very low usual activities		0.855 (0.462)*	0.889 (0.461)*		0.877 (0.462)*	0.915 (0.461)**	0.902 (0.461)*
Severe pain		0.981 (0.137)***	0.984 (0.137)***		0.985 (0.137)***	0.986 (0.137)***	0.983 (0.137)***
Very severe pain		1.921 (0.201)***	1.929 (0.200)***		1.922 (0.201)***	1.926 (0.200)***	1.927 (0.200)***
High anxiety/depression		0.330 (0.121)***	0.296 (0.121)**		0.329 (0.122)***	0.299 (0.121)**	0.302 (0.121)**
Very high anxiety/depression		0.856 (0.217)***	0.809 (0.217)***		0.881 (0.218)***	0.837 (0.217)***	0.840 (0.217)***
Married			-0.192 (0.114)*			-0.270 (0.135)**	-0.248 (0.135)*
Cohabiting			-0.259 (0.143)*			-0.338 (0.160)**	-0.315 (0.161)*
Children			-0.040 (0.063)			-0.048 (0.063)	-0.045 (0.063)
Immigrant			-0.381 (0.151)**			-0.329 (0.152)**	-0.338 (0.152)**
Second-gen imm. (2)			0.051 (0.366)			0.046 (0.366)	0.054 (0.366)
Second-gen imm. (1)			0.160 (0.233)			0.171 (0.233)	0.172 (0.233)
Region	<i>no</i>	<i>no</i>	<i>yes</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>
R-squared	0.22	0.38	0.39	0.22	0.38	0.39	0.39

Notes: In all models age fixed effects and year are included. In columns (1) to (3) we estimate years of schooling effect on total costs of drugs, and in columns (4) to (6) we estimate the ln. income effect on total costs of drugs. In column (7) both years of schooling and ln. income are included in the model. Standard errors are shown below the coefficients.

Table A5. Estimating the association between mean cost of drugs and years of schooling and income.

Men (n=3,994)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Years of schooling	-9.120 (15.912)	1.166 (16.234)	-2.592 (16.772)				-2.904 (17.224)
Logarithmic income				-18.340 (65.371)	47.384 (67.406)	5.939 (81.765)	9.108 (83.907)
BMI		45.175 (74.538)	45.536 (74.755)		41.844 (74.514)	45.846 (74.697)	45.019 (74.867)
BMI ²		-0.807 (1.297)	-0.818 (1.301)		-0.747 (1.298)	-0.820 (1.301)	-0.810 (1.303)
Underweight		-125.596 (671.641)	-119.418 (673.317)		-114.054 (671.738)	-115.180 (673.886)	-116.882 (674.045)
High self-reported health		-141.992 (221.794)	-150.930 (222.325)		-147.142 (221.915)	-152.370 (222.436)	-152.150 (222.467)
Medium self-reported health		-93.133 (209.721)	-103.198 (210.122)		-95.838 (209.752)	-103.530 (210.162)	-103.867 (210.198)
Low mobility		-159.079 (181.474)	-132.350 (181.804)		-157.406 (181.520)	-132.448 (181.837)	-133.089 (181.899)
Very low mobility		-176.994 (1,740.371)	-305.438 (1,743.884)		-149.377 (1,740.961)	-305.960 (1,744.150)	-306.059 (1,744.368)
Low self-care		397.634 (539.040)	431.810 (539.478)		412.425 (539.366)	431.749 (539.776)	434.071 (540.019)
Low usual activities		362.116 (134.786)***	359.924 (135.051)***		370.290 (134.990)***	362.227 (135.234)***	361.051 (135.431)***
Very low usual activities		275.787 (510.932)	264.596 (511.469)		285.136 (510.896)	267.604 (511.388)	265.144 (511.660)
Severe pain		91.904 (116.117)	96.827 (116.164)		89.538 (116.154)	96.035 (116.208)	96.273 (116.231)
Very severe pain		49.938 (183.620)	51.841 (183.739)		49.914 (183.638)	51.726 (183.778)	51.889 (183.803)
High anxiety/depression		273.894 (126.311)**	292.869 (126.792)**		280.625 (126.703)**	293.124 (126.970)**	293.302 (126.991)**
Very high anxiety/depression		-170.435 (243.123)	-119.107 (245.233)		-155.528 (244.079)	-117.279 (245.661)	-117.948 (245.724)
Married			139.448 (101.509)			133.530 (115.920)	132.478 (116.102)
Cohabiting			38.137 (116.627)			33.626 (127.417)	31.550 (128.027)
Children			-32.452 (49.879)			-33.082 (50.078)	-33.238 (50.093)
Immigrant			-175.149 (130.773)			-172.656 (133.070)	-171.367 (133.306)
Second-gen imm. (2)			-180.210 (294.422)			-177.089 (294.707)	-177.628 (294.762)
Second-gen imm. (1)			-33.547 (189.247)			-33.868 (189.296)	-32.951 (189.398)
Region	<i>no</i>	<i>no</i>	<i>yes</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>
R-squared	0.02	0.03	0.03	0.02	0.03	0.03	0.03

Notes: In all models age fixed effects and year are included. In columns (1) to (3) we estimate years of schooling effect on total costs of drugs, and in columns (4) to (6) we estimate the ln. income effect on total costs of drugs. In column (7) both years of schooling and ln. income are included in the model. Standard errors are shown below the coefficients.

Table A6. Estimating the association between mean cost of drugs and years of schooling and income.

Women (n=4,151)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Years of schooling	25.277 (16.534)	35.376 (16.836)**	33.740 (16.973)**				32.587 (17.404)*
Logarithmic income				-48.697 (64.227)	8.602 (65.883)	58.512 (81.208)	24.229 (83.222)
BMI		-3.874 (76.106)	6.217 (76.358)		-10.346 (76.107)	0.990 (76.359)	5.902 (76.381)
BMI ²		0.001 (1.385)	-0.167 (1.388)		0.078 (1.385)	-0.102 (1.389)	-0.158 (1.389)
Underweight		321.335 (284.346)	330.664 (284.784)		290.245 (284.182)	304.763 (284.616)	330.623 (284.863)
High self-reported health		-101.084 (194.134)	-118.273 (194.819)		-82.600 (194.350)	-103.921 (194.881)	-121.221 (195.039)
Medium self-reported health		215.468 (181.639)	205.274 (182.038)		217.333 (181.987)	207.790 (182.314)	203.220 (182.274)
Low mobility		-117.001 (147.175)	-119.337 (147.406)		-123.954 (147.415)	-123.686 (147.528)	-117.602 (147.518)
Very low mobility		69.656 (1,182.624)	-6.172 (1,184.687)		125.811 (1,183.311)	54.288 (1,184.996)	-4.390 (1,185.044)
Low self-care		81.326 (328.623)	65.110 (328.861)		73.513 (328.849)	58.347 (329.057)	66.452 (328.984)
Low usual activities		290.599 (127.721)**	282.488 (128.040)**		286.572 (127.887)**	283.071 (128.203)**	283.649 (128.163)**
Very low usual activities		303.154 (369.612)	307.992 (370.804)		316.295 (369.978)	324.053 (370.954)	309.732 (370.918)
Severe pain		121.247 (109.670)	115.564 (109.797)		125.444 (109.726)	118.946 (109.842)	115.273 (109.825)
Very severe pain		-70.696 (160.708)	-69.419 (160.841)		-70.523 (160.814)	-70.783 (160.936)	-69.927 (160.886)
High anxiety/depression		86.810 (96.752)	80.939 (97.322)		83.570 (97.283)	79.720 (97.503)	82.569 (97.485)
Very high anxiety/depression		-78.640 (173.435)	-80.532 (174.332)		-79.332 (174.335)	-79.378 (174.753)	-76.523 (174.706)
Married			-34.966 (91.649)			-75.888 (108.240)	-52.746 (108.910)
Cohabiting			-57.488 (115.116)			-99.734 (128.532)	-75.203 (129.158)
Children			-94.919 (50.482)*			-100.302 (50.947)**	-96.931 (50.963)*
Immigrant			-137.110 (121.005)			-121.043 (122.169)	-130.775 (122.242)
Second-gen imm. (2)			-121.910 (294.038)			-128.746 (294.270)	-119.807 (294.218)
Second-gen imm. (1)			-152.284 (187.030)			-151.731 (187.174)	-150.798 (187.117)
Region	<i>no</i>	<i>no</i>	<i>yes</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>
R-squared	0.01	0.02	0.03	0.01	0.02	0.02	0.03

Notes: In all models age fixed effects and year are included. In columns (1) to (3) we estimate years of schooling effect on total costs of drugs, and in columns (4) to (6) we estimate the ln. income effect on total costs of drugs. In column (7) both years of schooling and ln. income are included in the model. Standard errors are shown below the coefficients.