

# Impact of changes in out-of-pocket payments for health care on household budgets

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*ABSTRACT. The Czech Republic belongs to the countries with a relatively low level of private spending on health. As part of the health care reform package in 2008, some additional out-of-pocket payments were introduced, called ‘user (patient) fees’. Furthermore, the government intends to increase some user fees in the following years. There has been a serious discussion between proponents and opponents because an increase in out-of-pocket payments for health care may create financial obstacles for some households and restrict the desirable consumption of care. The objective of the paper is to determine the impact of changes in out-of-pocket payments on household budgets and provide solution for more just distribution of the burden. Data from the Household Budget Survey regularly collected by the Czech Statistical Office is used. Descriptive analyses and multivariate analyses were performed.*

*KEY WORDS: private expenditure, out-of-pocket payments, user fees, burden of household budgets, catastrophic payments*

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## 1. Introduction

Out-of-pocket payments rose considerably as a result of user fees introduction into the Czech health care system in 2008. The primary goal of the implementation of patient payments was the regulation of health care consumption (Ministry of Health of the Czech Republic, 2007), because the Czech Republic had belonged to the European top in the number of patient contacts with doctors (14,6 contacts per capita in 2007, in comparison with the average of EU25 with 7,7 contacts)<sup>1</sup>. Similarly, in the consumption of medications it had ranged among the countries with high consumption (in 2005 the consumption of medications per capita was twice higher in the Czech Republic than for example in Slovakia or the Netherlands) (UZIS, 2008). The reduction of overusing of health care should be reached due to confrontation of patient at least with partial costs of health services. The accompanying effect would be also the increase of additional sources into the system. On the other hand, rather than to regulate an unnecessary demand, higher out-of-pocket payments may generate further inequity between healthy and unhealthy persons. It is possible that the implementation of user fees restricts the desirable

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<sup>1</sup> WHO: European Health for all Database, 2009

consumption of health care due to the burden of household budgets with a new expense. This could cause a deterioration of the health status of citizens and much higher expenditure of health care system in the future.

The objective of the paper is to determinate the impact of out-of-pocket (OOP) payments after policy changes on household budgets in 2008 and 2009.

To accomplish this objective, it will be necessary to discuss the following research questions:

- What is the magnitude of OOP paid by households?
- What is the relative importance of different categories of health care for OOP?
- How are OOP distributed in the population?
- Which groups are extreme payers?
- What are the determinants of variation between households in OOP burden?

## 2. Background

Out-of-pocket payments are defined as personal household expenditure on health services and medical goods, therefore “an increasing reliance on out-of-pocket payments at the point of service pushes costs onto those that use health services the most. As income and health status are positively correlated, those on low-incomes suffer the most from out-of-pocket payments.” (Hopkins *et al.*, 2001) It is necessary to take into account that „out of pocket payments are the most fragmented across individual consumers, with no possibility of pooling risks. Out of pocket financing of health is the most likely reason that would characterize unfair distributions of health financing, and to generate severe financial losses and risk of impoverishment for some families.“ (Murray *et al.*, 2000:4) Many experts argue that out-of-pocket payments are usually the most regressive<sup>2</sup> way to pay for health (Kakwani, 1977; Vörk *et al.*, 2010; Habicht *et al.*, 2006; Hopkins *et al.*, 2001; Yardima *et al.*, 2010, Xu *et al.*, 2009), and the way that most exposes people to catastrophic financial risks. (Wagstaff and Doorslaer, 2002; Saltman and Figueras, 1997)

“The regressive distribution of health care spending is of particular concern since families cannot escape consumption of health care. [...] Out-of-pocket spending is particularly regressive with low-income families’ expenditure, as a share of income, [...] Low-income families pay over twice the share of income for health care as do high-income families” (Rasell *et al.*, 1994) Other vulnerable groups are elderly families (people over age 65). Moreover, elderly families with low income face higher out-of-pocket payments, as a share of income. (Berki, 1985, Rasell *et al.*, 1994, Wyszewianski, 1986)

Catastrophic health expenditure does not have to be always synonymous with high health-care costs. (Xu *et al.*, 2003) „An expenditure for medical care becomes financially catastrophic when it endangers the family’s ability to maintain its customary standard of living.“ (Berki, 1986)

Although Berki claims that „catastrophic illness, or, more precisely, financially catastrophic illness, affects a relatively small percentage of the population, the relative national magnitude of the problem depends entirely on how one defines a catastrophic level of expenditure, and who incurs the expense“. (Berki, 1986) Defining of the catastrophic level of expenditure is closely linked to the notion of fairness. Each society considers fairness in the other way. The fact that all households regardless of their income should contribute to health care equally could be somewhere considered for fair, but elsewhere it dominates the persuasion that it is fairer that all households pay equally but in relation to their income. It appears also opinions that rich households should contribute more than poor households or even that those who consume more should contribute more (according to volume of received care). Regardless of the notion of fairness, protection of people from catastrophic payments is widely accepted as a desirable objective of health policy.

„As soon as one accepts the presence of co-payments in principle, the question arises how to design a system of social protection for patients with large out-of-pocket payments. Such a system should be sufficiently targeted to protect the weakest groups in society, both in terms of income and in terms of health care costs.“ (Schokkaert *et al.*, 2008)

Many researchers have been focusing on the research of the out-of-pocket financial burden and possible impoverishment due to high out-of-pocket spending for health care. Some studies were conducted not only in low and middle income countries, where the issue is more serious, but also in high income countries.

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<sup>2</sup> It means that the richer households pay a smaller share of income than poorer households.

Some results are briefly discussed here. It is possible to generalize some findings from the results and to point out the household characteristics that can be related to high expenditure on health care.

In 1990s there was conducted a comprehensive multi-country analysis of the out-of-pocket burden in 59 countries from all over the world. (Xu *et al.*, 2003) This analysis showed that the proportion of households facing catastrophic payments from out-of-pocket health expenses varied widely between countries. There were countries with the ratio of households facing catastrophic expenditure from less than 0.01% in Czech Republic (data from 1999) and Slovakia (data from 1993) to 10.5% in Vietnam. They found out that catastrophic payments are common in middle-income countries, countries in transition, and in several low-income countries. On the contrary, the most developed countries had advanced social institutions that protect households from catastrophic spending. Therefore between these countries, only Portugal, Greece, Switzerland, and the USA had more than 0.5% of households facing catastrophic health spending. (Xu *et al.*, 2003) Although the analysis came from different household budget surveys usually made in 1990s and the results can be out-of-date, it still offers the first insight into the issue of high payments on health.

Study by Honk and Kim (Hong and Kim, 2000) dealt with the out-of-pocket burden across the life cycle stages in the USA (data from 1995). They found out that households headed by the elderly spent the most on health. Households older than 75 years compared to households headed by those aged 65 to 74 had higher spending. The youngest households (head under 25 years) spent the least on health care. They also claim that it is a natural process because with increasing age health conditions decreases and thus older individuals tend to consume more prescribed medications, purchase more medical aids (hearing aids), have more often examinations (eye exams). (Hong and Kim, 2000) Households with higher education spent lower share of the budget than households with higher education. They didn't find any significant influence of place of residence on the share of budget spent. Household size was significantly correlated to higher expenditure. Households without children spent more than households with children (particularly older couples without children). Thus, health care expenditure could endanger the financial well-being of elderly households, especially elderly households with low income.

More recent study was made in Turkey. As emerged from the analysis of the household burden in 2006, household head characteristics like lower education and status of unemployment were related to incurring high expenditure. Households with a disabled member or a senior member were also at risk of facing catastrophic expenditure. Moreover, when households lived in rural areas they were likely to face catastrophic expenditure. On the contrary, having a preschool aged child prevented households from extremely high expenditure while household size had no effect. (Yardima *et al.*, 2010)

Also a study from Estonia confirmed that one of the main determinants of high expenditure is having senior (above 65 years old) family members. The probability of facing high expenditures for a household having members above 65 years was much higher that of a household without senior members. (Habicht *et al.*, 2006) Impoverished households due to OOP payments were mostly single pensioners, followed by couple pensioners and a single parent with one child or a single of working age. Thus, risk of incurring high health expenditure was greater when there were seniors (65+), disabled, or chronically ill members in low-income households. (Vörk *et al.*, 2010). On the contrary, higher income and status of employment prevent facing catastrophic expenditure. A household headed by a male is less likely to face catastrophic expenditure than a household headed by a female. Having higher education was also a mitigating factor. The risk is not significantly affected by the number of children. (Vörk *et al.*, 2010) Households with children under 16 years didn't face high expenditure as often as adults and older people. (Habicht *et al.*, 2006) It resulted from the study that the distribution of out-of-pocket payments was regressive. Poorest part of the population spent in relative terms more than richest one. The poorest quintile spent almost exclusively on medications. The rich spent relatively more on outpatient services. For services such as outpatient drugs and dental care, there are either more inequalities in utilization or households face higher risk of impoverishment. For services with very little need for OOPs, such as inpatient care or emergency care, there was no impoverishment and also little difference in utilization by income level. (Vörk *et al.*, 2010)

Similar research was conducted in Latvia in 2006. (Xu *et al.*, 2009) It resulted from the research that although richer income groups spent much more on health than poor household in absolute terms, in relative terms (related to expenditure or capacity to pay) poorer households spent the most. Around 80 % of health expenditure of lower income households was spent on medications while rich households could afford to spend much more on outpatient services and other health products. "Catastrophic levels of OOP occur in households across all income groups in Latvia. Even though those officially identified as poor are exempt from cost sharing, lower income households are much more likely to face catastrophic health expenditure than the higher income

households.“ (Xu *et al.*, 2009) Similarly to other studies, households with members over 65, female headed households, households headed by an unemployed person or a person with a lower level of education, and rural households were more likely to encounter catastrophic health expenditure.

Study from 2006 conducted in France showed that around 14% of the population did not use health care services for financial reasons. Unlike to above mentioned studies, richer households spend not only more for their health in absolute terms but also in relative terms. Nevertheless, the poorest quintile spent on average €198 for health and then devoted 2.6% of its total expenditure, whereas the richest spent €1,447 which represents 4.2% of its total budget. (Dukhan, *et al.*, 2010) These numbers indicate some form of progressivity of out-of-pocket health expenditure. Female-headed households and the number of senior members (aged 65 and above) in the household were positively and significantly associated with high burden health expenditure. Similarly to other studies, the number of children under five years old was negatively related to a high burden of OOP health payments. Household size had no influence on the probability of facing higher health payments and higher education protects from high burden. For poor households, the highest share of expenditure is devoted to doctors' consultations and medication expenditure, whereas in the last quintile dentists and therapeutic equipments represent a large part of out-of-pocket expenditure. (Dukhan, *et al.*, 2010)

A lot of space was also devoted to the discussion about the burden of households with health care expenditure in Belgium. Belgian patients have to pay not only co-payments (co-payments are the difference between the convention tariff and the reimbursed amount but also relatively high supplements) but also sometimes very high supplements (amounts on top of the convention tariff). (De Graeve *et al.*, 2006) Almost 10% of the household have total OOP-payments larger than 5% of their net taxable income. There was a significant number of extreme payers with low incomes. The most spent early retired, retired and disabled individuals. OOP-payments for health care were found to be strongly regressive. (Schokkaert *et al.*, 2008) The risk of becoming an extreme payer is lower for the households living on unemployment benefits than for a randomly chosen household from the population. The risk is slightly larger for single parents, for households with a guaranteed income and for households with preferential tariff (pensioners, widow(er)s, persons with disabilities and orphans providing that their income do not exceed an annual limit). The risk is still larger for the chronically ill, those in their first year of disability, patients in rest and nursing homes for the elderly and the elderly handicapped. Regional effects did not show big differentiation. Income has a positive effect on the absolute level of co-payments and OOP-payments. Important driver into extreme payer groups are particularly expenditure for pharmaceutical. (Schokkaert *et al.*, 2008)

To summarize, the household characteristics which are mostly related to the extremely high out-of-pocket spending and to the burden of household budgets are following:

- Presence of elderly people in a household (over 65 years and older)
- Status of disability and chronically ill
- The status of unemployed (although in Belgium those on unemployment benefits was not the most endangered)
- Lower education
- Low income
- Female
- Single people (single elderly, single parent)

Some studies found out that living in rural area is also a factor of potential catastrophic expenditure (Turkey, Latvia), however, in other studies there were no significant influence of the place of residence (Belgium, USA). It was not found that high expenditure (in relative terms) is related to the households with children. The probability of facing catastrophic expenditure was lower for households with children than for other types of households.

All studies, except France, found out that out-of-pocket payments had regressive character. Thus, poor households spent in relative terms more on health care than rich households. In France, rich households spent the most in absolute and also in relative terms. This could be explained with special protective features in the social security system which makes the payments progressive.

Regarding categories of health services, expenditure on medications usually presents a major share of expenditure for poor households, rich households can afford to spend more on dental care and other luxury services (therapists, inpatient services, etc.).

### 3. Out-of-pocket payments in the Czech Republic

Financing of health care is based on a multi-source system in the Czech Republic. The main source of financing is compulsory public health insurance<sup>3</sup> and the other sources are state and regional (municipal) budgets and private payments. An overview of the shares of various sources in total expenditure from 2005 to 2009 is in Table 1.

**Table 1.** *The structure of health expenditure in 2005 - 2009 (in %)*

	2005	2006	2007	2008	2009*
<b>Public expenditure</b>	<b>87,5</b>	<b>86,9</b>	<b>85,4</b>	<b>82,7</b>	<b>83,6</b>
State and municipal budgets	9,7	10,1	9,4	8,1	7,3
Health insurance	77,8	76,8	76,0	74,6	76,3
<b>Private expenditure<sup>4</sup></b>	<b>12,5</b>	<b>13,1</b>	<b>14,6</b>	<b>17,3</b>	<b>16,4</b>
Total expenditure	100	100	100	100	100
<b>% of GDP</b>	<b>7,3</b>	<b>7,1</b>	<b>6,8</b>	<b>7,2</b>	<b>7,9</b>

Source: UZIS, 2010

\* preliminary data

Compulsory health insurance covers the whole population and reflects the principle of solidarity, equity and risk pooling. There is no possibility of opting out. Foreigners working for companies incorporated within the Republic are also covered. The health care benefits package is very broad. However, Czech patients are used to pay some out-of-pocket (OOP) payments. Within these OOP payments, one makes a distinction between direct payments and copayments. There are only a limited number of health services that are excluded from the statutory health care system. For example, services such as cosmetic or plastic surgery, abortions and other selected services performed on patient's requests (for example medical certificates, vaccinations) are fully paid by patients. Other usual OOP payments are payments for over-the-counter pharmaceuticals, some health products and limited number of above standard services (above standard room in a hospital). This group is called as direct payments.

Some health care services are reimbursed partially. All payments paid by patients above a reference price (which is covered by health insurance) are called copayments. Copayments are paid for dental care, some medications and medical aids. Moreover, additional OOP payments were introduced in 2008, called 'user (patient) fees'. These were implemented for selected health services that are reimbursed fully or partly by the health insurance companies as part of the health care reform package.

**Table 2.** *Patient fees in the Czech Republic since 2008*

Health care item	CZK	EUR
<b>Physician fee (per visit of general practitioner and</b>	30	1.14
<b>Emergency fee (per visit of emergency)</b>	90	3.41
<b>Prescription fee (per item on prescription)</b>	30	1.14
<b>Inpatient fee (per day in the hospital, spa, sanatorium)</b>	60	2.28

Source: MZ ČR (Ministry of Health), 2007.

Note: 1 EUR = 26.36 CZK (exchange rate on the 2<sup>nd</sup> of January 2008)

Patient fees are not applied to all health care services. Preventive services<sup>5</sup>, laboratory and diagnostic examinations, dispensary care (chronically ill children, pregnant women, etc.), haemodialysis and services connected to blood donation are fully covered by health insurance.

<sup>3</sup> Premiums are set as a percentage of the employee's salary (4.5 % paid by the employee, 9 % by the employer) and a flat rate paid by the government for specific groups (children, students, seniors, etc.)

In addition, some vulnerable groups are fully exempted from paying patient fees:

- citizens in material need<sup>6</sup> (approximately 1.5 % of the population)<sup>7</sup>
- citizens located in foster homes and orphanages
- citizens in protective treatment ordered by court
- specific cases which require the protection of public health (contagious diseases)
- disabled citizens put into sanatoriums
- seniors in retirement homes
- citizens in inpatient care who are left with 800 CZK or less after paying of the appropriate costs for accommodation and food or those who do not have any income

To minimize the impact of patient fees especially on those chronically and often ill, an annual counter of 5000 CZK (189.68 EUR) was implemented. If a patient reaches the counter, he/she keeps paying patient fees but the surpassing sum is retrospectively reimbursed to the patient by his/her insurance company. Health insurance companies are obliged to reimburse the surpassing sum within 60 days after the quarter of the year in which the patient reached the threshold<sup>8</sup>. It is necessary to mention that only physician fees, prescription fees and some copayments on medications<sup>9</sup> are included in the counter.

The first modification of exemptions was put in place In August 2008. Since then newborns no longer have to pay patient fees for the hospital stay related to birth. Other more significant changes in the concept of patient fees followed in April 2009. The protective annual threshold was decreased for children under the age of 18 and for seniors above 65 to 2500 CZK. The physician fee was abolished for children under the age of 18 years. Seniors were newly entitled to include the total sum of paid copayments on medications into the annual counter. The last important change occurred in the prescription fee. Patients have to pay this flat user fee providing that the remaining copayment is less than 30 CZK<sup>10</sup>.

There were also modifications in the concept of fees at the level of the regional government in 2009. The regional government practically abolished<sup>11</sup> fees in health care facilities (hospitals, pharmacies, other health centres) that it has owned. The system was confusing and unjust, because not all regions paid for patients all fees. Furthermore, patients had to pay all fees from their pockets in health care facilities owned by the State, municipalities or private bodies. The formal objective of such a policy was to protect patients from the high burden. The real objective was to protest against central health care policy.

## 4. Data and methods

### 4.1 Data and sample selection

The data used is the data from the Household Budget Survey that is regularly collected by the Czech Statistical Office. The Household Budget Survey provides information on expenditure and the consumption structure of a representative sample of the Czech households. The sampling unit for the survey is a household

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<sup>5</sup> An exemption is the fee for a dentist visit – the first preventive examination is paid and then the second preventive examination in a year is free of charge

<sup>6</sup> Material need is specified according to the law 111/2006 as a situation in which an individual (or individuals in a common household) does not have a sufficient income to secure his/her basic life needs and is not able to change this situation on his/her own. An individual (or individuals in a common household) is entitled to the benefits of material need providing that her/his income is lower than a set level of subsistence expenditure or faces a special situation (natural disaster, threat of social exclusion).

<sup>7</sup> Ministry of Labour and Social Affairs, 2010

<sup>8</sup> Zákon č. 48/1997 Sb., o veřejném zdravotním pojištění a o změně a doplnění některých souv. zákonů. (Public health insurance law)

<sup>9</sup> Only the amount of copayment for the cheapest medication available on the market with the same active component and the way of application (pastilles, drops, injections, etc.) is included.

<sup>10</sup> For example, when the sum of copayment on medication is 60 CZK then the patient pays only 60 CZK and no prescription fee. However, when the copayment is only 20 CZK then the patient pays the prescription fee of 30 CZK. It means at least 30 CZK has to be paid for prescribed medication.

<sup>11</sup> It had a form of grant, they paid it for patients.

(individuals living together on a common budget). The basic data set consists of 3000 households. The households are selected on the basis of purposive quota sampling and their structure reflects the structure of households in the Czech Republic. Each household keeps recording of expenditure every month in a year. The analysis is based on the data from 2007, 2008 and 2009. Data from the year 2007 was determined as the initial one because there were no user fees. Changes in expenditure on health care and the potential burden for households in 2008 and 2009 were analyzed and compared to the initial year.

#### 4.1.1 Outcome variables

To evaluate the burden of OOP payments on household budgets the absolute and relative definitions of burden were used. In the absolute term, OOP payments were formulated as the sum of OOP payments per household and/or OOP per capita on a monthly basis in CZK.

To say whether the expenditure is high or low for a particular household, it is necessary to relate it to the income of the household. Therefore the share of income spent on total OOP payments was calculated for all observed households. The net income<sup>12</sup> was chosen because this reflects the disposable amount of money of households. The variables of particular types of OOP payments were used for a more detailed analysis:

- Medication on prescription (copayments - partially reimbursed by the insurance companies; and direct payments - patient pays the full price – birth-control pills, vaccination not reimbursed by the health insurance companies)
- Medication without prescription (over-the-counter pharmaceuticals - direct payments)
- Prescription fee (user fee)
- Other health products (bandages, thermometers, syringes, etc.) (direct payments)
- Orthopaedic (therapeutic) products (plasters, orthopaedic shoes, contact lenses, optician's services, hearing aids, etc.) (direct payments, some of them can be partially reimbursed - copayments)
- Outpatient health care (application of vaccine, laser treatment, artificial insemination, donations, administration fees) (direct payments)
- Outpatient fee per visit (physician fee and emergency fee) (user fee)
- Dental health care (copayments or direct payments)
- Dentist fee per visit (user fee)
- Non-medical health care (laboratory tests, X-ray, services of therapists, attendants, transport in an ambulance, etc.) (copayment, direct payment)
- Inpatient health care (above-standard services - accommodation services, special treatment; administration fees, treatment in spa or sanatorium, administration fees, donations)
- Inpatient fee per day (fee for stay - night in a hospital, spa, sanatorium) (user fee)

To evaluate the burden of OOP payments for households that reached the annual counter in 2008 and 2009 the variable of reimbursement<sup>13</sup> included in the data sets was used.

## 2.1. Explanatory variables

To explain the burden of OOP payments on household budget the set of numeric and categorical variables was used. The numeric variables represent the number of pensioners per household and net income per household (in 1000 CZK).

Used categorical variables were following:

- Status of economic (in)activity of the household head
  - employee (employment contract including working students)

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<sup>12</sup> gross income minus income tax, social and health insurance, used savings and loans

<sup>13</sup> Amount of paid copayments and supplements above the annual threshold which is reimbursed to patient by his insurance company

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- self-employed (on basis of a trade license, professionals – doctors, lawyers, tax advisors, working for royalties – artists, interpreters, including self-employed students, owners of companies)
- unemployed (a person who does not have a paid job, but is willing to work and is searching for new employment activities)
- pensioner (drawing any kind of pension, non-working)
- inactive person (individual working in a household, on parental leave, an individual looking after an ill person, non-working students)
- Type of household
  - households without children
  - households with children (households with one child, with 2 children, with 3 and more children)
  - one-person households (households of an individual, a woman or a man living alone)
- Education of the household head
  - lower education (basic education, secondary education without graduation examination, including without education)
  - secondary education (education with graduation examination)
  - higher education (higher and university education)
- Place of residence (regional city; town; village)
- Gender of the household head
- Age groups (younger than 30; 31 to 45; 46 to 55; 56 to 65; 66 and older)

## **4.2 Methods**

To answer the defined research questions the analysis was carried out in two steps – descriptive analysis and multivariate analysis.

### *4.2.1 Descriptive analyses*

First of all, attention was paid to the composition of OOP payments to determine which type of services was responsible for the burden. In this phase, basic descriptive statistics and frequencies were discussed regardless of any household characteristics. In the next step, distribution of OOP payments among households was monitored to identify the households with the highest burden. The distribution was analysed not only according to the economic status of the head but furthermore also for income decile. To express the absolute amount of OOP payments spent on health equivalent income decile bands (using OECD scale) were used. A third section concentrated on households with extreme (catastrophic) payments and their characteristics. Although there is no general agreement in the literature about which level of expenditure is considered as “catastrophic”, I defined the threshold at the level of 5 % and more of net income spent on health. As will be shown further 5 % of income spent on health is more than twice the average spending of the selected sample. Therefore the threshold of 5 % can be considered being high enough to burden the budgets of the households in the Czech Republic. Concentrating only on 2008 and 2009, characteristics of households that reached the legal annual counter of 5000 CZK were analysed.

### *4.2.2 Multivariate analyses*

The methods of regression analysis were used for the determination of variation in the OOP burden between households in 2007, 2008 and 2009.

To estimate the model, all important determinants influencing OOP payments such as socio-demographic characteristics of the household, economic factors, morbidity (health status), preferences of patients and supply side factors should be included. (De Graeve et al., 2006, Siskou et al., 2008)

Unfortunately, it was impossible to include all necessary determinants because of the data limitations. In the data set only a limited number of socio-demographic characteristics of households and income information are



available; area of residence is available as well and can be used as a proxy for supply. It was expected that households living in cities (regional cities and towns) had higher expenditure than households living in rural areas. Not only because of the network of health facilities sometimes highly specialized but also with respect to higher prices (for example in pharmacies). To include the morbidity factor variables such as the age and the status pensioner were used. The status of pensioner in itself and higher age increases the probability of the existence of illness.

Thus, the predicting power is expected to be low because of the absence of other important factors. Moreover one should be aware of missing variables bias. The purpose of the analyses is therefore not to determine causal relationships of OOP spending. The results merely give a descriptive overview of characteristics of households paying more OOP or facing a higher relative burden.

Although the data is highly skewed, standard errors are not normally distributed and furthermore the heteroscedasticity is present, I decided to use the generalized linear model (GLM). For data analysis, the gamma distribution and log function fits model the best.

The following general model was constructed:

$$\begin{aligned} \text{OOP} = & \alpha + \beta_1 \text{income\_thousand} + \beta_2 \text{DUCH} + \beta_3 \text{age\_30} + \beta_4 \text{age\_45} + \beta_5 \text{age\_55} + \beta_6 \text{age\_65} + \beta_7 \text{age\_66} + \\ & \beta_8 \text{female} + \beta_9 \text{male} + \beta_{10} \text{HOUSEHOLD\_CHILD} + \beta_{11} \text{HOUSEHOLD\_2CHILDREN} + \\ & \beta_{12} \text{HOUSEHOLD\_MORECHILDREN} + \beta_{13} \text{INDIVIDUAL\_HOUSEHOLD} + \\ & \beta_{14} \text{HOUSEHOLD\_NOCHILDREN} + \beta_{15} \text{LOWER\_EDUCATION} + \beta_{16} \text{SECONDERY\_EDUCATION} + \\ & \beta_{17} \text{HIGHER\_EDUCATION} + \beta_{18} \text{regional\_city} + \beta_{19} \text{town} + \beta_{20} \text{village} + e_i, \end{aligned}$$

where OOP is the sum of out-of-pocket payments spent on health per capita. Income in thousand CZK and the number of pensioners were used as numerical explanatory variables. The dummy variables were constructed for all other explanatory variables. The dummy variable for the age; if it is a household where the head of the household belongs to the defined age group, then it takes the value 1, otherwise 0. Similarly, the dummy variables were created for households with children (with one child, 2 children, 3 and more children), without children and households of an individual; the dummy variables for gender, education (lower, secondary, higher) and the place of residence (village, town, regional city).

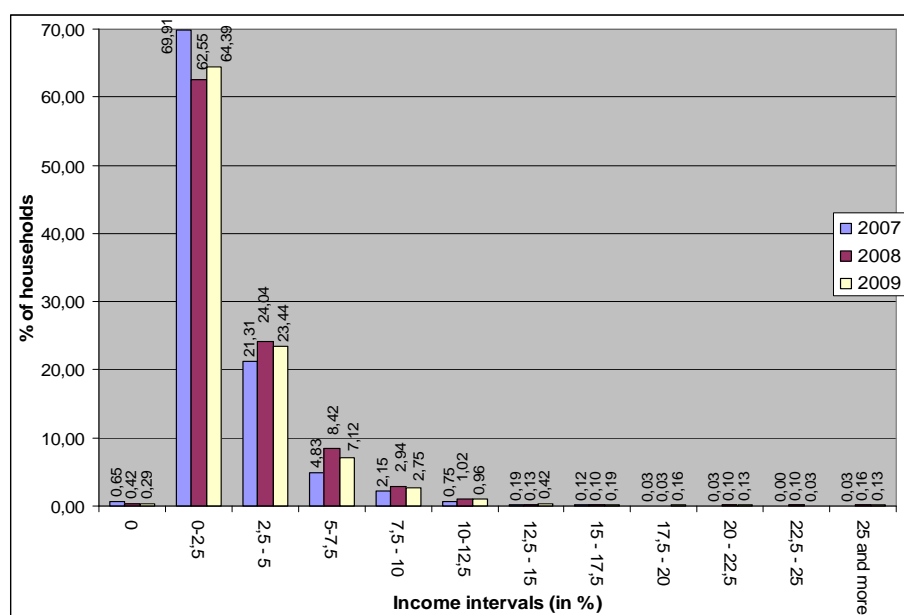
## 5. Results

### 5.1. Descriptive results

#### 5.1.1. Magnitude of out-of-pocket payments

This paragraph focuses on the overall magnitude of OOP payments and its changes after the patient fees implementation in the Czech health care system. Figure 1 presents relative (as a share of income) amounts spent out-of-pocket per household in 2007, 2008 and 2009.

**Figure 1.** Share of net income spent on OOP payments in 2007, 2008 and 2009



Source: calculated on the basis of data from the Household Budget Survey

While in 2007 more than 69.91 % of households spent less than 2.5 % of their net income on health, in 2008 it was only 62.55 % and in 2009 64.39 % of households. There were still some households with no expenditure on health in 2008 and 2009. Regarding the threshold of 5 % of income, 8.13 % of households spent at least this amount in 2007, 13 % in 2008 and 11.89 % in 2009. However, 98.85 % of households paid less than 10 % of their net income on health in 2007 and slightly less households in 2008 and 2009 (98.37 % and 97.99 %). In 2007, only 0.03 % of households faced very extreme expenditure – more than 25 % of their net income. After the implementation of user fees it was 0.16 % in 2008 and 0.13 % of the observed households in 2009.

It means that (only) around 1 % of the observed households faced health expenditure higher than 10 % of their net income in 2007. This number was slightly higher in 2008 and it reached almost 2 % in 2009. Although this figure is low, it is a worry one and should be taken into account.

**Table 3.** Out-of-pocket payments in 2007 - 2009

OOP	mean			median			max		
	2007	2008	2009	2007	2008	2009	2007	2008	2009
per household	454.1	588.2	596.1	328.7	444.3	433.1	10034.7	12625.5	7794.3
per capita	231.4	301.9	306.8	155.2	212.5	209.2	5017.3	12625.5	4712.3
% income	2.15	2.63	2.55	1.50	1.89	1.76	27.33	62.69	35.30

Source: calculated on the basis of data from the Household Budget Survey

The average amount of OOP payments paid by a household was 454.1 CZK per month in 2007 and increased to 588.2 CZK in 2008 and 596.1 CZK in 2009. This amounted to a per capita increase between 2007 and 2008 (2009) of about 70 CZK (75 CZK). Max values show the extreme cases. The fluctuation among years is obvious.

Households spent on average 2.15 % of their income on OOP payments in 2007 (there were no user fees), resp. 2.63 % in 2008 and 2.55 % in 2009. The median value was lower – 1.50 %, resp. 1.89 % and 1.76 %. What seems to be more interesting, it is the maximum share of income spent on OOP payments. This maximum was 27.33 % in 2007. In comparison to the mean share of 2.15 %, it is 13 times higher. The value in 2008 is extremely higher and even slightly higher in 2009 (35.30 %) than in 2007. There was a household which spent almost 63 % of its net income on OOP payments in 2008. Fortunately, such a high amount of income spent on health is exceptional as was shown in Table 3.

#### 5.1.2. Composition of out-of-pocket payments

The greatest share of out-of-pocket payments was made up of expenditure on pharmaceuticals (60.42 %), particularly on medications available without prescription – over-the-counter pharmaceuticals (32.99 %) in 2007. Czech households also spent a high amount of money on orthopaedic products (15.4 %) and dental services (11.49 %).

Comparing 2008 to 2007, households spent slightly more on prescribed medications (30.55 % instead of 27.43 %) and dental care (12.79 % instead of 11.49 %). Not surprisingly, there was an obvious increase in expenditure on outpatient and inpatient care. The explanation is the introduction of new patient fees. On the contrary, expenditure on over-the-counter pharmaceuticals greatly dropped (24.10 % instead of 32.99 %). Another decreases occurred in the categories of orthopaedics and other health products.

**Table 4.** Categories of OOP payments in 2007, 2008 and 2009 (in %).

Type of OOP	mean			mean (categories 2007)		
	2007	2008	2009	2007	2008	2009
orthopaedics	15.40	12.51	13.34	15.40	12.51	13.34
other health products	1.84	1.46	1.46	1.84	1.46	1.46
medication on prescription	27.43	16.65	16.26	27.43	23.83 <sup>14</sup>	21.96
medication on prescription - direct payment		6.72	5.32		6.72	5.32
over-the-counter pharmaceuticals	32.99	24.10	27.54	32.99	24.10	27.54
outpatient care	5.42	4.37	4.89	5.42	10.42 <sup>15</sup>	9.66
dental care	11.49	11.37	11.56	11.49	12.79 <sup>16</sup>	13.10
non-medical care	1.49	1.47	1.48	1.49	1.47	1.48
inpatient care	3.93	2.49	2.29	3.93	6.71 <sup>17</sup>	6.15
dentist fee	x	1.42	1.54	x	x	x
inpatient fee	x	4.21	3.86	x	x	x
outpatient fee	x	6.05	4.77	x	x	x
prescription fee	x	7.17	5.70	x	x	x
total	100.00	100.00	100.00	100.00	100.00	100.00

Source: calculated on the basis of data from the Household Budget Survey

Focusing on year 2009, expenditure on prescribed medications was slightly lower than in 2007. Copayments on prescribed medications and direct payments for prescribed medications dropped in comparison to 2008 as well. Households also spent slightly less on inpatient and outpatient care in comparison to 2008. All of these

<sup>14</sup> Including prescription fee

<sup>15</sup> Including outpatient fee

<sup>16</sup> Including dentist fee

<sup>17</sup> Including inpatient fee

decreases were caused particularly by the decrease in outpatient, inpatient fees and prescription fees (see the second and third column of Table 4).

Expenditure on over-the counter pharmaceuticals was lower than in 2007 but slightly higher than in 2008 (27.54 % instead of 24.10 %). Households spent again slightly more on orthopaedics than in 2008. Spending on dental care kept increasing trend since 2007. On the contrary, it seems that households compensated the implemented user fees particularly for the decrease in their expenditure on over-the-counter pharmaceuticals and orthopaedics.

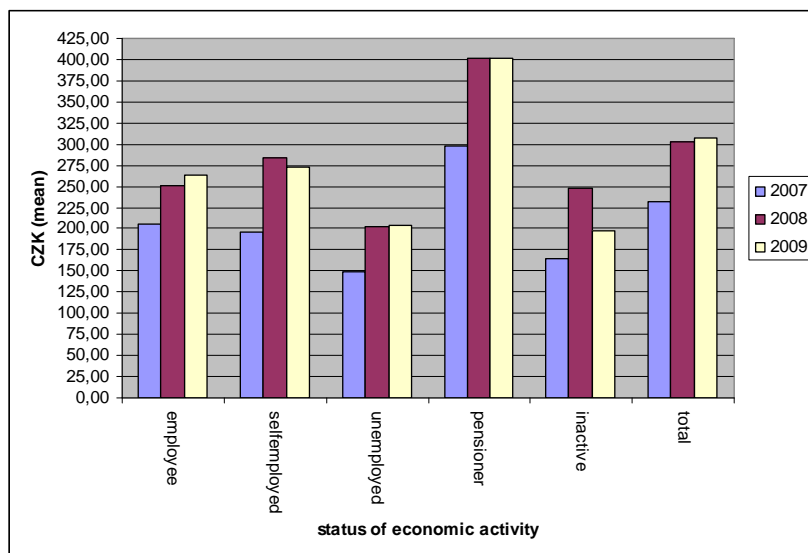
The biggest share of household budgets was spent on pharmaceuticals. Expenditure on orthopaedics and dental care was not negligible as well. Prescription and outpatient fees were the most important. Due to the implementation of fees, expenditure on outpatient and inpatient care considerably increased.

### 5.1.3. Out-of-pocket payments paid by different types of households

Following figures and tables focus on OOP payments of households according to their economic activity (economic activity of the head of a household) and the presence of children in a common household.

It is obvious from Figure 2 that households of pensioners spent the most. The results show that the first year after the user fees implementation, they faced the major increase in OOP payments comparing to the increase of other households and they had much bigger health expenditure than other household types. The big increase also occurred in households of self-employed and with an inactive household head. In 2009, expenditure remained almost unchanged for pensioners but there was a bigger decrease for inactive households.

**Figure 2.** OOP payments per capita in 2007, 2008 and 2009



Source: calculated on the basis of data from the Household Budget Survey

Concentrating on patient fees, households of pensioners spent more than half on fees than other households in 2008 and 2009 as well. Nevertheless, the value of spent fees decreased in 2009. Households of pensioners spent most often fees on prescription, followed by outpatient and inpatient fees. The increase in total OOP payments was caused almost only by implementation of patient fees for households of pensioners in 2008 (see Table 6). Patient fees counted around 85 % of the increase in OOP payments in households of employees and unemployed in 2008. Other households spent more on other health categories besides patient fees. Total drop in patient fees is obvious in 2009 (except of self-employed).

**Table 5.** Patient fees per capita according to the status of economic activity in 2008 (in CZK)

Status of economic activity	dentist fee		inpatient fee		outpatient fee		prescription fee	
	2008	2009	2008	2009	2008	2009	2008	2009
employee	4.1	3.39	7.95	7.78	13.79	11.39	13.02	10.92
self-employed	3.52	12.73	10.11	9.59	12.32	9.63	11.01	8.73
unemployed	2.47	3.23	9.43	7.01	16.04	13.16	16.11	11.5
pensioner	4.19	4.31	23.13	19.97	26.46	24.27	46.27	38.12
inactive	7.01	2.25	2.19	4.75	14.2	7.4	11.47	8.27
total	4.02	4.85	13.13	11.93	17.76	15.39	23.57	19.5

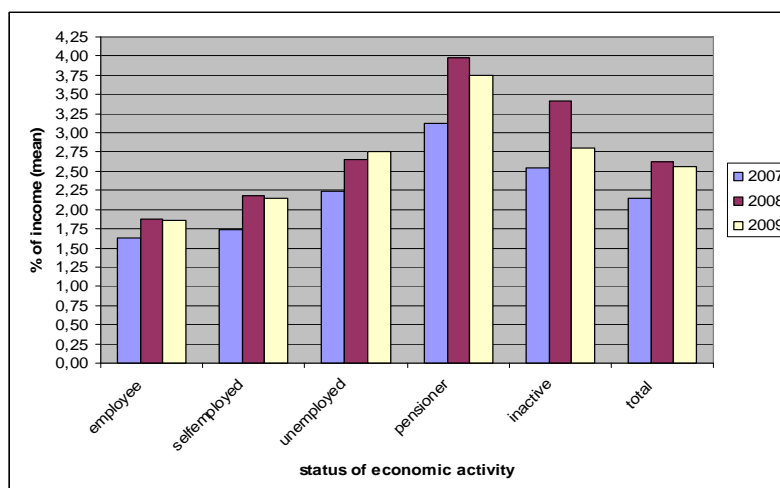
Source: calculated on the basis of data from the Household Budget Survey

**Table 6.** Increase in OOP payments in relation to fees (in CZK)

Status of economic activity	fees total		increase in OOP	
	2008	2009	2008/2007	2009/2007
employee	38.87	33.48	45.7	57.91
self-employed	36.96	40.69	88.12	77.47
unemployed	44.05	34.9	52.95	54.91
pensioner	100.05	86.68	102.7	102.9
inactive	34.88	22.67	83.01	33.03
total	58.49	51.67	70.55	75.37

Source: calculated on the basis of data from the Household Budget Survey

The share of income spent on OOP is shown in Figure 3. Similarly to the sum of OOP, households of pensioners spent the most - almost 4 % of their income on health in 2008 instead of 3.11 % in 2007. They spent by 0.65 p.p. (percentage points) more in 2009 than in 2007. A small decrease was observed between 2008 and 2009 (by 0.25 p. p.). Unlike to the absolute spending per capita, households of inactive spent the most after pensioners in the relative term. They faced 0.87 p. p. increase in OOP payments in comparison to 2007, on the other side, the increase accounted only 0.25 p. p. in 2009. Similarly, households of unemployed spent a big amount in relative terms and it had an increasing trend in all observed years.

**Figure 3.** Share of income spent on OOP payments in 2007, 2008 and 2009

Source: calculated on the basis of data from the Household Budget Survey

Focusing on households according to the presence of children, households with children spent more on health per household, however, the calculation on per capita basis shows that households with children spent much less

than households without children. Results in relative terms show the same (see Table 7). In this case, it is more appropriate to focus on results on per capita basis, because they are adjusted by household size. Households without children spent around half more than households with children in all observed years.

**Table 7.** *OOP payments of households with and without children*

Presence of children	OOP per household			OOP per capita			Share of income		
	2007	2008	2009	2007	2008	2009	2007	2008	2009
households without children	445.6	572.1	583.3	290.2	378.3	383.3	2.53	3.11	3.01
households with children	467.4	613.2	616.4	139.7	183.2	185.9	1.55	1.87	1.83
<b>total</b>	<b>454.1</b>	<b>588.2</b>	<b>596.1</b>	<b>231.4</b>	<b>301.9</b>	<b>306.8</b>	<b>2.15</b>	<b>2.63</b>	<b>2.55</b>

Source: calculated on the basis of data from the Household Budget Survey

Looking at the total sum of patient fees (Table 9), households without children spent by 150 % more in 2008 and even 310 % more in 2009. The introduction of fees caused an increase in OOP payments by around 86 % for households without children and for households with children only around 69 % in 2008 (75 % and 48 % in 2009).

Such a big difference in patient fees between households with and without children in 2009 can be explained by changes in the policy since second quarter of 2009. Children under 18 years have been exempted from paying of dentist and outpatient (physician) fees. The results in Table 8 confirmed these changes. While households with children spent less on dentist fee in 2009, households without children spent more than in 2008. Although both households spent less on other fees, the decrease was bigger for households with children.

**Table 8.** *Patient fees per capita in households with and without children (mean in CZK)*

Presence of children	dentist fee		inpatient fee		outpatient fee		prescription fee	
	2008	2009	2008	2009	2008	2009	2008	2009
households without children	4.73	6.48	17.51	16.41	21.76	20.01	32.77	27.43
households with children	2.91	2.28	6.31	4.83	11.54	8.08	9.26	6.97
<b>total</b>	<b>4.02</b>	<b>4.85</b>	<b>13.13</b>	<b>11.93</b>	<b>17.76</b>	<b>15.39</b>	<b>23.57</b>	<b>19.5</b>

Source: calculated on the basis of data from the Household Budget Survey

**Table 9.** *Increase in OOP payments in relation to fees (in CZK)*

Presence of children	fees total		increase in OOP	
	2008	2009	2008/2007	2009/2007
households without children	76.78	70.34	88.02	93.01
households with children	30.02	22.16	43.57	46.21
<b>total</b>	<b>58.49</b>	<b>51.67</b>	<b>70.55</b>	<b>75.37</b>

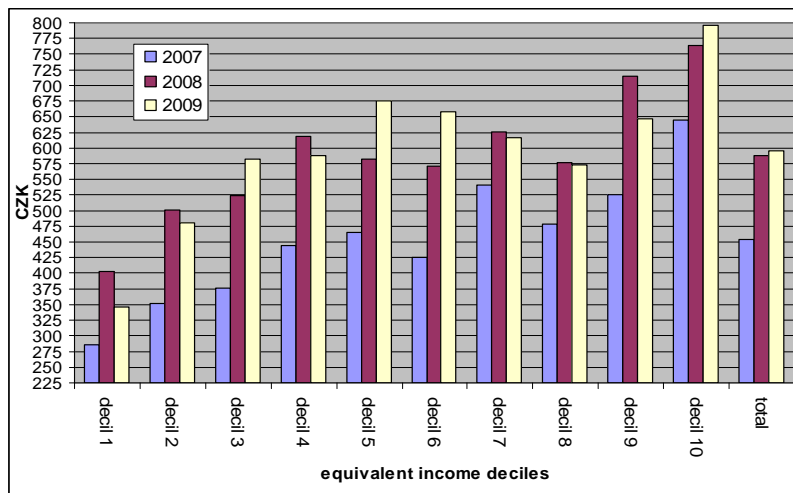
Source: calculated on the basis of data from the Household Budget Survey

#### 5.1.4. *Out-of-pocket payments according to income decile*

This part focuses on the distribution of OOP payments in absolute and relative terms according to income decile bands. Equivalent income decile bands are used (adjusted income for the size of a household using OECD equivalence scale).

As shown in Figure 4, the highest OOP payments were spent in the tenth (richest) decile and the smallest amount was spent by households belonging to the poorest first decile in all observed years. In 2008, households in the ninth but also in the fourth decile faced the highest increase in OOP payments. On the contrary, the smallest increase occurred for the households in the seventh and eighth decile. Households in the first five lowest decile faced on average slightly higher increase in OOP payments than households in the five highest income decile in 2008. Focusing on 2009, the increase in OOP payments continued further for households in the sixth, fifth and the third decile. A major increase occurred for households in the first and ninth income decile. Looking at Figure 4, the development of expenditure across income decile had more or less a steadily increasing trend (with small exemptions) in 2007 and 2008. Interestingly, there was an increasing trend from the first up to the fifth decile and a decreasing trend from the sixth to the eighth decile in 2009.

**Figure 4.** OOP payments per household in 2007, 2008 and 2009



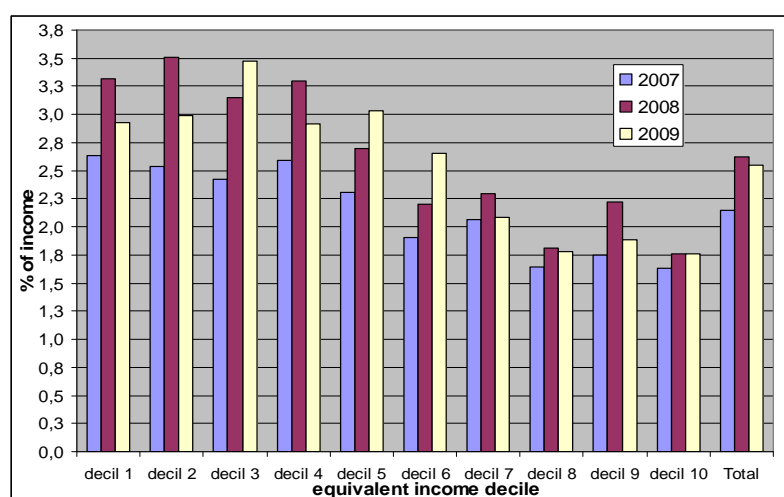
Source: calculated on the basis of data from the Household Budget Survey

The share of income spent on health care according to decile is shown in Figure 5. In 2007, the highest share of income spent on health was by the first, fourth and by the second decile. On the contrary, the richest households spent the smallest share of their income. The distribution of OOP payments had a regressive character although there were no user fees in 2007.

If we concentrate on year 2008, we see that the distribution changed. After the introduction of user fees, households in the second decile spent the highest share of their income, followed by the first and the fourth decile. In addition, households in the second, third and the fourth decile faced the highest increase in comparison to 2007.

The highest share of income spent on health households in the third decile, followed by fifth and second decile in 2009. Furthermore, households in the third decile faced the highest increase. An increase also occurred for households in the fifth and sixth income decile. All other decile spent a smaller amount of their income on health than in 2008. The highest decrease was observed for households in the second decile.

**Figure 5.** OOP payments as a share of income in 2007, 2008 and 2009



Source: calculated on the basis of data from the Household Budget Survey

Patient fees paid by different income decile are shown in Table 10. In total, households in the fourth, fifth and third decile spent the most on fees in 2008. Nevertheless, households in the fourth decile spent much more than households in the third and fifth decile. These households also spent the most on prescription and outpatient fees. Concerning only the expenditure on prescription and outpatient fees, the richer decile, the lower the expenditure was. Interestingly, households in the fourth decile spent much more on inpatient fees than other decile groups. The differences are huge comparing to the seventh, eight but even to the first decile. Dentist fees are more frequent for richer households. Households in the third, fourth and the first decile spent the least. However, dentist fees comparing to other fees had a smallest importance in 2008.

User fees had undoubtedly an effect on the increase in OOP payments and counted for a major part of the increase. Unexpectedly, the increase in OOP payments for households in the fifth and seventh decile was caused only by user fees. There had to be also an increase in another categories of expenditure for other income decile, nevertheless, user fees counted for a major part of the increase.

**Table 10.** Patient fees in 2008 and 2009 (mean per month)

Equivalent income decile	Dentist fee		Inpatient fee		Outpatient fee		Prescription fee	
	2008	2009	2008	2009	2008	2009	2008	2009
decil 1	6.68	5.4	16.23	7.73	32.61	24.05	41.39	27.97
decil 2	9.39	4.49	23.21	15.93	38.28	31.16	48.31	38.57
decil 3	6.27	9.76	27.69	29.86	38.09	33.86	51.33	47.09
decil 4	6.61	5.98	46.34	42.3	40.36	30.37	56.63	42.54
decil 5	9.27	29.11	26.57	16.96	43.68	32.79	53.29	43.31
decil 6	8.92	7.55	32.65	37.29	34.73	30.26	37.66	35.26
decil 7	10.63	7.2	15.41	18.87	37.28	26.5	39.63	31.18
decil 8	9.87	7.65	17.74	15.78	30.37	27.06	31.25	25.94
decil 9	7.64	7.87	20.77	31.33	31.08	25.47	33.13	25.08
decil 10	8.41	6.98	21.13	14.43	29.19	23.19	29.22	23.39
total	8.37	9.21	24.79	23.05	35.57	28.47	42.19	34.04

Source: calculated on the basis of data from the Household Budget Survey



**Table 11.** Increase in OOP payments in relation to fees (in CZK)

Equivalent income decile	Patient fees total		Increase in OOP	
	2008	2009	2007/2008	2007/2009
<b>decil 1</b>	96.91	65.15	116.02	60.78
<b>decil 2</b>	119.19	90.16	149.4	127.23
<b>decil 3</b>	123.38	120.57	146.62	205.33
<b>decil 4</b>	149.94	121.19	174.22	143.37
<b>decil 5</b>	132.82	122.18	116.21	209.46
<b>decil 6</b>	113.96	110.36	146.17	233.02
<b>decil 7</b>	102.95	83.75	86.06	76.36
<b>decil 8</b>	89.25	76.43	98.04	94.13
<b>decil 9</b>	92.63	89.75	190.27	121.46
<b>decil 10</b>	87.95	68.00	118.56	149.51
<b>total</b>	110.91	94.77	134.10	142.00

Source: calculated on the basis of data from the Household Budget Survey

In 2009, the distribution of user fees between decile bands is similar to 2008. However, there was an overall decrease in the paid amount of user fees in comparison to 2008. The most significant drop was observed for households in the first, second and fourth decile. There is an extremely high value in the fifth decile paid for dentist fees. It may be caused by coincidence by few households in the decile with an extremely high amount of paid dentist fees.

Focusing on the distribution of OOP payments among income decile in 2008 and 2009, the summary is as follows:

- Households belonging to the second, first and fourth income decile (the second, third and the fifth decile in 2009) spent the biggest share of net income on health care.
- The smallest share of income is spent by the richest decile (richest five decile)
- Households in the third, fourth and fifth decile spent most on user fees in total.
- Households in the third, fourth and fifth decile spent also most on outpatient and prescription fees.
- Households in the fourth decile spent much more on inpatient fees than other decile groups.

The results showed that the most vulnerable groups are households in the second, third and fourth (fifth) income decile regarding the share of income spent on health care. Households in the fourth decile spent not only a very high share of their income but they also spent a lot on inpatient, outpatient and prescription fees. Therefore I focused on the prevailing characteristics of households belonging to the decile bands with the highest spending. Characteristics of observed households were always compared to average households.

To sum up, the prevailing characteristics of households in income decile bands with highest OOP payments and user fees were following<sup>18</sup>:

- Older heads of households (average between 56 – 61 years with the decreasing age in richer decile)
- The higher number of women as a household head, the lower the income decile
- Households with lower education (the lower decile the lower the level of education; minimum number of households with higher education)
- Mostly household heads with status of a pensioner (decreasing trend with richer income decile)
- Households with a lower number of economically active members and a higher number of pensioners in a common household
- Either households with the place of residence in villages and opposite a lower share of households living in regional cities
- A big share of households of individuals in the lowest decile bands

<sup>18</sup> I analyzed the characteristics according to the information about households from the data sets. Frequencies are not displayed here because of the limited extent of the paper.

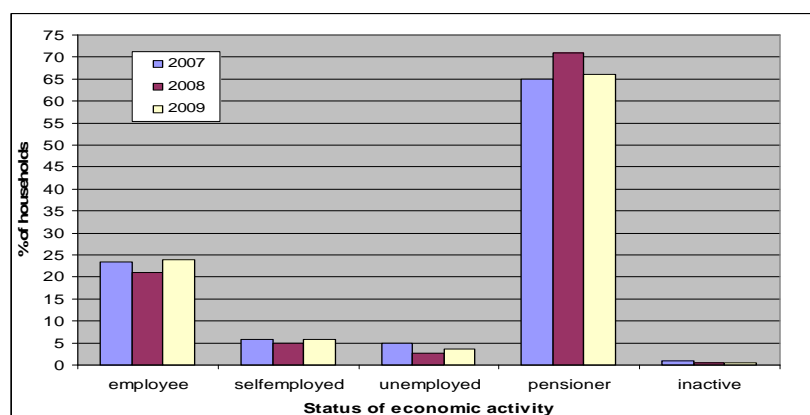
### 5. 1. 5 Households with extreme (catastrophic) payments on health care

This part focuses on the households that faced extreme OOP payments. I defined the extreme (catastrophic) payments as payments on health care as a share of net income above 5 %. The threshold of 5 % was considered being high enough with respect to mean and median values of income spent on health in the observed sample (see Table 3).

In 2007, when there were no user fees, 8.13 % of households spent at least 5 % of their income. In 2008, it amounted for 13 % of households and 11.89 % in 2009. Thus, there was a small decrease between 2008 and 2009.

Households with extreme payments were different from the ‘average’ households. These households were much older than general households: the average age of the household head was around 12 years higher. As a result these households had a higher number of economically inactive members (more pensioners living in a common household) and were also considerably smaller. The number of children living in a common household was very small. Around 89 % of all households with catastrophic payments did not have children. There is a greater share of individual households or of households with a female head. The pensioner status was more than two times as often as in other households in the sample. There was a higher share of households living in big regional cities. Regarding education the number of households with lower education was slightly higher in comparison to all households.

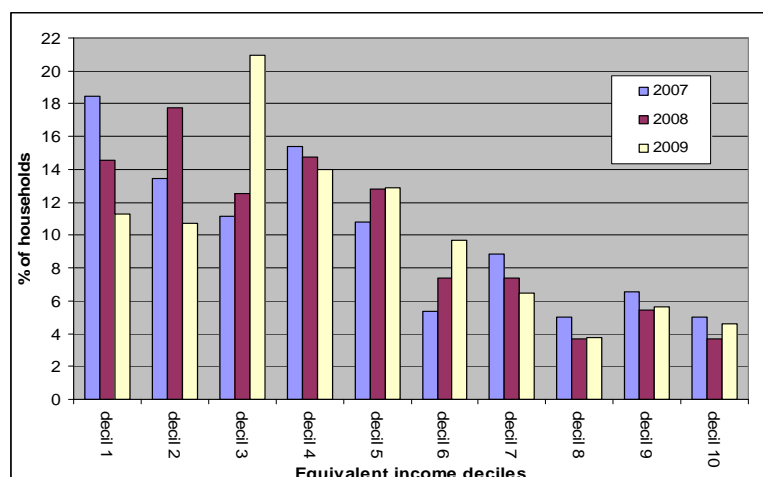
**Figure 6.** Structure of households with extreme payments (according to the status of economic activity)



Source: calculated on the basis of data from the Household Budget Survey

Focusing on the status of economic activity, they were mostly made up of households of pensioners (around 65 % of households). The second most frequent type were the households of employees (around 20 %). There was an obvious increase in the number of households of pensioners to benefit of other types of households after the implementation of user fees.

Extreme payers were particularly the households in the first decile in 2007. In 2008 it switched to the second decile and in 2009 to the third decile. The number of households from the first decile had a decreasing trend. On the contrary, the number of households in the third decile was increasing. It is obvious from Figure 7 that extreme payers are usually from poorer decile. While in 2007 around 68 % of households belonged to the poorest five decile bands, in 2008 it was 72 % and in 2009 around 70 %.

**Figure 7.** Households with extreme payments in 2007, 2008 and 2009 (according to income decile)

Source: calculated on the basis of data from the Household Budget Survey

#### 5.1.5.1 The catastrophic OOP payments according to the categories of health services

Households with extreme payments faced an increase in medications on prescription in 2008 and 2009 as well, although in 2009 with a small decrease comparing to 2008. Expenditure on over-the-counter pharmaceuticals decreased in 2008 but again increased in 2009 comparing to 2007. They also spent a high amount on orthopaedic products and dental care. Particularly expenditure on dental care rose considerably in 2008 and also in 2009.

**Table 12.** Categories of OOP payments in 2007, 2008 and 2009 (households with OOP above 5 %)

Type of OOP	mean			median		
	2007	2008	2009	2007	2008	2009
orthopaedic	194.80	178.17	208.58	45.83	38.25	38.33
other health products	22.90	11.32	19.52	2.75	0.00	2.42
medication on prescription	348.01	401.46	376.53	280.41	338.08	333.67
medication without prescription	283.78	238.38	308.89	199.00	156.00	211.67
outpatient care	113.08	135.19	163.50	0.00	57.50	55.13
dental care	171.60	231.82	266.79	0.00	12.50	33.75
non-medical care	16.83	12.25	24.31	0.00	0.00	0.00
inpatient care	139.20	168.93	168.09	0.00	0.00	0.00

Source: calculated on the basis of data from the Household Budget Survey

Looking at Table 13 we can see that the majority of the increase in OOP payments was caused by the implementation of user fees. OOP payments increased only by 87 CZK but user fees amounted for 241 CZK in 2008. It is a sign of the decrease in expenditure on another types of health care. In 2009, paid user fees also further slightly increased.

**Table 13.** Increase in OOP payments in relation to fees (in CZK)

year	mean fees		increase in OOP	
	2008	2009	2007/2008	2007/2009
total CZK	241.17	245.64	87.32	242.58

Source: calculated on the basis of data from the Household Budget Survey

It emerges from the structure of paid user fees that the most frequent are prescription fees and inpatient fees. Dentist fees are less important. Comparing 2009 to 2008, there was a major drop in the amount of paid prescription fees and a slight decrease in outpatient fees. On the contrary, inpatient fees further increased. However, looking at the median value (which remain unchanged), there is a number of households without this type of expenditure. Surprisingly, dentist fees rose considerably on average, but the median value remained at 5 CZK in both years.

**Table 14.** *User fees in 2008 and 2009 (in CZK)*

Fees	mean		median	
	2008	2009	2008	2009
<b>Dentist fee</b>	10.24	29.45	5.00	5.00
<b>Inpatient fee</b>	83.04	90.46	0.00	0.00
<b>Outpatient fee</b>	54.80	48.25	50.00	40.08
<b>Prescription fee</b>	93.09	77.48	82.25	65.17

Source: calculated on the basis of data from the Household Budget Survey

## 5.2. Multivariate results

Multivariate analyses were used to analyze the relationship between the OOP payments and particular socio-demographic characteristics and to explain which characteristics (variables) had a significant influence on OOP payments.

Results are shown in Table 15 below. OOP payments per capita were used as a dependent variable in the model.

To interpret the results, presence of a pensioner in a household increased significantly OOP payments spent on health in all observed years. Furthermore, households with a pensioner in a common household faced significantly higher expenditure (per capita) since user fees were implemented. Changes in net income had a small impact on OOP payments spent and households spent less on health with each increasing unit of income after the implementation of user fees than in 2007.

Focusing on the age of a household head, the head of households aged 18 to 30 spent significantly less than other age groups in 2007 – 2009 and a difference was even deeper in 2008 and 2009 comparing to the reference group. All other observed age groups spent on health more than the reference group. Comparing 2008 to 2007, the difference in spending of age group 31 to 45 and 46 to 55 was smaller. On the contrary, households in age group 66 and more faced a bigger increase than the reference group comparing 2008 to 2007 and a mild increase when we compare 2009 to 2007.

Women spent on health more than men, however, after the implementation of user fees the difference between gender was smaller an increasing trend in 2009.

The more children in a common household, the less the spending is on health (per capita) in comparison to households without children. In 2008, the difference between households with children and without children was smaller than in 2007, but in 2009 the difference was again deeper. On the contrary, households of an individual spent the most and after the implementation of user fees they faced a significantly higher increase.

Households spent more on health with the increasing level of education. The amount of OOP payments of households with secondary education was closer to the amount spent by households with lower education after the implementation of fees. Unlikely, households with higher education spent slightly less in 2008 than in 2007 but in 2009 they spent much more than households with lower level of education.

Since 2008 there were no significant differences in OOP payments according to the place of residence of households.

Results of the regression analysis showed that households with the following characteristics faced higher OOP payments (per capita) in the observed years:

- households with older family members; households with pensioners in a common household
- household without children and one-person households
- women
- households with a higher level of education

**Table 15.** *Generalized linear model (Gamma distribution, log link function)*

	2007	2008	2009
adjusted R	0,1341	0,0863	0,1206
(Intercept)	4.665*** (.0931)	4.938*** (.1059)	4.992*** (.1056)
number of pensioners	.128** (0.0372)	.133** (.0411)	.166*** (.0398)
income_thousand	.016*** (0027)	.012*** (.0026)	.012*** (.0022)
age_30	-.235** (.0731)	-.306*** (.0791)	-.299** (.0929)
age_55	.172** (0572)	.156* (.0634)	.185** (.0632)
age_65	.250*** (0704)	.270** (.0835)	.214** (.0708)
age_66	.322*** (0783)	.416*** (.0851)	.339*** (.0850)
female	.271*** (.0551)	.180** (.0676)	.198** (.0630)
household_child	-.405*** (0711)	-.294*** (.0639)	-.399*** (.0681)
household_2children	-.585*** (0644)	-.453*** (.0641)	-.476*** (.0709)
household_morechildren	-.966*** (.0964)	-.667*** (.1157)	-.828*** (.0980)
individual_household	.181** (.0642)	.300*** (.0759)	.247** (.0739)
secondary_education	.199*** (.0370)	.160*** (.0419)	.128** (.0386)
higher_education	.351*** (0560)	.233*** (.0562)	.356*** (.0578)
regional_city	.145** (0439)	.092 (.0482)	.080 (.0455)
village	-.041 (.0361)	.028 (.0366)	-.020 (.0399)

Source: calculated on the basis of data from the Household Budget Survey

Note: Significance level at \* 5 % \*\* 1% \*\*\* 0.1 %

Reference categories: age 31 - 45, male, household without children, lower education, town.

Nevertheless, the above mentioned characteristics of households had influenced the expenditure on health even before the implementation of user fees. As was shown, households with a higher level of education spent more on health. This might be a sign of awareness of the value of health. Although households with higher education spent much less in 2008 probably as a result of savings connected to a new expense on health (fees), they calculated with user fees in the next year (in 2009) and spent even more than in 2007.

Focusing only on the major changes in parameter estimates, households with the following characteristic faced significantly higher expenditure after the implementation of user fees:

- households with a head of household older than 56 years and particularly 66 and more
- households of an individual (one-person households)
- households with more pensioners in a common households

Particularly these characteristics construct a profile of prospective most vulnerable households.

## 6. Discussion

The Czech Republic belongs to the countries with a low level of private health spending even after the implementation of user fees (see for example the database of WHO). Czech patients do not have to pay as some western Europeans do (and I don't mention other poorer countries). The burden of household budget for the Czech patients is much lower than in comparison to the countries mentioned in section 2 of the paper. I used the catastrophic payments threshold at the level of 5 % and I related it to the net income. Still, the number of households that exceeded this threshold was around 11 %. Using the threshold of 10 %, the number was only around 2 %. Of course, these numbers are very low, but in the Czech context they represent a relatively high burden for some households. Regarding the annual counter, there were an insignificant number of households in the data sets that reached the counter in 2008 and 2009. Therefore the results were not discussed.

Unfortunately, there was no information on the health status of patients in the used data sets. Currently, there is no survey which would include income and expenditure data and health status information. Therefore I used as a proxy of morbidity the age and the status of pensioner. Of course, this is the most important limitation of the analysis.

It is obvious from the results from 2009 that there was a decrease in out-of-pocket payments and in the burden as well. This can be explained not only by some modifications in the policy (more exemptions, lower annual counter for some patients) but also by the regional policy. In fact, there were much more exemptions from paying patient fees. But they widely varied between regions and even between cities. Although I am aware of some biases, the results shade some important aspects of out-of-pocket spending in the Czech Republic.

## 7. Conclusion

The implementation of user fees led to the increase in the burden of household budgets, which is not surprising, because user fees were a new type of health expenditure. Nevertheless, as was shown, there are still some households with no expenditure and the majority of households spent a small share of their budget on health care. The most vulnerable groups are households of pensioners that spent the most on health care not only in relative terms but also in absolute terms. Relating to the income, households of inactive individuals and unemployed also spent a big share of their budget. Policy opponents often claimed that it is necessary to protect households with children. However, the results did not confirm that households with children belonged to the vulnerable groups. Contrarily, they spent a much smaller share of their income on health care and also per capita when the size of household was adjusted.

Whether we focus on households according to income deciles bands, richer households tended to spend more in absolute terms. However, if we relate the spent amount on OOP payments to the household income, then we find out that poorer households had higher expenditure. Nevertheless, OOP payments have already had a regressive character before the implementation of user fees.

It emerged from the descriptive analyses that households with older members and with pensioners spent the most on health care. Households without children or one-person households had also higher expenditure. Another critical combination was when the household head is a woman (sign of an incomplete family). These results were also confirmed by results of multivariate analyses. Higher burden of household budgets were likely to be related more to lower income and also to lower education (even if in the absolute spending per capita, households with higher education spent more).

The most was spent on pharmaceuticals. Particularly households of pensioners spent the most on prescribed medications and on prescription fees. They also paid a lot for outpatient and inpatient fees. There is missing a regulation of maximum number of inpatient days in the Czech Republic for that the patient has to pay an inpatient fee. Such a regulation would protect particularly pensioners from high expenditure for a long-term inpatient stay. It is not possible to abolish outpatient and prescription fees for pensioners due to regulatory purposes (regulation of health care consumption). However, there should be another protective feature for poor pensioners (for example lower rate of a fee and lower annual counter).

Policy-makers should consider carefully before the other increase in OOP payments whether protective features should focus only on particular socio-economic groups or also on the different levels of household income. The status of pensioner is an important sign, but on the contrary, presence of children does not have to be always related to the high burden. It seems that more important than the socio-economic status is the level of household income. Thus, exemptions from paying should not be applied implicitly for the particular group, but they should either take into account the income level of the group.

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