Income-related inequality in health care financing and utilization in Estonia 2000–2007

Health Financing Technical Report

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ABSTRACT

This paper analyses out-of-pocket payments (OOPs), their impact on catastrophic expenditures and the distribution of the taxation burden to finance health care in Estonia from 2000 to 2007. It also looks at income-related inequality in Estonian health care utilization in 2006. We use microdata of the Estonian Household Surveys collected by Statistics Estonia, national health accounts data, detailed tax revenue structure from 2000–2007, results from the ALAN microsimulation model, statistical and econometric methods outlined in Xu (2005), Klavus (1998), Habicht et al.(2006) and van Doorslaer and Masseria (2004).

The results show that out-of-pocket expenditures have increased since 2000. The socioeconomic factors that determine the relatively high household health expenditure relative to capacity to pay are those that describe income level, on the one hand, and health expenditure, on the other hand. Most affected are elderly people whose expenditure for both prescription and over-the-counter drugs increases their risk of impoverishment. The analysis of inequality in health care utilization shows that after taking into account the need for health care, the use of dental care, phone consultations and other medical specialties are positively related to income. Day treatment utilization also turns out to be highly related to income, though it is statistically insignificant due to very small number of people it in our sample who have used. The increasing share of OOPs has lead to a decline in the progressivity of overall health care financing.

Keywords

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1. Introduction

Concerns about rising out-of-pocket payments (OOPs) and inequalities in health care financing and utilization have been on the agenda of the Estonian Ministry of Social Affairs for several years and were recently raised by the Estonian Health Insurance Fund. The topics have been now continuously analysed for some years to understand the trends, with considerable technical and financial support from the World Health Organization. Previous studies include analysis of OOPs in 1996, 2000 and 2001 (Habicht et al., 2006), trends in health care financing (Couffinhal and Habicht, 2005), sustainability of health care financing (Võrk et al., 2005) and access to health care (Habicht & Kunst, 2005).

This technical report provides an overview of OOP trends, their size and distribution over socioeconomic groups, their impact on impoverishment of Estonian households and the overall health care financing burden distribution in Estonia from 2000 to 2007. It also looks at income-related inequality in health care utilization in Estonia in 2006.

The report uses mainly microdata from the Estonian Household Budget Surveys 2000–2007 collected by Statistics Estonia, a special module of the survey on health care utilization and health-related expenditure in 2006, national health accounts data 2000–2007, tax revenues 2000–2007 and results from the ALAN tax-benefit microsimulation model (Andres Võrk and Alari Paulus). We use statistical and econometric methods outlined in Xu (2005), Klavus (1998), Habicht et al. (2006), and van Doorslaer and Masseria (2004, for OECD countries).

The report only very briefly discusses the overall organization of health care in Estonia. For an in-depth analysis see Koppel et al. (2008). For a history of the regulation influencing OOPs in Estonian legislation up to 2004, see Habicht et al. (2006). From 2005 to 2007, no major changes were implemented concerning OOPs, except variations in the list of prescription medicines compensated partly by the Estonian Health Insurance Fund.

Section 2 analyses OOPs for health care, 2000–2007 and their impact on catastrophic expenditures and impoverishment, using statistical, graphical and econometric methods. Section 3 analyses the distribution of the taxation burden for financing health care from 2000 to 2007. Section 4 looks at income-related inequality in health care utilization in Estonia in 2006. Section 5 summarizes main findings.

2. Out-of-pocket payment and catastrophic expenditure

2.1. Data

About two thirds of Estonian health care financing comes from earmarked social tax funds via the Health Insurance Fund; about a quarter is financed by OOPs and the rest comes via the central government (see the following table).

Table 1. Sources of health care financing in Estonia, by institution (%)

Source	Main source of revenue	1999	2000	2001	2002	2003	2004	2005	2006	2007
Public sector		**76.8**	**76.4**	**77.8**	**76.3**	**77.0**	**75.5**	**76.7**	**73.3**	**75.6**
Central government	VAT, personal and corporate income tax, excise duties, etc.	8.7	8.4	8.2	8.1	10.0	8.5	9.4	9.3	9.9
Local governments	Personal income tax, land tax, transfers	2.2	2.0	2.6	2.5	1.6	1.3	1.1	1.8	1.7
Health Insurance Fund	Earmarked social tax funds (13%)	66.0	66.0	67.0	65.6	65.4	65.7	66.2	62.1	64.0
Private sector		**19.6**	**23.3**	**22.2**	**23.7**	**22.9**	**24.0**	**23.0**	**26.1**	**23.3**
Private insurance	Travel insurance, life insurance	0.8	1.0	1.1	1.0	0.0	0.1	0.3	0.3	0.3
Households	OOPs	14.0	19.7	18.8	19.9	20.3	21.3	20.4	25.1	21.9
Non-profit sector		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Private enterprises		4.8	2.6	2.3	2.8	2.7	2.6	2.3	0.7	1.1
Foreign sector		3.5	0.3	0.0	0.0	0.1	0.5	0.3	0.6	1.1
Total		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Total as a share of GDP		**5.9**	**5.4**	**4.9**	**4.9**	**5.0**	**5.2**	**5.1**	**5.2**	**5.4**

Source: Tervise Arengu Instituut, http://www.tai.ee/failid/Kogukulud_yld_1999_2007_28052009.xls, own calculations.

When we add temporary incapacity benefits (sickness, maternity, adoption and care), paid by the Health Insurance Fund, to the national health accounts data, the public sector share becomes even larger (the 2007 share would come to 68.7%). We have omitted temporary incapacity benefits from this analysis, as they are usually not considered a part of health care expenditures.

In our distribution analysis we use 2000–2007 data from the annual national household budget surveys conducted by Statistics Estonia since 1996. For an overview of the Household Budget Survey methodology, see Statistics Estonia (2006). From 1996 to 1999, the data collection methods were slightly different. Earlier years are partly covered in Habicht et al. (2006).

The household budget survey includes information on household monthly income, expenditures and characteristics. It includes OOP data and private health insurance. Definitions of the key variables and their codes in the Estonian household budget survey (HBS) are on the following table. Households record all monetary and non-monetary income and expenditure, except for food, during one month. Food expenditure is recorded for two weeks and scaled up.

Table 2. Definition of key variables

Term	Definition
Total expenditure	Monthly household monetary and in-kind consumption expenditure (HBS code V05).
Out-of-pocket expenditure on health	Monthly monetary and in-kind out-of-pocket expenditure on health care (HBS code V40).
Out-of-pocket expenditure by type	Four types: supplies, medicine, outpatient care, inpatient care (see Annex I for grouping information), only monetary expenditure available
Private health insurance contributions	Monthly private monetary health insurance contributions (HBS codes starting with 1253 or 1243, depending on year)
Health expenditure	Monthly monetary and in-kind expenditure on health care and private insurance
Food expenditure	Monthly monetary and in-kind expenditure on food and non-alcoholic beverages (HBS code V06)
Sample weight variable	HBS variable (a sample weight for the expenditure part of the survey)
Expenditure quintiles (values 1–5)	Quintiles based on total expenditures (V05), with equivalence weights
Urban (values 1–0)	1 – large town, county town, other town,; 0 – large or small village
Presence of children (younger than 16)	1–0 dummy variable
Presence of people older than 65	1–0 dummy variable
Education of the household head	ISCED grouping: 1&2, 3, 4, 5+
Male head of household	1–0 dummy variable
Main household language not Estonian	1–0 dummy variable
Household members in poor health	1 if self-assessed health is "poor" or "very poor"; 0 otherwise
Household members with disabilities	1 if self-assessed disability or long-term disease; 0 otherwise
Absence of health insurance	1 if no health insurance, as answered by people themselves; 0 – if health insurance
Estonian regions	NUTS 3 definitions (groups of counties): North – Harju West – Hiiu, Lääne, Pärnu, Saare Central – Rapla, Järva, Lääne-Viru North-East – Ida-Viru South – Jõgeva, Põlva, Tartu, Viljandi, Võru, Valga
Distance to nearest doctor	Categorical variable: 1) up to 0.5 km; 2) 0.5–1 km; 3) 1–2 km; 4) 2–5 km; 5) 5–10 km; 6) More than 10 km

The sample size has decreased over the years, especially between 2002 and 2003, because Statistics Estonia had to economize on the cost of the survey. There have also been relatively low response rates (about 50% for the household income and expenditure part). The effective size of the sample in our analysis is about 6000 households from 2000–2002 and around 3500 households from 2003–2007 (see Table 3). Except in the case of regression models, we present only point estimates and do not calculate standard errors (they are available from the author on

request). Relatively small sample sizes may cause some additional variation when comparing results of different years, but they are unlikely to influence the overall trend observed for 2000-2007.

Table 3. Sample size of the Estonian Household Budget Survey used in the analysis

Year	Number of households
2000	6256
2001	6053
2002	5721
2003	3391
2004	3233
2005	3601
2006	3807
2007	3406

Source: Statistics Estonia, own calculations.

Average OOPs by households increased from 143 krooni per month in 2000 to 367 krooni per month in 2007, about a 148% increase. But if we take the price increase into account (changes in the CPI health expenditure component), then real OOP expenditure has increased by about 66%.

Table 4. Descriptive statistics of the main variables (in millions of krooni)

		2000	2001	2002	2003	2004	2005	2006	2007
Total household consumption expenditure	Monthly mean	5 216	5 422	5 720	5 886	6 438	7 143	8 144	9 283
	Stnd. deviation	4 777	5 345	5 446	5 406	6 308	6 949	7 394	8 921
	Annual total	34 421	35 670	37 479	38 380	42 237	46 749	54 480	64 203
Food expenditure (per household)	Monthly mean	1 666	1 717	1 745	1 756	1 804	1 944	2 081	2 359
	Stnd. deviation	1 024	1 086	1 101	1 157	1 174	1 226	1 300	1 448
	Annual total	10 994	11 298	11 436	11 451	11 835	12 723	13 922	16 312
Household OOPs	Monthly mean	143	142	160	199	229	235	354	365
	in constant prices, 2000	143	128	133	146	160	161	236	226
	Stnd. deviation	504	409	386	448	498	450	712	801
	Annual total	941	935	1 049	1 297	1 503	1 536	2 368	2 521
Household OOPs in National Health Accounts	Annual total	1 015	1 006	1 184	1 380	1 659	1 794	2 637	2 842

Source: Statistics Estonia, Estonian Household Budget Survey microdata (own calculations); National Health Accounts: Tervise Arengu Instituut, http://www.tai.ee/?id=5619.

The total annual OOPs in the sample is about 10% less than in the National Health Account statistics, which are partially derived from the same survey, but are adjusted to accord with national supply-side accounts data.

The largest share of OOPs goes both over-the-counter and prescription drugs (see Annex 1 for classification and Annex 2 for descriptive statistics). The second largest component is outpatient care (chiefly dental care), followed by various supplies (eyeglasses and dentures comprising the largest share). Expenditure on inpatient care is very small, more than half related to spa services.

Table 5. Mean total and monetary OOPs for health, in krooni per month

Year	Total OOPs	Household monetary OOPs	Medicine	Inpatient care	Outpatient care	Supplies	Dental care*
2000	142.6	140.7	68.9	5.0	45.0	21.8	36.7
2001	142.1	139.7	72.9	5.5	39.3	22.0	37.2
2002	160.1	155.8	84.8	2.9	45.4	22.7	42.3
2003	198.9	194.8	105.0	3.3	60.4	26.1	53.2
2004	229.1	227.5	124.0	12.4	52.7	38.4	57.1
2005	234.6	232.8	140.0	10.7	49.4	32.7	44.2
2006	353.9	349.4	181.8	9.4	97.4	60.8	78.5
2007	364.5	359.3	191.4	13.7	76.3	77.9	77.6

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.
* outpatient dental care and dental supplies

There is a very small difference between the average OOPs for health expenditure as published by Statistics Estonia and that resulting from our microdata analysis (see Table 6), plausibly due to minor differences in the calculation of actual household size during the survey month or the sampling weights.

Table 6. Health expenditure per household member and as share of total expenditure

Year	Health expenditure per household member (krooni per month) (Statistics Estonia calculations)	Share of health in total household expenditure	Health expenditure per household member (krooni per month) (own calculations)
2000	58.0	2.6%	59.0
2001	58.0	2.5%	59.0
2002	65.3	2.6%	66.4
2003	79.6	3.1%	82.8
2004	95.1	3.4%	95.8
2005	97.4	3.1%	98.0
2006	148.7	4.0%	151.6
2007	156.8	3.6%	160.1

Source: Statistics Estonia online database, Estonian Household Budget Survey microdata, own calculations.
Note: The figures are in current values (unadjusted for inflation).

Table 6 also shows that on average the share of health in total household expenditure increased from 2.6% in 2000 to 3.6% in 2007, but this hides large variations among households. There are many households where health expenditure constitutes a very large share of the total, even driving people below the poverty line. This is a subject of the remaining analysis of this section.

2.2. Overview of methods and intermediate results

For catastrophic expenditures we use methods outlined in Xu (2005), and the following draws heavily from that source.

A food-share based poverty line was used for estimating household subsistence, to allow international comparison with earlier studies. (The main results using a national absolute poverty line are found in Annex 6.) The food-share based poverty line is defined as the food expenditure of the household whose share of food expenditure in total has the median value. In order to

minimize measurement error, we used the average food expenditure of households whose share of total expenditure is between the 45th and 55th percentiles of the total sample.

$$poverty\ line = \frac{\sum_{i \in S} w_i \times equalized\ food\ expenditure_i}{\sum_{i \in S} w_i}$$

where set S consists of all households whose share of food expenditure falls between the 45th and 55th percentiles of the total sample, and w_i are survey weights.

Considering the economy scale of household consumption, the following household equivalence scale is used:

$$household\ equivalence\ size = (household\ size)^{0.56}$$

The median share of food expenditure has declined quickly over recent years, from 38.7% in 2000 to 31.5% in 2007; similarly the 45th and 55th percentiles have decreased. The resulting poverty-line average food expenditure per equalized household member increased by 51.9% from 2000 to 2007 (1020 krooni to 1549 krooni). The increase is slightly more than the increase in the consumer price index for food and non-alcoholic beverages (32.8%) during the same period, suggesting a real increase in food expenditures of typical households and resulting rise in the poverty line.

Our poverty line is more than the value of the official minimum food basket (1031 krooni in 2007), but smaller than the subsistence minimum (2341 krooni), which includes a minimum expenditure on housing and non-food items. And, of course, it is also lower than the relative poverty line (60% of median income) published by Statistics Estonia.

Table 7. Shares of food expenditure and impoverished households

	2000	2001	2002	2003	2004	2005	2006	2007
Share of food expenditure								
45th percentile, %	36.4	36.1	35.0	32.7	31.7	30.9	29.6	29.7
50th percentile, %	38.7	38.3	37.0	34.4	33.8	33.2	31.4	31.5
55th percentile, %	40.7	40.6	39.2	36.4	35.6	35.0	33.2	33.4
Poverty line (krooni in month)	**1 020**	**1 060**	**1 086**	**1 108**	**1 178**	**1 263**	**1 338**	**1 549**
Share of poor households, %	6.9	6.3	7.0	6.3	6.6	6.0	5.3	4.4
Share of poor (total expenditure below poverty line), %	5.8	5.1	5.5	4.8	4.8	4.7	4.0	3.4
Share of households whose food expenditure is less than subsistence expenditure, %	56.5	57.0	58.2	59.9	61.6	61.7	59.6	58.8
Official poverty lines (krooni in month)								
Subsistence minimum*	1 229	1 306	1 389	1 411	1 489			
					1 836	1 938	2 081	2 341
Minimum food basket	593	646	669	657	696			
					762	816	888	1 031
Absolute poverty line*	1 454	1 538	1 593	1 614	1 836	1 938	2 081	2 341
Share of poor people/households*, %	28.9	26.2	25.0	19.6	16.1	13.2	8.3	6.5
	25.8	26.2	22.6	17.0	14.8	12.4	7.6	6.2
Relative poverty line†	1 490	1 575	1 731	2 006	2 332	2 846	3 480	
Share of poor people†, %	18.3	18.2	17.9	20.2	18.3	18.3	19.5	

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

* A change in the methodology for the subsistence minimum and absolute poverty line took place in 2004, setting the former as equal to the latter. The subsistence minimum includes expenditure on food, housing and individual non-food items. See Statistics Estonia for details: http://pub.stat.ee/px-web.2001/I_Databas/Social_life/06Households/02Household_budget/02Monthly_expenditure/HH24.htm.

† A change in the methodology for the relative poverty line occurred in 2003. See Statistics Estonia for details: http://pub.stat.ee/px-web.2001/I_Databas/Social_life/13Social_exclusion_Laeken_indicators/HHS00.htm.

Note that the way the equivalence scale is calculated determines the poverty line, the measurement of capacity to pay, the expenditure quintiles and hence the share of households with catastrophic health costs. In Annex 6 we present some of the results using the absolute poverty line calculated by Statistics Estonia and the national equivalence weights until 2003 (1:0.8:0.8) and OECD weights (1:0.7:0.5) for 2004 onwards, because the WHO weighting scheme implies a considerably larger share of joint consumption at the household level (e.g. housing costs) than is suitable for Estonia.

We calculated the subsistence expenditures for each household based on a selected poverty line and the size of the household.

$$subsistence\ expenditure_i = household\ equivalence\ size_i \times poverty\ line$$

A household is defined as poor if its consumption expenditure is below the subsistence expenditure level.

$$poor_i = 1 \quad if\ household\ consumption\ expenditure_i < subsistence\ expenditure_i$$
$$poor_i = 0 \quad otherwise$$

The share of poor households (whose total consumption expenditure is less than the food expenditure of a typical household) in different years according to our method has been around 5–7%. Compared to the official national absolute poverty rate, the poverty rate based on food share was considerably less from 2000 to 2005, but fairly close in 2006–2007. This is to be expected as food-based poverty rates are of a relative type of poverty and are therefore not affected as much by an overall increase in household income.

We also analyse the impact of OOPs on household poverty. Here we consider a household to be poor when consumption expenditure excluding OOPs – i.e., non-health expenditures – is less than the subsistence expenditure.

$$poor_i = 1 \quad if \ consumption \ expenditure_i - OOP_i < subsistence \ expenditure_i$$
$$poor_i = 0 \quad otherwise$$

Now we can find the proportion of households that were not poor before the OOPs (that is if all the expenditures could be used on non-health goods), but ended up below poverty line after OOPs.

$$impoverished_i = 1 \quad if \ consumption \ expenditure_i >= subsistence \ expenditure_i \quad \&$$
$$consumption \ expenditure_i - OPPs < subsistence \ expenditure_i$$
$$impoverished_i = 0 \quad otherwise$$

Note that those households who were already poor before the OOPs are still poor and value of the "impoverished" variable is always zero for them.

This definition of impoverishment is useful for analysing the financial burden of OOPs in different socioeconomic groups to see which are most affected by OOPs and the trends over the observed period, 2000–2007.

To measure the relative size of OOPs in different socioeconomic groups, we use a notion called "household capacity to pay", which is defined as the household spending potential above subsistence expenditure, that is, the amount available for non-food spending. If a household's actual food expenditures are already lower than subsistence spending, then its total non-food expenditures are used as capacity to pay. We assume that those households with very low food expenditure can cope with such a level, but no less. Those households having high food expenditure are assumed able to reduce it to the average subsistence level.

$$capacity \ to \ pay_i = consumption \ expenditure_i - \min(subsistence \ expenditure_i, food \ expenditure_i)$$

Because the subsistence expenditure was based on the median percentage of food spending in total expenditure, a large share – about 60% – of the households have actual food expenditures lower than the subsistence level. Subsequently the variable burden of health payments is defined as the OOPs as a percentage of a household's capacity to pay.

$$burden \ of \ health \ payments_i = \frac{OOPs_i}{capacity \ to \ pay_i}$$

In the current analysis we consider a health payment burden to be "high" if OOPs constitute more than 20% of capacity to pay, and "catastrophic" if OOPs are more than 40% of capacity to pay. The results are presented in Section 2.3.

2.3. Results for catastrophic payments

This section presents the main results for the size of OOPs in different socioeconomic groups, the share of households with high and catastrophic health expenditures and the impact of OOPs on household impoverishment. The text proper consists mainly in graphs and brief discussions of the most important results. Depending on the variables not all years are represented, but only 2000, 2004 and 2007. In the annexes there are tables for all years, 2000–2007. When comparing results for the years 2000 and 2001 with the previous study by Habicht et al.(2006), one should note that there may be minor differences in the variable definitions, i.e. the total consumption used to find capacity to pay and expenditure quintiles.

2.3.1. Absolute and relative OOP size by quintile

In general, households with higher total expenditure also have higher expenditure on health care in all years. Average expenditure has increased during the period, although in 2005 average growth was moderate, with even a small decrease in the fourth and fifth quintiles. In 2006 there was a sharp increase in expenditure, which slowed down in 2007. As there was no significant change in legislation concerning patients' copayments in 2006, the rapid increase may be due to sample variation.

Fig. 1. OOPs per household by quintiles
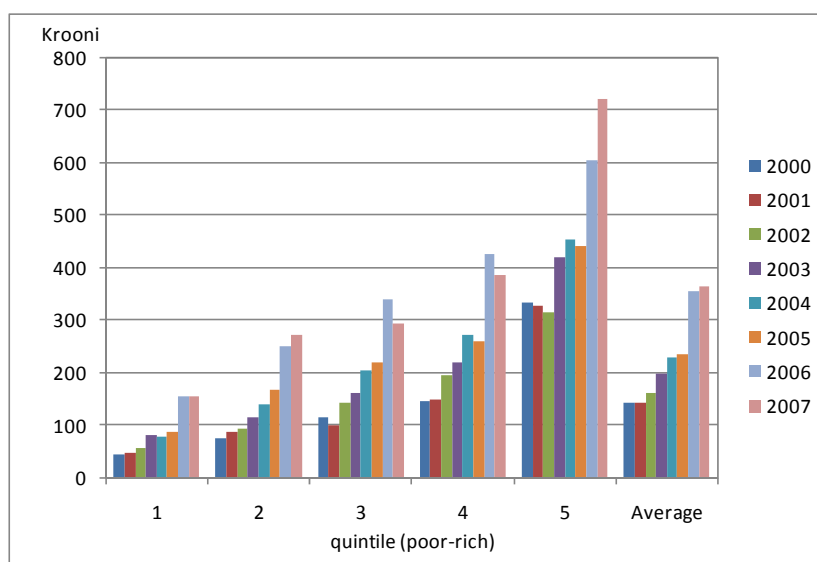
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Note: The figures are in current values (unadjusted for inflation). Here and throughout this section each quintile includes an equal number of households. The quintiles are based on equivalized household consumption expenditure.

The average share of OOPs in total household expenditure increased from 3% in 2000 to 5% in 2007. It increased from 2000–2004, dropped slightly in 2005 and increased again in 2006–2007. Overall, households in lower quintiles spend proportionally more on health care.

Fig. 2. OOPs as a proportion of total household expenditure by quintiles
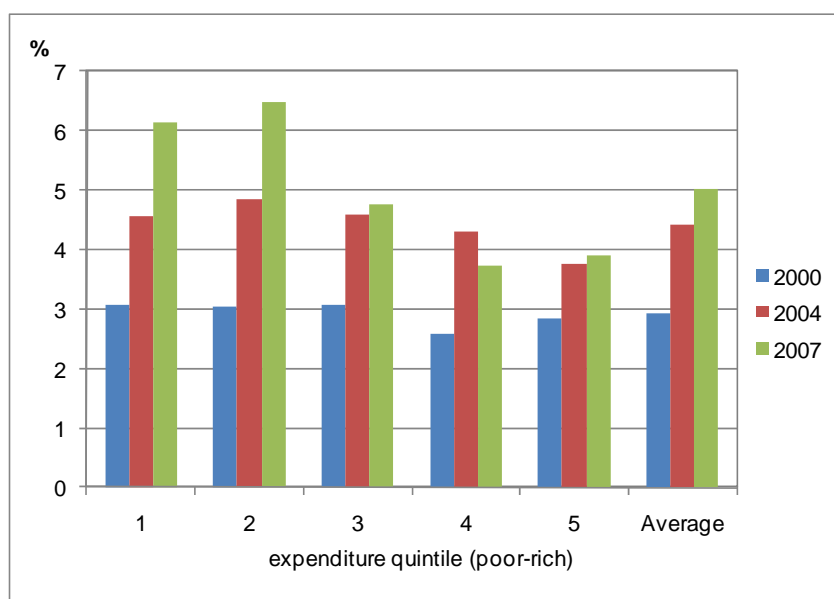
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Table 8. Household structure by quintile in 2007 (%)

Quintile	1	2	3	4	5	Total
Household type						
Single pensioner	30.1	23.0	14.1	5.0	3.2	15.1
Single of working age	18.6	18.0	17.4	20.6	16.6	18.3
Couple – pensioners	9.3	8.3	5.3	5.4	3.6	6.4
Couple – at least one of working age	7.9	12.6	12.2	18.3	21.5	14.5
Single parent with one child	2.1	2.2	3.0	1.6	1.7	2.1
Single parent with two or more children	1.0	0.4	1.3	0.4	0.2	0.7
Couple with one child	3.9	5.7	9.0	8.8	12.6	8.0
Couple with two children	3.1	3.0	6.3	5.5	7.2	5.0
Couple with three or more children	0.7	1.3	1.6	2.2	1.5	1.5
Couple with minor and adult children	2.3	3.5	4.2	7.5	7.8	5.0
Two-generation household	15.3	17.0	19.8	19.7	20.5	18.5
Three-generation household	2.5	2.8	2.1	2.6	2.0	2.4
Other household	3.1	2.1	3.7	2.5	1.9	2.7
Total	100	100	100	100	100	100

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Note: A pensioner is defined as person older than 65; child is defined as under 16. Quintiles are based on household consumption expenditure.

The risk of belonging to the first quintile is highest for single pensioners and pensioner couples: 40% of single pensioners and 29% of pensioner couples belonged to the first quintile in 2007. Single parents, especially with two or more children, also have a higher risk of being in the first quintile.

Table 9. Distribution of household types by quintile, 2007 (%)

Quintile Household type	1	2	3	4	5	Total
Single pensioner	40.1	30.5	18.7	6.7	4.2	100
Single of working age	20.5	19.7	19.1	22.7	18.1	100
Couple – pensioners	29.3	26.0	16.6	17.1	11.1	100
Couple – at least one of working age	11.0	17.3	16.9	25.3	29.6	100
Single parent with one child	20.2	20.7	28.7	14.7	15.6	100
Single parent with two or more children	31.4	13.4	39.2	10.8	5.2	100
Couple with one child	9.9	14.3	22.5	22.1	31.3	100
Couple with two children	12.6	12.1	25.0	21.9	28.5	100
Couple with three or more children	10.1	17.6	21.4	30.4	20.4	100
Couple with minor and adult children	9.0	14.1	16.5	29.7	30.7	100
Two-generation household	16.6	18.4	21.5	21.4	22.1	100
Three-generation household	20.8	23.3	17.9	21.6	16.5	100
Other household	23.2	16.0	27.9	18.7	14.2	100
Average	20	20	20	20	20	100

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Note: see previous table

2.3.2. Absolute and relative sizes of OOPs by region

There are five regions, defined at NUTS-3 level, in Estonia, with different socioeconomic conditions and demographics. The North, which includes the capital, Tallinn, is the wealthiest and youngest, while the South is the oldest. The North-East (Ida-Virumaa) has the highest unemployment and a large non-Estonian population. OOPs have increased during the period in all five regions. They have been slightly lower in the North-East in recent years, but are still are proportionally highest of all regions. OOPs are also relatively high in the South.

Fig. 3. OOPs per household by region
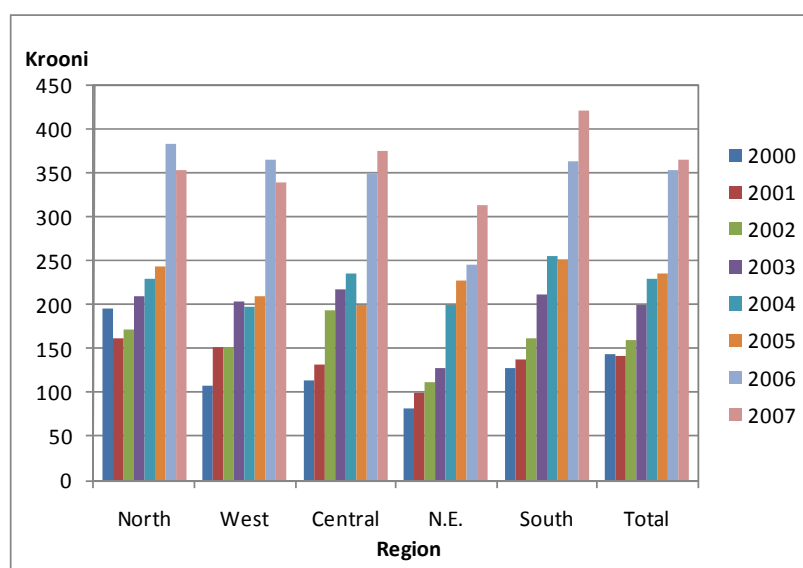
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Fig. 4. OOPS as a percentage of total household expenditure by region
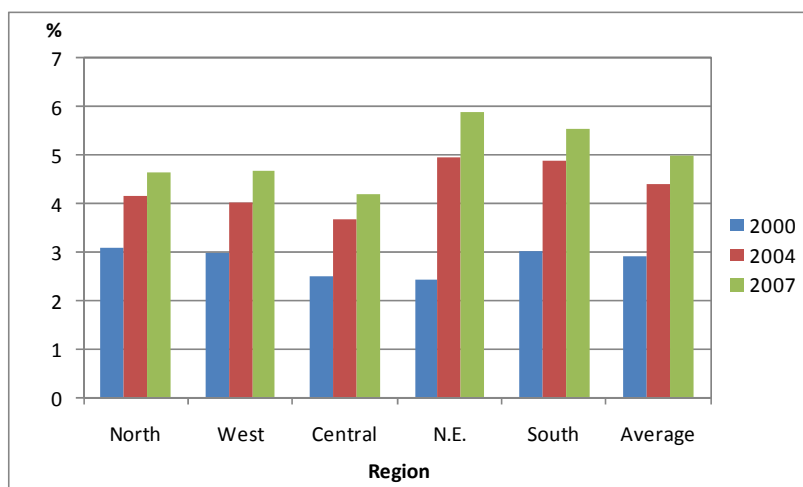
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

2.3.3. Structure of out-of-pocket payments

The share of medicine costs in OOPs during the period 2000–2007 was around 50–60%; outpatient care comprised 20–30%, various other supplies 15–22% and inpatient care 2–5%.

Fig. 5. Structure of OOPS, 2000–2007
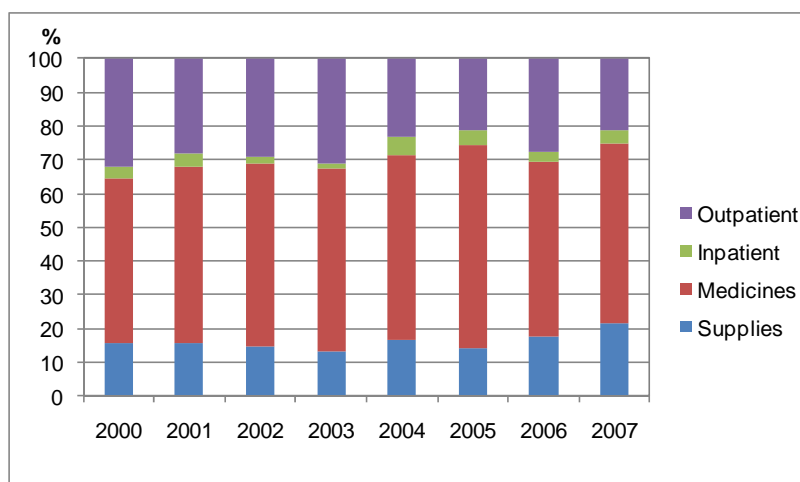
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Households in the lowest, poorest quintile spend 85–90% on medicines, about 5% on medical supplies (eyeglasses, dentures, vitamins), and about 5–10% on outpatient care (mostly dental). The richer the households the more they spend on outpatient care and supplies, and less on medicines. Richer households also spend more on inpatient care, usually spa services.

In 2006 there was an additional module to the household budget survey that asked separately about expenditure for prescription and over-the-counter drugs. The data show that about 70% of expenditure on medicines is for prescription drugs and 30% for over-the-counter drugs.[1] The share of prescription drugs is slightly larger in lower quintiles (71% and 76% in the first and

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[1] According to the National Health Accounts data, the share of prescription drug expenditure fluctuated around 70–75% from 2003 to 2007. In 2006 it was exactly 70%, as in our microdata.

second) and lower in higher quintiles (65% and 67% in the fourth and fifth). This means that prescription drugs constitute an important share (61%) of OOPs for the bottom quintile.

Fig. 6. Structure of OOPs by quintile, 2000, 2006 and 2007
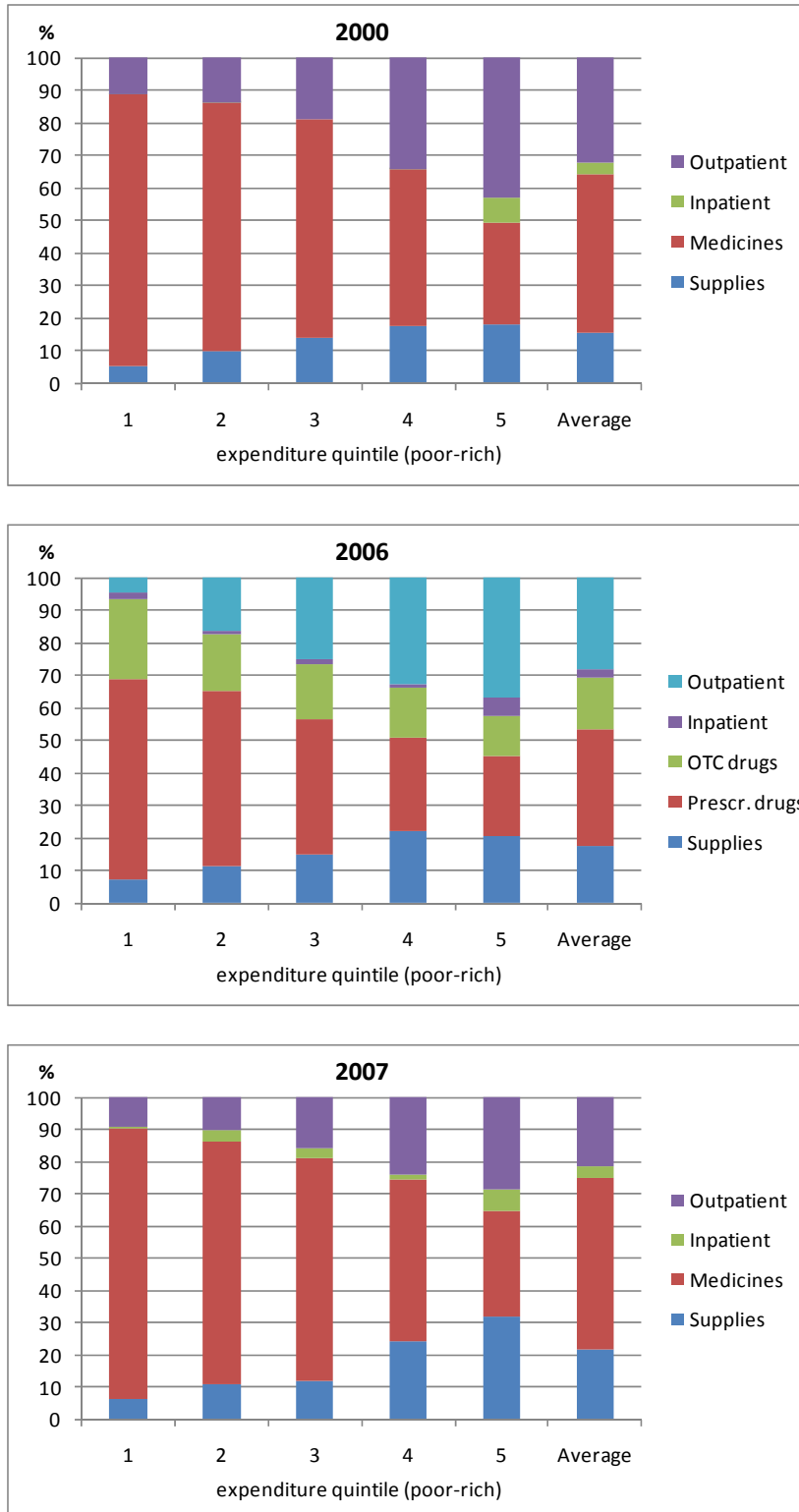
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Dental care expenditure in 2000–2007 consists mainly of dentures (included in "supplies" on previous graphs) and dental care (outpatient care). Dental care as a share of total OOPs declined slightly from 26% in 2000 to 22% in 2007. There is a clear tendency of households with higher income to spend proportionally more on dental care: for the highest quintile it constitutes about one third of OOPs, but for the lowest quintile it is only about 7–8%. In absolute terms, households in the top quintile spent on average 40 times more on dental care than households in the bottom quintile in 2000-2007.

Fig. 7. Dental costs as a percentage of OOPs by quintile, 2000, 2004 and 2007
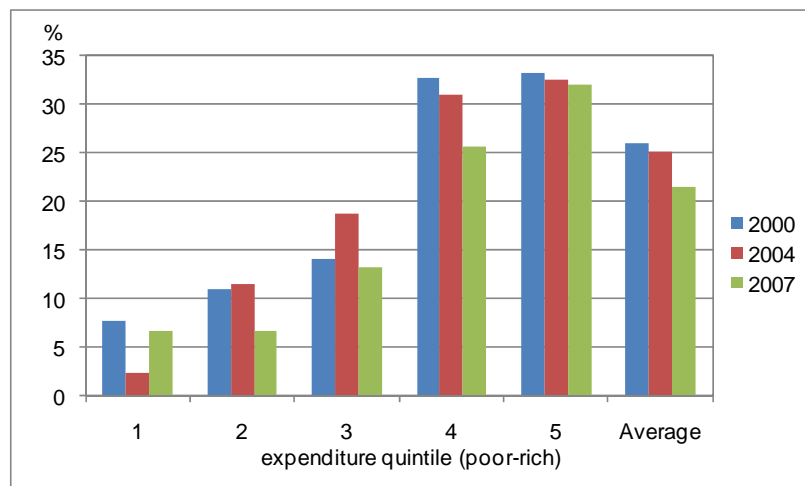
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

In the Section 4 of this paper we also analyse the utilization of dental services and its relationship to household income. We find that poorer households have considerably fewer dental visits, implying unequal access to dental care.

2.3.4. OOP relative to capacity to pay

Another way to measure the relative burden of OOP is its size relative to household capacity to pay, defined as resources available after median or actual expenditure for food consumption, whichever was lower.

During the observed period the share of health expenditure relative to household capacity to pay increased. About 2–4% of households had health expenditures larger than 40% of their capacity to pay, in other words, catastrophic payments. The share of households with catastrophic expenditure did not increase very much. A larger increase is that among households with health expenditure of between 20–40% of capacity to pay, which almost doubled over the period, from 4.6% in 2000 to 8.8% in 2007. By 2007, about 12% of all households had health expenditure of more than 20% of their capacity to pay and another 12% were between 10–20% of capacity. This means that about 86% of households have health expenditure of lower than 10% of their capacity to pay.

Fig. 8. Percentage of households with high OOPs relative to capacity to pay
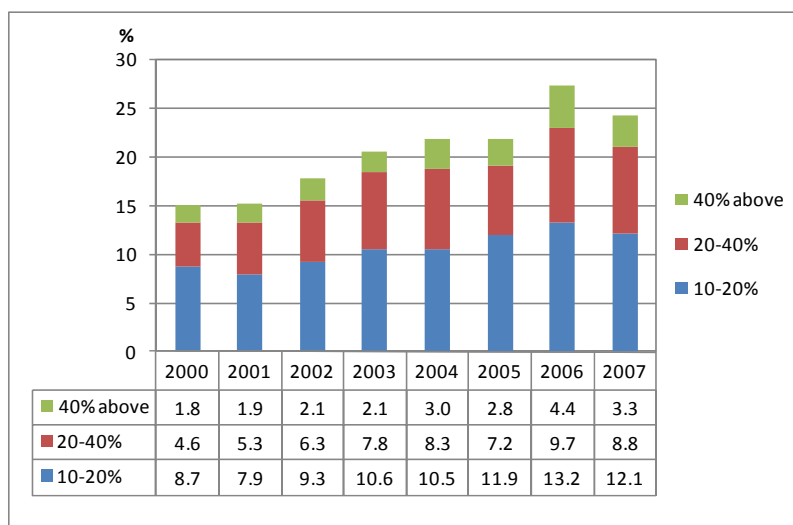
	2000	2001	2002	2003	2004	2005	2006	2007
40% above	1.8	1.9	2.1	2.1	3.0	2.8	4.4	3.3
20-40%	4.6	5.3	6.3	7.8	8.3	7.2	9.7	8.8
10-20%	8.7	7.9	9.3	10.6	10.5	11.9	13.2	12.1

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

As expected, lower quintiles have higher share of households with high OOPs relative to capacity to pay. In the bottom quintile the share of households with health expenditure of more than 20% of capacity to pay increased from 12% in 2000 to 22% in 2007. For the top quintile the increase was from 3.6% to 5.1%.

Fig. 9. Percentage of households with high health payments (> 20% of capacity) by quintile, 2000, 2004 and 2007
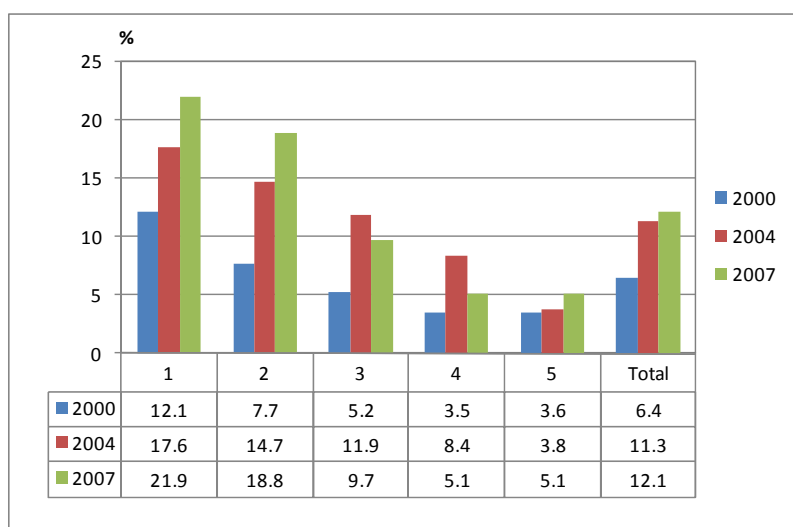
	1	2	3	4	5	Total
2000	12.1	7.7	5.2	3.5	3.6	6.4
2004	17.6	14.7	11.9	8.4	3.8	11.3
2007	21.9	18.8	9.7	5.1	5.1	12.1

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

One can also look at the development of the mean ratio of OOPs to capacity to pay and distinguish between different categories of OOPs. The following figure shows that during the period 2000–2007 the mean ratios steadily increased. Drug costs were by far the largest factor, especially for the poorest households.

Fig. 10. Household OOPs relative to capacity to pay by type of expenditure, quintile and year
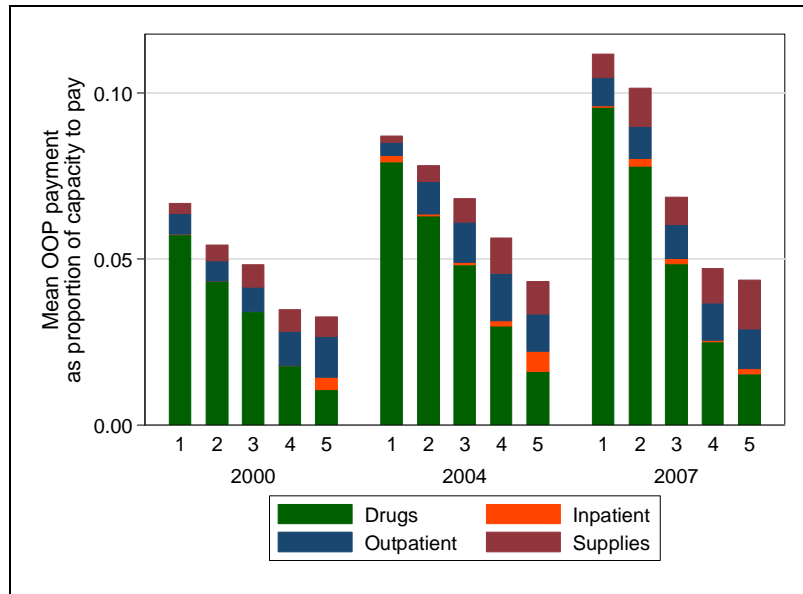
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

More detailed analysis on the proportion of households with high health expenditure (more than 20% of capacity to pay) by quintiles and years confirms that drug purchases are the main cause of high health expenditure; the share of other items is negligible. Outpatient care and supplies exceed 20% of capacity to pay for 1–2% of households, even for some households in the top quintile, but this is may partly be explained to the monthly nature of the data, where one-time costs of dental care or eyeglasses constitute a large share of monthly expenditure.

Fig. 11. Percentage of households with high (>20%) health payments by type, quintile and year
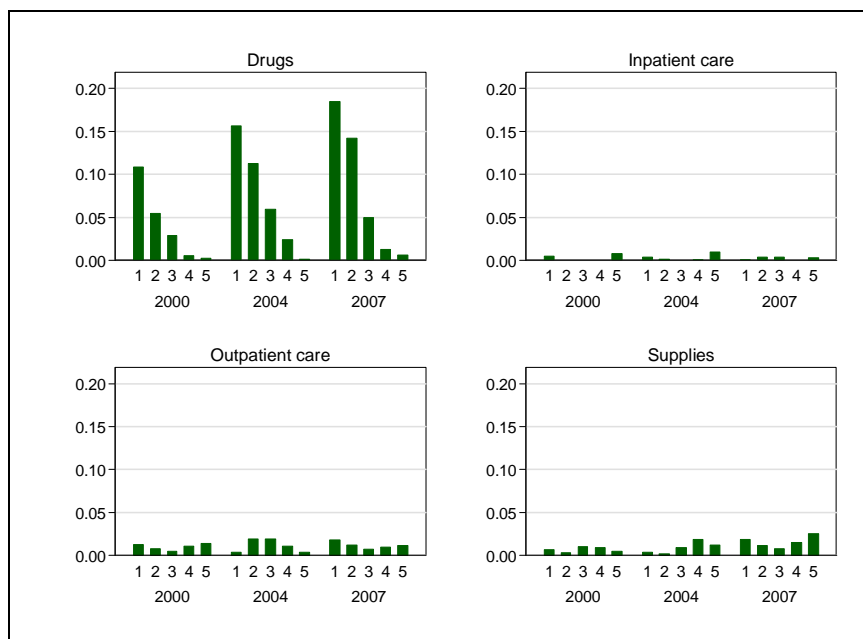
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

When considered by socioeconomic group, pensioners – both singles and couples – represent the highest proportion of households with high health expenditure relative to capacity to pay, at

27.4% over 2000–2007. For all other household types the proportions are lower than average. Least affected are couples with children.

Fig. 12. Percentage of households with high health payments (> 20% of capacity to pay) by type
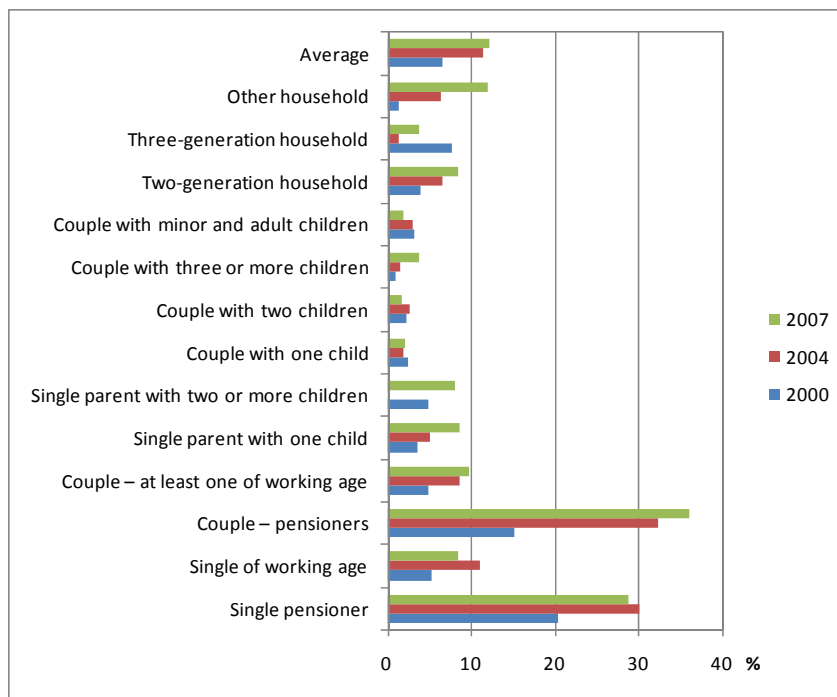
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Households including people with poor health or disabilities are at higher risk of having high health payments. This is partially due to age, because single pensioners and pensioner couples most often have relatively high health expenditures.

Fig. 13. Households with high health payments by number of members with poor or very poor health
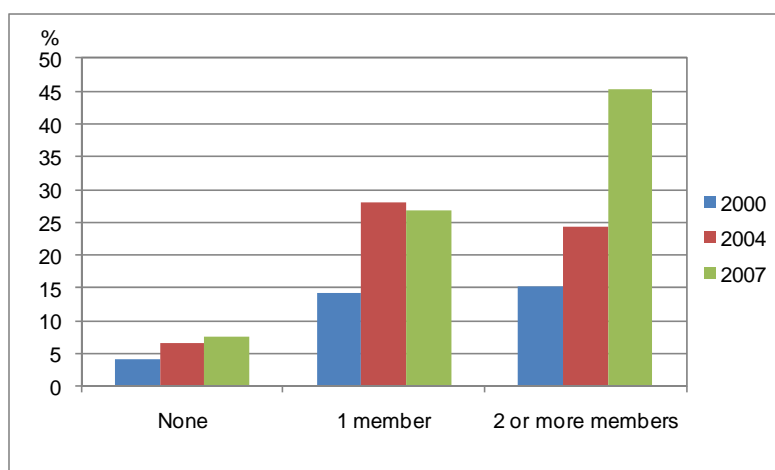
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Fig. 14. Percentage of households with high health payments by number of people with disability or chronic diseases in the household
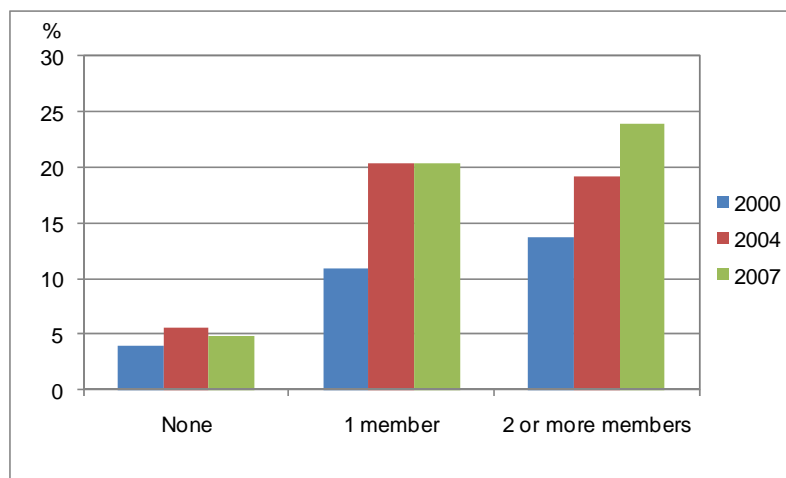
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Absence of health insurance does not seem to increase the risk of having high health payments. (See also Annex 4 for the absence of health insurance by age groups in different years.)

Fig. 15. Percentage of households with high health payments by number of members without health insurance
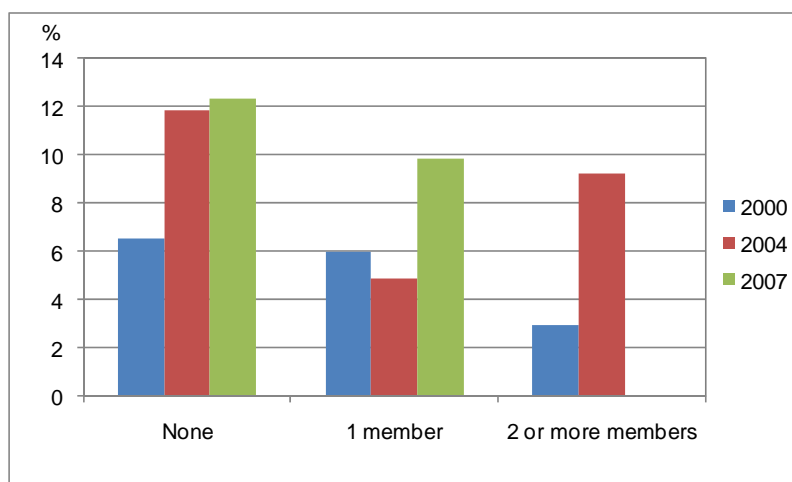
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

2.3.5. The impact of OOPs on poverty

Another way to analyse the impact of OOPs on households is to directly quantify their effect on poverty rates, as defined before and after OOPs. This section analyses the impact of OOPs on impoverishment by expenditure quintiles, household type and the health status of household members. As the impact of OOPs on the poverty rate depends on income distribution (or in this case expenditure), OOPs distribution and the agreed poverty line, it is perhaps more useful for comparing the impact of OOPs on different socioeconomic groups or following a trend. (See also Annex 6 for the impact when using the official absolute poverty line.)

OOPs for health increased poverty rates by 0.8–1.8% in 2000–2007 (average 1.2%). The overall poverty rate (before OOPs) was on average 6.1% in 2000–2007 (from Table 7 in Section 2.2). Hence, OOPs would increase the poverty rate by approximately one fifth (or about 1 percentage

point) if they were excluded from household expenditures. The effect occurs nearly exclusively in the bottom quintile, where it was on average 5.6% during the observed period.

Fig. 16. Percentage of households impoverished due to OOPs, by quintile
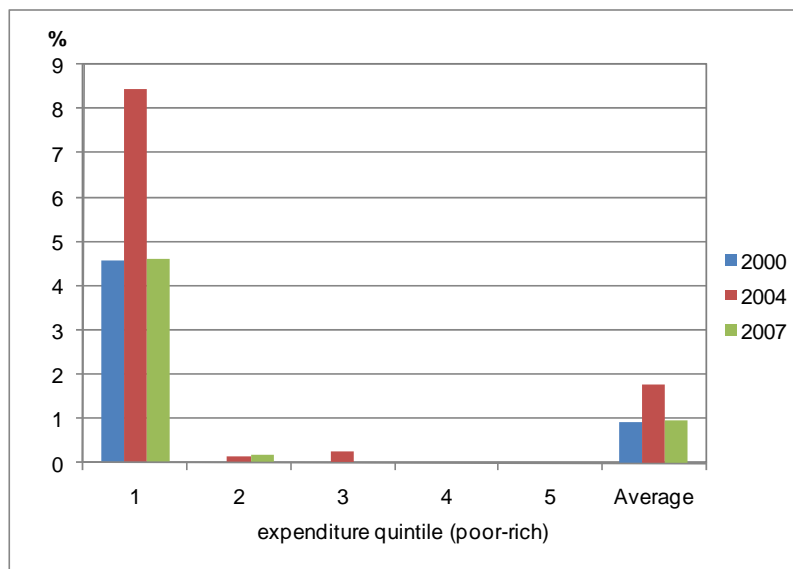
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Again, single pensioners are the most affected: on average about 4.8% of them are pushed below the poverty line because of OOPs. Other household types most affected are pensioner couples (2.2% average), singles of working age (0.9%) and two-generation households (0.6%).

Absence of health insurance does not seem to influence poverty, except in 2006, when about 12% of households were impoverished when they had two or more members without health insurance, but this most likely due to the small sample.

Fig. 17. Percentage of households impoverished due to OOPs, by type
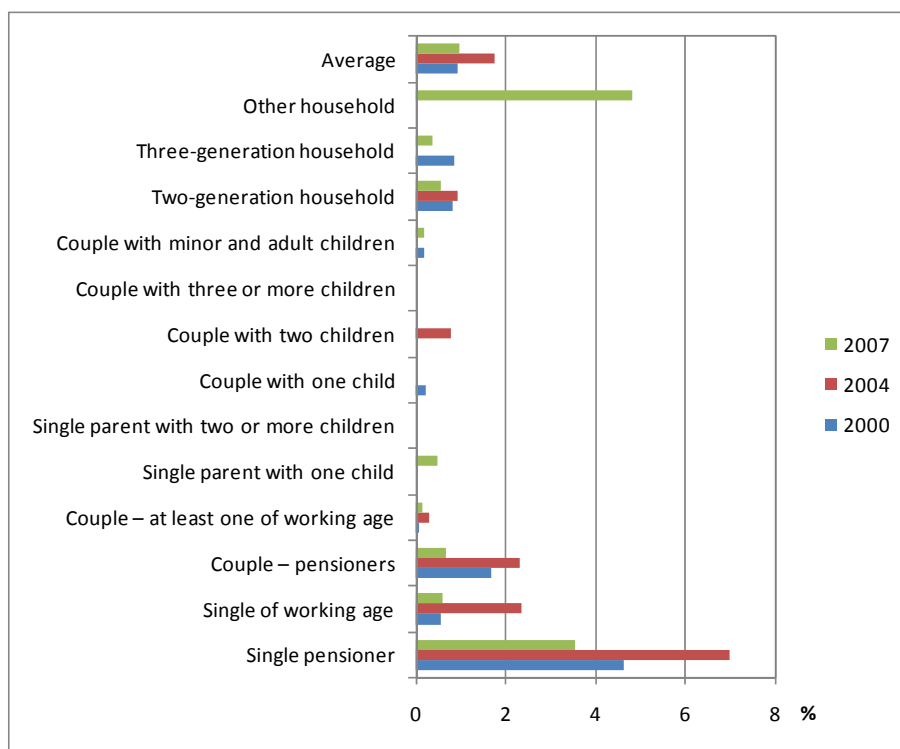
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Fig. 18. Percentage of households impoverished due to OOPs by number of members without health insurance
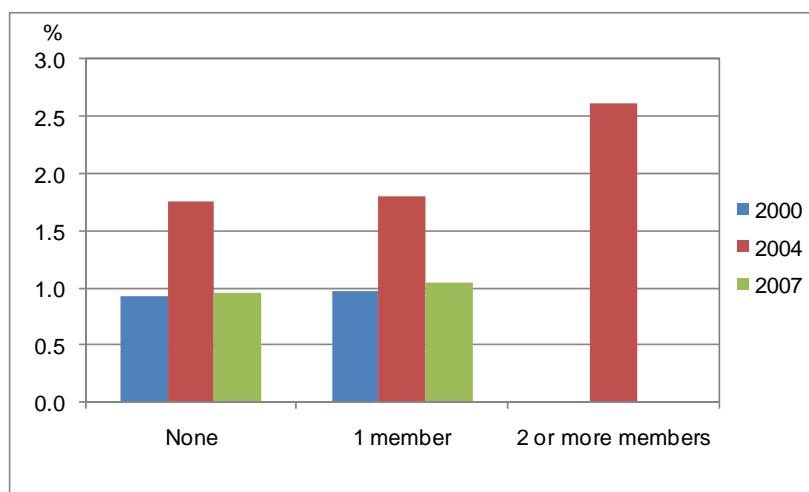
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

2.3.6. Determinants of high health expenditure – regression models

This section summarizes the main determinants of high health expenditure using multivariate regression models. A logistic model is estimated, where a dependent variable is coded 1 if the household has high health expenditure (OOPs > 20% of capacity to pay), and 0 otherwise. Odds ratios are given together with significance levels. Three logistic regression models are presented that differ slightly in the number and composition of explanatory variables.

Logistic regression models show that high health expenditure relative to capacity to pay can be explained by determinants describing household income level and health expenditure. Table 10 describes the health status of a household with the indicator variable of disability or chronic disease sufferers, and Fig. 19 graphs the estimated odds ratios. Table 11 includes the indicator variable of any members with poor or very poor self-assessed health status relative to their peers. Table 12 includes additional indicator variables describing the distance to the nearest doctor. There are separate models for each year and pooled data over the years.

First, the risk of relatively high expenditures on health is increased by low household income: the higher the income quintile, the lower the odds of high health expenditure. The risk is also smaller when the household's head is male and the head's education is higher; presumably both are additional proxies for the permanent household income. The risk of high health expenditure is greater when there are senior members (65 or older), those with disabilities or chronic illnesses (Table 10) or with poor or very poor health assessment (Table 11). The absence of health insurance does not seem to have any reasonable pattern (negative influence on high expenditure in 2001 and 2002 in some regression models cannot be explained, most likely due to small samples).

The pooled regression model over the years shows that risk increased steadily until 2004, after which the pattern is not so clear; it was lower in 2005 and 2007, but higher in 2006.

Adding the variable for distance to the nearest doctor does not change the results of the other variables (Table 12), nor do its own coefficients have any significant pattern.

The positive news is that the risk of high health expenditure is not significantly affected by the ethnicity (proxied by the main household language) nor the number of children. This suggests that children are protected from high health expenditure, and that there is no ethnic inequality.

Fig. 19 illustrates clearly that the most important determinants of relatively high health expenditure are being old and ill. Pensioners have both relatively low income (average old-age pension in Estonia is about 40% of the average after-tax wage) and their need for health care is high. Earlier analysis also revealed that the most important expenditure for poorer households is medicine, especially prescription drugs.

Overall, we may well conclude that medicinal costs are the most important contributing factor in high health expenditure. This suggests that designing an optimal copayment structure for prescription drugs and guaranteeing their affordability, especially for pensioners, should be priorities of Estonian health financing policy to reduce the risk of OOP-induced impoverishment. Of course, households may simply decide not to purchase dental and other outpatient care, corrective lenses or dentures if there is no urgency. In Section 4 we also see that there is also considerable income-related inequality in health care utilization.

Fig. 19. Odds ratios and their confidence intervals from a logistic model, pooled 2000-2007
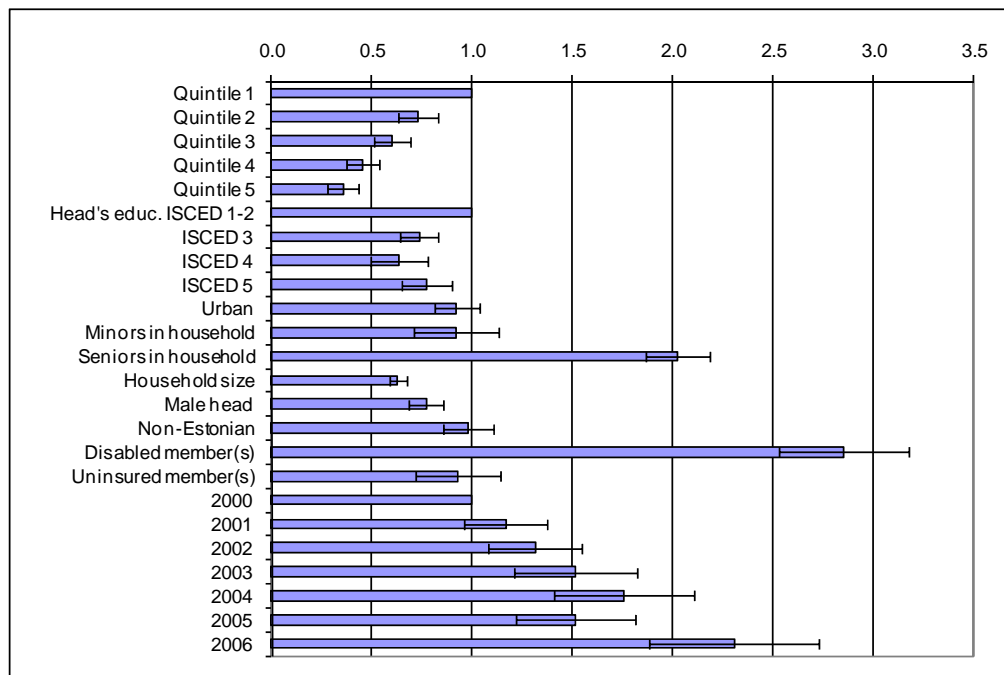
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.
Note: the figure uses the results from the pooled regression model from Table 10

Table 10. Logistic regression models: determinants of high health expenditures I

	2000	2001	2002	2003	2004	2005	2006	2007	Pooled
	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se
Quintile 2	0.627‡	0.808	0.799	0.591†	0.835	0.879	0.649‡	1.036	0.778‡
	(0.108)	(0.128)	(0.124)	(0.127)	(0.176)	(0.166)	(0.108)	(0.193)	(0.051)
Quintile 3	0.505‡	0.462‡	0.617‡	0.512‡	0.835	0.832	0.498‡	0.588†	0.607‡
	(0.102)	(0.086)	(0.106)	(0.118)	(0.184)	(0.188)	(0.095)	(0.129)	(0.046)
Quintile 4	0.442‡	0.389‡	0.406‡	0.458‡	0.845	0.300‡	0.368‡	0.403‡	0.449‡
	(0.108)	(0.085)	(0.093)	(0.118)	(0.215)	(0.076)	(0.078)	(0.097)	(0.039)
Quintile 5	0.607†	0.364‡	0.353‡	0.407‡	0.479†	0.373‡	0.157‡	0.509†	0.381‡
	(0.151)	(0.102)	(0.090)	(0.125)	(0.162)	(0.112)	(0.047)	(0.155)	(0.041)
Urban	1.243	0.869	0.786*	0.900	1.060	0.631‡	1.083	1.509†	0.990
	(0.190)	(0.126)	(0.107)	(0.157)	(0.184)	(0.112)	(0.160)	(0.255)	(0.057)
Minors in household (<16)	1.248	0.863	0.713	0.940	0.961	0.836	0.842	0.815	0.890
	(0.326)	(0.230)	(0.201)	(0.313)	(0.288)	(0.279)	(0.274)	(0.340)	(0.104)
Seniors in household (>65)	1.995‡	1.909‡	2.026‡	1.999‡	2.346‡	1.949‡	1.920‡	2.003‡	2.005‡
	(0.197)	(0.170)	(0.200)	(0.235)	(0.268)	(0.216)	(0.177)	(0.212)	(0.075)
Household size	0.699‡	0.666‡	0.653‡	0.594‡	0.594‡	0.596‡	0.639‡	0.692‡	0.639‡
	(0.070)	(0.056)	(0.057)	(0.061)	(0.064)	(0.059)	(0.056)	(0.072)	(0.023)
Male head	0.678‡	0.745†	0.795*	0.961	0.666‡	0.663†	0.876	0.816	0.777‡
	(0.099)	(0.100)	(0.102)	(0.161)	(0.104)	(0.106)	(0.118)	(0.125)	(0.042)
Head's education ISCED 2	0.711*	0.703*	1.025	1.054	1.392	0.895	0.668	0.725	0.870
	(0.146)	(0.144)	(0.194)	(0.300)	(0.402)	(0.250)	(0.171)	(0.184)	(0.075)
ISCED 3	0.573‡	0.610†	0.773	0.850	0.993	0.620*	0.443‡	0.515‡	0.640‡
	(0.113)	(0.121)	(0.138)	(0.238)	(0.279)	(0.166)	(0.111)	(0.122)	(0.053)
ISCED 4 +	0.534‡	0.654*	0.668*	0.943	0.765	0.690	0.698	0.418‡	0.652‡
	(0.129)	(0.163)	(0.151)	(0.306)	(0.248)	(0.205)	(0.190)	(0.116)	(0.064)
Main language is not Estonian	0.733*	0.786	0.884	0.930	1.056	1.354*	1.005	1.184	1.008
	(0.121)	(0.130)	(0.140)	(0.172)	(0.190)	(0.240)	(0.157)	(0.208)	(0.062)
Member(s) with disabilities or chronic diseases	2.297‡	2.828‡	2.919‡	3.459‡	2.667‡	3.003‡	2.905‡	3.572‡	2.920‡
	(0.312)	(0.367)	(0.387)	(0.591)	(0.443)	(0.512)	(0.421)	(0.639)	(0.163)
Uninsured member (s)	1.263	0.673	0.566†	1.022	0.690	1.012	1.309	1.198	0.957
	(0.304)	(0.163)	(0.150)	(0.332)	(0.254)	(0.377)	(0.350)	(0.361)	(0.104)
2001									1.168*
									(0.108)
2002									1.317‡
									(0.120)
2003									1.531‡
									(0.159)
2004									1.774‡
									(0.182)
2005									1.532‡
									(0.155)
2006									2.337‡
									(0.219)
2007									1.808‡
									(0.180)
Constant	0.169‡	0.249‡	0.222‡	0.207‡	0.171‡	0.331‡	0.490†	0.169‡	0.156‡
	(0.039)	(0.054)	(0.051)	(0.067)	(0.057)	(0.110)	(0.147)	(0.051)	(0.018)
Pseudo R^2	0.132	0.178	0.203	0.189	0.197	0.211	0.213	0.211	0.194
Observations	6141	5916	5579	3303	3152	3522	3726	3359	34 698

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Notes: Here and in the following regression models the dependent variable is 1 if health expenditures are more than 20% of the capacity to pay and 0 otherwise. Significance levels ‡ p<0.01, † p<0.05, * p<0.10. The pooled model does not take into account the influence of repeated households in different years on standard errors.

Table 11. Logistic regression models: determinants of high health expenditures II

	2000	2001	2002	2003	2004	2005	2006	2007	Pooled
	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se
Quintile 2	0.663†	0.829	0.838	0.578†	0.873	0.873	0.646†	1.076	0.795‡
	(0.114)	(0.131)	(0.130)	(0.127)	(0.184)	(0.165)	(0.111)	(0.203)	(0.053)
Quintile 3	0.541‡	0.506‡	0.636‡	0.507‡	0.909	0.812	0.548‡	0.640†	0.640‡
	(0.110)	(0.095)	(0.110)	(0.120)	(0.203)	(0.187)	(0.104)	(0.141)	(0.048)
Quintile 4	0.461‡	0.413‡	0.427‡	0.443‡	0.859	0.298‡	0.390‡	0.423‡	0.463‡
	(0.114)	(0.090)	(0.098)	(0.117)	(0.215)	(0.077)	(0.084)	(0.103)	(0.040)
Quintile 5	0.648*	0.378‡	0.374‡	0.399‡	0.511†	0.372‡	0.173‡	0.554*	0.401‡
	(0.161)	(0.105)	(0.096)	(0.124)	(0.172)	(0.115)	(0.052)	(0.168)	(0.043)
Urban	1.271	0.886	0.846	0.970	1.099	0.659†	1.097	1.444†	1.011
	(0.197)	(0.129)	(0.117)	(0.172)	(0.188)	(0.116)	(0.163)	(0.245)	(0.059)
Minors in household (<16)	1.274	0.827	0.746	0.982	0.927	0.805	0.781	0.758	0.878
	(0.333)	(0.220)	(0.211)	(0.332)	(0.271)	(0.262)	(0.254)	(0.310)	(0.102)
Seniors in household (>65)	1.980‡	1.788‡	1.928‡	1.931‡	2.276‡	1.978‡	1.888‡	1.954‡	1.957‡
	(0.201)	(0.161)	(0.198)	(0.228)	(0.261)	(0.217)	(0.177)	(0.211)	(0.074)
Household size	0.688‡	0.679‡	0.642‡	0.565‡	0.590‡	0.601‡	0.643‡	0.690‡	0.634‡
	(0.070)	(0.057)	(0.056)	(0.060)	(0.062)	(0.059)	(0.057)	(0.072)	(0.023)
Male head	0.679‡	0.776*	0.818	0.992	0.648‡	0.655‡	0.863	0.806	0.778‡
	(0.100)	(0.104)	(0.106)	(0.171)	(0.100)	(0.104)	(0.117)	(0.123)	(0.042)
Head's education ISCED 2	0.742	0.740	1.072	1.266	1.464	0.889	0.702	0.708	0.916
ISCED 3	(0.155)	(0.153)	(0.207)	(0.364)	(0.416)	(0.250)	(0.182)	(0.195)	(0.080)
	0.614†	0.666†	0.817	1.113	1.111	0.699	0.444‡	0.481‡	0.691‡
	(0.123)	(0.136)	(0.149)	(0.320)	(0.310)	(0.188)	(0.113)	(0.125)	(0.059)
ISCED 4 +	0.567†	0.731	0.718	1.338	0.873	0.754	0.716	0.393‡	0.714‡
	(0.138)	(0.184)	(0.163)	(0.446)	(0.282)	(0.228)	(0.198)	(0.118)	(0.071)
Main language is not Estonian	0.747*	0.778	0.879	0.884	1.083	1.381*	1.036	1.160	1.013
	(0.122)	(0.129)	(0.139)	(0.167)	(0.194)	(0.245)	(0.163)	(0.206)	(0.063)
Member(s) with (very) poor health	2.455‡	3.046‡	3.283‡	3.719‡	3.341‡	2.700‡	3.311‡	3.152‡	3.103‡
	(0.345)	(0.414)	(0.444)	(0.636)	(0.539)	(0.432)	(0.456)	(0.495)	(0.169)
Uninsured member (s)	1.230	0.627*	0.537†	0.948	0.683	0.977	1.299	1.132	0.924
	(0.296)	(0.150)	(0.146)	(0.302)	(0.252)	(0.369)	(0.346)	(0.326)	(0.099)
2001									1.110
									(0.103)
2002									1.313‡
									(0.120)
2003									1.597‡
									(0.168)
2004									1.904‡
									(0.194)
2005									1.658‡
									(0.169)
2006									2.624‡
									(0.247)
2007									2.091‡
									(0.210)
Constant	0.168‡	0.236‡	0.223‡	0.214‡	0.168‡	0.388‡	0.567†	0.273‡	0.163‡
	(0.039)	(0.052)	(0.053)	(0.070)	(0.055)	(0.127)	(0.161)	(0.083)	(0.019)
Pseudo R^2	0.134	0.180	0.209	0.192	0.210	0.205	0.220	0.204	0.197
Observations	6141	5916	5579	3303	3152	3522	3726	3359	34 698

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Notes: significance levels ‡ p<0.01, † p<0.05, * p<0.10. The pooled model does not take into account the influence of repeated households in different years on standard errors.

Table 12. Logistic regression models: determinants of high health expenditures III

	2000	2001	2002	2003	2004	2005	2006	2007	Pooled
	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se
Quintile 2	0.659†	0.844	0.847	0.574†	0.856	0.850	0.638‡	1.080	0.794‡
	(0.114)	(0.134)	(0.131)	(0.126)	(0.184)	(0.159)	(0.110)	(0.206)	(0.053)
Quintile 3	0.540‡	0.519‡	0.636‡	0.507‡	0.901	0.794	0.545‡	0.640†	0.639‡
	(0.110)	(0.098)	(0.109)	(0.118)	(0.199)	(0.181)	(0.103)	(0.141)	(0.048)
Quintile 4	0.454‡	0.421‡	0.426‡	0.438‡	0.831	0.294‡	0.388‡	0.424‡	0.462‡
	(0.112)	(0.092)	(0.098)	(0.115)	(0.210)	(0.075)	(0.083)	(0.104)	(0.040)
Quintile 5	0.653*	0.383‡	0.375‡	0.398‡	0.502†	0.358‡	0.171‡	0.544†	0.400‡
	(0.163)	(0.107)	(0.097)	(0.124)	(0.171)	(0.111)	(0.051)	(0.166)	(0.043)
Distance to doctor	0.828	0.917	0.805	0.881	0.799	1.244	1.122	1.193	0.999
0.5–1 km	(0.176)	(0.195)	(0.155)	(0.210)	(0.191)	(0.292)	(0.227)	(0.284)	(0.081)
1–2 km	1.008	1.172	0.949	0.886	1.526*	1.449	1.007	1.305	1.166*
	(0.203)	(0.232)	(0.175)	(0.218)	(0.355)	(0.334)	(0.213)	(0.308)	(0.093)
2–5 km	0.980	1.419*	1.126	1.044	1.070	1.447	0.817	1.390	1.171*
	(0.207)	(0.280)	(0.227)	(0.256)	(0.259)	(0.370)	(0.185)	(0.307)	(0.095)
5–10 km	2.020‡	0.791	0.665	1.13	1.199	1.391	1.003	1.240	1.147
	(0.518)	(0.219)	(0.167)	(0.399)	(0.365)	(0.432)	(0.290)	(0.362)	(0.122)
More than 10 km	1.323	0.812	0.666	0.895	0.440†	1.172	0.672	0.879	0.803*
	(0.457)	(0.258)	(0.201)	(0.355)	(0.168)	(0.379)	(0.226)	(0.281)	(0.098)
Urban	1.637‡	0.815	0.762*	1.022	0.982	0.651†	0.995	1.351	0.978
	(0.293)	(0.129)	(0.120)	(0.232)	(0.195)	(0.137)	(0.186)	(0.274)	(0.067)
Minors in household (<16)	1.279	0.852	0.737	0.989	0.928	0.800	0.782	0.758	0.877
	(0.334)	(0.228)	(0.208)	(0.338)	(0.271)	(0.263)	(0.256)	(0.310)	(0.102)
Seniors in household (>65)	1.981‡	1.776‡	1.921‡	1.926‡	2.324‡	1.966‡	1.886‡	1.953‡	1.955‡
	(0.200)	(0.159)	(0.198)	(0.227)	(0.270)	(0.218)	(0.178)	(0.209)	(0.074)
Household size	0.684‡	0.670‡	0.642‡	0.561‡	0.595‡	0.601‡	0.643‡	0.688‡	0.633‡
	(0.071)	(0.057)	(0.056)	(0.059)	(0.063)	(0.059)	(0.057)	(0.072)	(0.022)
Male head	0.675‡	0.792*	0.814	0.999	0.641‡	0.656‡	0.870	0.802	0.778‡
	(0.100)	(0.106)	(0.104)	(0.171)	(0.100)	(0.104)	(0.119)	(0.123)	(0.042)
Head's education ISCED 2	0.751	0.719	1.067	1.262	1.434	0.873	0.711	0.693	0.912
	(0.157)	(0.149)	(0.207)	(0.362)	(0.408)	(0.246)	(0.186)	(0.192)	(0.080)
ISCED 3	0.619†	0.640†	0.807	1.104	1.105	0.690	0.438‡	0.473‡	0.690‡
	(0.125)	(0.130)	(0.147)	(0.316)	(0.307)	(0.187)	(0.112)	(0.125)	(0.059)
ISCED 4 +	0.57‡	0.718	0.702	1.345	0.837	0.749	0.714	0.385‡	0.710‡
	(0.142)	(0.182)	(0.160)	(0.447)	(0.270)	(0.226)	(0.198)	(0.119)	(0.071)
Main language is not Estonian	0.769	0.787	0.896	0.892	1.115	1.403*	1.020	1.169	1.024
	(0.126)	(0.131)	(0.143)	(0.168)	(0.202)	(0.253)	(0.163)	(0.207)	(0.064)
Member(s) with disabilities or chronic diseases	2.405‡	3.138‡	3.322‡	3.721‡	3.427‡	2.671‡	3.344‡	3.112‡	3.101‡
	(0.340)	(0.428)	(0.452)	(0.643)	(0.559)	(0.428)	(0.464)	(0.487)	(0.169)
Uninsured member(s)	1.223	0.646*	0.551†	0.941	0.663	0.942	1.326	1.116	0.921
	(0.294)	(0.156)	(0.151)	(0.301)	(0.244)	(0.358)	(0.355)	(0.321)	(0.099)
2001									1.103
									(0.103)
2002									1.315‡
									(0.120)
2003									1.604‡
									(0.169)
2004									1.912‡
									(0.195)
2005									1.662‡
									(0.170)
2006									2.633‡
									(0.248)
2007									2.100‡
									(0.211)
Constant	0.136‡	0.235‡	0.263‡	0.217‡	0.171‡	0.316‡	0.628	0.246‡	0.156‡
	(0.037)	(0.060)	(0.071)	(0.082)	(0.062)	(0.119)	(0.196)	(0.085)	(0.020)
Pseudo R^2	0.139	0.184	0.212	0.193	0.220	0.207	0.222	0.206	0.198
Observations	6141	5916	5579	3303	3152	3522	3726	3359	34 698

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Notes: significance levels ‡ p<0.01, † p<0.05, * p<0.10. Pooled model does not take into account the influence of repeated households in different years on standard errors.

3. Impact of health care financing on redistribution

3.1. Data and methodology

This section considers the progressivity of health care financing and its impact on redistribution, using the approach described by Klavus (1998) and drawing heavily from his article to describe the methodology.

As seen in Table 1, about two thirds of health care financing comes from the social tax (payroll tax) and about one fifth from OOPs. The central government share is about 8–10% and local governments contribute about 1%. Hence the role of other taxes is actually negligible. (For a brief overview of the Estonian tax system see the European Commission, 2009). As National Health Accounts give only the main source of financing by institutions and not by taxes, the share of taxes was calculated using the proportion of taxes in respective budgets:

$$s_i = \sum_{j=1}^{3} w_j \times f_{ij}$$

where

s_i is the share of certain taxes in financing health expenditures,

w_j is the share of certain institutions (health insurance fund, central or local government) in financing health expenditures, directly from NHA data),

f_{ij} is the share of certain taxes in the revenues of the institutions, from Statistics Estonia data.

Table 13. Sources of health care financing by tax item, 2000-2007 (%)

	2000	2001	2002	2003	2004	2005	2006	2007
Social tax	66.0	67.0	65.6	65.4	65.7	66.2	61.6	64.0
Personal income tax	3.5	3.9	3.8	3.2	2.6	2.1	2.8	2.7
Value added tax	4.6	4.4	4.3	5.2	4.1	5.0	5.2	5.5
Out-of-pocket payments	19.7	18.8	19.9	20.8	21.3	20.4	25.1	21.9
Excise taxes	1.6	1.7	1.7	1.9	1.9	2.2	2.0	2.0
Others (other taxes, foreign sector, other private sector)	4.6	4.1	4.7	3.5	4.3	4.1	2.9	3.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: National Health Accounts of the Ministry of Social Affairs, Tax revenues from Statistics Estonia, own calculations

Table 14. Sources of health care financing in 2004 (%)

Main source of revenue	(1) Share of total health expenditure (NHA data)	(2) Share of the financing body's total revenue (Budget data)	(3) = (1)x(2) Share of the particular revenue type in health expenditure
Public sector	75.5		
Health Insurance Fund	65.7		
Earmarked social tax (13%)		100	65.7
Central government	8.5		
Value added tax		48.1	4.1
Personal income tax		16.9	1.4
Excise duties		22.3	1.9
Other revenues		12.7	1.1
Local government	1.3		
Personal income tax		90.7	1.2
Land tax		7.2	0.1
Private sector	24.0		
OOPs	21.3		21.3
Other private sector	2.7		2.7
Foreign sector	0.5		0.5
Total	100		100

Note that there are also non-tax revenues in central and local government budgets that are not taken into account in these calculations. The share of taxes in the state budget was about 80% (81% in 2006, 83% in 2007). Other main sources of revenue are various EU transfers (about a half of non-tax revenues), income from economic activities and property (e.g., dividends) and the sale of property. The share of taxes in local government budgets varies considerably among municipalities; on average it was 55% in 2008. Other main sources are a block grant, earmarked grants for current expenditures and investment grants from the central state budget and income from economic activities and property. Excluding non-tax revenues from central or local governments will slightly overestimate the shares of other taxes, but since many non-tax revenues are earmarked for non-health purposes, the bias is minor. Neither was it taken into account that part of the motor fuel excise tax revenue is supposed to go to road construction, or a small part of alcohol and tobacco excise taxes, or that all gambling taxes are earmarked. So in Table 13, for example, the 2007 share of VAT in financing health expenditures according to the NHA would be 4–6%, personal income tax 1.7–2.9%, total excise taxes 1.3–2.0%, capital income tax 0.7–1.1% and other categories 2.8–6.1%. (The wide range of the last is explained by the inclusion of non-tax revenues in one scenario.)

After the share of individual taxes in health care financing is determined, the next step is to determine the amount of taxes every household pays and their distribution as well as OOPs. Unfortunately, there is no data on labour taxes or consumption taxes in the Household Budget Survey (HBS) data. Furthermore, as it is not possible to merge the data with official tax records, the only option is to simulate the taxes. We used the data on taxes from the ALAN tax-benefit microsimulation model by Alari Paulus and Andres Võrk of 2 August 2009.[2] The model

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[2] It is a classic standard static tax-benefit model that uses Estonian Household Budget Survey data and simulates all possible taxes. The model has been used many times for analyses of the Estonian tax-benefit system and its impact on redistribution, poverty reduction and labour supply incentives. For an overview of the model see Võrk, Paulus,

simulates all labour taxes (social tax, income tax), income tax on capital, consumption taxes (value-added tax, excise taxes on alcohol, tobacco, gasoline). Land tax is taken from the original data. Concentration indexes were calculated for all simulated taxes and OOPs. Using the weights from Table 13, these were aggregated to get the overall progressivity of health care financing.

Table 15. Structure of gross income and main taxes

	Construction
Labour cost (defined here as **gross income**)	Simulated
Payroll taxes paid by employers	Simulated
Social tax (33% of gross wage)	Simulated
Pension insurance contribution (20% of gross wage)	Simulated
Health insurance contribution (13% of gross wage)	Simulated
Employer unemployment insurance contribution (0.3% of gross wage in 2004)	Simulated
Gross wage	Simulated from current after-tax income from HBS data
Employee unemployment insurance contribution (0.6% of gross wage in 2004)	Simulated
Pension insurance contribution to funded scheme (2% of gross wage)	Simulated
Income tax (The 2004 marginal tax rate was 24% of gross wage minus insurance contributions, but the most important allowances and deductions were taken into account.)	Simulated
Net income (after declaration of taxes)	Simulated from gross earnings
VAT on VAT-taxable consumption	Simulated
Out-of-pocket expenditures on health	Directly from HBS data
Land tax	Directly from HBS data
Excise taxes on tobacco and alcohol	Simulated
Excise taxes on gasoline and other fuels	Simulated

Note: The tax base and taxes of the self-employed are slightly different; other income (pensions, benefits) is also taxed differently. The ALAN model takes these variations into account.

Next, individual progressivity indicators for social tax, personal income tax, value added tax and OOPs were calculated, then weighted as per Table 13.

The OECD equivalence scales 1:0.7:0.5 were used to calculate household equivalent sizes. Note that this is different from the weights used in Sections 2 and 3, where the WHO approach for calculations of catastrophic expenditures was followed.

Next all monetary variables (gross income, social tax, personal income tax, value added tax, out-of pocket payments) were identified per equivalent household size. Averages for each variable in the sample and their value for each household relative to the average were calculated. Household statistical weights were always used when calculating means, variances etc.

Poltimäe (2008) (available in Estonian only). Note that the model is in continuous development, which also means that the results in this section change slightly when the underlying data simulated by the improved model change. So far, the updates of the model have had only minor impact on the estimated progressivity coefficients with no change in overall conclusions.

Cumulative ranks were assigned to households according to their gross income (yi), including all the payroll taxes, social insurance contributions and income tax. Because of the statistical weights, the rank was defined as the cumulative proportion of the population up to the midpoint of each group interval:

$$R_i = \sum_{j=0}^{i-1} w_j + w_i / 2$$

where w_i is the statistical weight (inverse of the sampling probability) of the household i and w_0 =0.

The relative position of the household in the rank is found as the cumulative proportion divided by the total number of households in the population (sum of the statistical weights).

$$F_i = \frac{R_i}{\sum_{j=1}^{N} w_j}$$

Then the weighted variance of the relative positions $Var(F_i)$ are found. Both F_i and $Var(F_i)$ play important role in further calculations.

The Gini coefficient of the gross income and concentration indexes of the taxes can be calculated as slope coefficients from the following regression:

$$2 \times Var(F_i) \frac{y_i}{\bar{y}} = \alpha + \beta \times F_i + \varepsilon_i$$

where y_i and $\bar{y}$ are the individual values and the weighted mean of the gross income (to get the Gini index G) or other monetary variable (to get concentration indexes C). The regression uses household weights.

Progressivity indexes were calculated from a similar regression model:

$$2 \times Var(F_i) \left(\frac{c_i}{\bar{c}} - \frac{y_i}{\bar{y}} \right) = \alpha + \beta \times F_i + \varepsilon_i$$

where y_i is gross income and c_i is the household's part of health expenditure in the given category.

Since standard errors are not given for our results (because the simulated taxes from the ALAN model do not have any reliable measure of variability), the progressivity index values P could simply be calculated as a difference between the concentration index C and Gini index G: $P = C - G$.

3.2. Results

Positive values on a progressivity index, or a concentration index larger than the Gini index, show that the tax is progressive; that is, rich households pay a relatively larger share of these taxes relative to their income. Negative values show the opposite, that poorer households pay

more relative to their income. Our results show that the social tax (a major source of financing) and personal income tax are progressive, and VAT, excise taxes and OOPs are regressive. Personal income tax is the most regressive of them, because of tax-free allowances that make average income tax smaller for low-income households. As there are no tax-free allowances under the social tax, it is slightly less progressive. VAT and excise taxes are both regressive, because poorer households consume relatively more and save less, but different components of excise taxes have different degrees of regressivity. The most regressive taxes are the tobacco and alcohol excise taxes, especially that on vodka. The excise taxes on wine and gasoline are progressive, because wealthier households consume more wine and drive more.

Table 16. Concentration indexes of health care financing, 2000–2007

	2000	2001	2002	2003	2004	2005	2006	2007
Gross income (Gini)	0.430	0.418	0.426	0.413	0.407	0.402	0.391	0.389
Social tax	0.572	0.582	0.587	0.576	0.573	0.552	0.544	0.532
Personal income tax	0.646	0.658	0.654	0.632	0.645	0.646	0.634	0.605
Value-added tax	0.261	0.263	0.261	0.262	0.270	0.271	0.265	0.261
Excise taxes	0.285	0.299	0.285	0.289	0.283	0.271	0.244	0.276
Out-of-pocket payments	0.130	0.134	0.072	0.094	0.013	0.024	0.017	0.010

Source: Statistics Estonia, Estonian Household Budget Survey microdata, ALAN microsimulation model, own calculations

Taking the weighted average (using weights from Table 13), overall financing was slightly progressive during the period considered, meaning that households with higher gross income paid more in health expenditure (cf., Fig. 20). However, progressivity clearly decreased during the period, mainly due to the increasing share of OOPs and their increasing regressivity. By 2006, the distribution of the burden of health care financing was practically neutral, but in 2007 progressivity increased again due to a drop in the share of OOPs.

Table 17. Kakwani progressivity indexes of the health care financing components, 2000–2007

	2000	2001	2002	2003	2004	2005	2006	2007
Social tax	0.142	0.164	0.161	0.163	0.165	0.150	0.153	0.143
Personal income tax	0.216	0.241	0.228	0.219	0.238	0.244	0.243	0.216
Value-added tax	-0.169	-0.155	-0.165	-0.151	-0.138	-0.131	-0.125	-0.128
Excise taxes	-0.145	-0.119	-0.141	-0.124	-0.125	-0.131	-0.146	-0.113
Out-of-pocket payments	-0.300	-0.284	-0.354	-0.319	-0.395	-0.378	-0.374	-0.379
Contribution to the total index (weighted with the share of financing)								
Social tax	0.094	0.110	0.106	0.107	0.109	0.099	0.095	0.092
Personal income tax	0.007	0.009	0.009	0.007	0.006	0.005	0.007	0.006
Value added tax	-0.008	-0.007	-0.007	-0.008	-0.006	-0.007	-0.007	-0.007
Excise taxes	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.002
Out-of-pocket payments	-0.059	-0.053	-0.070	-0.066	-0.084	-0.077	-0.094	-0.083
Total	**0.032**	**0.057**	**0.034**	**0.037**	**0.023**	**0.018**	**-0.001**	**0.005**

Note: The totals were calculated as weighted sums, using the shares of total health financing (see Table 13 for weights).

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Fig. 20. Progressivity of health care financing and its components
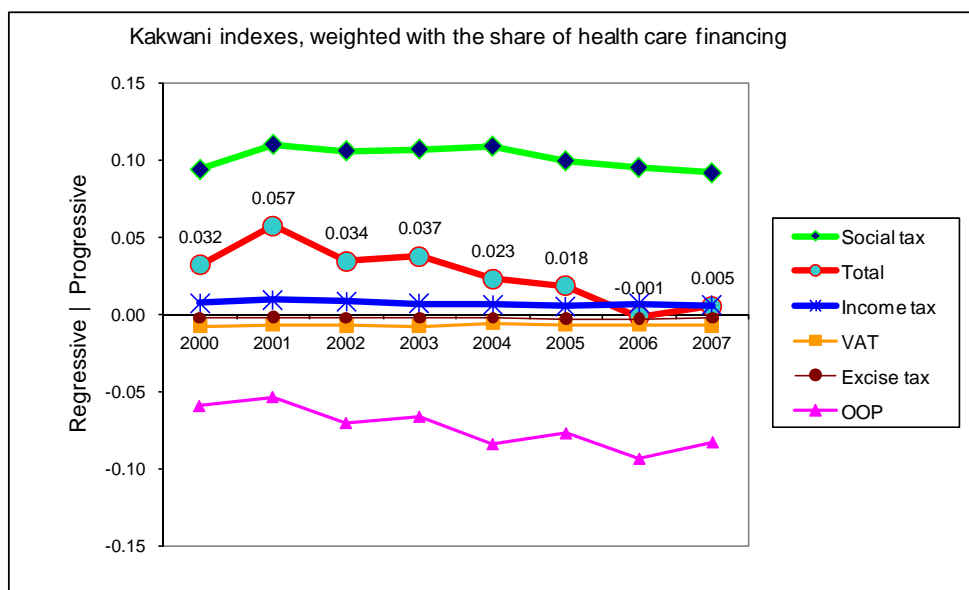
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

The progressivity analysis is important when we consider which taxes should be used in what proportions to finance health care. Estonia has relied so far mainly on progressive labour taxation, which has balanced regressive OOPs. Social partners (trade unions, employers unions) and labour market experts see that labour taxes, especially the social tax that is used to finance the health and pension system, are too high, and governments seek mainly increases in consumption taxes to compensate for the reduction in the social tax. If regressive consumption taxes, especially those on alcohol or tobacco, are increased and the labour tax decreased, then overall health care financing becomes more regressive. Therefore, to maintain the current level of redistribution via health care financing it is essential that either OOPs be reduced or that low-income households be compensated for any increase in consumption taxes, for example via higher social assistance benefits.

4. Income-related inequality in Estonian health care utilization

4.1. Data and methodology

Following the methods outlined in van Doorslaer, Masseria et al.(2004), a major study on OECD countries, income-related inequality in health care utilization was measured with a concentration index (CI) and horizontal inequity was measured with a horizontal inequity index (HI) derived from the CI after standardizing the need for health care.

Micro-level data from the Estonian Household Budget Survey (HBS) from 2006 were used, as this wave of the HBS included a separate section on health status and health care utilization. The self-reported number of contacts with health service providers during last six months was used to measure health care utilization.

Visits to family doctors, dentists, other medical specialists, phone consultations, emergency medical care (ambulance), day treatment and hospitalization were all differentiated. The need for health care was approximated to age, gender, self-reported health status and self-reported

disability status. In total, data on 7826 adult individuals (older than 15) in 3628 households were used.

Income was measured as disposable (variable s04 in the data). Household sizes were made comparable using OECD equivalence scales 1:0.7:0.5. All household members were included for simple utilization rates and equivalized income, but to find concentration indexes only adults were included, in order to have a basis of comparison to the van Doorslaer study.

As in the previous section, concentration indexes of the utilization rates were calculated as slope coefficients from the following regression:

$$2 \times Var(F_i)\frac{y_i}{\bar{y}} = \alpha + \beta \times F_i + \varepsilon_i$$

where y_i and $\bar{y}$ are the individual values and weighted mean of the health care utilization rates for different categories of health care and F is the relative position of the individual i in the cumulative income distribution. The resulting concentration indexes are presented in the second column of Table 20.

To take into account variations in the need for health care, the following "demand" function for health care utilization was estimated:

$$y_i = \alpha + \beta \ln inc_i + \sum_k \gamma_k x_{k,i} + \sum_p \delta_p z_{p,i} + \varepsilon_i$$

where:

y_i is the number of contacts (visits) with health care providers during the period by individual i;

$\ln(inc_i)$- log of the person i's household equivalized income;

x_k – variables representing the need for health care;

z_p – other variables influencing demand for health care; and

α, β, γ_k and δ_p – parameters

Then expected utilization rates were found for an individual i at the values of need variables x given other characteristics z at their sample mean values.

$$\hat{y}_i^X = \hat{\alpha} + \hat{\beta} \ln inc^m + \sum_k \hat{\gamma}_k x_{k,i} + \sum_p \hat{\delta}_p z_p^m .$$

And the need-standardized utilization rates were derived as follows:

$$\hat{y}_i^{IS} = y_i - \hat{y}_i^X + y^m$$

where y^m is the average utilization rate in the sample. And the standardized concentration index and its standard errors were calculated similarly as above from the following regression model:

$$2 \times Var(F_i)\frac{\hat{y}_i^{IS}}{\bar{\hat{y}}} = \alpha + \beta \times F_i + \varepsilon_i \, .$$

The resulting concentration indexes are presented in the last column of Table 20. The need for health care is measured using interactive terms of age groups and gender, self-assessed health status and self-assessed disability. Non-need variables that influence health care utilization are income, education level and social status.

Table 18. Variables used in the standardization regression model

Variables	Definition in Household Budget Survey data
Need variables	
Age and gender interaction terms	Age groups: 16–35, 36–45, 46–65, 66–75
Self-assessed state of health, relative to age group	very good, good, neither good nor poor, poor, very poor (variable B11)
Presence of disability or chronic disease	No disability; disability, but does not need to be attended; disability and needs to be attended sometimes or permanently (variables B12 and B13)
Non-need variables	
Income	Disposable income (variable s04) per equivalized household size, in natural logarithm
Education	Pre-primary, primary, lower secondary, upper secondary or post-secondary non-tertiary, tertiary (variables B17 and B18 combined)
Social status	Self-employed, employee, pensioner, unemployed, student, homemaker, unable to work because of illness, on maternity leave (variables B20, B24, B25, B28 combined)

Note that the regression models are estimated using ordinary least squares (OLS), although utilization rates are discrete variables, with large numbers of people making no use of the system. We rely here on the results of van Doorslaer, Masseria et al.(2004) and their contention that more complicated nonlinear models would yield qualitatively similar results.

4.2. Results

First the distribution of utilization rates of different health care services are depicted (Table 19) for the last six months. Overall about 55% of people had visited their family doctor at least once, about 30% had visited a dentist or other medical specialist. Only about 15% had had a telephone consultation, about 5% had used an ambulance service. Day treatment had been used by only a few, less than 2%, and about 5% had been hospitalized at least once.

Table 19. Utilization of health care services during the last six months

Number of visits	Health care services						
	Family doctor	Dentist	Other medical specialist	Phone consultation	Emergency medical care (ambulance)	Day treatment	Hospitali-zation
0	44.8	72.5	68.3	85.2	95.5	98.5	94.8
1	22.4	13.1	16.4	5.5	3.3	1.1	4.2
2	16.0	7.1	8.0	4.8	0.8	0.2	0.8
3	7.6	3.2	3.1	2.0	0.2	0.0	0.1
4	3.4	1.7	1.6	1.0	0.0	0.0	0.0
5 or more	5.8	2.4	2.6	1.4	0.2	0.1	0.0
Total	100	100	100	100	100	100	100

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Fig. 21. Number of visits during last six months by income quintiles

	Family doctor	Dentist	Specialist	Phone consult.	Ambulance	Day treatment	Hospita-lization
Quintile 1	1.45	0.43	0.62	0.29	0.09	0.03	0.08
Quintile 2	1.51	0.48	0.68	0.39	0.09	0.02	0.09
Quintile 3	1.35	0.71	0.71	0.36	0.06	0.03	0.06
Quintile 4	1.22	0.65	0.66	0.37	0.08	0.03	0.06
Quintile 5	1.02	0.75	0.60	0.38	0.05	0.03	0.04
Average	1.31	0.60	0.65	0.36	0.08	0.03	0.06
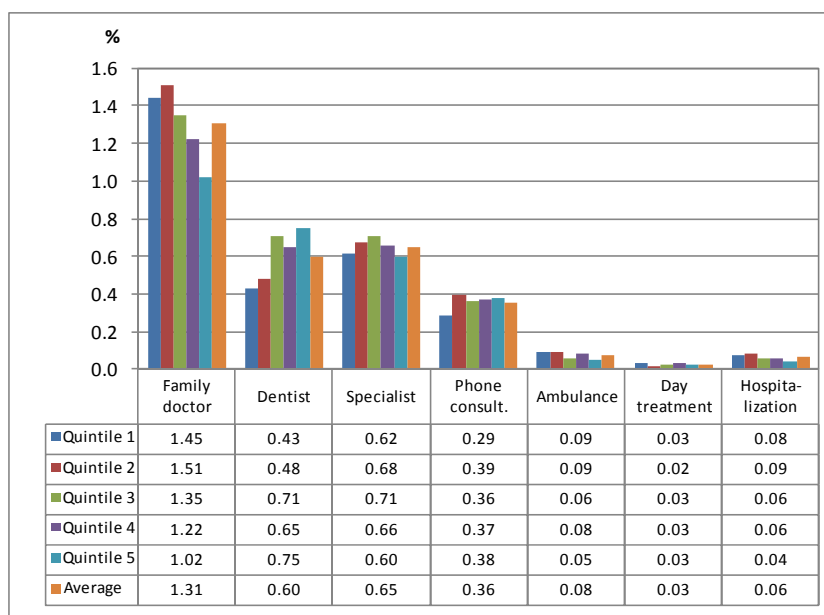
Note: each quintile includes an equal number of people. The quintiles are based on equivalized household disposable income.

The average number of visits to the family doctor during last six months is 1.3, to a dentist 0.60 and other specialists 0.65. The average number of telephone consultations is 0.08, day treatments 0.03 and hospitalization 0.06.

Fig. 22. Proportion of people making at least one visit during last six months, by income quintiles

	Family doctor	Dentist	Specialist	Phone consult.	Ambulance	Day treatment	Hospita-lization
Quintile 1	55.2	21.0	27.5	11.2	4.9	1.4	5.9
Quintile 2	60.4	22.4	33.0	16.2	6.1	1.5	6.6
Quintile 3	55.7	28.9	32.4	15.0	3.9	1.7	4.8
Quintile 4	53.8	30.5	34.5	16.8	4.5	1.4	4.9
Quintile 5	50.7	34.5	30.8	14.7	3.4	1.4	3.6
Average	55.2	27.5	31.7	14.8	4.5	1.5	5.2
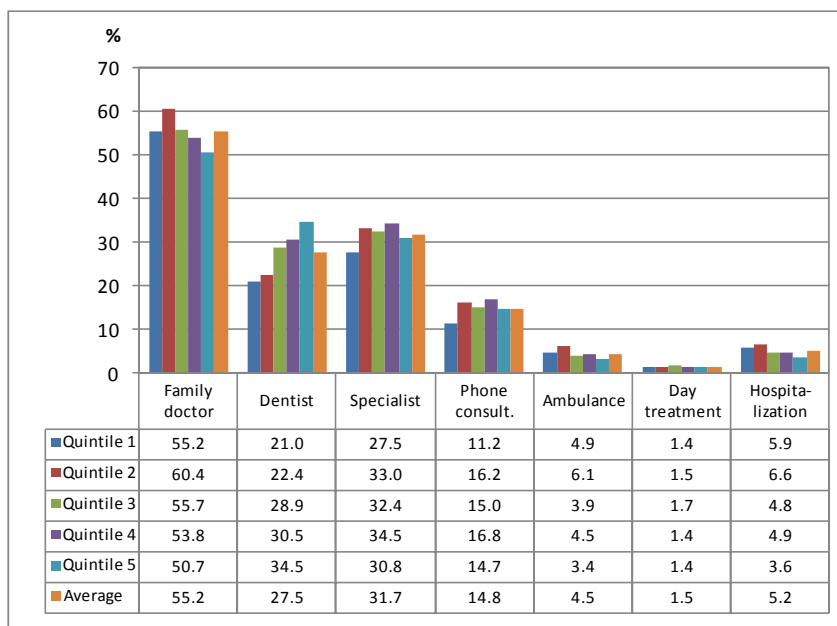
Note: each quintile includes equal number of people. The quintiles are based on equivalized household income.

Both the average number of visits by quintiles and the concentration indexes, where utilization of health care is not adjusted for differences in need, suggest that family doctors, ambulance services and hospitalization are used more by people in the lower quintiles. Dental care is used more by those with higher income. There is no clear pattern in the utilization rates of specialist care and day treatment; the former seems to be higher in the middle-income groups.

After standardization for health care need (see Annex 7 for details of the regression models), measured by age-gender interactive terms and self-assessed health and self-assessed disability status, negative relationships between income and visits to family doctor, ambulance services and hospitalization disappear. The utilization of dental care, phone consultations and other medical specialists turn out to be positively related to income. Day treatment use also turns to be highly related to income, though it is statistically insignificant due to very small fraction of people who have used it.

Table 20. Concentration indexes of health care utilization

Health care service	Unstandardized concentration index (stnd. error)	Standardized concentration index (stnd. error)
Family doctor	-0.070‡ (0.014)	0.009 (0.012)
Dentist	0.145‡ (0.019)	0.138‡ (0.018)
Other medical specialists	-0.010 (0.018)	0.049† (0.017)
Telephone consultations	0.010 (0.030)	0.110‡ (0.028)

Health care service	Unstandardized concentration index (stnd. error)	Standardized concentration index (stnd. error)
Emergency medical care (ambulance)	-0.133† (0.056)	-0.035 (0.054)
Day treatment	-0.050 (0.108)	0.148 (0.103)
Hospitalization	-0.121‡ (0.037)	0.017 (0.035)

Notes: individual level data, people older than 15 years;

significance levels ‡ p<0.01, † p<0.05, * p<0.10.

Table 21. Unstandardized (CI) and standardized (HI) concentration indexes of health care utilization in Estonia and OECD countries

	GP care (Family doctor)		Specialist care		Hospital care (inpatient)		Dental care	
	CI	HI	CI	HI	CI	HI	CI	HI
Estonia	**-0.070***	**0.009**	**-0.010**	**0.049***	**-0.121***	**0.017**	**0.145***	**0.138***
Austria	-0.073*	0.001	0.021	0.078*	-0.097*	0.041	0.079*	0.063*
Belgium	-0.144*	-0.057*	-0.031	0.038*	-0.222*	-0.048	0.048*	0.030
Canada	-0.089*	-0.016*	-0.015*	0.054*	-0.256*	-0.078*	0.131*	0.126*
Denmark	-0.104*	-0.028*	0.009	0.093*	-0.205*	-0.093	0.072*	0.049*
Finland	-0.008	0.045*	0.110*	0.136*	-0.170*	-0.047	0.121*	0.103*
France	-0.027*	-0.005	0.037*	0.063*	-0.019	0.035	0.075*	0.062*
Germany	-0.075*	-0.021	-0.003	0.045*	-0.059*	-0.029		
Greece	-0.148*	-0.033*	-0.074*	0.055*	-0.230*	0.003	0.104*	0.095*
Hungary	-0.101*	-0.024	-0.019	0.055*	-0.160*	-0.052	0.139*	0.122*
Ireland	-0.161*	-0.061*	0.005	0.129*	-0.261*	-0.033	0.161*	0.130*
Italy	-0.059*	-0.026*	0.072*	0.112*	-0.036	0.033	0.108*	0.105*
Netherlands	-0.098*	-0.038*	-0.051*	0.019	-0.158*	-0.040	0.044*	0.042*
Norway	-0.066*	-0.006	0.015	0.063				
Portugal	-0.074*	0.008	0.140*	0.208*	-0.192*	0.004	0.216*	0.196*
Spain	-0.114*	-0.047*	-0.026	0.066*	-0.168*	0.025	0.149*	0.137*
Sweden					-0.122*	-0.006		
Switzerland	-0.062*	-0.024	0.051*	0.074*	-0.128*	-0.063	0.059*	0.062*
United Kingdom	-0.119*	-0.042*	-0.062*	0.017	-0.181*	0.013		
United States					-0.252*	-0.017	0.181*	0.173*

*significant at 0.05 level

Source: van Doorslaer, Masseria 2004, Tables A8–A11

In general, the results for Estonia are comparable those for the OECD countries (see Table 21). There is no inequality in the use of primary health care once we control for need variables. But wealthier households have an advantage concerning specialist care, as in other OECD countries, just as in the utilization of hospital care there is no indication of inequality in access to hospital care after need is considered. Finally, there is great inequality in the use of dental care in Estonia, with the standardized concentration index one of table's largest values. This confirms the

analysis in Section 2, namely to the effect that households in the upper quintiles spent considerably more on dental care than households in the bottom quintile.

The analysis shows that dental care, telephone consultations and other specialist care are problematic areas of inequity, where the poorer population is at a disadvantage. Because the main obstacle to dental care is high OOPs for adults, little can be done to improve access without increasing coverage by the Health Insurance Fund. Concerning inequalities in telephone consultations and specialist care, other less costly interventions could be appropriate, for example, educating patients, or improving the specialist care referral system.

5. Conclusions

Our results confirm the results of earlier studies and show that the general trend of increasing OOP expenditures that started at the beginning of 2000s has continued, although there have been year-to-year fluctuations. The increasing share of OOPs in health care financing has lead to a decline in the progressivity of overall health care financing.

The socioeconomic factors that determine the relatively high household health expenditures compared to capacity to pay are those that describe income level, on the one hand, and health expenditures on the other hand. The risk of relatively high expenditures is increased by low income (especially in the first quintile), the presence of seniors or members with disabilities or chronic illnesses. The absence of health insurance does not have any impact. Pooled regression models over the years confirm that the risk of high health expenditure and impoverishment has increased since 2000, and the impoverishment risk is highest for single pensioners. OOPs increase the absolute poverty rate by 2–3%, of which about 1% is an increase in direct poverty.

Drug expenditures are the most important factor in high health expenditure relative to capacity to pay. This suggests that finding an optimal structure of prescription drug copayments and guaranteeing their affordability, especially for pensioners, should be a priority area for Estonian health financing policy. In the case of dental care, and perhaps other outpatient care or the purchase of eyeglasses or dentures, households may simply decide forego them if there is no urgency.

The analysis of health care utilization inequality shows that after taking need into account, dental care, telephone consultations and medical specialist usage are problematic areas, positively related to income. Day treatment turns out to be highly related to income, though it is statistically insignificant due to the very small number of people who have used it in the sample.
The results for health care financing progressivity show that the social tax, a major source of financing, and personal income tax are highly progressive components, and OOPs (the second largest source), and VAT are regressive components. Overall financing is slightly progressive, meaning that households with higher gross income also have higher health expenditure. Progressivity decreased during the period 2000–2007, mainly due to an increasing share of regressive OOPs, but again there are small swings in the trend.

Estonia has so far relied mainly on progressive labour taxation, which has balanced regressive OOPs. In the future, if regressive consumption taxes – especially those on alcohol and tobacco – are increased and the labour tax is decreased, overall health care financing will become more regressive. Therefore, to maintain the current level of redistribution via health care financing, it

is essential that either OOPs be reduced or the increase in consumption taxes be partly compensated to low-income households, for example via higher social assistance benefits.

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Annex 1

DERIVATION OF OOP EXPENDITURE FROM ESTONIAN HOUSEHOLD BUDGET SURVEY DATA

Code in 2004–2007	Code in 2000–2003	Name in Estonian	Name in English	Supply	Medicines	Outpatient	Inpatient	Dental exp.
0600000	0600000	Tervishoid	Health					
0610000	**0610000**	**Meditsiinitooted, -vahendid ja seadmed**	**Medical products, appliances and equipment**	1				
0611000	0611000	Farmaatsiatooted	Pharmaceutical products	1				
0611100	0611100	Farmaatsiatooted	Pharmaceutical products	1				
0611101	0611101	Ravimid	Drugs		1			
0611102	0611102	Vitamiinid	Vitamins	1				
0612000	0611200	Muud meditsiinitooted	Other medical products	1				
0612100		Muud meditsiinitooted	Other medical products	1				
0612101	0611201	Sidumismaterjalid	Bandages	1				
0612102	0611202	Süstlad	Syringes	1				
0612103	0611203	Kondoomid	Condoms	1				
0612104	0611204	Muud meditsiinitooted (kraadiklaas, kuumavee- ja jääkotid)	Other medical products (hot-water bottles and ice bags)	1				
0613000		Terapeutilized vahendid ja seadmed	Therapeutic appliances and equipment	1				
0613100	0611300	Terapeutilized vahendid ja seadmed	Therapeutic appliances and equipment	1				
0613101	0611301	Prillid	Eyeglasses	1				
0613102	0611302	Hambaproteesid	Dentures	1				1
0613103	0611303	Muud terap. seadmed, varustus (proteesid, tugivah., invakärud)	Other therapeutic appliances and equipment (prosthetic devices, orthopaedic braces and supports, wheelchairs, etc)	1				
0620000	**0620000**	**Ambulatoorsed teenused**	**Outpatient services**			1		
0621000	0621000	Meditsiiniteenused	Medical services			1		
0621100	0621100	Meditsiiniteenused	Medical services			1		
0621101	0621101	Arsti konsultatsioon	Consultation of physicians in general or specialist practice			1		
0621102	0621102	Tasulised analüüsid (protseduurid)	Procedures			1		

Code in 2004–2007	Code in 2000–2003	Name in Estonian	Name in English	Supply	Medicines	Outpatient	Inpatient	Dental exp.
0621103	0621103	Visiiditasu	Visit fee			1		
0621104	0621104	Med. massaaz (õlavöö/kaela)	Massage			1		
0622000	0622000	Hambaraviteenused	Dental services			1		1
0622100	0622100	Hambaraviteenused	Dental services			1		1
0622101	0622101	Hamba plombeerimine	Dental filling			1		1
0622102	0622102	Hambaproteeside valmistamine	Fitting costs of dentures			1		1
0622103	0622103	Muud hambaravi teenused	Other dental services			1		1
0623000	0623000	Parameditsiiniteenused	Paramedical services			1		
0623100	0623100	Meditsiinilaborite ja röntgenikeskuste teenused	Medical laboratory and X-ray centre services			1		
0623101	0623101	Meditsiinilaborite ja röntgenikeskuste teenused	Medical laboratory and X-ray centre services			1		
0623200	0623200	Meditsiinilise abipersonali teenused	Medical auxiliary services			1		
0623201	0623201	Nõelravi, kõneterapeutide jne. teenused	Acupuncture, speech therapists, etc.			1		
0623202	0623202	Arsti poolt määratud ravivõimlemine	Physiotherapists			1		
0623203	0623203	Muud meditsiini abitöötajate teenused	Other services			1		
0623300	0623300	Muud liiki haiglavälised teenused	Other non-hospital services			1		
0623301	0623301	Muud haiglavälised teenused	Other non-hospital services			1		
0630000	**0630000**	**Haiglateenused**	**Hospital services**				1	
0631000	0631000	Haiglateenused	Hospital services				1	
0631100	0631100	Haiglateenused	Hospital services				1	
0631101	0631101	Haiglateenused	Hospital services (medical services)				1	
0631102	0631102	Sanatooriumiteenused	Spa services (accommodation, food and drink)				1	

Source: Statistics Estonia

Annex 2

AVERAGE MONTHLY OOPS IN THE ESTONIAN HOUSEHOLD BUDGET SURVEY DATA, 2000–2007, BY TYPE, POSITIVE EXPENDITURES

(Note: each category includes only positive expenditures, zero expenditures are excluded.)

COICOP code (2000–2003)	Short description	2000	2001	2002	2003	2004	2005	2006	2007
1. Medical products, appliances and equipment									
611101	Drugs	165	179	199	233	268	280	294	340
611102	Vitamins	61	81	80	98	127	100	134	143
611201	Bandages	16	28	24	35	23	28	31	27
611202	Syringes	39	43	12	5	129	69	55	28
611203	Condoms	25	26	46	52	19	17	43	43
611204	Other products	132	172	144	198	188	182	166	237
611301	Eyeglasses	426	542	391	482	552	412	655	1 054
611302	Dentures	1 266	1 171	970	1 539	2 305	2 304	1 170	4 619
611303	Other therapeutic appliances	595	302	828	537	444	341	496	383
2. Outpatient services									
621101	Consultation	139	151	120	156	209	252	229	305
621102	Procedures	526	169	361	199	208	277	571	636
621103	Visit fee	15	16	20	44	51	53	65	64
621104	Massage	272	195	252	380	415	412	436	391
622101	Dental filling	371	435	395	476	475	492	566	687
622102	Fitting dentures	1 810	1 325	1 550	1 374	1 143	1 479	2 570	1 748
622103	Other dental services	206	118	228	193	308	324	1 047	472
623101	Lab services	105	106	280	101	116	123	171	97
623201	Acupuncture, speech therapy, etc.	208	155	182	192	559	236	308	398
623202	Physiotherapists	33	0	135	0	30	150	48	99
623203	Other services	188	116	65	244	350	103	0	650
623301	Other non-hospital services	319	294	291	524	370	50	91	960
3. Hospital services									
631101	Hospital services	1 787	1 507	969	284	391	360	267	437
631102	Spa services	2 136	2 380	1 638	3 771	2 969	1 909	1 868	4 492

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Annex 3

AVERAGE MONTHLY OOPS IN THE ESTONIAN HOUSEHOLD BUDGET SURVEY DATA, 2000–2007

(Note: includes also observations with zero expenditures)

COICOP code (2000-2003)	Short description	2000	2001	2002	2003	2004	2005	2006	2007
1. Medical products, appliances and equipment									
611101	Drugs	68.6	72.7	84.8	103.0	123.9	139.6	182.1	190.7
611102	Vitamins	2.4	3.2	3.3	3.8	5.4	6.0	16.7	15.2
611201	Bandages	0.3	0.6	0.8	1.0	0.8	0.9	2.0	0.8
611202	Syringes	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.0
611203	Condoms	0.1	0.1	0.1	0.4	0.0	0.1	0.5	0.5
611204	Other products	2.5	2.6	2.1	3.2	2.5	2.8	4.6	3.9
611301	Eyeglasses	11.2	10.9	8.5	9.6	11.5	13.1	23.2	29.9
611302	Dentures	2.0	3.4	6.3	6.9	15.2	8.0	5.8	23.2
611303	Other therapeutic appliances	2.9	0.9	1.9	0.5	2.6	2.3	6.5	3.6
2. Outpatient services									
621101	Consultation	2.4	1.2	2.2	2.4	2.4	3.1	2.4	2.6
621102	Procedures	3.8	1.4	2.2	1.2	2.2	4.3	11.7	11.3
621103	Visit fee	0.6	0.5	0.6	2.8	3.9	4.0	8.2	5.4
621104	Massage	1.7	1.5	2.2	4.1	1.4	0.2	1.2	1.1
622101	Dental filling	21.5	28.3	27.3	36.3	33.0	31.9	54.1	50.2
622102	Fitting dentures	10.0	5.1	7.4	8.0	5.2	4.7	12.5	1.7
622103	Other dental services	3.1	0.2	0.9	0.8	3.3	1.1	5.4	1.9
623101	Lab services	0.2	0.1	0.3	0.5	0.3	0.3	0.6	0.3
623201	Acupuncture, speech therapy, etc.	0.3	0.5	0.9	0.8	0.8	0.3	0.7	0.8
623202	Physiotherapists	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
623203	Other services	1.0	0.2	0.0	0.5	0.0	0.1	0.0	0.2
623301	Other non-hospital services	0.5	0.9	0.6	1.7	0.2	0.0	0.0	0.1
3. Hospital services									
631101	Hospital services	3.0	3.4	1.4	1.5	4.5	5.3	4.0	5.3
631102	Spa services	2.0	1.9	2.6	1.8	7.7	5.2	5.4	8.3

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Annex 4

UNINSUREDS BY AGE AND QUINTILE, AS PER THE HOUSEHOLD BUDGET SURVEY
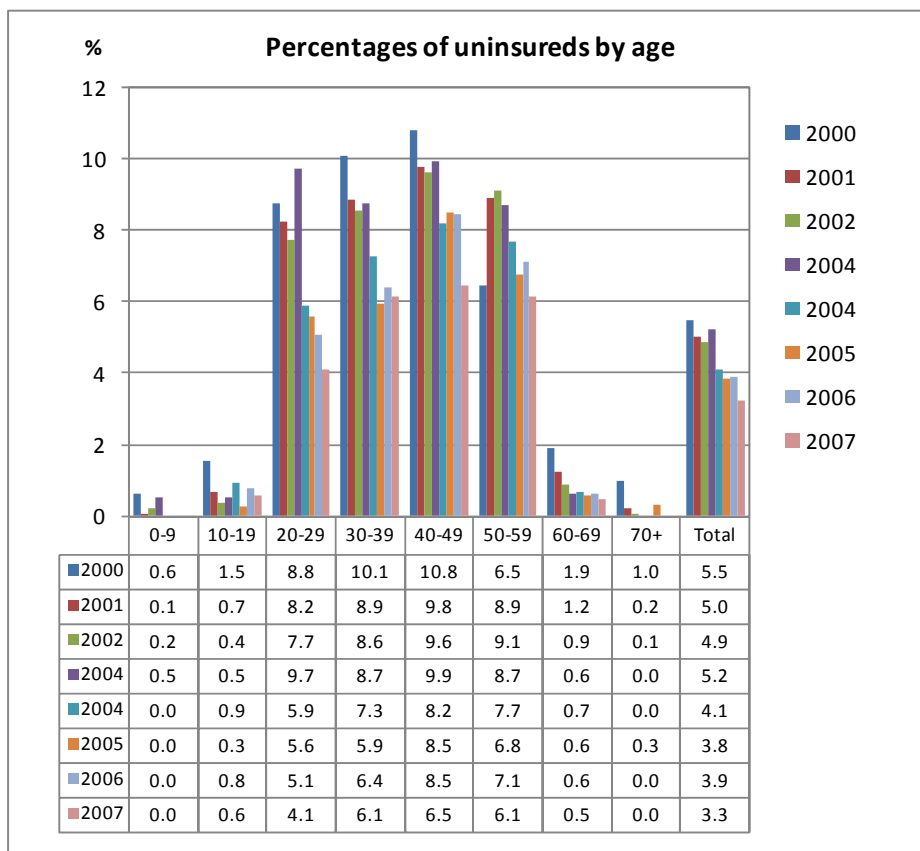
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70+	Total
2000	0.6	1.5	8.8	10.1	10.8	6.5	1.9	1.0	5.5
2001	0.1	0.7	8.2	8.9	9.8	8.9	1.2	0.2	5.0
2002	0.2	0.4	7.7	8.6	9.6	9.1	0.9	0.1	4.9
2004	0.5	0.5	9.7	8.7	9.9	8.7	0.6	0.0	5.2
2004	0.0	0.9	5.9	7.3	8.2	7.7	0.7	0.0	4.1
2005	0.0	0.3	5.6	5.9	8.5	6.8	0.6	0.3	3.8
2006	0.0	0.8	5.1	6.4	8.5	7.1	0.6	0.0	3.9
2007	0.0	0.6	4.1	6.1	6.5	6.1	0.5	0.0	3.3

Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

% Percentages of uninsureds by quintile

	1	2	3	4	5	Total
2000	12.0	6.1	4.5	3.9	2.3	5.5
2001	11.1	6.8	4.0	3.2	1.8	5.0
2002	11.6	6.0	3.6	3.3	1.7	4.9
2004	11.0	4.6	6.6	3.5	1.9	5.2
2004	8.9	5.2	3.8	2.5	1.7	4.1
2005	9.8	3.4	3.4	2.6	1.4	3.8
2006	10.4	3.2	2.6	2.3	2.3	3.9
2007	6.7	3.2	3.2	2.0	2.0	3.3
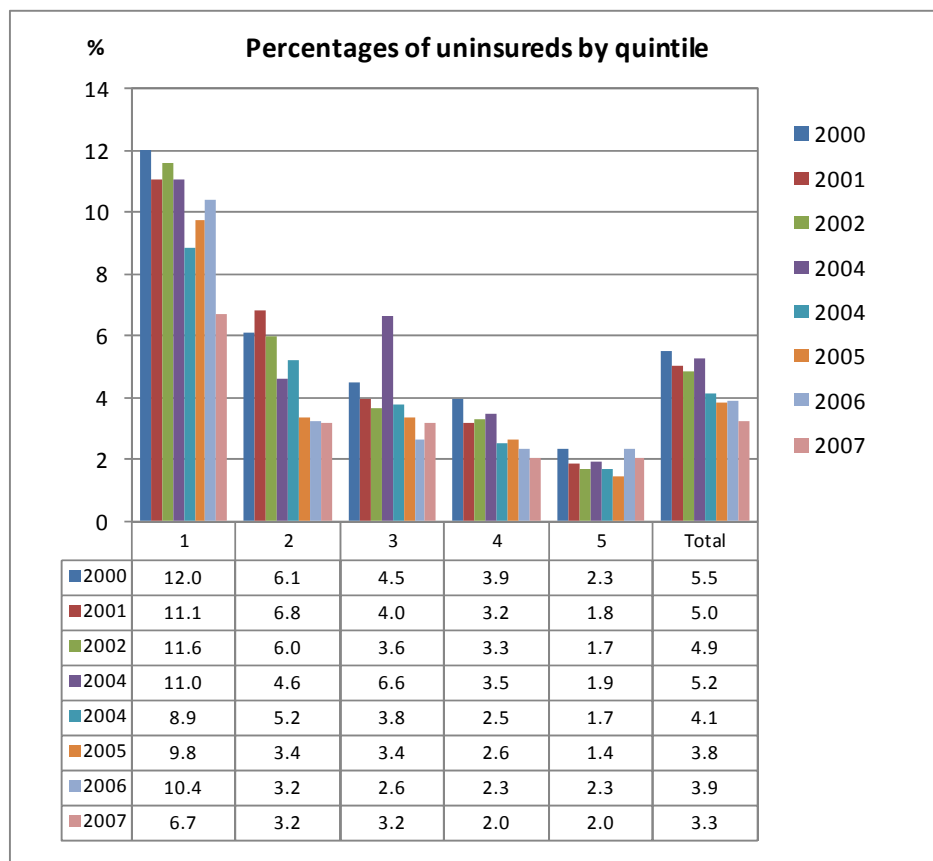
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Note: Quintiles are based on household equivalent consumption expenditures.

Annex 5

COMPARISON OF EQUIVALENCE WEIGHTS

Using different household equivalence scales influences the calculated poverty line and relative position of households. The figure below describes the impact of different household equivalence weights on different household types. The WHO weighting scheme (household size to the power of 0.56) makes the situation of a single person relatively worse off compared to households with two adults or two adults and two children, for example. The other two weights are the Estonian national weights until 2003 (1:0.8:0.8) and since 2004 (old OECD weights: 1:0.7:0.5).
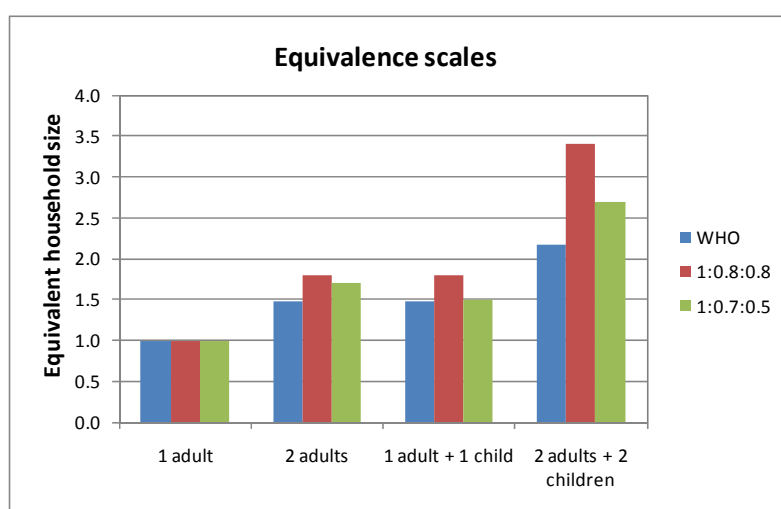
It is partly up to the final user which equivalence weights and poverty line to use in the calculations. For international comparisons of catastrophic expenditures, perhaps the WHO weights are more useful, but for comparison of Estonian social policy instruments' effectiveness, the national poverty lines might be more relevant. The next annex presents some results using the national absolute poverty line and corresponding household equivalence weights.

Annex 6

THE IMPACT OF OOPs ON FALLING BELOW THE ABSOLUTE POVERTY LINE

	2000	2001	2002	2003	2004	2005	2006	2007
Official absolute poverty line (krooni)*	1 454	1 538	1 593	1 614	1 836	1 938	2 081	2 341
Households with income below poverty line (%)	25.8	26.2	22.6	17.0	14.8	12.4	7.6	6.2
Households with income below 80% of poverty line (direct poverty) (%)	15.2	14.4	13.6	10.6	8.5	6.9	3.9	*NA*
Consumption expenditure below absolute poverty line, (% of households)								
Including OOPs	29.3	31.8	31.1	28.2	27.2	23.4	20.8	19.1
Excluding OOPs	31.6	34.0	33.6	30.7	30.3	27.1	24.2	23.1
Impact of OOPs on increase in poverty rate	**2.4**	**2.3**	**2.5**	**2.5**	**3.1**	**3.7**	**3.4**	**4.0**
Consumption expenditure below 80% of absolute poverty line (direct poverty), (% of households)								
Including OOPs	18.1	18.5	19.2	17.2	16.6	14.2	12.1	11.0
Excluding OOPs	19.8	20.6	21.1	19.2	19.0	16.4	15.2	13.4
Impact of OOPs on increase in direct poverty rate	**1.7**	**2.1**	**1.9**	**2.1**	**2.4**	**2.2**	**3.0**	**2.4**
Income below absolute poverty line, (% of households)†								
Total income	26.7	26.8	23.3	18.4	15.9	13.9	9.2	8.1
Excluding OOPs	30.3	31.0	27.0	21.2	19.9	16.8	11.8	10.2
Impact of OOPs on increase in poverty	**3.7**	**4.2**	**3.8**	**2.8**	**4.0**	**2.9**	**2.6**	**2.1**
Income below 80% of absolute poverty line (direct poverty), (% of households)								
Total income	16.1	15.0	14.3	12.0	9.6	8.6	5.4	5.6
Excluding OOPs	18.2	17.2	16.1	13.3	11.9	9.8	6.7	6.8
Impact of OOPs on increase in direct poverty	**2.1**	**2.2**	**1.8**	**1.3**	**2.3**	**1.2**	**1.3**	**1.1**
WHO equivalence weights, poverty line and definition of income (see Section 2.3.4) (%)								
Impact of OOPs on increase in poverty	**0.9**	**1.0**	**1.2**	**1.2**	**1.8**	**0.8**	**1.6**	**1.0**

* The methodology was changed in 2004, with the subsistance minimum set equal to the absolute poverty line. The subsistence minimum includes expenditures for food, shelter and individual non-food items.

The absolute poverty line was calculated by Statistics Estonia using Estonian national equivalence weights (1:0.8:0.8) until 2003 and OECD weights (1:0.7:0.5) from 2004 onwards. See Statistics Estonia for details: http://pub.stat.ee/pxweb.2001/I_Databas/Social_life/06Households/02Household_budget/02Monthly _expenditure/HH24.htm

† Income was calculated from the HBS data as a variable (income per capita in the file perepilt.dbf) times the number of household members (variable a9). It is slightly larger than the modified income variable used to calculate

poverty rates by Statistics Estonia; therefore, our poverty rate estimates are slightly higher than the official rates. Still, the impact of OOPs on changes in the poverty rate should not be greatly affected.
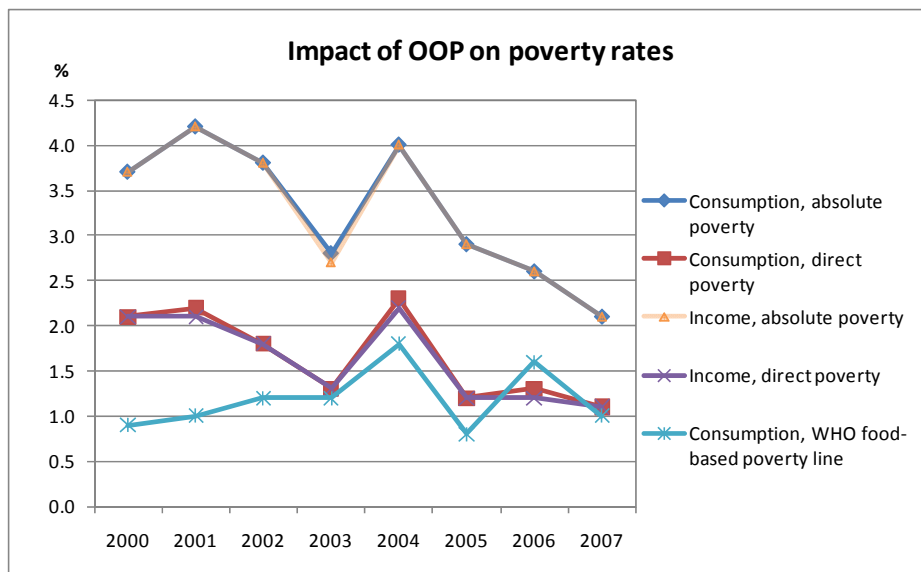
Source: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations.

Annex 7

DETERMINANTS OF HEALTH CARE UTILIZATION. RESULTS FROM OLS REGRESSION ANALYSIS

OLS estimation results with robust standard errors. Dependent variable: number of visits during last 6 months.

	Family doctor	Dentist	Other specialists	Telephone	Ambulance	Day treatment	Hospitali- zation
Log (Income)	0.066	0.176‡	0.148‡	0.106‡	-0.000	0.004	0.002
	(0.050)	(0.035)	(0.042)	(0.028)	(0.010)	(0.006)	(0.008)
Education (ISCED 0)							
ISCED I	0.587*	-0.260	0.245	0.260	-0.164	0.019	-0.064
	(0.303)	(0.181)	(0.240)	(0.212)	(0.204)	(0.053)	(0.112)
ISECD II	0.714†	-0.135	0.339	0.247	-0.129	0.019	0.012
	(0.286)	(0.181)	(0.225)	(0.196)	(0.203)	(0.049)	(0.113)
ISCED III	0.670‡	-0.106	0.460‡	0.257	-0.111	0.034	0.009
	(0.288)	(0.181)	(0.226)	(0.196)	(0.204)	(0.052)	(0.113)
ISCED IV+	0.724†	-0.009	0.531†	0.344*	-0.077	0.022	0.024
	(0.291)	(0.191)	(0.229)	(0.200)	(0.206)	(0.050)	(0.113)
Status (Farmer)							
Self-employed	-0.225	0.136	-0.271	-0.056	0.015	0.018	-0.090
	(0.199)	(0.158)	(0.382)	(0.107)	(0.020)	(0.018)	(0.100)
Employed	-0.123	0.064	-0.272	-0.063	0.015	0.012	-0.097
	(0.184)	(0.123)	(0.371)	(0.092)	(0.016)	(0.016)	(0.099)
Employee	0.091	-0.047	0.004	-0.034	0.095†	-0.017	-0.084
	(0.207)	(0.130)	(0.359)	(0.107)	(0.047)	(0.034)	(0.101)
Pensioner	-0.399†	-0.083	-0.196	-0.107	0.025	0.009	-0.102
	(0.197)	(0.149)	(0.361)	(0.101)	(0.025)	(0.016)	(0.102)
Unemployed	0.087	0.296†	-0.186	-0.154	0.019	0.015	-0.100
	(0.200)	(0.145)	(0.372)	(0.103)	(0.019)	(0.018)	(0.100)
Student	-0.443†	0.047	-0.192	-0.076	0.014	-0.007	-0.116
	(0.201)	(0.160)	(0.423)	(0.112)	(0.021)	(0.014)	(0.102)
Inactive	0.381	-0.131	-0.065	-0.217	0.050	0.046	-0.005
	(0.836)	(0.174)	(0.442)	(0.275)	(0.114)	(0.078)	(0.158)
Disabled	-0.044	-0.003	0.167	0.407†	0.089†	0.034	0.064
	(0.263)	(0.191)	(0.412)	(0.191)	(0.039)	(0.023)	(0.123)
Age 35–44	0.011	0.098	0.170‡	-0.097†	-0.036‡	-0.002	-0.021†
	(0.084)	(0.156)	(0.062)	(0.041)	(0.014)	(0.006)	(0.010)
45–64	0.169†	-0.036	-0.131†	-0.114†	-0.026	0.002	-0.016
	(0.083)	(0.071)	(0.063)	(0.045)	(0.022)	(0.010)	(0.013)
65–75	0.281*	0.084	0.059	-0.149*	-0.040	0.012	0.053
	(0.144)	(0.097)	(0.121)	(0.082)	(0.056)	(0.033)	(0.035)
75+	-0.053	-0.097	-0.092	-0.176*	-0.047	-0.001	0.103*
	(0.176)	(0.099)	(0.152)	(0.103)	(0.062)	(0.041)	(0.053)
Female	0.378‡	0.390‡	0.371‡	0.175‡	-0.022†	0.004	0.031†
	(0.076)	(0.078)	(0.077)	(0.054)	(0.011)	(0.005)	(0.014)
Female 35–44	0.079	-0.213	0.194*	0.127	0.022	0.009	-0.024
	(0.137)	(0.185)	(0.115)	(0.088)	(0.018)	(0.010)	(0.019)
Female 45–64	0.056	-0.070	-0.066	0.092	0.077†	0.020	-0.007
	(0.125)	(0.098)	(0.097)	(0.078)	(0.036)	(0.020)	(0.020)
Female 65–74	0.077	0.367‡	-0.250*	0.100	0.037	0.041	-0.090†
	(0.160)	(0.109)	(0.148)	(0.098)	(0.061)	(0.042)	(0.038)
Female 75+	0.124	-0.207	0.504‡	0.233*	-0.002	0.070†	-0.115†
	(0.203)	(0.128)	(0.173)	(0.131)	(0.046)	(0.035)	(0.056)
Health (v.good)							
Good	0.181‡	0.181‡	0.167‡	0.087†	0.006	-0.004	0.010
	(0.061)	(0.069)	(0.054)	(0.041)	(0.010)	(0.006)	(0.010)
Satisfactory	0.568‡	0.127	0.329‡	0.201‡	0.018	0.026	0.031†
	(0.084)	(0.079)	(0.070)	(0.053)	(0.016)	(0.017)	(0.013)
Bad	1.214‡	0.114	0.592‡	0.418‡	0.114†	0.038*	0.141‡
	(0.146)	(0.103)	(0.116)	(0.103)	(0.053)	(0.020)	(0.028)
Very bad	1.151†	0.061	0.863‡	0.918‡	0.748‡	0.156	0.383‡
	(0.464)	(0.127)	(0.257)	(0.228)	(0.186)	(0.131)	(0.078)
Disabled	0.607‡	0.052	0.319‡	0.166†	0.029	-0.001	0.009
no help needed	(0.091)	(0.053)	(0.070)	(0.065)	(0.020)	(0.016)	(0.018)

	Family doctor	Dentist	Other specialists	Telephone	Ambulance	Day treatment	Hospitali-zation
Disabled	0.727‡	-0.022	0.473‡	0.378‡	0.047	0.015	0.052*
help needed	(0.138)	(0.075)	(0.101)	(0.095)	(0.052)	(0.019)	(0.028)
Constant	-0.788	-1.125‡	-1.267‡	-1.036‡	0.124	-0.068	0.084
	(0.531)	(0.362)	(0.400)	(0.313)	(0.213)	(0.070)	(0.181)
R^2	0.151	0.033	0.078	0.062	0.048	0.006	0.073
N	7809	7809	7809	7809	7809	7809	7809

	Family doctor	Dentist	Other specialists	Telephone	Ambulance	Day treatment	Hospitali-zation

Annex 8

STATISTICAL TABLES ON OOPS

Source for all statistics: Statistics Estonia, Estonian Household Budget Survey microdata, own calculations

Table A1. Household OOPs for health by quintiles

Expenditure quintile	2000	2001	2002	2003	2004	2005	2006	2007
1	44	48	56	81	77	88	155	154
2	76	86	94	113	140	167	249	272
3	115	100	142	160	204	218	339	294
4	146	150	195	220	272	260	425	384
5	333	327	314	420	453	440	603	720
Average	143	142	160	199	229	235	354	365

Table A2. Household OOPs by region (krooni)

	2000	2001	2002	2003	2004	2005	2006	2007
North	195	162	172	209	230	243	383	353
West	108	151	152	204	198	208	365	339
Central	114	132	193	218	236	199	350	375
N.E.	81	99	112	127	200	227	246	313
South	127	138	161	211	256	251	364	420
Average	143	142	160	199	229	235	354	365

Table A3. Household OOPs as a percentage of total household expenditure, by quintile

	2000	2001	2002	2003	2004	2005	2006	2007
1	3.1	3.3	3.8	4.9	4.6	4.8	7.4	6.1
2	3.0	3.6	3.7	4.0	4.8	5.4	6.6	6.5
3	3.1	2.6	3.7	3.9	4.6	4.5	6.1	4.8
4	2.6	2.7	3.2	3.5	4.3	3.3	5.0	3.7
5	2.8	2.7	2.6	3.5	3.8	3.2	3.4	3.9
Average	2.9	3.0	3.4	4.0	4.4	4.2	5.7	5.0

Table A4. Household OOPs as a percentage of total household expenditure, by region

	2000	2001	2002	2003	2004	2005	2006	2007
North	3.1	2.5	3.0	3.4	4.2	3.9	5.6	4.6
West	3.0	3.3	3.6	3.9	4.0	3.7	5.8	4.7
Central	2.5	2.9	3.9	4.6	3.7	3.5	5.2	4.2
N-East	2.5	3.0	3.0	3.6	5.0	5.4	6.0	5.9
South	3.0	3.5	3.8	4.8	4.9	4.7	5.9	5.5
Average	2.9	3.0	3.4	4.0	4.4	4.2	5.7	5.0

Table A5. Structure of OOPs by quintile in 2000 (%)

2000	Supply	Medicines	Inpatient	Outpatient	Total
1	5	83	0	11	100
2	10	76	0	14	100
3	14	68	0	19	100
4	18	48	0	34	100
5	18	32	8	43	100
Average	15	49	4	32	100

Table A6. Structure of OOPs 2000–2007 (%)

	Supply	Medicine	Inpatient	Outpatient	Total
2000	15	49	4	32	100
2001	16	52	4	28	100
2002	15	54	2	29	100
2003	13	54	2	31	100
2004	17	55	5	23	100
2005	14	60	5	21	100
2006	17	52	3	28	100
2007	22	53	4	21	100

Table A7. Structure of OOPs in 2006 (%)

	Supplies	Prescription drugs	OTC drugs	Inpatient	Outpatient	Total
1	7	61	25	2	5	100
2	11	54	17	1	16	100
3	15	41	17	1	25	100
4	22	29	16	1	33	100
5	21	24	12	6	37	100
Average	17	36	16	3	28	100

Table A8. Structure of OOPs by quintile, 2000, 2006 and 2007 (%)

	Supplies	Medicine	Inpatient	Outpatient	Total
2000					
1	5	83	0	11	100
2	10	76	0	14	100
3	14	68	0	19	100
4	18	48	0	34	100
5	18	32	8	43	100
Average	15	49	4	32	100
2006					
1	7	86	2	5	100
2	11	71	1	16	100
3	15	59	1	25	100
4	22	44	1	33	100
5	21	37	6	37	100
Average	17	52	3	28	100
2007					
1	6	84	1	9	100
2	11	75	3	10	100
3	12	69	3	16	100
4	24	50	1	24	100
5	32	33	7	29	100
Average	22	53	4	21	100

Table A9. Share of dental expenditure as percentage of OOPs, by quintile

Quintile	2000	2001	2002	2003	2004	2005	2006	2007
1	7.7	4.8	3.0	9.2	2.4	5.4	2.8	6.7
2	11.1	9.0	9.8	9.4	11.5	5.9	10.9	6.8
3	14.1	11.3	19.9	20.1	18.7	16.7	22.6	13.2
4	32.8	23.7	30.3	23.8	31.0	19.3	29.9	25.7
5	33.3	40.8	38.3	40.7	32.6	27.8	27.2	32.0
Average	26.1	26.6	27.2	27.3	25.1	19.0	22.5	21.6

Table A10. Percentage of households with high health payments (above 20% of capacity to pay), by quintile, 2000–2007

Quintile	2000	2001	2002	2003	2004	2005	2006	2007
1	12.1	13.9	15.9	19.4	17.6	17.8	28.3	21.9
2	7.7	10.7	11.7	11.6	14.7	15.5	18.5	18.8
3	5.2	5.2	8.1	8.2	11.9	9.8	12.6	9.7
4	3.5	3.8	4.1	6.2	8.4	3.4	8.2	5.1
5	3.6	2.5	2.5	4.3	3.8	3.2	3.0	5.1
Average	6.4	7.2	8.5	10.0	11.3	9.9	14.1	12.1

Table A11. Household OOPs as mean proportions of capacity to pay by type of expenditure, quintile and year

	Quintile	Medicine	Inpatient care	Outpatient care	Supplies
2000					
	1	0.057	0.000	0.006	0.003
	2	0.043	0.000	0.006	0.005
	3	0.034	0.000	0.007	0.007
	4	0.018	0.000	0.010	0.007
	5	0.011	0.004	0.012	0.006
2001					
	1	0.064	0.000	0.003	0.003
	2	0.054	0.000	0.006	0.004
	3	0.030	0.000	0.006	0.005
	4	0.021	0.000	0.007	0.007
	5	0.011	0.002	0.012	0.005
2002					
	1	0.073	0.000	0.002	0.004
	2	0.052	0.000	0.007	0.004
	3	0.039	0.000	0.010	0.007
	4	0.021	0.001	0.011	0.008
	5	0.011	0.001	0.012	0.006
2003					
	1	0.082	0.000	0.007	0.003
	2	0.057	0.000	0.008	0.003
	3	0.041	0.000	0.014	0.003
	4	0.024	0.000	0.015	0.008
	5	0.015	0.001	0.015	0.008
2004					
	1	0.079	0.002	0.004	0.002
	2	0.063	0.001	0.010	0.005
	3	0.048	0.001	0.012	0.007
	4	0.030	0.002	0.014	0.011
	5	0.016	0.006	0.011	0.010
2005					
	1	0.081	0.002	0.008	0.003
	2	0.076	0.003	0.006	0.005
	3	0.045	0.001	0.011	0.009
	4	0.028	0.001	0.008	0.006
	5	0.016	0.003	0.010	0.008
2006					
	1	0.125	0.002	0.006	0.011
	2	0.076	0.001	0.015	0.011
	3	0.053	0.001	0.019	0.014
	4	0.028	0.001	0.019	0.015
	5	0.016	0.002	0.012	0.008
2007					
	1	0.096	0.000	0.009	0.007
	2	0.078	0.002	0.010	0.012
	3	0.049	0.002	0.010	0.008
	4	0.025	0.000	0.011	0.011
	5	0.015	0.002	0.012	0.015

Table A12. Percentage of households with high health payments (above 20% of capacity to pay) by type of expenditure, quintile and year

	Quintile	Medicine	Inpatient	Outpatient	Supplies
2000					
	1	11	0	1	1
	2	5	0	1	0
	3	3	0	1	1
	4	1	0	1	1
	5	0	1	1	1
2001					
	1	13	0	1	0
	2	8	0	1	1
	3	3	0	1	1
	4	1	0	1	1
	5	0	0	1	1
2002					
	1	15	0	0	1
	2	10	0	1	0
	3	5	0	1	1
	4	1	0	1	1
	5	0	0	1	1
2003					
	1	17	0	1	0
	2	9	0	1	0
	3	5	0	2	0
	4	2	0	1	2
	5	1	0	1	1
2004					
	1	16	0	0	0
	2	11	0	2	0
	3	6	0	2	1
	4	2	0	1	2
	5	0	1	0	1
2005					
	1	16	0	1	1
	2	13	0	1	1
	3	5	0	1	1
	4	1	0	1	0
	5	0	0	1	1
2006					
	1	24	0	1	1
	2	12	0	2	1
	3	7	0	2	2
	4	1	0	2	1
	5	0	0	1	0
2007					
	1	18	0	2	2
	2	14	0	1	1
	3	5	0	1	1
	4	1	0	1	1
	5	1	0	1	3

Table A13. Percentage of households with high health payments by household type

Household type	2000	2001	2002	2003	2004	2005	2006	2007
Single pensioner	20.2	22.8	27.2	25.0	30.1	29.1	35.7	28.8
Single of working age	5.2	4.1	5.6	9.1	10.9	8.5	11.1	8.3
Couple – pensioners	15.1	19.6	26.6	27.8	32.3	27.8	34.5	35.9
Couple – at least one of working age	4.8	7.6	7.1	8.8	8.5	7.8	9.7	9.6
Single parent with one child	3.5	2.6	4.2	5.3	5.1	0.6	8.2	8.5
Single parent with two or more children	4.8	0.0	1.9	0.0	0.0	0.0	0.0	7.9
Couple with one child	2.4	1.5	1.5	2.5	1.9	2.4	3.7	2.1
Couple with two children	2.1	2.4	1.2	1.0	2.6	0.5	2.2	1.7
Couple with three or more children	0.9	0.7	1.0	0.7	1.4	1.9	0.0	3.7
Couple with minor and adult children	3.0	1.8	1.9	3.1	3.0	3.2	4.1	1.9
Two-generation household	3.9	4.3	5.4	6.5	6.4	5.1	12.3	8.4
Three-generation household	7.7	2.8	2.3	2.7	1.3	1.4	5.0	3.6
Other household	1.2	4.6	6.4	7.0	6.4	8.0	8.3	12.0
Average	6.4	7.2	8.5	10.0	11.3	9.9	14.1	12.1

Table A14. Percentage of households with high health payments by number of people with poor or very poor health in the household

	2000	2001	2002	2003	2004	2005	2006	2007
None	4.2	4.1	4.4	5.5	6.6	6.1	9.0	7.5
1	14.2	17.5	22.0	23.0	27.9	24.0	32.4	26.7
2 or more	15.2	23.1	21.0	29.2	24.3	23.4	36.4	45.3

Table A15. Percentage of households with high health payments by number of people with disability or chronic diseases in the household

	2000	2001	2002	2003	2004	2005	2006	2007
None	3.9	4.1	4.0	4.4	5.6	4.5	7.1	4.9
1	11.0	14.0	17.8	18.0	20.3	19.5	23.4	20.3
2 or more	13.7	14.8	12.6	20.5	19.1	14.1	24.7	24.0

Table A16. Percentage of households with high health payments by region (%)

	2000	2001	2002	2003	2004	2005	2006	2007
North	6.1	4.4	5.6	7.7	10.8	8.6	12.1	9.8
West	6.9	8.8	9.8	10.4	12.5	8.4	14.0	11.1
Central	5.1	6.0	9.7	11.8	6.6	7.2	10.8	8.1
N.E.	6.1	9.0	8.5	11.2	14.4	15.7	19.5	19.1
South	7.4	10.0	11.2	11.7	11.5	10.7	15.7	14.2
Total	6.4	7.2	8.5	10.0	11.3	9.9	14.1	12.1

Table A17. Percentage of households with high health payments by number of uninsureds

	2000	2001	2002	2003	2004	2005	2006	2007
None	6.5	7.6	9.0	10.4	11.9	10.2	14.3	12.4
1	6.0	3.8	3.8	7.3	4.9	5.9	12.4	9.8
2 or more	3.0	2.6	3.1	3.0	9.2	16.1	14.9	0.0

Table A18. Percentage of households impoverished due to OOPs, by quintile

Quintile	2000	2001	2002	2003	2004	2005	2006	2007
1	4.6	4.6	5.7	5.8	8.4	3.5	7.8	4.6
2	0.0	0.4	0.1	0.0	0.2	0.4	0.0	0.2
3	0.0	0.0	0.0	0.1	0.2	0.0	0.3	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.9	1.0	1.2	1.2	1.8	0.8	1.6	1.0

Table A19. Percentage of households impoverished due to OOPs, by region

	2000	2001	2002	2003	2004	2005	2006	2007
North	0.5	0.2	0.7	0.1	1.2	0.8	0.7	0.5
West	1.4	1.2	1.0	1.1	1.6	0.7	1.7	0.3
Central	0.8	1.4	1.1	1.6	1.2	0.7	0.5	0.9
N.E.	1.1	1.3	1.1	3.1	3.6	0.9	3.3	1.2
South	1.2	1.7	2.0	1.6	1.9	0.9	2.5	1.9
Total	0.9	1.0	1.2	1.2	1.8	0.8	1.6	1.0

Table A20. Percentage of households impoverished due to OOPs, by household type

Household type	2000	2001	2002	2003	2004	2005	2006	2007
Single pensioner	4.6	4.8	4.9	4.7	7.0	3.7	5.2	3.6
Single of working age	0.6	0.2	0.6	0.4	2.4	0.3	2.1	0.6
Couple – pensioners	1.7	2.3	3.5	2.7	2.3	1.6	3.1	0.7
Couple – at least one of working age	0.1	0.4	0.6	0.6	0.3	0.4	1.0	0.1
Single parent with one child	0.0	0.6	0.0	1.7	0.0	0.0	0.4	0.5
Single parent with two or more children	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Couple with one child	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Couple with two children	0.0	0.0	0.0	0.6	0.8	0.0	0.3	0.0
Couple with three or more children	0.0	0.0	0.9	0.0	0.0	2.2	0.0	0.0
Couple with minor and adult children	0.2	0.4	0.3	0.2	0.0	0.2	0.0	0.2
Two-generation household	0.8	0.6	0.4	0.3	0.9	0.2	0.8	0.6
Three-generation household	0.8	0.3	1.8	0.0	0.0	0.0	0.0	0.4
Other household	0.0	0.0	0.7	2.1	0.0	0.0	0.0	4.8
Average	0.9	1.0	1.2	1.2	1.8	0.8	1.6	1.0

Table A21. Percentage of households impoverished due to OOPs, by number of uninsureds

	2000	2001	2002	2003	2004	2005	2006	2007
None	0.9	1.1	1.2	1.3	1.8	0.8	1.4	1.0
1	1.0	0.2	0.6	0.0	1.8	1.2	2.7	1.0
2 or more	0.0	0.4	1.4	0.6	2.6	0.0	11.8	0.0
Average	0.9	1.0	1.2	1.2	1.8	0.8	1.6	1.0