

HOW DOES THE INTRODUCTION OF HEALTH INSURANCE CHANGE THE EQUITY IN THE HEALTH CARE FINANCING IN BULGARIA

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Abstract

The study examines the effect of the health care reform in Bulgaria in 1999 on the equity of health care financing. It explores the distribution of different types of health care financing over income. Furthermore, it separates the financial and socially-related reasons for these differences dividing them into vertical and horizontal inequalities. It suggests a method of distinguishing between financially based and “exclusion based” reasons for having progressive/regressive health care financing. Moreover, it looks at the social factors which shape the health expenditure patterns and determines those social characteristics which lead to exclusion from the health care system.

Keywords: health care financing, equity in health care financing, income inequality, redistribution

INTRODUCTION

Since the start of the transition period in Bulgaria in 1989 all social systems have undergone dramatic changes. These changes have had a significant influence on all of the factors determining the population's health. These factors may have arisen from sources outside of the health care system, such as household and community related factors and government policy as well as within the health care system itself. The process of transition has increased the social inequalities in the society by bringing a vast part of the population into poverty and at the same time shattering social security systems. Moreover, Bulgaria's transition phase has exhibited particular influence over the health care sector, including various quality, equity and efficiency problems and a substantial decrease in health outcomes (Koulaksazov et al. 2003).

During the 1990's the health sector in Bulgaria has continued to be characterised by the Semashko model of central planning (inherited from the communist era). The system was financed by general taxation, with public ownership and management of the health care facilities. The universal entitlement to health care had to be delivered by a health care system which was increasingly inefficient and under-financed. In addition, the political and economic crises in the 90's slowed the reformation of the health care system, resulting in financial malfunctioning within the sector, including increased public debts for the health entities, and a glut of corruption and informal payments. All these factors led to the break with the comprehensiveness of health care and left the most vulnerable part of the population without access to the health care system.

In order to understand the equity challenge for health care reform, the research will highlight the most relevant processes preceding its start. Economically, Bulgaria has gone through several shocks during the transition period. The country experienced economic crises in 1996-1997, including hyperinflation in 1997. The living standards of the population dropped

substantially. This crisis had several consequences for the process of health care delivery including decreasing the ability of the system to provide health care, and increasing the need for it.

Traditionally in the communist countries the salaries of the medical staff were kept at 70-80 percent of the average salary, which did not change after the transition (Thompson et al. 2000). As a reaction to underpayment, physicians have been topping up their income with under-the-table payments as a price for their work. Surveys on informal payments for health services in 1998 – 1999 show up to 51% of the respondents paying for services which are officially free (Balabanova et al. 2002a; Ministry of Health 2001). In addition the lack of affordable treatments and drugs has been a serious issue for the population. In 1997 16% of the respondents of a survey stated that whilst ill they had not consulted a doctor, because they could not afford it (Balabanova et al. 2002b).

Moreover, the percentage of the unemployed population was rising. The unemployment rate reached 15.0% in the urban areas and 17.3% in the rural areas in 1997 (Ministry of Health 2001). This brought a large proportion of the society into poverty and dependence on state welfare. Furthermore, with the increase in poverty, the lifestyle of the population exhibited greater unhealthy behaviours. Uitenbroek et al. explained this phenomenon in the transition countries with the focus of the population on increasing socio-economic problems (1996). Similarly, governmental policy could not pay the respective attention to lifestyle related problems, because of the priority of macroeconomic reform policies (Balabanova et al. 1998). These factors led to a decline of health status. Simultaneously, the ageing of the population increased the number of the people who needed health care, and at the same time could not afford to pay for it. The worsening health status of the population, combined with both

impoverishment and an increase in out-of-pocket payments for health care, pointed towards serious equity issues in the provision of health care.

A health care reform was introduced at the end the 1990's. The start of the reforms in 1999 had to face worsening health and health service problems, decreasing authority of the medical professionals and enormous tensions in the system as a whole. Furthermore, the financial protection in health care sector was severely undermined and there was lack of cooperation with the other social sectors. The constitutional rights of citizens to "medical insurance guaranteeing them affordable medical care, and to free medical care in accordance with conditions and procedures established by law"(Constitution of Republic of Bulgaria 1991 Article 52, s.a. 1) were disregarded.

In the existing literature there are detailed descriptions of the health care reforms, the most comprehensive of which is the National Health Strategy (Ministry of Health 2001). This study will only outline those elements which have a direct impact on the equity of the health care provision. The reforms introduced a system of compulsory health insurance. It is financed by six percent hypothecated health tax on the income. For the non-earners the tax is paid accordingly by different social security systems, so that ideally the whole population would be covered. Nevertheless, the bureaucratic process of unemployment registration has left a significant part of this group in an uninsured position. This has left financial obligations, which for some people have become a serious financial burden. In addition, there is a ceiling for the maximum health care contribution making the tax very regressive for the high earners.

On the point of delivery of health care, there is fee for service payment in the outpatient sector and per diem payment in the inpatient sector. Additionally, regardless of significant growth in public expenses for pharmaceuticals, patients pay for the majority of the drugs out-of-pocket

(OOP). Health care facilities were decentralised, and many were privatised in order to stimulate competition between them, leaving some strategic areas under governmental control. The goal of the reform is to improve the “health of the nation by building pluralism, democracy, accessibility, equity, solidarity and shared responsibility for health” (Ministry of Health 2001). As in most of the other transition countries, social insurance was introduced with the expectation that it would generate additional revenues for the health care system (Thompson & Witter 2000). Still, these revenues have been growing slowly in Bulgaria and at the same time the other sources of financing have been significantly reduced (Hutton 2002). As a result the general health expenditures in the country did not rise as expected. They are still under 4.5% of the GDP although the plan in the beginning of the reform was that they will reach 6% by 2006 (Ministry of Health 2001).

RESEARCH GOALS

There are many ways to approach the equity theory. It is not a clear ethical concept. The equality of one variable can often clash with the equality of another. In his book “Inequality Reexamined”, Sen explains this clash with the actual diversity of the human beings and the diversity of focus. To solve these problems he rephrases the search for equality on a practical level to one question: “Equality of what?” (2003). To answer this question this research will use the egalitarian definition of the equity of health care provision implied by the Bulgarian Constitution: distribution according to the need and financing according to the ability to pay (Gillon 1986; Van Doorslaer et al. 1993). This study will focus on the ability of the reformed health care system to address the equity in the health care financing challenge during the transition phase (1995-2001).

Equity and health inequalities have been a major focus of research in the OECD and developing countries. The existing research on Bulgaria shows an increase in the inequalities

regarding the access to health care at the end of the 1980's (Minev et al. 1990). The most recent research examines the problems of informal payments (Delcheva et al. 1997), public attitudes towards payments for health services (Pavlova et al. 2002) and spatial and temporal access (Balabanova & McKee 2002b; Pavlova et al. 2003) during the prereform period. This data reveals deepening equity problems in the health care provision in Bulgaria, however, there remains a paucity of evidence regarding the ability of the current health care reform and health care insurance to address these issues. Therefore, this research will examine:

- Who is paying for health care? How has this changed during the transition period?
- Are those who need health care able to receive it? If not, why? How has this changed during the transition period?

The study examines the above questions by looking at several aspects of the health care financing. Firstly, it examines the structure of different types of health care financing and their change during the reform. Secondly, it explores the relationship between income and health care expense. Thirdly, it separated the financial and socially-related reasons for differences in health expenditure by dividing them into vertical and horizontal inequity in health care financing. Fourthly, it looks at those social factors which shape health expenditure patterns and determines those social characteristics which lead to exclusion from the health care system. Finally, the research examines changes in health care utilisation in relation to need and income distribution.

DATA SOURCES AND METHODOLOGY

The research will make use of the Living Standards Measurement Surveys of the World Bank, which are household surveys for the years 1995 and 2001. The aim of the research will be to compare the equity of the prereform and the post-reform health care provision. The surveys use standardised questionnaires including questions for self-assessed morbidity, socio-economic status, health care utilisation and expenditure. These are available on a household and personal level, encompassing 2400 households, or about 7000 people.

Additional data was obtained from the Bulgarian National Health Insurance Fund, Health Information Center, National Institute of Statistics and the Institute for Trade Union and Social Research in Bulgaria (ITUSRB) regarding the distribution of resources, diseases and general health care accounts. Research aims to investigate the different determinants affecting the dimensions of population health so that factors which are specific to the transition period can be identified.

There will be two main directions of the analyses: measuring equity in financing, and measuring equity in benefits. Inequalities will be investigated on both a ‘vertical’ level – if unequal need or ability to pay is treated with according inequality, and on a ‘horizontal’ level – if equal need or ability to pay are treated equally (Van Doorslaer et al. 1993). Therefore, the analyses will combine mechanisms measuring health differences between population groups and health distribution across individuals (Anand et al. 2001).

HEALTH CARE EXPENSES AND INCOME DISTRIBUTION

An inequality measure is usually defined in terms of deviation of a given distribution of a variable from the “ideal distribution”. The equity measures represent deviation from perfect equality, which in our case is an egalitarian distribution. This comes from the presumption

that each individual has an identical utility function with diminishing marginal utility (Kakwani et al. 1980). According to the chosen definition of equity, our research question could be translated into estimation terms as defining if the health care payments are distributed proportionately to the income.

The Gini coefficient attempts to measure the deviation from the perfect equality without regard of the actual function. Mahalanobis (1960) extends and generalizes the concept of the Lorenz curve into the so-called concentration curves. Kakwani (1977a) examines the distribution of different economic variables and gives a more detailed explanation of the concentration curves. Concentration index of a commodity is closely related to its elasticity. Kakwani brings the idea of comparing the elasticity of the different goods by plotting their concentration curves with the Lorenz curve. This gives the opportunity of comparing the distribution of the expense for certain goods to the distribution of the income. By means of these concentration indexes Kakwani (1977a) introduces an index of the elasticity (inelasticity) of a commodity. This index indicates the extent to which elasticity deviates from unity over the whole income range.

The concentration curves, first used by Wagstaff et. al. (1989) in health research, are a standard measure of equity and inequality in health and health care (Koolman et al. 2004). Therefore, for the purposes of this research, plotting the concentration curve of the health care expenses will help comparing their distribution with that of income. “The concentration curve, and related concentration index, provides a means of assessing the degree of income-related inequality in the distribution of a health variable” (World Bank 2004a; World Bank

2004b)¹. The concentration index (C) measures the area between the diagonal (or the line of perfect equality) and the concentration curve - $F(h)$ (Kakwani 1977b; Kakwani & World Bank. 1980; Kakwani et al. 1997; Wagstaff et al. 1989):

$$(E 1) C=1-2\int_0^1 F(h)dh.$$

C can take values between -1 and 1. If C equals “-1” then all of the observed variable is concentrated in the poorest person. If C equals “1” then all of the observed variable is concentrated in the richest person. When C equals “0” then the observed variable is distributed on average equally across income. Nevertheless, a “0” value for C does not mean that everybody in the society possesses equal portion.

Furthermore, Kakwani (1977b) offers a method of assessing the deviation of the distribution of the commodity from the income distribution. This is the so-called Kakwani index of progressivity (K), which equals the Concentration index minus the Gini coefficient (G) (Kakwani 1977b; Kakwani & World Bank. 1980; Wagstaff et al. 1999). K is defined as:

$$(E 2) K = C - G$$

K equals twice the area between the Lorenz and Concentration curves. If the system is regressive then K is negative, and if the system is progressive then K is positive. K can take values between -2 and 1. When $K=-2$ then the income is concentrated in the richest person and the poorest person pays all of the income tax. When $K=1$ then the pre-tax income is distributed equally and the entire tax burden is borne by the richest person. If $K=0$ then there is, on average, proportionate taxation (Wagstaff et al. 1999).

¹ The series of 20 Technical Notes of the World Bank includes elaborate description of the quantitative methods for the analysis of health sector inequalities: Edited by A Wagstaff, O O'Donnell, E van Doorslaer and M. Lindelöw, published by the World Bank, 2004.

One of the problems with the Kakwani coefficient is that it is very sensitive to the measurement of the Gini coefficient. As health care expenses are a necessity rather than a luxury (Kakwani & World Bank. 1980), then there are two main factors to determine the Kakwani coefficient. The first is income inequality and the second is the ability of the health system to provide health care according to the ability to pay. Nevertheless, a failure in the system to provide equitable financing for health care will result in relatively worse health equity if there is higher income inequality. In other words, the income inequality factor plays a very significant role in the maintaining of equitable health care financing. The way in which health care should be financed should be able to respond to the needs of the society and the general economic state in order to maintain a healthy society.

INCOME, GINI COEFFICIENTS AND EQUIVALENCY SCALE

Considering the importance of the proper choice of an income variable the study will examine the different options. Gini coefficients based on the income of the LSMS surveys give significantly different results from the official statistics for Bulgaria. The main reasons for the differences are the use of income (instead of consumption) as the base for the estimation of the Gini coefficients, differences in the equivalence scales, unit in the surveys (household or person) and the way in which the income variable has been constructed.

The Inequality Database of the United Nations offers a comparison of the Gini coefficients published officially by different national and international organisations (United Nations 2005). The Gini coefficients vary within significantly broad intervals. The interval for 1995 is between 0.283 and 0.3896. In 2001, it varies between 0.3215 and 0.5396. Several conclusions can be drawn from this data. Firstly, the income-based Gini coefficients are significantly higher than the consumption/expenditure based coefficients. As this study is interested in the

people's ability to pay it will look at the income variable which gives more inflated results. This might be a result of minimum changes in consumption patterns during the observed period. Secondly, the discrepancies in 1995 and 2001 between the income and consumption-based income differences grow significantly. The interval rises from 0.106 to 0.216. The Bulgarian National Statistics Institute reports Gini coefficients of 0.36 for 1995 and 0.317 for 2001, which rises slightly to 0.34 for 2002 (National Statistical Institute 2004). These results are relatively low and do not appear to show social changes, most likely because they are based on consumption variables.

For the purpose of this research the income variable is based on a gross, per capita income equalised with an equivalency scale constructed on the base of the per capita consumption of the households in Bulgaria. The equivalency scale is estimated on the quarterly observations of the consumption patterns in Bulgaria by age group by the ITUSRB, which publishes the only official poverty line and minimum living standard estimates (2004).

The scale is developed from the quarterly data for the monthly expenses of a four-member family and a single person by age. The values estimated by the ITUSRB are for the period December 2003 – December 2004, and are based on monthly household diaries, which give average monthly consumption, by person, by age (Ivanova 2003). There have been constructed two equations presuming that each member added to an existing household saves a fixed sum of his income compared to his expense if he was single. According to the age people have different expenses given by the estimated age-price baskets. The average percentage of the cost of living for the above years by age multiplied by the number of people by age in the LSMS data should equal the average in the society estimated by ITUSRB multiplied by the total number of people in the LSMS. The ITUSRB data provides an average cost of living for a working person. This yields the following equations:

$$(E 3) X + (X-s) = 2 * Cw$$

$$(E 4) (C3-s)*N3 + (C6-s)*N6 + (C13-s)*N13 + (C18-s)*N18 + X*N1 + (X-s)*N2 = Ca*Na$$

X - is cost of living for the head of a family; s - is saving from living in the household; Cw - is cost of living of a working person; $N1$ - is number of heads of the families in the dataset; $N2$ - is number of grownups who are not heads of families in the dataset; Nm - is number of members in the age group where m is the highest age in the group; Cm - is average cost of living by age; Ca - is average cost of living; Na - is total number of people in the sample

The solution of these equations gives the following relations between the family members:

Table 1 Equivalency scale

Head of a family	Grown up in the family	Child 0-3	Child 4-6	Child 7-13	Child 14-18
1	0.88	0.36	0.39	0.61	0.69

This equivalency scale is based on the consumption patterns in Bulgarian society during the transition period and considers the price relations in the country. Although, the consumption baskets are from a period, which does not include the years of the LSMS surveys it is believed to be much closer to the consumption patterns from the surveyed years than the one presumed in general equivalency scales such as the OECD scale.

STANDARDISATION

Existing inequalities in health care financing may be due to differences in the ability of the individuals to pay, or due to differences in the way the system treats individuals with different social characteristics. Therefore, there can be distinction between income based inequalities

and social status related ones. The method of standardisation for income group helps us distinguish between inequalities in the health care financing due to unequal treatment on economic grounds - unequal ability to pay or vertical inequalities, and inequalities based on differences in the social status. Kakwani uses this method to exclude from the analysis of health inequalities the unavoidable (policy-irrelevant) inequality, or the one that does not depend on the health care system arrangements (Kakwani et al. 1997). In terms of health care financing, the standardisation method provides a measure of the vertical inequality.

Methods of direct and indirect standardisation may be used.² The indirectly standardised health care expense variable (y) is the difference between observed and expected values of y (E 5). The expected y for the i -th person is the average y for the individuals with the same standardising variables as i (Gravelle 2003). The aim of the standardisation is to see the distribution of the variable of interest y in the absence of differences in the distribution of certain standardising variables (x). The regression equation is thus:

$$(E\ 5) \ y_i = \alpha + \sum_j \beta_j x_{ji} + \sum_k \gamma_k z_{ki} + \varepsilon_i$$

i denotes the individual and z are variables that are not standardised, but which are controlled for in the estimation of β_j . The standardised distribution of y is the distribution that can be expected to be observed if there were no differences in the x 's (World Bank 2004c; World Bank 2004e).

If C is the unstandardised Concentration coefficient and CI is the standardised Concentration coefficient then:

² The biggest disadvantage of direct standardisation is that it can only be used with grouped data and if used with individual data loses the precision from the grouping process (Gravelle 2003; Kakwani et al. 1997; Wagstaff et al. 1998).

$$(E 6) \Delta C = C - CI$$

In the case of health care expenses the index has a reverse meaning from the original index as it measures expenses ranked by income not utilisation (Kakwani et al. 1997). ΔC has negative/positive values if vertical inequalities are favouring the more/less advantaged members of the society.

ΔC shows the progressiveness/regressiveness of the health care payments only due to health care financing arrangements. The difference between the Gini coefficient and ΔC is then a measure of the vertical equity (Ev).

$$E 7 \quad Ev = G - \Delta C$$

Ev measures the arrangements of the system providing financing according to the individual ability to pay. If Ev is positive/negative, this will mean that the financing of the health care system is progressive/regressive. If Ev is equal to 0 then the financing of the health care is on average equitable.

DECOMPOSITION ANALYSIS

Standardisation assists in estimation of vertical inequalities. Still, the horizontal inequalities between different social groups are associated with various social arrangements. Each aspect of the socio-economic status of an individual can have different effects on the health and health care related inequalities. Therefore, the next step will be to study these effects by decomposing the inequality measure by studying the effect of the different socio-economic groups. The decomposition analysis reveals the relative contribution of these various factors in explaining the total inequality. The inequalities are country specific and the health sector outcomes can vary according to the ability of the system to target the country-specific inequality driving factors. The decomposition health inequality analysis has been used mainly in the analysis of the health inequalities (Claeson et al. 2002; Van Doorslaer et al. 2003; Van

Doorslaer et al. 2004b; Wagstaff et al. 2003; World Bank 2004c) and service utilisation (Van Doorslaer et al. 2004c; World Bank 2004e). This analysis also contributes to the understanding of the equity in the health care financing by mapping the disadvantaged and potentially excluded groups. This analysis provides the basis for the distribution of targeted subsidies and increases in the equity of health care financing.

The method of Indirect standardisation uses the concentration index C (E 1) as a measure of relative income related inequality. C can be computed using the covariance between y_i (health care expenditures or service utilisation) and the relative fractional rank (r_i) such that:

$$(E 8) C = 2/\bar{y} * cov_w(y_i, r_i)$$

Where \bar{y} is the (weighted) mean of y and w_i is the sampling weight if each individual i .

Wagstaff et. al. use (E 5) to decompose the measured degree of inequality into the contribution of the explanatory variables (2003). The x variables are a set of regressors associated with the independent variable. They are exogenous variables that effect the y variable. Therefore, the concentration index can be rewritten as:

$$(E 9) CI = \sum_k (\beta_k * \bar{x}_k / \bar{y}) C_k + C_\varepsilon / \bar{y}$$

\bar{x}_k is the mean of x_k and C_ε is the generalised concentration index for ε_i . The concentration index CI then consists of the weighted sum of the concentration indices of the k regressors and the residual component. The “shares” of the regressors are the elasticity of y to x_k . The residual component is the inequality that cannot be explained by the variation of the explanatory x variables. Thus, the total inequality is divided into the inequalities added by each group of x_k . The decomposition allows for seeing the contribution of each separate regressor by its impact on the demand/need, measured by the elasticity and the degree of unequal distribution across income measured by the C_k (Van Doorslaer et al. 2004a).

Van Doorslaer and Jones A.M. point out that the method has some disadvantages concerning the definition of the policy relevancy of variables (2004a). Van Doorslaer et. al. (2002) and Schokkaert et. al. (2004) note that the inclusion of the non-need or policy based variables can add to the model. Gravelle (2003) develops a model of “partial concentration index” which controls for income and other non-standardising policy-related variables. Thus, he defines three types of x variables x : income (x_i), policy-relevant (x_p) and policy irrelevant variables (x_n). The index is a measure of the ‘policy relevant income related inequality’(p. 804). It is estimated by removing the effect of the policy irrelevant or standardising variables. Gravelle defines as policy irrelevant variables those, whose effect on y or whose joint distribution with income cannot be altered by policy (p. 804). Then the concentration index equals:

$$(E 10) \quad C_2 = (\beta_i \bar{x}_i / \bar{y}) C_i + \sum_p (\beta_p \bar{x}_p / \bar{y}) C_p + \sum_n (\beta_n \bar{x}_n / \bar{y}) C_n + C_\varepsilon \bar{y}$$

The first term is the partial contribution of the income to the inequality (C_i is the Gini coefficient), the second is the contribution of the policy irrelevant variables, the third is the contribution of the policy relevant variables, and the last term is the residual term which presents the correlation between the residual and the income rank.

The decomposition offers an alternative estimate of vertical equity (E 6):

$$(E 11) \quad VE = C - \sum_n (\beta_n \bar{x}_n / \bar{y}) C_n = (\beta_i \bar{x}_i / \bar{y}) C_i + \sum_p (\beta_p \bar{x}_p / \bar{y}) C_p + C_\varepsilon \bar{y}$$

VE is the “augmented partial concentration index” used by Gravelle (2003). It estimates the policy relevant measure of income related inequality. It excludes from the unstandardised concentration coefficient the need based (policy irrelevant) inequalities. The residual term is the difference between the actual and the standardised concentration index. There is a debate in the literature if the residual term should be included in the policy relevant or need based category (justifiable or unjustifiable inequality). In the original index developed by Gravelle this term is excluded, which supposes that those variables which are not included in the equation are need based and therefore provide need based inequalities. In contrast Van

Doorslaer et. al. (2004c) suppose that the inequality unexplained by the standardised equation is a result of the policy relevant factors. Considering the possible data limitations, this research will treat the inequality expressed by the residual term as unjustifiable and will include it in the policy relevant income inequality.

Gravelle's index is defined as the directly standardised C (Van Doorslaer et al. 2004c). It employs the regression equation to estimate the elasticity of the separate factors. Therefore, when excluding the effect of the X variables the method only extract the effect of the variables, which are compared to the omitted dummy variables in the equation, because it does not estimate their effect. Furthermore, the policy relevant inequality expressed by the index depends on the choice of a base income group (need) variable. The standardised C excludes the complete effect of all standardising variables. Therefore, it is a better measure of the policy relevant inequality. Nevertheless, the method gives a way of viewing the effects of the separate factors and their contribution to the general inequality.

BENEFIT INCIDENCE ANALYSIS

The analysis methods described so far help explaining the inequality distribution of the financing of the health care but it does not facilitate understanding of who actually receives the benefits from these payments or who uses the health care funds. Equity as an objective of the health care system can be reached by developing target groups and subsidising different areas. The recipients of these subsidies are not always the target groups. Benefit incidence analysis helps assessing the targeted efficiency of the public subsidies. It also reveals the horizontal equity distribution in health care delivery – if people with equal need are treated equally. Benefit incidence analysis describes the distribution of health sector subsidies across individuals ranked by their income (World Bank 2004d). This distribution shows if the subsidies benefit the poor and close or increase the inequality gap.

Average unit costs are used to estimate the amount of the subsidy. The subsidy received by each individual for each service is equal to the number of times using the service multiplied by the unit cost.

RESULTS

ILL HEALTH AND HEALTH CARE EXPENDITURE

Figure 1 and 2 present the health care expenses and the health care need by income quintile and type of health care payment for 1995 and 2001. There does not appear to be a significant correlation between income distribution and the occurrence of ill health or disability for the two years. Nevertheless, out-of-pocket payments constitute the majority of health care expenses. This particularly influences the low-income quintiles when people suffered from illness in 1995. Their out-of-pocket expenses are more than twice as large as the average and are larger than those of the long-term disabled. Therefore, total health care expenses are substantially larger for those who have been ill. For the upper quintiles, the occurrence of disease does not appear to play such a significant role. Long-term disability also shapes the expenditure curves, and there is a positive trend in both out-of-pocket and total payments with the increase of the income. In comparison, the health expenditure distribution in 2001 seems to have a much clearer trend in that there is an increase in spending with an increase in income. This may be influenced by the relatively lower number of the ill and disabled in the lowest quintile. Still, the occurrence of both risks has significant influence on expenditures, but in comparison to 1995, it seems to have a more substantial impact on the high-income groups. In 2001 the rich were spending more out-of-pocket while needing health care. The positive trend in the total health spending in all groups is additionally shaped by the progressiveness of the health insurance tax, and the percentage of general taxes that are spent on health care.³ It may be noted that, after the reform, the health insurance contribution and the “tax financed” health expenditures are an insignificant part of the total health expenditures and, therefore, insufficient to change their distribution. Although this gives progressivity to

³ The tax health expenditures are estimated as a certain percentage of the tax paid. The percentage equals the total government spending on health care of the total tax collected for the year.

the health care expenditures, the poor have very significant out-of-pocket contributions. The introduction of health insurance does not appear to have changed the problem with large expenses associated with the experience of ill health. Should the poor experience a health risk, it can produce a shock effect on their budgets and create additional social problems.

Figure 1: Health care expenses by type and by quintile 1995

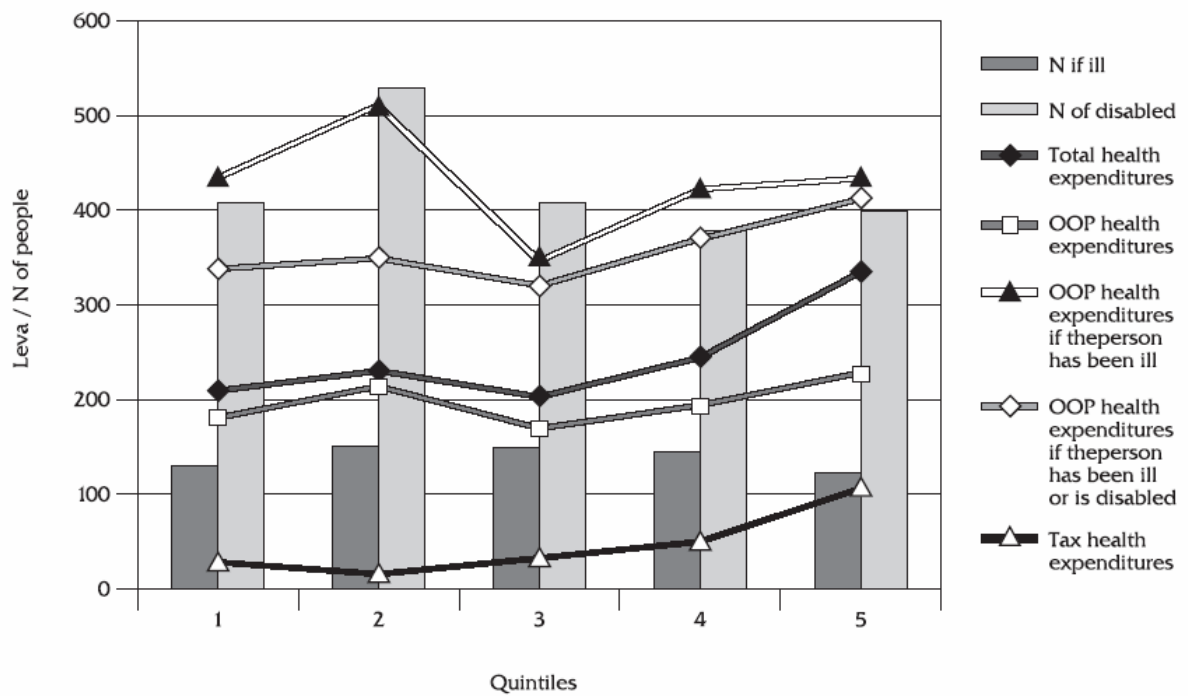
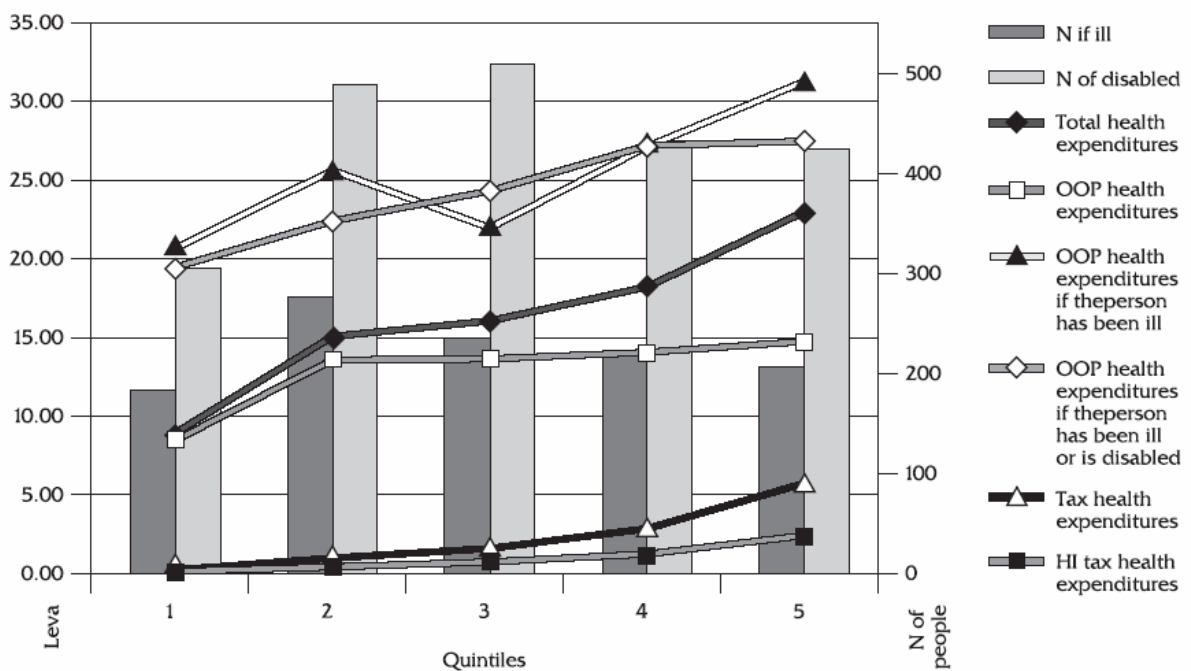


Figure 2: Health care expenses by type and by quintile 2001



INCOME DISTRIBUTION AND HEALTH CARE EXPENDITURE

To look more closely at the health expenditures distribution in comparison to the income distribution, the study will examine the Lorenz and the Concentration curves for 1995 (Figure

3) and 2001 (Figure 4). The curves are a method of visualising the equity of the different types of health care payments. An equitable distribution will be the one which has a concentration curve coinciding with the Lorenz curve. In this case people will be paying for health care according to their ability to pay (their income). Any curve that lies below the Lorenz curve will have a progressive taxation effect on income, and any curve above it will have a regressive effect. Thus the areas between the Concentration curves and the Lorenz curves can be compared. This comparison can be numerically presented by the Kakwani coefficient – Table 2 (E 1 and (E 2). If the curves do not coincide it will be clear which distribution is more progressive/regressive, and if they do coincide, then should be taken into account the marginal utility of the individuals above and below these points. While using Concentration and Kakwani Coefficients each individual is given equal marginal utility. In other words, they treat the poorer and the richer person as having equal benefit from any additional unit of income. Therefore, both the curves and the coefficients should be examined.

Table 2 Gini, Concentration and Kakwani coefficients

Year	Gini coefficient	Concentration coefficients				Kakwani coefficients			
		Out-of pocket payments	Tax payments	Health insurance payments	Total health payments	Out-of pocket payments	Tax payments	Health insurance payments	Total health payments
1995	0.354	0.034	0.359	no	0.096	-0.320	0.005	no	-0.258
2001	0.468	0.072	0.466	0.443	0.152	-0.396	-0.002	-0.025	-0.316

Figure 3: Lorenz and Concentration Curves 1995

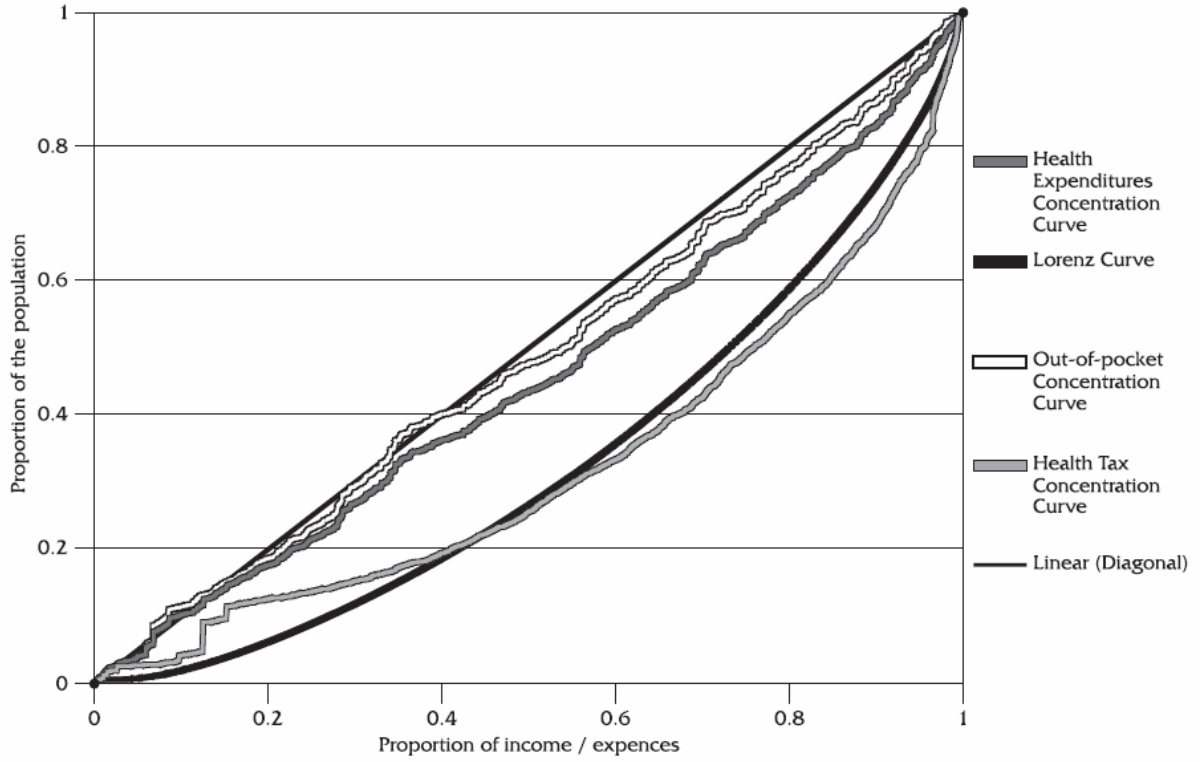
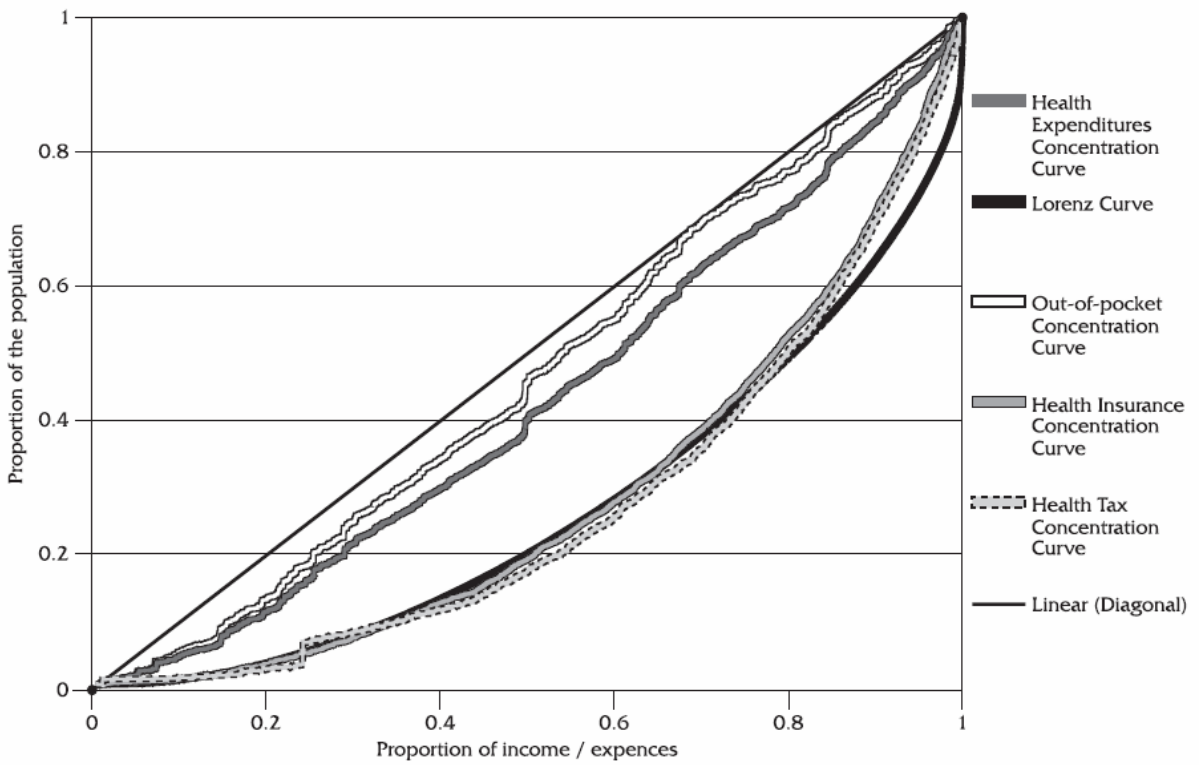


Figure 4: Lorenz and Concentration Curves 2001



The only health care payment with a slightly progressive effect on income is the tax payment in 1995. Closer examination of the tax concentration curve for 1995 shows that these payments are very regressive for the upper part of the bottom quintile of the income distribution. Similarly, for the same part of the population there are very regressive trends in the out-of-pocket and the total health care payments. Therefore, the taxation in 1995 can be considered inequitable for the population between the second and the fourth decile.

In contrast, although the Kakwani coefficients for the tax payments and the health insurance payments are slightly regressive in 2001, the curves show that they are quite proportionate to the income for the lower income groups. This in general is more important for the distribution of health care payments because although equitable is considered a payment made according to the ability to pay, the marginal utility of the poor is much higher.

When considering the proportion of the different methods of health care financing it has to be noted that the structure of the OOP and the tax-financed payments has not changed. In 1995 there was 81% financing from OOP and 19% through general taxation. In 2001 the financing was 80% from OOP, 14% through general taxation and 6% from health insurance contributions. These results suggest that the influence of the reforms on the financing of the health care system have a very insignificant effect. Although the reforms may have established equitable financing through health insurance taxation, this has not changed the financing structure of the revenues. Therefore, the reforms have been unable to shift the total financing of the health care sector towards financial-ability-based financing.

These results lead to several conclusions. Firstly, the income inequality has increased very substantially between 1995 to 2001. The Gini coefficient has increased by 24.4%. This puts a big challenge in front of the health care system to reach equitable financing. Secondly, all

health care payments are much more progressive, but considering the steep slope of the Lorenz curve, the system has not developed a mechanism to respond to the changes in the economy. Thirdly, in 2001 there was still a very large percentage of OOP, which as in 1995 was very regressive. This makes the total health payment distribution a very regressive one. Finally, the larger Kakwani coefficient for the total health payments shows a significant increase in the financial equity problem. Nevertheless, if the lower income groups are considered, from the figures it is visible that the gap between the income and the health care payment in 2001 is much smaller than in 1995. It appears that, although the system has not managed to reach the equity goal, it has made it relatively cheaper for the poor to access the system under the context of an increasing challenge to reach equity.

VERTICAL FINANCIAL EQUITY

So far the research has only looked at the unstandardised concentration coefficients. If it wants to assess the vertical equity, or the distribution of health care expenses amongst the people with different ability to pay, it should estimate the income related inequalities, which are the *X* variables (E 5). For this purpose the sample is divided into 100 income groups. The regression controls for age–sex differences, marital status, nationality, public/private facility use, region, education and employment status. These are the *Z* variables in the regression equation (E 5).

The Newey-West convenient regression method is used to control for serial correlation and heteroscedasticity. The income standardised *CI* for 1995 (with control for the *Z* variables) is 0.0533 with t-ratio: 2.3 and for 2001 is 0.08 with t-ratio: 4.96 and 0.00 significance. This is the policy-irrelevant inequality in the health care financing. The difference between *C* and *CI* is the concentration coefficient of vertical income-based inequalities in health care financing.

$$(1995) \Delta C = 0.0964 - 0.0533 = 0.0431$$

$$(2001) \Delta C = 0.1518 - 0.08 = 0.0718$$

The index (E 6) (Van Doorslaer et al. 2004c) is positive. Therefore, the vertical inequality favours those who are worse-off. There are several conclusions to be made. Both income and non-income related factors contribute to inequalities in financing which favour the poor. The distribution of health care expenses became more progressive after the health care reforms due to income related differences. Furthermore, the increase in *CI* shows that the factors unrelated to income have also led to an increase in the progressiveness of the health care payments. Although generally this might appear as a positive tendency, it might be a result of abstention from health care amongst some social groups. Moreover, the health care policy response to income inequalities is smaller than it can actually reflect upon the population. This response can be seen by the change in the *Ev* (E 7) (Table 3).

Table 3 Gini, Income driven Concentration and Vertical Equity coefficients

Year	Gini coefficient	Income driven Concentration coefficients		Vertical Equity Coefficients	
		Out-of pocket payments	Total health payments	Out-of pocket payments	Total health payments
1995	0.354	- 0.006	0.0431	0.360	0.311
2001	0.468	0.004	0.0718	0.464	0.396

Ev reflects only the policy of health care financing. It excludes from the equation factors that have influenced the health care payment distribution which are not related to the income distribution. This measure will exclude the effect of abstaining from use of the health care services for not income-related reasons.

The standardised CI for the out-of-pocket payments ($Cloop$) provides results which are slightly different.

$$(1995) \Delta Cloop = 0.034 - 0.04 = -0.006$$

$$(2001) \Delta Cloop = 0.072 - 0.068 = 0.004$$

The effect of income driven inequality, as expected, is very small. The negative value of the $\Delta Cloop$ in 1995 means that the out-of-pocket payments are regressive to income in relation only to the income groups. In other words, if all of the other social factors were equal, out-of-pocket payments would have been regressive. However this trend changes after the reform, due either to regulation, or to financially motivated abstention from the use of health care, income has a progressive influence on the OOP. A further study of the factors that define the level of the health care expenses will include decomposing the concentration of the OOP. People's motivation for spending on health care is based on the expenses which they make out-of-pocket. Therefore, OOP will be used for an analysis of the socially determined health care expense patterns.

INFLUENCE OF THE SOCIAL STATUS ON THE FINANCIAL EQUITY

Decomposition of the health care inequalities can give a more detailed explanation of the influence of the different social factors on the general inequality in the financing of health care (E 10). Only ten percent of the variability of the health care expenses can be explained by the controlling factors. Figure 5 and Figure 6 show the statistically significant factors and their contribution to the concentration coefficient of the health care expenses.

Table 4 shows the elasticity of the OOP health expenses with respect to the studied factors, the concentration index of Z (Cz) in relation to income, and their contribution to C . The elasticity shows the corresponding change in health care expenses with the change of the factor, or it is the beta coefficient from the regression equation. Cz shows the distribution of

the people with the studied characteristics amongst the income range. Negative elasticity is often combined with negative concentration indexes, which gives a positive contribution of the factor to C . A negative/positive value for C_z means that there is a higher concentration of the Z category within the poor/rich. A negative/positive elasticity means that the Z category spends on average less/more of its income on health care.

Figure 5: Influence of the different factors on the Concentration index of the OOP 1995

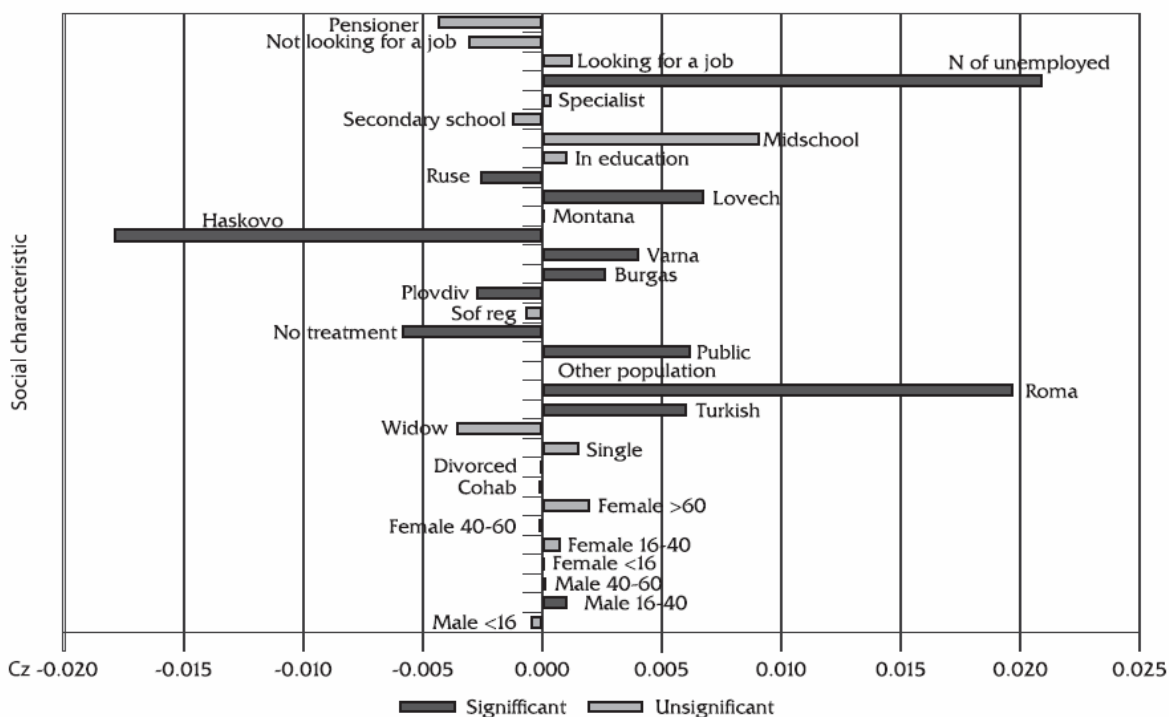


Figure 6: Influence of the different factors on the Concentration index of the OOP 2001

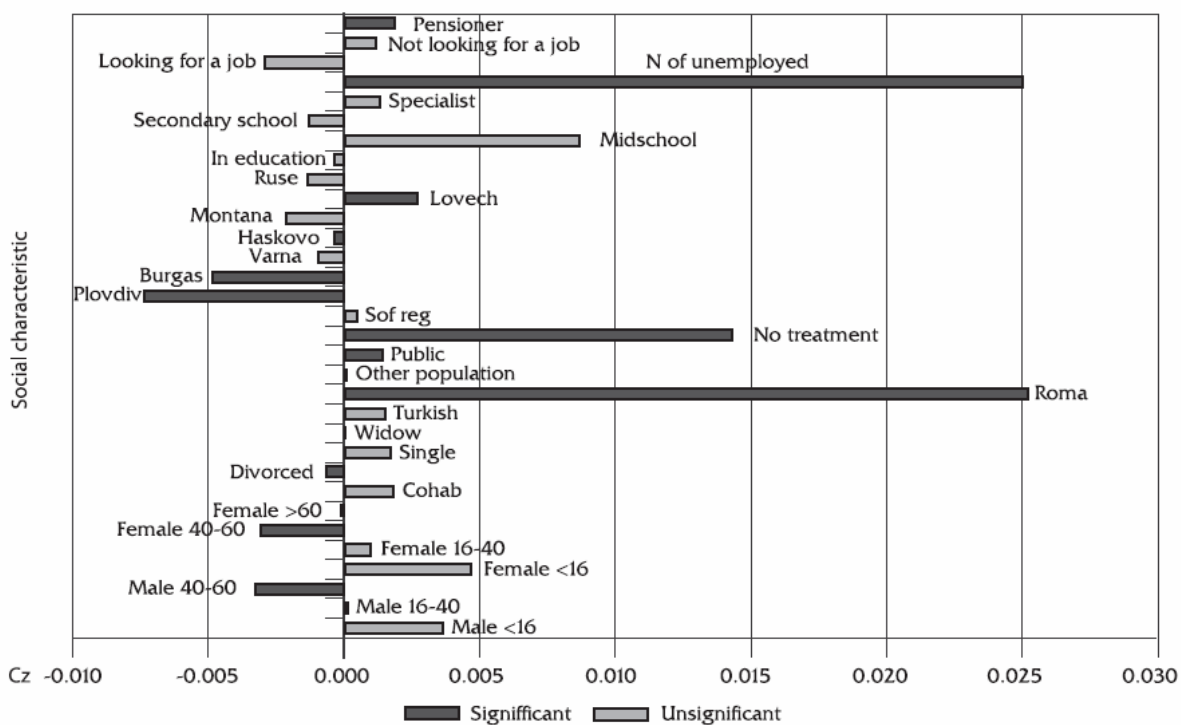


Table 4 Elasticity, Z concentration coefficients and their contribution to C

	1995				2001			
	Elasticity	Cz	Contribution	% contrib	Elasticity	Cz	Contribution	% contrib
male <16	0.005	-0.077	0.000	-0.004	-0.027	-0.131	0.004	0.024
male 16-40	0.034	0.028	0.001	0.010	-0.034	-0.004	0.000	0.001
male 40-60	0.001	0.085	0.000	0.001	-0.035	0.091	-0.003	-0.021
female <16	0.001	-0.019	0.000	0.000	-0.031	-0.152	0.005	0.031
female 16-40	0.018	0.037	0.001	0.007	-0.041	-0.024	0.001	0.006
female 40-60	-0.002	0.043	0.000	-0.001	-0.040	0.075	-0.003	-0.020
female >60	-0.017	-0.115	0.002	0.020	-0.013	0.006	0.000	0.000
cohabiting	0.004	-0.024	0.000	-0.001	-0.005	-0.367	0.002	0.012
divorced	0.000	-0.082	0.000	0.000	0.012	-0.053	-0.001	-0.004
single	-0.071	-0.020	0.001	0.015	-0.032	-0.053	0.002	0.011
widow	0.024	-0.146	-0.004	-0.037	0.003	0.009	0.000	0.000
Turkish	-0.042	-0.141	0.006	0.062	-0.005	-0.315	0.001	0.010
Roma	-0.030	-0.653	0.020	0.204	-0.038	-0.657	0.025	0.166
Other population	-0.002	-0.001	0.000	0.000	0.000	-0.153	0.000	0.000
public	-0.287	-0.021	0.006	0.064	0.026	0.053	0.001	0.009
no treatment	-3.716	0.002	-0.006	-0.060	-1.300	-0.011	0.014	0.094
Sofia region	-0.018	0.036	-0.001	-0.007	0.005	0.084	0.000	0.003
Plovdiv	0.036	-0.075	-0.003	-0.028	0.049	-0.150	-0.007	-0.048
Burgas	-0.040	-0.064	0.003	0.027	0.056	-0.086	-0.005	-0.032
Varna	-0.032	-0.124	0.004	0.041	0.021	-0.044	-0.001	-0.006
Haskovo	-0.104	0.171	-0.018	-0.185	0.032	-0.010	0.000	-0.002
Montana	-0.005	-0.008	0.000	0.000	0.017	-0.126	-0.002	-0.014
Lovech	-0.075	-0.089	0.007	0.070	0.039	0.069	0.003	0.018
Ruse	-0.068	0.037	-0.003	-0.026	0.016	-0.081	-0.001	-0.009
In education	0.032	0.030	0.001	0.010	0.014	-0.023	0.000	-0.002
Mid-school	-0.078	-0.115	0.009	0.093	-0.035	-0.246	0.009	0.057
Secondary school	-0.025	0.047	-0.001	-0.012	-0.009	0.139	-0.001	-0.008
Specialist	0.003	0.094	0.000	0.003	0.005	0.275	0.001	0.009
N of unemployed	-0.171	-0.121	0.021	0.216	-0.119	-0.210	0.025	0.165
looking for a job	-0.004	-0.330	0.001	0.012	0.008	-0.368	-0.003	-0.019
not look for a job	0.015	-0.202	-0.003	-0.031	-0.003	-0.344	0.001	0.007
pensioner	0.053	-0.081	-0.004	-0.044	0.089	0.021	0.002	0.012

One of the main contributors to C is the number of unemployed in a family. The negative elasticity values presume that unemployment might be a major reason for abstention from use of health care services and medications. A similar tendency is the pro-poor increase of the Cz for the non-Bulgarian ethnic groups, which is also a result of non-utilisation. This suggests that it is a major factor within the Roma population, which is on average significantly poorer and on average has decreasing health care spending. This tendency to an increase in socially

related differences in the spending amongst the different nationalities is an example of a growing progressivity of health care spending as a result of growing social inequalities. This demonstrates that the concentration coefficient alone cannot determine the character of the inequalities in the health care payments, namely: income proportionality, which we aim at, or social exclusion. Within the Turkish minority group, there is also a negative C_z and elasticity, presuming abstention from utilisation, but this tendency has decreased over time. It is interesting to note that although this group has become poorer, it has started spending more on health care. Likewise, the group with the lowest education has a positive contribution to C due to negative C_z and elasticity. Over time there has been a tendency towards a reduction in the economic status of the less educated people but the discrepancies in their health care spending have diminished.

There are also regional discrepancies which tend to favour the poor in the wealthier regions, but this has had a reverse effect over time. Treatment in a public facility also has a positive effect on C . Interestingly, in 1995, the poor were spending more in the public health care sector, but they were spending less on average. In 2001, this trend changed and the rich are spending more, which has also been connected with positive elasticity. This might be an effect of the regulation of out-of-pocket payments and the increase in the use of private services from 4% in 1995 to 35% in 2001 in the outpatient sector (Table 5). This presumption may be examined by studying service utilisation.

HEALTH CARE SERVICE UTILISATION AND FINANCIAL EQUITY

Figure 7: Outpatient utilisation 1995

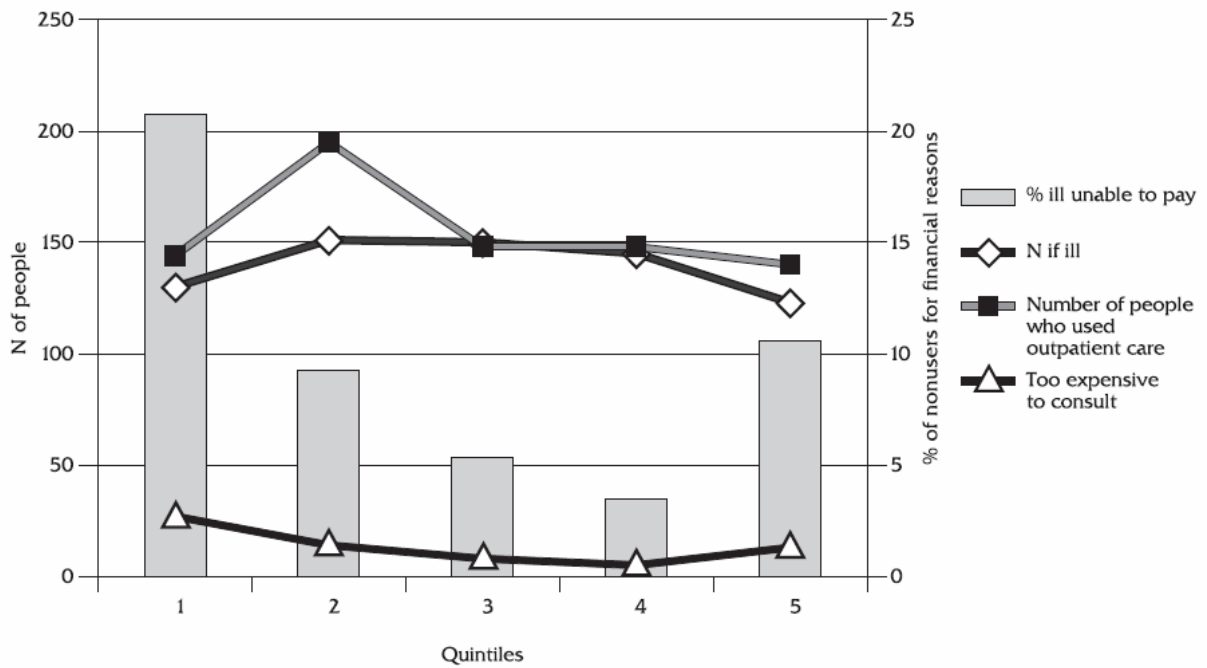
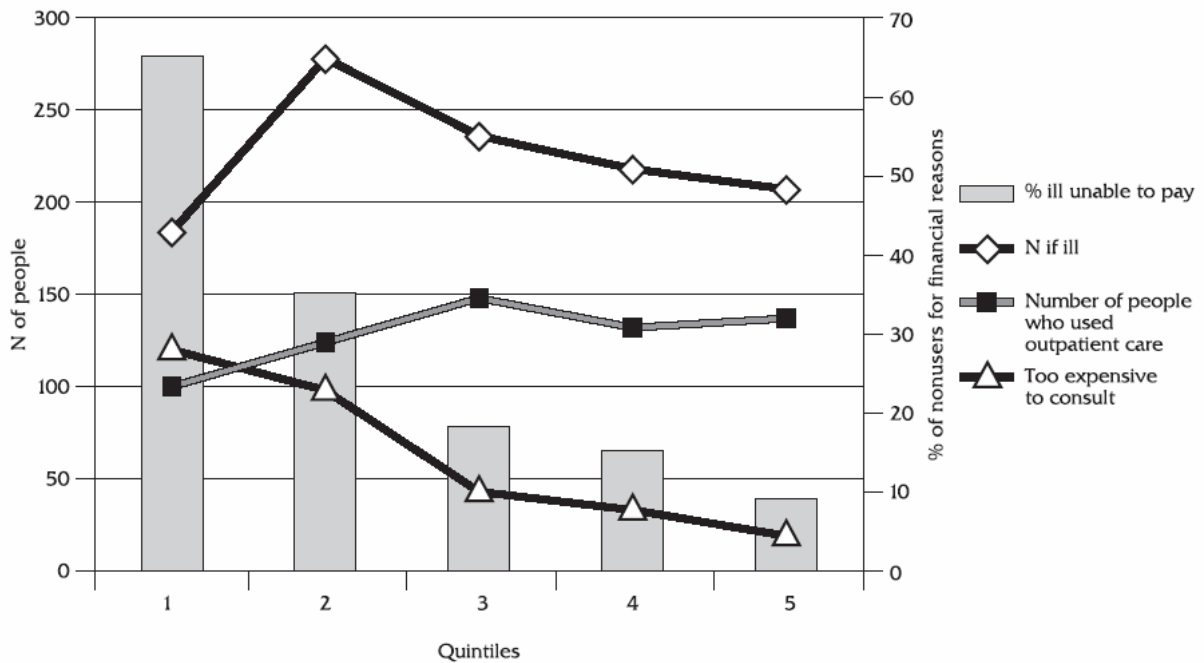


Figure 8: Outpatient utilisation 2001



The above results suggest that some of the changes in health spending patterns might have been a result of abstention from health care use because of the increase in the burden of health

care costs. This hypothesis may be tested by looking at the number of people who have reported that they have not used health care services whilst ill, because it was not affordable. Figure 7 and Figure 8 test this hypothesis. A direct measure of the changes in non-utilisation is the percentage of ill persons who did not use health care because they couldn't afford it. In 1995, there is a slight trend towards non-utilisation in the bottom quintiles, but if the actual percentages are taken into account it appears that in 2001 there were more than 65% in the poorest quintile that couldn't afford to use health care, versus 21% in 1995. The trend of decrease of this percentage is clearer in 2001 - 9% in the upper quintile and 11% in 1995. This reveals a serious problem for financial access to the health care system after the reforms.

Table 5 Outpatient utilisation

Quintile	1995					2001					Total	
Year	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	1995	2001
Number of people who used outpatient care	144	195	148	148	140	100	124	148	132	137	775	641
Number of consultations	330	378	257	317	304	186	208	269	238	263	1586	1164
Price of a consultation	109.5					8					109.5	8
Subsidies for outpatient care	36135	41391	28142	34712	33288	1488	1664	2152	1904	2104	173667	9312
Public	126	180	164	174	142	140	160	172	148	192	786	812
Private	7	5	7	6	6	32	72	70	65	46	31	285

The discrepancies in the need and use of health care are examined according to the utilisation of the services⁴. Table 5 shows that in 1995 utilisation is mainly dependent on number of consultations, and there is no pro-poor or pro-rich trend. In 2001 there was an increase in utilisation for in upper income quintiles connected with the lower use of outpatient care by the lower quintiles. This phenomenon can be explained by non-utilisation due to financial

⁴ The utilisation of health care subsidies was estimated on an average price per outpatient visit in 1995 (NCHI and Ministry of Health 1996) and price as defined by the National framework contract for 2001(National Framework Contract 2000),

restraints. In other words, the lack of financial protection for the poorest people has not only left them without access to the health care system, but has also left them with lower use of public subsidies. Furthermore, it can be concluded that there is a trend towards subsidising health care for the wealthier segments of the society.

CONCLUSION

One of the aims of the introduction of a health care insurance system in Bulgaria in 2000 was to improve the equity in the provision of health care. The equity goal of the reform is a changing multivariate one. It depends on the income distribution in the society, which defines the ability of the population to buy health care services, changes in the social arrangements and the health care provision itself.

During the six-year period under study, income inequality has grown very substantially. This has increased the role of the health care system in building “medical insurance guaranteeing them (the citizens) affordable medical care”(Constitution of Republic of Bulgaria 1991 Article 52, s.a. 1). The income inequality has also made it more difficult to reach financing adequate to the ability of the people to pay and financial access to the system, which will allow adequate delivery for those in need.

The financing of the health insurance system has gradually moved away from financing from the general budget. The aim was to insure stable financing of the sector. Furthermore, the changes in the financing of the health care have included significant efforts to regulate out-of-pocket payments, which are the most regressive system of financing. Nevertheless, out-of-pocket payments have remained the major means of financing. This has maintained a high financial impact at the point of need and use of services, which makes the occurrence of health risks a significant financial burden. After the health sector reforms these occurrences have had a less severe effect on the income of the poor. This tendency is not necessarily positive, because it appears to be shaped not by choice but by affordability. It will still be an overstatement if the success of the reform in the financing of the sector is discussed without considering that health insurance is only 6% of the health care expenses. The only way to gain

significant results will be to increase the proportion of insurance-based financing, and decrease the level of out-of-pocket payments.

After the reforms, the progressiveness of the out-of-pocket payments more than doubled. Additionally, the proportion of tax payments has also increased. These two factors have made the progressiveness of total health care spending much higher. However, this increase has been insufficient to compensate for the increase in income inequality. As a result, financing of the health insurance system has been more regressive than that prior to reforms. Financial equity has decreased over the time period. Still, for the poor in 2001, the distribution of health care expenditures has reflected the distribution of income much more accurately. This means that health care expenses have not been such a burden for the worse-off as they were before the reforms. Nonetheless, one has to be careful when judging the changes in health care expenditures. Their decrease for the poor would be clearly a positive trend only if all of the other factors were kept constant, particularly the utilisation of the services. In this case the positive effect is dubious because the goal has been reached by paying the price of non-treatment, which can have a much worse effect.

Methodologically, the division of the concentration coefficient into income and non-income factors leads to several important results. Firstly, the increase in the progressivity of health care payments is not a positive factor if it is due to abstention from use of health care by specific social groups. This leads to further social exclusion. Only an understanding of the reasons for this exclusion can help the system to reach the excluded. Secondly, the only way to consider the equity of health care financing is by looking at the vertical equity. Thus, social-status related factors can be eliminated so that fair decisions about the financing of the system may be made.

The changes in the progressiveness of health care expenses are due to increase in the proportionality of health care payments to income, and due to changes in the willingness of the different social categories to pay for health care. Both factors have had a positive effect over time. This means that health care payments are less proportionate to income levels due to the system arrangements than it actually appears. Another conclusion from this analysis is that there are social characteristics, which prevent part of the society from using health care. Usually, this is connected to social characteristics which are associated with lower social class. Unemployment is a major factor for spending less on health care and non-utilisation. A notable difference exists within the Roma population. There has been a substantial increase in the health care spending differences between this group and the rest of the population over time. This is a result of the impoverishment of the people from the minority group, and a decrease in the average spending on health care. The results suggest that the health care reforms have created a system, which is even more exclusive for this ethnic group. The reforms have had the opposite effect on the Turkish minority, by making the system more inclusive for them, regardless of the overall impoverishment of the group.

Another factor has been the level of education. Less educated people have been much less likely to spend on health care after the reforms. Another problem appears to be regional inequalities. There are substantial discrepancies amongst the geographic regions, which is most likely a result of spatial inequalities in service provision. In addition, younger families and families with children, in particular spend much less on health care. One of the explanations of this may be that there is less of a need for health care for younger people, but the result for the families with children presumes that there might have been a positive effect of some special maternity programmes. These findings suggest that the system has increased the social exclusion of particular groups, which are already socially deprived. This presumes that there might be a need for additional targeted programmes.

As has already been suggested, over time there has been decrease in the usage of health care. After the reforms, the affordability problem has grown and has developed a very clear link to the level of income. In other words, the poor cannot afford to use health care as much as the rich. As a result, public expenditure on health care mainly benefits the rich. Therefore, considering the regressive character of health care financing, and adding the progressive effect of health care subsidies, the health insurance system has had a very regressive redistributive effect on the purchasing power of the population.

In conclusion, it appears that the introduction of health care insurance has not improved the equity of health care financing. Both from the financing and delivery perspectives, the problems have deepened. Even though the main problems for the financing of the health care system come from the increase in overall impoverishment of the population, the system has not been able to develop “safe-ways” for the poor to enter. The main problem is the increase in number of people unable to afford health care services and the impoverishment effect for those who use them. This tendency leaves the lower income groups with a choice of extreme poverty or untreated illness. A particularly disturbing result is that the increase in the discrepancies of health care use amongst different social groups. These tendencies push parts of the society with specific social characteristics into the poverty trap and so create a base for long-term ethnic and social problems. Therefore, future changes in the health care system have to take into account these deepening problems and adopt targeted programmes for the excluded groups. Only then the system can prevent negative long-term consequences.

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