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Does debt make people sick?

Health effects of long-term over-indebtedness in Finland

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Long-term over-indebtedness reflects on health. In particular, indebtedness increases morbidity among women.¹ The study involved 64,000 Finns.

Introduction

Finland entered a deep recession in the early 1990s (Kalela & al. 2001). During 1991–1993, gross national product dropped by 11% and unemployment rose from a few percentage points to nearly 20%. The crisis had the greatest impact on people who lost their job, their company, and/or their credit rating. We address the question of how extended over-indebtedness that began, at the latest, during the 1990s recession is linked to morbidity. In the background section, we begin by examining the definition and prevalence of over-indebtedness, societal regulation of indebtedness, and its health impacts. We then use register data for over-indebted persons to model the links between over-indebtedness and morbidity as measured in terms of entitlements to special reimbursement of medicine expenses.

Debt as such is not a sign of financial problems — a large amount of debt can also indicate a high level of solvency. There is no official definition of over-indebtedness that could differentiate between people who have excessive debt and those who do not (Turunen & Hiilamo 2014). Over-indebtedness refers to a situation in which there is not enough money to pay loans after the payment of necessary, everyday expenses and in which the indebted person does not have property that can be used to cover the debt. A key element in the definition of administrative over-indebtedness is an entry by the authorities or a court decision concerning failure to pay debts (Betti & al. 2001). In Finland, a credit data entry is the result of extended payment difficulties and is made when neglect of payment has been confirmed by a court decision or enforcement authority action. Prior to this, payment has been in arrears for an average of 6–8 months and several collection letters have been sent concerning the unpaid payment. (Suomen Asiakastieto Oy 2014; Vitikka 2013.)

Although there were over-indebted persons in Finland before the 1990s recession, the recession caused steep growth in the number of indebted individuals (Muttillainen 2002). Between 1990 and 1997, the number of people with payment defaults increased from 200,000 to more than 350,000 (Ministry of Social Affairs and Health 2006).

Over-indebted persons can manage their debts by, for example, balancing expenses and income and negotiating with creditors. Mediation is the primary means of dealing with debts — in the 1990s and early 2000s, an estimated 100,000–200,000 households resorted to mediation solutions to handle their debts (Muttillainen 2004). Two years after the onset of the depression, the Act on the Adjustment of the Debts of a Private Individual took effect in Finland in 1993 (L 57 / 1993) and ended the prevailing tradition of life-long liability for debt (Muttillainen 2004). Based on the act, the debts of a person who encounters overwhelming debt problems can be adjusted by confirming a payment schedule which corresponds to the ability of the debtor to pay. However, impediments to debt arrangement include: The poor ability of the debtor to pay (for example, due to unemployment), the debtor's neglect of obligations or dishonesty, debt incurred recklessly, debt incurred on the basis of criminal activity, and debt adjustment granted earlier (L 75/1993, 9a§ and 10 §; Koulu & Lindfors 2010). Even in the absence of an official impediment, not all over-indebted individuals apply for debt adjustment, for example, with consideration to the position of guarantors, mental health problems or poor health in general. (Iivari 2001). Over-indebted individuals who, for one reason or another, are not within the scope of debt adjustment are subject to enforcement if they have income or assets that are eligible for distraint and garnishment (Iivari 2001). A debtor's income and property can be distrained and garnished until the debt is eventually paid in full.

Based on the Enforcement Code (L 705/2007) that took effect in 2008, a payment liability is erased 15 years after the time that the court makes a payment decision on the debt. With this change in legislation, all unpaid debts for which a judgement was issued prior to March 1, 1993 and for which a debt adjustment agreement was not made were erased retroactively in March 2008. Many debts sentenced for payment during and after the recession have also gradually been erased since March 2008. Following enactment of the law, erased debts continued to carry an entry in the payment default register until the registration regulations for payment default entries also changed in 2010: On April 1, 2010, the amendment (L 933/2009) to the Credit Information Act (L 527/2007) took effect, stipulating the removal of a payment default entry from the credit information register after the debt was erased. The erasing of debts and removal of a payment default entry finally provided freedom for those individuals who became indebted during the recession and whose debts were subject to enforcement for years.

The effects of over-indebtedness on well-being

Over-indebtedness and a payment default entry not only interfere with ordinary consumption but also make it, for example, more difficult to rent an apartment and find employment. Low income has generally been found to

¹ The Journal Yhteiskuntapolitiikka had published the results in Finnish language (Blomgren, Maunula, Hiilamo 2014).

correlate with poorer than average health and a higher mortality rate (for example, Marmot 2002; Tarkiainen & al. 2012). In particular, over-indebtedness has been shown to have a connection with thoughts of suicide, depression, perceived health, and health behaviour (Turunen & Hiilamo 2014). Studies have very often demonstrated a link between indebtedness and many types of mental disorders (for example, Bridges & Disney 2010; Cannuscio & al. 2012; Hintikka & al. 1998; McLaughlin & al. 2012; Taylor & al. 2007) and also physical morbidity (for example, Cannuscio & al. 2012; Drentea & Lavrakas 2000; Lenton & Mosley 2008). Studies show that health behaviour serves as a key mediating factor between debt, debt-related stress, and health impacts (Drentea & Lavrakas 2000). A recent behavioral economics study found that economic scarcity has a strong effect on people's decision-making ability and lifestyle — people living in a state of scarcity have to concentrate on their immediate subsistence and often make decisions that may be harmful in the long term (Mullainathan & Shafir 2013). This mechanism may also explain the connection between over-indebtedness and harmful health behavior that was observed earlier.

Studies carried out in Finland show that indebted people are particularly inclined to experience mental health problems and other diseases as well as symptoms that indicate psychosocial stress and even thoughts of suicide (Nykänen & al. 1995; Iivari & Heinonen 1997; Hintikka & al. 1998; Hintikka & al. 1999; Iivari & Mälikä 1999; Pärnänen 2000).

Data and methods

Sample and variables

We utilize register data concerning long-term over-indebtedness that began in the 1990s at the latest to study how over-indebtedness was connected to morbidity during the 1990s and 2000s. Morbidity is measured through entitlements to special reimbursement of medicines prescribed for treatment of following chronic diseases: hypertension, diabetes, bronchial asthma and other obstructive pulmonary diseases, coronary heart disease, and psychoses. We analyse the prevalence and incidence of all reimbursement entitlements as well as separately five most common disease groups for which the entitlements are granted in Finland. These are hypertension, diabetes, bronchial asthma and other obstructive pulmonary diseases, coronary heart disease, and psychoses. Within the framework of this study, it is not possible to focus on the causal mechanism of specific diseases in detail, and thus each disease group is examined on the general level. Earlier studies showed a particular link between mental health problems and over-indebtedness, so it can be assumed that the connection will also be visible in these data, at least for psychosis. We can also hypothesize that there is a connection between other above-mentioned disease groups and over-indebtedness, as lifestyle is a key risk factor in such diseases and earlier studies have shown a link between over-indebtedness and lifestyle.

There is no easy way to obtain register data on over-indebtedness in Finland. For this study, we examined over-indebtedness that occurred by 1995 on the basis of the credit information register maintained in Finland by Suomen Asiakastieto Oy. Indebted individuals were identified from the credit information register by utilising the above-mentioned legislation on erasing of debts and processing of payment default entries in the following manner. The amendment (L 933/2009) to the Credit Information Act (L 527/2007) that entered into force in April 2010 provided that all payment default entries removed from the credit information register for people whose debt had been erased by the date in question. Based on the Enforcement Code (L 750/2007), the debt may have already been erased before 2010, but in this case the payment default entries for all debts that had been erased by that point were removed. The entries removed from the credit information register involved unpaid debts for which a judgement was handed down at least 15 years earlier, in other words, by the end of March 1995.

Personal IDs were obtained from Suomen Asiakastieto Oy for people whose debt-related payment default entries were removed during the period of April 1–9, 2010. This identified 37,093 persons who became over-indebted at least 15 years earlier. The register did not contain information about the amount of the original debt or about the year in which the debt was incurred. Thus, some of the people may already have become over-indebted before the 1990s recession, and such people could not be separated from those who become indebted during the recession. However, since the problem of over-indebtedness increased significantly at the beginning of the 1990s in comparison to earlier times (Mutttilainen 2002), we can assume that the majority of over-indebted people identified from the register had become indebted specifically as a consequence of the overheated economy and resulting recession.

The data were further restricted to people who were of working age (18–64) before the recession began in 1989 and after it ended in 1995 and for which a place of domicile existed in Finland in 2010. After these restrictions, the data comprised 32,182 over-indebted individuals. Thus, the subjects for the data were aged 18–58 in 1989, 24–64 in 1995 and 39–79 in 2010, when their payment default entries were finally removed. The data include people who were not granted debt adjustment and also people who, for one reason or another, never applied for debt adjustment. The data do not include people who were involved in debt adjustment at the time of collection, because being subject to debt adjustment is an impediment to the final erasing of debts.

It should be noted that the information on over-indebtedness in the data is personal — our analysis addresses over-indebted individuals, not over-indebted

households. The data do not contain information on the income, asset or debt situation of other household members.

For each over-indebted person, a control matched for age, gender and place of residence in 2010 was selected by means of random sampling from the personal data file of the Social Insurance Institution of Finland (Kela), which is the authority responsible for Finnish social insurance. The controls did not have any removal of payment default entries in the Suomen Asiakastieto Oy register. Register data for the years 1989–2010 was taken from Kela's Register for Reimbursed Drug Purchases, Register for Pension Benefits, Unemployment Security Register, and Sickness Allowance Register and combined for the over-indebted individuals and controls. Furthermore, register data from the Finnish Centre for Pensions concerning disability pensions in the employment pension system was combined with the data. This provided a unique set of register-based follow-up data concerning over-indebted individuals over a period of 21 years (from 1989 to 2010).

Table 1 presents the distributions of data according to the variables used in matching as the situation in 2010. For reasons of comparison, the distributions for population of a similar age were also calculated from information available in Statistics Finland's StatFin statistical database (<http://statfin.stat.fi>). The over-indebted persons and controls are not presented separately — based on the background information, these groups have exactly the same distribution, because the selection of controls was done according to the variables presented in the table. In comparison to the population of the same age, men are overrepresented in the research data, as are people living in the Greater Helsinki-Uusimaa region. Furthermore, persons in our data set are younger than the population of the same age band.

As a result, it should be noted that since the controls were selected for over-indebted individuals, the controls do not represent the entire population of non-over-indebted persons in Finland. The group identified as being over-indebted is missing those people who became over-indebted before 1995, but who managed to handle their debts through mediation or debt adjustment before they were erased and those over-indebted people who passed away before April 2010. On the other hand, the control group may contain people who were also over-indebted at some time but who managed to handle their debts, and over-indebted individuals whose debts had not yet been erased.

The indicators used for morbidity were the validity of entitlements to special reimbursement for medicines during each year and the date of commencement of new entitlements to special reimbursement. Kela grants entitlements to special reimbursement for medicines prescribed by a doctor for treatment of chronic diseases, and validity of entitlement to reimbursement can thus be considered to describe chronic morbidity (Saastamoinen & al. 2012).

In the analyses, we examine the validity or commencement of all entitlements to medicine reimbursement in total and also separately for the five most common and thus most significant disease group in terms of medical treatment: hypertension, diabetes (the majority of entitlements to reimbursement are granted for type 2 diabetes), bronchial asthma and other obstructive pulmonary diseases, coronary heart disease, and psychoses.

Simultaneous occurrence of diseases is common, but this issue was left outside the scope of the article. For the most part, entitlement to special reimbursement remained valid once it was granted; 82% of the entitlements to special reimbursement in the data were valid until further notice.

The analyses were performed separately for men and women. Other socio-demographic background variables included information about the person's age and domicile, which was classified on the basis of place of residence information according to Statistics Finland's major regions classification. In addition, to control for pre-existing health conditions, information about whether the person had sickness allowance days and/or whether the person was on disability pension before the recession in 1989–1990 was used as indicators of health before the recession. No other socio-demographic background variables were available in the data.

Methods

At a first stage, we calculate the yearly prevalence of entitlements to medicine reimbursement for all over-indebted persons and for the controls. In further analyses of disease incidence, we focus on people who were not entitled to the special reimbursement at the beginning of the follow-up. The starting point for incidence follow-up was January 1, 1995 because over-indebtedness was known to occur by 1995 at the latest (the debt removal entry was in 2010) and the start of new entitlements to special reimbursement for medicines was followed until March 31, 2010, in other words, until the debts were removed from the register. These analyses involved 41,103 men and 19,689 women (see Table 2).

The incidence of new entitlements to reimbursement for medicines for over-indebted individuals and the controls is examined with Kaplan–Meier methods, and in the multivariate analyses the incidence of new entitlements to reimbursement for medicines is modeled by means of the Cox regression methods. Since a new entitlement to special reimbursement for medicines always begins on the first day of the month, the Cox models were used to model the time in months from the start of the follow-up until the beginning of the month in which the entitlement to reimbursement took effect for the first time. If no entitlement to reimbursement appeared, the length of the follow-up period was set as the number of months between the beginning of the follow-up and the last day of the follow-up period, in this case 182 months.

Cox's regression analysis was used to calculate the hazard ratio (HR) for the start of entitlement to special reimbursement, which describes the risk of over-indebted persons to obtain entitlement to special reimbursement for medicines in comparison to the controls during the period of 1.1.1995–31.3.2010. The Cox regression analysis is based on the assumption that the hazard ratio for the binary event being examined is constant among the groups being compared at any starting point of the follow-up. This method makes it possible to study the role of the independent factors affecting the outcome and control the confounding factors. (Kestilä & al. 2012). Case-control studies normally use a logistic regression model, but use of the Cox model is also possible due to similarities in the likelihood functions of the models (Vierkant & al. 2000). The analyses were performed with the SAS Enterprise Guide 4.3 software (SAS Institute Inc. 2011).

Results

Table 3 contains information about the proportions of people who had valid entitlements to special reimbursement of medicines in the over-indebted and control groups during 1990–2010. In 1990, the difference between over-indebted persons and controls was quite small: before the recession, over-indebted women were already slightly less healthy than their female controls, and the situation was rather systematically similar among the different disease groups. With regard to men, the controls were more likely to have entitlements to special reimbursement than over-indebted people at the starting point — in part, this was due to the fact that hypertension was more common in the control men.

The proportion of holders of reimbursement entitlements increased during the follow-up in both over-indebted individuals and controls. The increase was mainly due to aging of both groups during the follow-up period: older people are more likely to have reimbursement entitlements than younger people (Kela 2013). However, for the most part, the difference between over-indebted individuals and the controls increased so that in the latest measurements, over-indebted persons had a larger number of entitlements to reimbursement in comparison to the controls. In men, an exception to this was chronic hypertension and all entitlements to special reimbursement.

The commencement of new entitlements to special reimbursement was initially examined using Kaplan-Meier estimates (diagrams 1a–f). The diagrams show the proportion (Kaplan-Meier survival probability) of those who had not been granted entitlement to special reimbursement for the medicines in question by each date. For purposes of simplicity, this is called “probability of remaining healthy” in the diagrams, although in this case health is only measured via the entitlement to special reimbursement being examined in each case.

The diagrams confirm the results presented in Table 3 above. Over time, the proportion of holders of entitlements to special reimbursement increased in all groups subject to follow-up. When examining all entitlements to special reimbursement, the curves for over-indebted women and female controls increasingly diverged over time, but the curve for over-indebted men differed only slightly from the curve for control men (Diagram 1a). Entitlements to reimbursement began more quickly for over-indebted women than for the control group in each disease group examined (Diagrams 1b–1f), while the difference for men was not nearly as clear.

With regard to the diseases examined, the difference between over-indebted people and controls was clearest and most consistent for diabetes (Diagram 1c) and psychoses (Diagram 1f). In terms of chronic bronchial asthma and chronic obstructive pulmonary diseases (Diagram 1d), the group of indebted men and the control group barely differed from each other, but women showed clear differences between the groups. Entitlements to reimbursement on the basis of chronic coronary heart disease (Diagram 1e) appeared earlier in over-indebted individuals than in the controls with regard to both the women's and men's groups. Chronic hypertension (Diagram 1b) differed from other disease groups, namely morbidity in over-indebted men was lower than in the controls – contrary to the result concerning women. In addition to the five most common grounds for entitlements to special reimbursement, all other entitlements to special reimbursement for medicines were examined as a group. The differences in morbidity between over-indebted people and the controls were very small in this respect (more detailed results are not presented in this article). The difference between over-indebted people and the controls at the end of the follow-up period in 2010 was greater for women than for men in nearly every disease group.

Tables 4 and 5 present the hazard ratios (HR) for incidence of entitlements for special reimbursement as calculated using a Cox regression analysis for each disease group. The tables present the main effects models, in which each variable is alone in the model, and the adjusted models, in which all variables are in the model simultaneously. The results from the adjusted model are reported below. When examining all entitlements to special reimbursement for medicine, the risk of disease for men did not differ between over-indebted persons and the controls, but the risk for over-indebted women was 35% higher (HR 1.35) than for the controls (Tables 4 and 5, section a). The risk of disease in over-indebted women was higher than for the controls in a statistically significant manner for all the disease groups examined. This result is similar for men with the exception of chronic hypertension, for which the risk of disease for over-indebted men was about one fourth lower than for the controls (HR 0.76) With the exception of chronic hypertension, the relative difference between over-indebted individuals and the controls was noticeably higher for women than for men. The biggest differences between over-indebted people and the controls

were found in psychoses and diabetes — for men the risk of developing psychosis was 1.61 times greater and the risk of developing diabetes 1.24 times greater than in the controls. The equivalent figures for women were even higher: 1.94 and 2.27.

The links between age and place of residence and morbidity were in accordance with the results of earlier studies. With age, the risk of morbidity increased in both genders in all disease groups with the exception of psychoses, where the risk was inversely related to age. The morbidity risk for people living in Northern and Eastern Finland was (with the exception of psychoses) higher than for those living in other regions. There was no connection between receiving sickness allowance before the recession and morbidity in women in any of the adjusted models a–f, but men who received sickness allowance had a lower risk of receiving entitlements to reimbursement for medicines than those who did not have a history of sickness allowance before the recession.

On the other hand, being on disability pension prior to the recession doubled the risk of incidence of entitlement to reimbursement for medicines in both men and women; for psychosis, the increase in risk was four– fivefold. However, adjustment of these factors did not significantly affect the link between over-indebtedness and morbidity.

Discussion

New instruments to assist indebted people were created in Finland in the 1990s in order to alleviate the consequences of economic crises. The debt restructuring procedure that took effect in 1993 erased the debts of tens of thousands of people. However, a significant number of people remained outside the scope of the arrangements due to impediments written into the act or because of failure to apply for arrangement. Although concern for this group has been expressed (for example, Iivari & Mälkiä 1999), no long-term follow-up studies on the well-being of people who living with excessive debt have been conducted to date. Our study contributes to filling the above-mentioned gap in examining the consequences of over-indebtedness.

According to the results, over-indebtedness has a clear link to psychological and physical morbidity as measured by entitlements to special reimbursement for medicines used to treatment of certain chronic diseases — particularly among women. For women, the difference in morbidity between over-indebted individuals and the controls was clear in all of the disease groups examined, while for men the difference was only observed in some disease groups (especially diabetes and psychoses). It is possible that personal indebtedness and the financial concerns of a family living in a state of debt have a greater impact on the well-being of women through perceived stress. Research has demonstrated that the primary responsibility for managing daily routines and ensuring that everyday life runs smoothly more often lies with women than men (Nettleton & Burrows 1998; Miettinen 2008). How a family copes in the midst of debt problems may have been more of a concern for women than for men, also in post-recession Finland.

It should also be noted that the debt information in our data is on individual level. In practice, however, the effects of indebtedness on financial scarcity are experienced at the household level. Over-indebted men, such as entrepreneurs, may have relied on their spouse's resources for income — and possibly even transferred income to a spouse who had no debt. In contrast, women's indebtedness may mean that both spouses are over-indebted, meaning that the over-indebtedness of the household is more total in nature. On the other hand, the difference between men and women may be partly explained by the fact there were far less over-indebted women than men, and thus over-indebted women were more strongly selected according to the socio-economic factors connected to health. Men who became over-indebted during the recession may not have differed very much from the rest of the population in terms of health-related background characteristics, because such a large proportion of men experienced debt problems.

For both men and women, the difference between over-indebted persons and the controls was particularly large for psychoses and diabetes. Some earlier studies also found a connection between debt problems and symptoms of psychosis (Jenkins & al. 2008) as well as with other mental health disorders (for example, Bridges & Disney 2010; Hintikka & al. 1998; McLaughlin & al. 2012; Meltzer & al. 2013; Taylor & al. 2007). Research has also shown that lifestyle is more likely to have a harmful impact on health for over-indebted people than for other groups (for example, Drentea & Lavrakas 2000). This study also indicated the same results, as the onset of type 2 diabetes is mainly lifestyle-related (for example, Pajunen & al. 2010).

Among men, the outcome for chronic hypertension differed from the results regarding other diseases: morbidity for the male controls was clearly higher than for over-indebted men. The result may be explained in part by the fact that chronic hypertension is a rather common national disease in Finland — approximately half a million citizens of this country's 5.5 million inhabitants had entitlements for special reimbursement at the end of 2011 (Partio 2012) and social background factors may not have selected people for disease as strongly as for less common diseases. It is also possible that hypertension diseases in over-indebted men are under-diagnosed in comparison to others.

However, it should be noted that the results do not show a causal link between over-indebtedness and morbidity. Over-indebted individuals were compared to matched controls with regard to age, gender and place of residence, but the matching was not done in relation to other factors affecting over-indebtedness. Thus, at least some of the difference between the over-indebted individuals and the controls may be attributed to other factors, such as earlier labor market position, income level, family position, and education. However, the variables mentioned were unfortunately not available in our data, so their impact could not be adjusted in the regression models. The sequence of becoming over-indebted and morbidity was controlled by including only people who did not have any entitlements to special reimbursement for medicines at the start of the follow-up period in the regression models. However, many chronic diseases develop slowly and although the persons did not have any entitlements to special reimbursement at the beginning of the follow-up, they may have already been sick or developing the disease in question. This means that a deteriorated state of health may have contributed to over-indebtedness, for example, through reduced working capacity.

Our data on over-indebted individuals only include those persons whose debts were not handled prior to their being erased in 2010. Our study population may be quite heterogeneous, as the data did not include information about the amount of the original debt or reason for the payment default entry — only the fact that the over-indebted persons could have been subject to enforcement for at least 15 years. As a result, people who were released from their debts through debt adjustment or paid off their debts earlier in some other way, for example, via a mediation solution, were not included in the data. However, it can be assumed that the over-indebted people included in our data were in a weaker position than over-indebted people who had successfully managed to handle their debts, since over-indebtedness in the study group had lasted for at least 15 years and they had not been able to pay off those debts.

People who died as a result of the diseases that were the target of investigation were not part of the data. The over-indebted individuals in our data may be slightly better off than if information about those over-indebted people who passed away during the follow-up period of 1995–2010 had also been available. The links between over-indebtedness and morbidity would probably appear somewhat stronger if we had also been able to take mortality into consideration. Although entitlements for special reimbursement for medicines are often used as an indicator of morbidity (Kela 2013; Saastamoinen & al. 2012), examining them only highlights diseases for which medicines are within the scope of special reimbursement. For example, depression is a disease that international literature has shown to be connected to over-indebtedness. However, entitlements to special reimbursements for medicines cannot

be used as an indicator for the incidence of depression, because entitlement to special reimbursement is only granted for depression when the depression has psychotic characteristics (Kela 2014). Furthermore, the criteria for receiving entitlement to special reimbursement can differ from the prevailing diagnosis criteria, so entitlement to reimbursement is not a completely reliable indicator of the incidence of a certain disease. In order to receive entitlement to reimbursement, the patient must also attend to his/her health at least to the extent of contacting a doctor to obtain a diagnosis and arrange appropriate treatment. It is possible and even probable that diseases among over-indebted persons are not identified in their entirety when using entitlements to special reimbursement as a measurement if a higher than average number of over-indebted persons fail to seek treatment from a doctor due to poverty or life management problems. In addition, over-indebted individuals are presumably not as likely as the controls to have access to high quality occupational healthcare as part of an employment relationship in Finland. This may partly explain the surprising result that over-indebted men, both at the starting point and throughout the follow-up period, had less entitlements for special reimbursement for medicines to treat chronic hypertension than the controls.

Conclusions

Over-indebtedness is linked to higher morbidity, especially among women. There is a particularly clear link between long-term payment difficulties and psychoses and diabetes in both men and women. Prevention of over-indebtedness and developing solutions to deal with debt problems promote public health.

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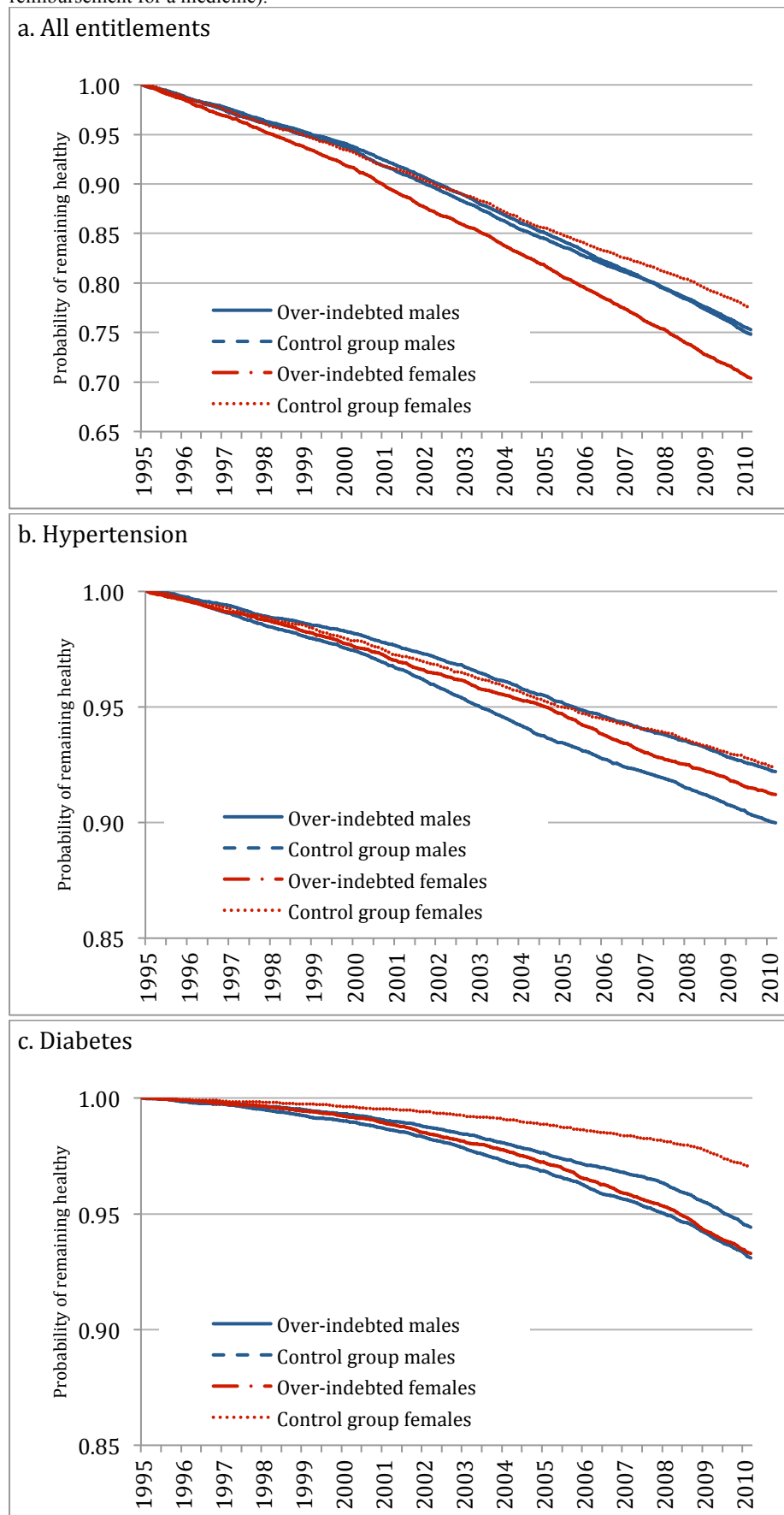
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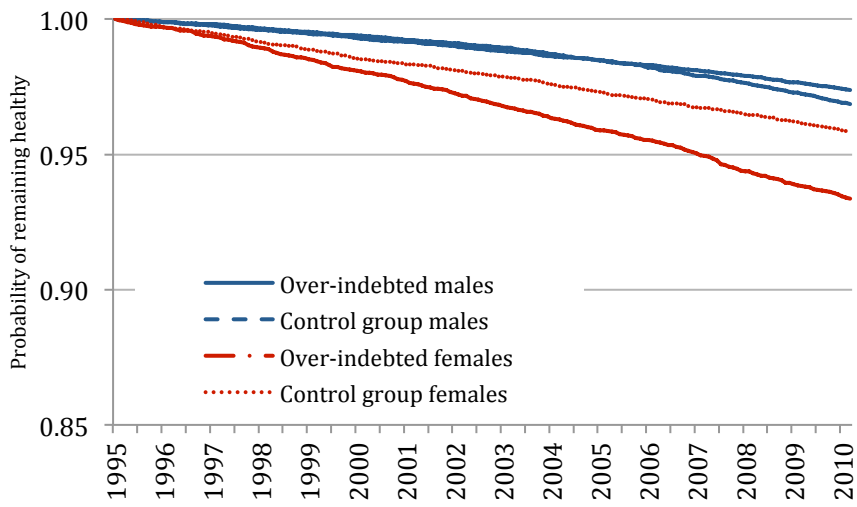
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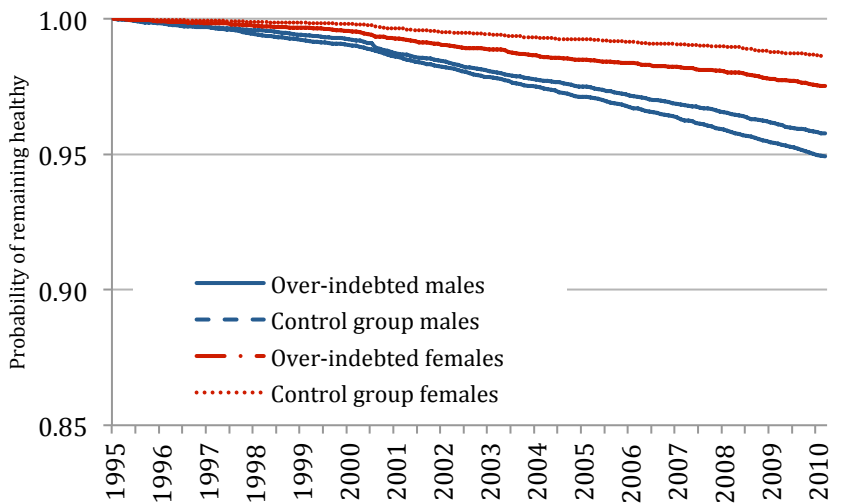
Figure 1. Kaplan-Meier survival probabilities for remaining healthy (i.e. not receiving entitlement to special reimbursement for a medicine).



d. Chronic bronchial asthma & COPD



e. Chronic coronary heart disease



f. Psychoses

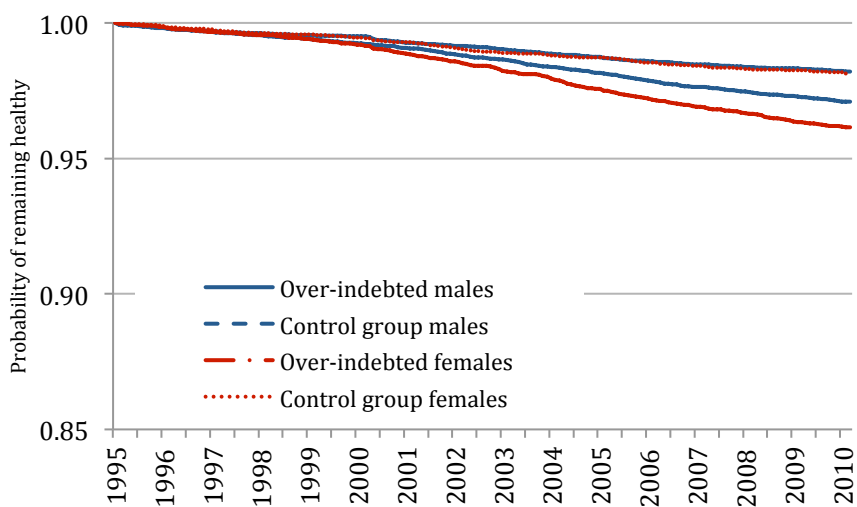


Table 1. Data distribution (%) of over-indebted by gender, age and major region in comparison with the Finnish population of similar age in 2010.

| | Over-indebted & control group | Finnish population of age 39-79 ¹ |
|------------------------------|-------------------------------|--|
| Gender | | |
| Male | 67 | 49 |
| Female | 33 | 51 |
| Age | | |
| 39-49 | 36 | 30 |
| 50-59 | 38 | 29 |
| 60-69 | 22 | 26 |
| 70-79 | 4 | 15 |
| Major region | | |
| Helsinki-Uusimaa | 31 | 27 |
| Southern Finland and Åland | 23 | 23 |
| Western Finland | 22 | 25 |
| Northern and Eastern Finland | 24 | 25 |
| Total | 100 | 100 |
| N | 64,364 | 2,635,363 |

¹ Source: Statistics Finland, StatFin-database (http://tilastokeskus.fi/tup/statfin/index_en.html).

Table 2. Distribution of data used in the explanatory analyses (%): males and females who didn't have existing entitlements to special reimbursements in January 1st, 1995.

| | Male | Female |
|--|-------|--------|
| Over-indebted / control group | | |
| Over-indebted | 50 | 50 |
| Control group | 50 | 50 |
| Age | | |
| 24-29 | 15 | 22 |
| 30-39 | 40 | 39 |
| 40-49 | 35 | 30 |
| 50-64 | 10 | 9 |
| Major region | | |
| Helsinki-Uusimaa | 31 | 32 |
| Southern Finland and Åland | 23 | 23 |
| Western Finland | 22 | 22 |
| Northern and Eastern Finland | 24 | 23 |
| Sickness allowance | | |
| Didn't receive sickness allowance in 1989–1990 | 93 | 92 |
| Received sickness allowance in 1989–1990 | 7 | 8 |
| Disability pension | | |
| Not on disability pension in 1989–1990 | 97 | 97 |
| With disability pension in 1989–1990 | 3 | 3 |
| Total | 100 | 100 |
| N | 41103 | 19689 |

Table 3. Entitlements to special reimbursement for medicine during 1990–2010, males (N=43394) and females (N=20970) of the research data.

| | MALES | | | | | FEMALES | | | | |
|---------------------------------|-------|------|------|------|------|---------|------|------|------|------|
| | 1990 | 1995 | 2000 | 2005 | 2010 | 1990 | 1995 | 2000 | 2005 | 2010 |
| All entitlements | | | | | | | | | | |
| Over-indebted | 6.3 | 10.1 | 14.4 | 21.5 | 28.7 | 10.1 | 14.1 | 19.3 | 26.9 | 34.1 |
| Control group | 7.5 | 11.6 | 16.3 | 23.3 | 29.3 | 8.4 | 11.7 | 16.3 | 22.0 | 27.1 |
| Hypertension | | | | | | | | | | |
| Over-indebted | 1.6 | 3.1 | 4.8 | 7.7 | 10.0 | 2.4 | 3.9 | 6.0 | 8.9 | 11.3 |
| Control group | 2.5 | 4.3 | 6.8 | 10.4 | 13.0 | 1.8 | 3.2 | 5.3 | 7.8 | 9.8 |
| Diabetes | | | | | | | | | | |
| Over-indebted | 0.8 | 1.4 | 2.5 | 4.8 | 7.9 | 0.6 | 1.0 | 1.9 | 4.1 | 7.2 |
| Control group | 0.7 | 1.1 | 1.9 | 3.7 | 6.3 | 0.6 | 0.8 | 1.2 | 2.0 | 3.6 |
| Chronic bronchial asthma & COPD | | | | | | | | | | |
| Over-indebted | 1.4 | 1.9 | 2.4 | 3.3 | 4.6 | 2.3 | 3.7 | 5.3 | 7.1 | 9.0 |
| Control group | 1.2 | 1.8 | 2.4 | 3.1 | 4.0 | 1.6 | 2.6 | 3.7 | 4.8 | 5.9 |
| Chronic coronary heart disease | | | | | | | | | | |
| Over-indebted | 0.2 | 0.8 | 1.8 | 3.4 | 5.3 | 0.1 | 0.4 | 0.9 | 1.7 | 2.5 |
| Control group | 0.2 | 0.8 | 1.6 | 2.9 | 4.3 | 0.2 | 0.3 | 0.5 | 0.9 | 1.5 |
| Psychoses | | | | | | | | | | |
| Over-indebted | 0.8 | 1.4 | 1.7 | 2.7 | 3.3 | 1.4 | 2.3 | 2.7 | 4.0 | 4.9 |
| Control group | 1.1 | 1.6 | 1.9 | 2.4 | 2.7 | 1.0 | 1.6 | 1.8 | 2.3 | 2.6 |

Table 4. Hazard ratios (HR) for incidence of entitlements for special reimbursement by disease groups, main effects model and adjusted (standardized) model of the Cox regression analysis: males (N=41 103).

| | a. All entitlements | | | | b. Hypertension | | | | c. Diabetes | | | |
|---|------------------------------------|-----------------|----------------|-----------------|-----------------------------------|-------------------|----------------|-------------------|--------------------|-----------------|----------------|-----------------|
| | Main effects model | | Adjusted model | | Main effects model | | Adjusted model | | Main effects model | | Adjusted model | |
| | HR | 95% CI | HR | 95% CI | HR | 95% CI | HR | 95% CI | HR | 95% CI | HR | 95% CI |
| Over-indebted (cf. control group) | 1.02 | (0.98 - 1.06) | 1.00 | (0.96 - 1.04) | 0.77 | (0.72 - 0.82) | 0.76 | (0.71 - 0.81) | 1.25 | (1.16 - 1.35) | 1.24 | (1.14 - 1.34) |
| Age in 1995 (cf. 24-29) | | | | | | | | | | | | |
| 30-39 | 1.50 | (1.39 - 1.62) | 1.49 | (1.38 - 1.62) | 2.27 | (1.93 - 2.68) | 2.28 | (1.94 - 2.68) | 2.07 | (1.70 - 2.51) | 2.05 | (1.69 - 2.50) |
| 40-49 | 2.70 | (2.50 - 2.91) | 2.66 | (2.46 - 2.87) | 4.55 | (3.89 - 5.33) | 4.54 | (3.88 - 5.32) | 4.21 | (3.49 - 5.08) | 4.14 | (3.43 - 5.00) |
| 50-65 | 4.89 | (4.50 - 5.31) | 4.73 | (4.35 - 5.15) | 6.22 | (5.26 - 7.36) | 6.26 | (5.29 - 7.41) | 7.67 | (6.31 - 9.34) | 7.35 | (6.04 - 8.95) |
| Major region in 2010 (cf. Helsinki-Uusimaa) | | | | | | | | | | | | |
| Southern Finland and Åland | 1.04 | (0.99 - 1.10) | 1.02 | (0.97 - 1.08) | 1.01 | (0.91 - 1.11) | 1.00 | (0.90 - 1.09) | 1.02 | (0.92 - 1.14) | 1.01 | (0.90 - 1.12) |
| Western Finland | 1.21 | (1.15 - 1.28) | 1.19 | (1.13 - 1.26) | 1.39 | (1.27 - 1.52) | 1.36 | (1.24 - 1.49) | 1.24 | (1.12 - 1.38) | 1.20 | (1.08 - 1.34) |
| Northern and Eastern Finland | 1.35 | (1.28 - 1.42) | 1.35 | (1.28 - 1.42) | 1.46 | (1.33 - 1.59) | 1.46 | (1.34 - 1.60) | 1.18 | (1.06 - 1.31) | 1.17 | (1.06 - 1.31) |
| Received sickness allowance in 1989–1990 (cf. didn't receive) | 0.97 | (0.89 - 1.04) | 0.88 | (0.82 - 0.96) | 0.85 | (0.74 - 0.97) | 0.82 | (0.72 - 0.94) | 1.13 | (0.98 - 1.31) | 1.00 | (0.86 - 1.15) |
| Was on disability pension in 1989–1990 (cf. wasn't) | 2.54 | (2.33 - 2.76) | 1.95 | (1.79 - 2.13) | 1.57 | (1.34 - 1.85) | 1.22 | (1.04 - 1.44) | 2.37 | (2.01 - 2.79) | 1.73 | (1.46 - 2.04) |
| | | | | | | | | | | | | |
| | d. Chronic bronchial asthma & COPD | | | | e. Chronic coronary heart disease | | | | f. Psychoses | | | |
| | Main effects model | | Adjusted model | | Main effects model | | Adjusted model | | Main effects model | | Adjusted model | |
| | HR | 95% CI | HR | 95% CI | HR | 95% CI | HR | 95% CI | HR | 95% CI | HR | 95% CI |
| Over-indebted (cf. control group) | 1.20 | (1.07 - 1.34) | 1.18 | (1.06 - 1.33) | 1.20 | (1.10 - 1.32) | 1.20 | (1.09 - 1.31) | 1.63 | (1.43 - 1.85) | 1.61 | (1.41 - 1.83) |
| Age in 1995 (cf. 24-29) | | | | | | | | | | | | |
| 30-39 | 1.39 | (1.12 - 1.74) | 1.39 | (1.11 - 1.73) | 4.03 | (2.79 - 5.82) | 4.03 | (2.79 - 5.82) | 0.74 | (0.63 - 0.88) | 0.72 | (0.61 - 0.85) |
| 40-49 | 2.15 | (1.73 - 2.67) | 2.13 | (1.72 - 2.64) | 13.26 | (9.28 - 18.97) | 13.15 | (9.19 - 18.80) | 0.54 | (0.45 - 0.65) | 0.50 | (0.42 - 0.60) |
| 50-65 | 3.15 | (2.48 - 4.01) | 3.08 | (2.42 - 3.92) | 29.17 | (20.33 - 41.87) | 28.77 | (20.03 - 41.31) | 0.40 | (0.30 - 0.53) | 0.33 | (0.24 - 0.44) |
| Major region in 2010 (cf. Helsinki-Uusimaa) | | | | | | | | | | | | |
| Southern Finland and Åland | 1.06 | (0.90 - 1.26) | 1.05 | (0.89 - 1.25) | 1.16 | (1.01 - 1.32) | 1.13 | (0.99 - 1.29) | 0.99 | (0.83 - 1.18) | 0.97 | (0.82 - 1.16) |
| Western Finland | 1.26 | (1.07 - 1.48) | 1.23 | (1.05 - 1.45) | 1.18 | (1.04 - 1.35) | 1.13 | (0.99 - 1.29) | 0.88 | (0.74 - 1.06) | 0.88 | (0.73 - 1.05) |
| Northern and Eastern Finland | 1.56 | (1.34 - 1.82) | 1.56 | (1.34 - 1.82) | 1.67 | (1.48 - 1.88) | 1.68 | (1.49 - 1.90) | 1.12 | (0.95 - 1.32) | 1.06 | (0.90 - 1.26) |
| Received sickness allowance in 1989–1990 (cf. didn't receive) | 1.22 | (0.99 - 1.49) | 1.13 | (0.92 - 1.39) | 0.84 | (0.70 - 1.02) | 0.71 | (0.59 - 0.86) | 1.03 | (0.80 - 1.31) | 0.92 | (0.72 - 1.18) |
| Was on disability pension in 1989–1990 (cf. wasn't) | 1.75 | (1.34 - 2.29) | 1.39 | (1.06 - 1.82) | 2.68 | (2.25 - 3.21) | 1.74 | (1.45 - 2.08) | 4.23 | (3.43 - 5.20) | 4.91 | (3.97 - 6.07) |

