Provision of Public Goods in the Transition Process: Empirical Evidence on Access to Health Care in Rural Regions of Russia

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Abstract

The objective of the paper is to identify the determinants of access to health care in rural Russia. We started out with the observation that the transition process has affected the provision of social services in the Russian Federation in general, and in rural areas in particular, owing to the overlap with agricultural reforms. Based on this observation we asked how the reduced role of the state and the concomitant decentralization of policy making has affected access of the rural populace to social services. A review of the available literature on this topic resulted in the formulation of the following three hypotheses. Firstly, that income is a determinant of access to health care. Secondly, that informal payments play an important role in determining access, and thirdly that there are large differences in access to health care services between districts. The hypotheses were tested using household data from a survey conducted in two regions of Russia in 2000. The results indicate that in the study regions, contrary to expectations, neither income nor informal payments are important determinants of access. However, there are large differences in out-of-pocket expenditures between districts, indicating that access to health care varies between districts.

Keywords

Russia, transition process, public goods, health care, rural development

1 Introduction

In the Russian Federation, one of the erstwhile socialist countries of the Former Soviet Union (FSU), hopes were high that democracy and a market economy would bring about rapid improvements in living conditions. The 1990s showed, however, that the shift from a planned to a market economy would take much longer than originally anticipated. Therefore, it is likely that the transition process went along with a significant reduction of social services being provided free of charge to the Russian population. The most significant factor in the expected reduction of public services available in all regions is likely to be the change of paradigm from a largely egalitarian socialist planned economy to a market economy.

In rural areas of the Russian Federation, however, it is likely that the reduction of social services has been particularly severe for various reasons. The economic downturn has been particularly severe and has been associated with the collapse of the former collective farms. At the end of the 90s about 80 percent of the large scale agricultural enterprises were unprofitable. Prior to the collapse of the socialist system these farms effectively constituted focal points for the rural communities and were strongly engaged in the provision of various social services. Health services, but also other social services such as maintenance of public infrastructure etc. were offered as public goods by these farms, or were at least dependent on these farms. Furthermore, the massive scale of inter-regional redistribution policies applied in the former Soviet Union obscured structural weaknesses. For example, large sections of the population were obliged to live in rural regions with few resources (e.g., agriculturally marginal areas) – regions which would not have offered a sufficient economic basis for income under market conditions. Therefore, it is hypothesized that the wide-spread collapse of the social security system hit such population groups all the harder.

While it is obvious that the provision of social services in rural areas has changed significantly, it is unclear how the quality and quantity of social services as well as the institutional and

organisational arrangements with which these goods are provided have changed (OECD, 2001). Against this background, the objective of the paper is to provide a case-study of social service provision, namely the provision of health care in some rural regions of Russia. We will ask how the reduced role of the state and the concomitant decentralization of policy making has affected the access of the rural populace to social services in rural areas. And, more specifically, what institutional arrangements exist today with respect to provision of health care services in rural regions of Russia (chapter 2)? We push the analysis of such institutional changes forward by empirically looking into the question which factors determine access to health care of individual rural households. Access to health care will be defined as: a) the likelihood of visiting a health care provider and b) in terms of the financial burden, more specifically the out-of-pocket payments borne by individuals. On the basis of a household survey which has been conducted in two *oblasts* (i.e. regions) in the European part of Russia we will test some of our hypotheses econometrically with binary logit and tobit models (chapter 3). Based on the qualitative and quantitative analysis, we will then derive some policy conclusions and identify remaining knowledge gaps with respect to the provision of social services in rural Russia (chapter 4).

2 Health care in transition: the rural Russian setting

The central health achievement of the Former Soviet Union was the provision of universal coverage and equitable access to health care on the basis of citizenship. Officially the population were guaranteed comprehensive coverage, free at the point of use, and were only asked to pay out-pf-pocket for out-patient prescriptions, prostheses and dental care. In rural areas the first point of contact in the health system was the health post, staffed by a feldsher-midwife (WHO, 1998). Any problems requiring more complex treatment would be referred to the next level of the hierarchy – a rural health centre, polyclinic or the central district hospital. The health post itself would be frequently provided by a rural enterprise, such as a *kolkhoz* or *sovkhoz*, rather than by the local government. Even where rural enterprises were not the owners of health care facilities they frequently acted as patrons, contributing resources towards the maintenance of the facility.

With transition from a planned to a market economy came changes to the health care system. During the early 1990s the highly centralised Soviet health care system gave way to a more decentralised model with a reduced role for the state. The provision of public services in Russia is intimately linked to the health of the fiscal system. Throughout most of the 1990s Russia's public finances have been in varying degrees of crisis. In 1994, the public budget deficit culminated and constituted 10.4% of GDP (three times the respective "Masstricht criterion"). Nevertheless, Russian reformers wanted to preserve universal access to free health care and even increase financing of the health sector. At the same time the role of market forces was to be increased. Hence, a system of universal compulsory medical insurance was signed into law in 1993 (Twigg, 1998) with the intention that it should contribute 30% of the total health care budget. While the payroll tax did cover 35% of the health budget by 1997, financing of health care in real terms has declined by more than 30% since 1991 (OECD, 2001), see Table 2.1.

Under the new system regions (*oblasts*) and districts (*raions*) own and monitor health care institutions, while insurance funds deal with cash flows and insurance companies. Regions are obliged to finance 60% of the health care system and have total control over the regional compulsory health insurance funds (WHO, 1998). However, decentralisation of the health care system did not stop with the regions. The autonomy of districts has increased substantially over the last 10 years. They take on the executive role at the local level, with health care having become the *de facto* responsibility of the districts. Large variations in the interpretation of the role of districts in the health care system have increased regional disparities in health care provision, as has the differences in income between regions. In general, *raions* lack the

necessary financial means to provide these services. According to the available literature, the raions concentrate their limited funds on urban facilities, neglecting rural areas. Statistics show a drastic decline in public service provision in rural areas since 1992. This urban bias is one of the prime reasons for the continuing role of agricultural enterprises in rural public service provision. Traditionally, rural services, whether public or private, were provided by enterprises located in rural areas. Since 1991 many services have been municipalized, but owing to limited financing by municipalities health posts, schools, kindergartens etc. still receive support from rural enterprises which mostly are agricultural or forestry enterprises.

Table 2.1 Public expenditure on health care, 1991-1998

	1991	1992	1993	1994	1995	1996	1997	1998
Public expenditure (% of GDP)	2.9	2.5	3.7	3.9	2.9	3.1	3.4	3.1
Consolidated budget	2.9	2.5	3.1	3.2	2.4	2.5	2.8	2.4
Compulsory Medical Insurance Fund	n/a	n/a	0.6	0.7	0.5	0.6	0.6	0.7
Public expenditure (1991=100)								
Real health expenditure	100	80	108	98	72	71	81	67
Consolidated budget	100	80	91	81	59	57	65	51
Compulsory Medical Insurance Fund	-	-	17	17	13	14	16	16

Source: OECD, 2001:37

The statuary health care system guarantees access to a comprehensive range of services to the entire population at no charge. Those in work are covered by insurance payments made by their employers, while the unemployed, children, students, pensioners and the disabled are covered by contributions made by district authorities on their behalf. Voluntary health insurance is available for those who wish to secure additional services, but in 1998 less than one per cent of the population held private insurance policies (WHO, 1999). The decline in public funding has however, been severe, considerably reducing the ability of the health system to provide high quality care to all patients. To help meet the shortfall in public funding the practice of informal patients payments and formal patient charges has expanded according to the OECD (2001). A survey by the University of Boston found that although public expenditure on health care declined from its already low position between 1997 and 1998, total health care spending was about equal to the OECD average (OECD, 2001). This was achieved by a substantial increase in private expenditure on health care. Indeed, the ratio of public to private financing of health care in Russia is much higher than the OECD average, in December 1998 the Russian ratio was almost 1:2 compared to an OECD average ratio of 3:1. The practice of informal and formal patient charges is, moreover, a vehicle whereby patients gained access to medical care. People who could pay received care, those who could not, waited or did not receive care (OECD, 2001). Such a development has important implications for access to health care and equality of access. If under-the counter payments are widespread and act as a vehicle whereby patients gain access to health care, then one can no longer talk about universal access to health care.

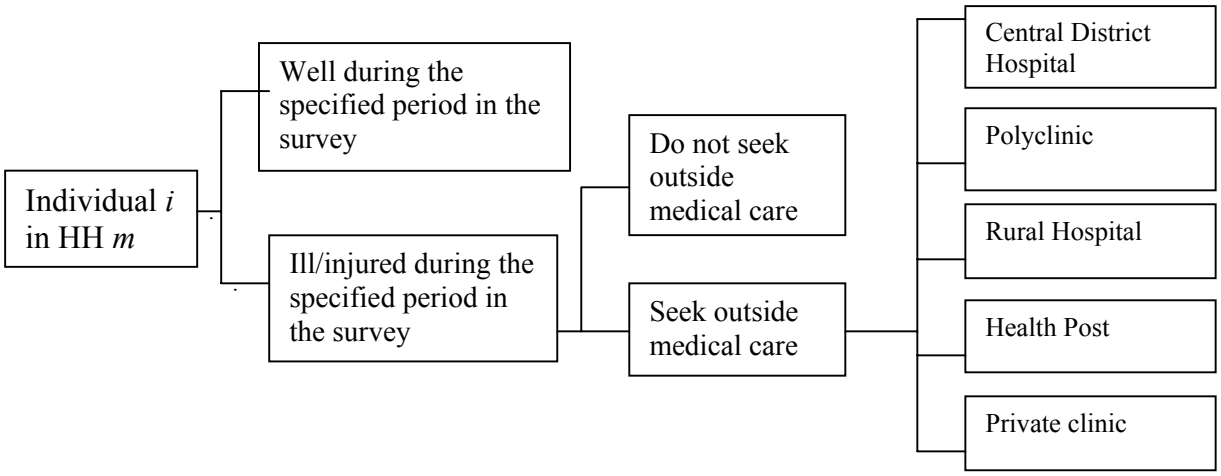
3 Empirical analysis of changes in access to health care in rural Russia

3.1 Theoretical Framework

The modern health care demand analysis is heavily based on the neo-classical paradigm of rational consumer and constrained utility maximisation theories. The basic idea in most of the health care demand analyses is that an individual, facing different health care providers, is assumed to maximise utility from health (H) and consumption of a composite good (C) subject to income and health production function constraints. This implies that in the event of illness or injury, individuals or the household must decide whether to seek medical care and from which provider, based on price and non-price factors and the perceived quality of the provider. Then

individuals will choose, from an array of providers, the alternative that gives them the maximum utility. If we assume that provider *j* yields the greatest utility to individual *i* then the probability that the j^{th} alternative will be chosen (given the individual seeks medical care) is taken as the health care demand function for individual *i*. Diagrammatically, the procedure can be presented as shown in Figure 1.

Figure 1 Household's or Individual's Decision Tree



Source: after Asfaw (2002).

The problem can also be presented algebraically as follows. In a given period, individual *i* is assumed to maximise utility (*U*), conditional on the consumption of health provided from provider *j*.

$$Max: U_{ij} = U(H_{ij}, C_{ij}) + \varepsilon_{ij} \quad (1)$$

The random error term, ε_{ij}, captures the notion that efficacy of medical care is not deterministic. Utility is maximised subject to the budget constraint and health production function:

$$Y_i = P_{ij} + p_c C_{ij} \quad \text{(Budget constraint)} \quad (2)$$

$$H_{ij} = H_0 + Q_j(X,Z) \quad \text{(Health production function)} \quad (3)$$

Where H_{ij} is the post-treatment health status of the individual treated by provider *j*, C_{ij} is the consumption level after choosing provider *j*. p_c is the price normalised to one for identification purpose. The total income of the individual or household is given by *Y*, P_{ij} is the price of medical treatment from provider *j* and includes monetary outlay, travel time and waiting time. H_0 is the initial health status of the individual, and Q_j is the improvement thereof, which is a function of a vector of individual characteristics (*X*) that affect health outcome and a vector of provider characteristic (*Z*).

An individual will maximise the unconditional utility function (*U**) given by

$$U_i^* = Max\ (U_{i1}, U_{i2}, \ldots, U_{i\,J+1}) \quad (4)$$

where U_{ij} is the utility function from provider *j* and $j = 1, 2, \ldots, J+1$.

The solution to (4) gives the health care alternative that is chosen. Note that provider *j* is chosen if and only if $U_{ij} > U_{ik}$ for all $k = 1, \ldots, J+1$, $k \neq j$. The conditional utility function of provider *j* can be calculated by solving for C_j from (2) and substituting (2) and (3) into (1) as follows.

$$U_{ij} = U(H_0 + Q_{ij}(X, Z), Y - P_{ij}) + \varepsilon_{ij} \quad (5)$$

As long as the conditional utility function, U_{ij}, in (5) is quasi-concave in H_{ij} and C_{ij}, and H_{ij} and C_{ij} are greater than zero, a conditional indirect utility function will exist (with properties of quasi-convexity, and decreasing prices and increasing income) given by

$$V_{ij} = V(P_{ij}, H_0, Q_{ij}(X, Z), Y,) + \varepsilon_{ij} \quad (6)$$

Equation (6) is the reduced form of the indirect utility function of alternative *j* and it forms the bases of estimating health care demand functions in most of the literature.

Economic studies on the demand for health care confirm that price, both in terms of cash and time, is an important determinant. The factors that have been studied and deemed important are travelling time and distance to facility (Acton, 1975; Gertler and van der Gaag, 1990; Hodgkin, 1996), cash price for health care (Akin et al 1987) and waiting time (Besley et al 1999). These studies suggest that households in both developing and developed countries take decisions to seek health care in response to economic constraints such as cash prices and travel time, as well as income. Income appears to be a particularly important constraint in developing countries, while travel and waiting time are important determinants in those developed countries that have either a national health service (such as the UK) or wide-spread health insurance coverage (Germany). Few studies within the economics literature have explored what determines household demand for health care in transition economies. The increase in formal and informal payments discussed in the previous section suggests that ability-to-pay is becoming increasingly important in gaining access to health care. More explicitly the question of interest is whether the determinants of demand in transition economies more closely resemble those of developing or developed countries. Based on this discussion we postulate the following hypotheses:

Hypothesis 1: Income is an important determinant of access to health care services.

Hypothesis 2: Informal payments are a second important determinant of access to health care services.

Hypothesis 3: There are large differences in access to health care services between districts.

3.2 The Data

The study uses data collected in a survey carried out by the Agrarian Institute, Moscow in cooperation with [author] in October 2000. The survey was carried out in two regions of European Russia, Oryol and Leningrad. Rural households located in eight districts were surveyed as to their expenditure on health and education, income, economic activity and general living conditions. The health related variables were based on a three month recall period and include case of illness, choice of health care provider, amounts paid for consultation and pharmaceuticals. Moreover, the survey recorded the overall sum spent on health care during one month, irrespective of whether or not a household member has been ill. To complement the household data the survey included a community component, which provides information on the availability of health facilities in the community.

The sample contains 321 households. A two-stage sampling procedure was used to select households: in the first stage 4 communities were picked in each of the districts in which the survey was carried out. In the second stage household were selected using constant sampling fraction to ensure that within each district each household had the same probability of being selected. Households were selected using linear systematic sampling with community registers providing the sampling frame.

3.3 Econometric Analysis

3.3.1 The Econometric model

To empirically assess the determinants of demand for health care services a two part model (based on that developed as part of the Rand Health Insurance Experiment, see Manning *et al*, 1987) is used. The first part analyses the determinants of *using health care services*, while the second analyses determinants of *health care expenditure* for those who reported use. A two-

model approach is chosen as using expenditures alone does not allow capture of the use of those who did not seek care. The distribution of health care expenditure is typically not a normal distribution, there are many non-spenders who did not use health care in the recall period. Furthermore, the distribution is censored owing to a number of users who did not incur any expenditure on use. In Russia, visits to health care providers are ostensibly free of charge and thus a proportion of health care users may not incur any out-of-pocket expenditures upon using a health care provider. This problem is solved through the use of a tobit model, while the problem of non-users is addressed by restricting the analysis of health care expenditures to those who reported use.

Part one of the model is a binary logit model. It estimates the probability of an individual visiting a health care provider during the recall period. Formally it can be written as follows:

$$Prob\ (visit>0) = X\beta + e \qquad (1)$$

Part two is a tobit model that estimates the incurred level of out-of-pocket expenditures conditioned on positive use of health care service. Formally it can be written as:

$$Out\text{-}of\ pocket\ exp/visit>0 = X\gamma + \mu \qquad (2)$$

Where X is a set of individual and household characteristics that are hypothesised to affect individual patterns of utilization and expenditure, β and γ vectors of coefficients, e and μ error terms.

The two-part model is extended through the addition of a third model which estimates the determinants of monthly private expenditure on health care. This third model is added to provide insights into private expenditures on health irrespective of whether a household member is ill or not. Households use pharmaceuticals on a preventive basis, or purchase them directly without visiting a doctor. Such expenditures constitute on average 5.3% of the household budget (for the sampled households), and factors that influence monthly private expenditures on health could differ widely from those that determine expenditure conditional on use.

The third model has monthly health care expenditure per capita as its dependent variable and can be written as follows:

$$Health\ exp\ per\ capita>0 = X\gamma + \varepsilon \qquad (3)$$

3.3.2. Variables included in the analysis

The main variables of interest in this analysis are income and district level variables such as district expenditure on health care per capita and the district dummies. If formal and informal patients charges, as well as pharmaceutical prices, have increased to the extent that access to health care is now determined by ability to pay, then income is likely to play a substantial role in determining demand. However, if the socialist system, with universal access, continues to prevail then income is not expected to influence expenditure substantially.

District level variables are of interest owing to the decentralisation of health care to the district level. Overall responsibility for health care is split between municipalities and the Regional Health Insurance Funds. If this decentralisation of health care has resulted in inter-district differences in access to health care and the quality of service provided, then it should be reflected in the significance of the district variables. It is anticipated that, *ceteris paribus*, the likelihood of visiting a health care provider is higher and the level of out-of-pocket expenditures lower, in districts that spend more on health care per capita. A second district variable that is included in the model is population density. Population density affects the provision of health care services through its affect on the unit cost of provision. It is anticipated that households in districts with high population densities have higher probabilities of visiting a health care provider and face lower costs as a result of lower unit costs of provision. An overview of the variables used in the

analysis is provided by Table 3.1. The analysis restricts itself to those households for which consumption expenditure data were available as this is the income measure used. Models one and three use the entire data set, while model 2 restricts itself to households that reported a visit to a health care provider during the recall period. The number of observations are 296 in models one and three and 159 in model two.

Table 3.1 Overview of variables used in the analysis

Variable	Description	Mean	S.D.
Dependent variables			
VISIT (dummy)	A household member visited a health care provider during the recall period (1=yes).	0.53	(0.5)
ILLCOST	Out-of-pocket payments incurred during one visit (roubles).	170.97	(538.24)
Independent variables			
Household and individual characteristics			
AGE	Age of household head	53.5	(15.2)
EDYEARS	Number of years of education of household head	8.15	(3.22)
INCOME	Logged monthly household expenditure per capita.	6.731	(0.746)
SIZE	Total number of adults and children in the household	2.8	(1.39)
CHILDREN	Number of household members under 18	0.59	(0.88)
CAR (dummy)	Household owns a car (1=yes)	0.23	(0.42)
EXEMPT (dummy)	Patient has exemption status (1= yes)	0.089	(0.287)
HSTATUS	Household expenditure on pharmaceuticals during one month recall period	161.56	(381.01)
Health care provider			
FAP (dummy)	Patient visits health post (1=yes)	0.15	(0.36)
RUHOSP (dummy)	Patient visited rural hospital (1=yes)	0.13	(0.33)
CLINIC (dummy)	Patient visited polyclinic (1=yes)	0.13	(0.33)
CRH (dummy)	Patient visited district hospital (1=yes)	0.09	(0.29)
ENT (dummy)	Patient visited enterprise clinic (1=yes)	0.009	(0.096)
PRIV (dummy)	Patient visited private clinic (1=yes)	0.006	(0.079)
SPECIAL (dummy)	Patients visited a specialist hospital (1=yes)	0.016	(0.12)
Community characteristics			
COMPOP	Population of community	2802.12	(2133.98)
KMHOSP	Distance to nearest hospital	9.41	(8.13)
District characteristics			
POPDENS	District population density measured in persons per km²	21.360	(9.886)
RAIMEDPC	District expenditure on health care per capita	250.10	(110.59)

Standard deviations shown in brackets.

Economic studies on the demand for health care confirm that price, both in terms of cash and time, is an important determinant. Factors that have been found to be important are travelling time and distance to facility (Acton, 1975; Gertler and van der Gaag, 1990; Hodgkin, 1996), cash price for health care (Akin *et al* 1987) and waiting time (Besley *et al* 1999). These studies suggest that households in both developing and developed countries take decisions to seek health care in response to economic constraints such as cash prices and travel time, as well as income. Income appears to be a particularly important constraint in developing countries, while travel and waiting time are important determinants in those developed countries that have either a national health service (such as the UK) or wide-spread health insurance coverage (Germany).

Other factors that have been found to influence demand for health care include household characteristics such as age and education level. With increasing age, expenditures on medical care are expected to rise. If education increases the efficiency with which gross investments are

produced, then the correlation between medical expenditure and education is expected to be negative (Grossman, 1972).

It should be noted that as only 7% of households made informal payments no variable for informal payments was included in the analysis. Instead, informal payments are one of the components of the variable ILLCOST, and as such hypothesis 3 cannot be tested independently.

3.4 Results and Discussion

3.4.1 Probability of visiting a health care provider

The decision of a household member to visit a health care provider is assumed to be influenced by individual, household, community and district characteristics. The most important variable in the analysis is income and whether this affects demand for health care. If health care is a normal good then we would expect it to be positively correlated with demand for health care, and hence expect households with higher per capita incomes to have a greater likelihood of visiting a health care provider. In this model the analysis is limited to house

The variables representing individual and household characteristics include age and education level of the household head responsible for the household budget, household size, the number of children in the household and car ownership as well as a proxy for health status. Age is hypothesised to have a positive effect on likelihood of visiting a health care provider as demand for health care increases with age. More educated household heads are assumed to have a lower likelihood of visiting a health care provider. Both household size and the number of children are expected to have a positive effect on visiting a health care provider. Car ownership is hypothesised to increase likelihood of visit as it increases mobility of household members. To control for self-selection bias a health status proxy, household expenditure on medication, is included. It is assumed that a member from a household with poor health status is more likely to visit a health care provider than a member of a healthier household.

At the community level, availability of health care services is expected to influence access. Therefore distance to the nearest hospital is included in the regression. It is anticipated to have a negative impact on access. To control for specific local settings size of the community is included in the model.

Finally, the district in which the household is located affects use of health care services. It is anticipated that households located in districts with higher health care subsidies are more likely to use health care services than those in other districts as are households located in districts with higher population densities. The results of the logit regression are shown in table 3.2 below.

The model is highly significant overall and the pseudo R^2 value of 0.51 can be considered as fairly good for cross-sectional data. The model shows that income does not have the expected significant positive effect, indeed the effect of income is negative! Such a result indicates that use of health care services is not influenced by income. Moreover, poorer households are more likely to visit a health care provider, which may be a reflection of the worse health status of poor households compared to rich households. An important household characteristic in determining use of a health care provider is the number of children present in the household. For every additional child the probability of visiting a health care provider increases by 12.4%.

Whereas household characteristics have a significant influence on using a health care provider, characteristics of the household head do not. In fact it turns out that households with older household heads are less likely to visit a health care provider, while education has a positive influence on use. Household size is also negatively correlated with use. The sample included a number of one-person households, upon illness members of smaller households are more likely to visit a health care provider as there is no-one to take care of them in the home.

Table 3.2 Marginal coefficients for the determinants of probability of visiting a health care provider

Variable	Marginal Coefficient	
Dependent variable is household member visited a health care provider		
Constant	0.302	(0.447)
AGE	0.004	(0.003)
EDYEARS	0.010	(0.011)
INCOME	-0.042	(0.047)
SIZE	-0.042	(0.037)
CHILDREN	0.124**	(0.058)
CAR	-0.005	(0.084)
HSTATUS	0.001***	(0.0003)
COMPOP	-0.000	(0.000)
KMHOSP	-0.010**	(0.004)
RAIMEDPC	-0.001**	(0.0003)
POPDENS	-0.006	(0.004)
Number of observations	296	
Chi^2	47.446	
Significance level	0.000	
Pseudo R^2	0.507	
Log likelihood	-180.772	
% correctly predicted	67.905	

* Significant at 0.1 level, ** Significant at 0.05 level, *** Significant at 0.01 level.
Standard errors shown in brackets.
Source: own estimation using LIMDEP.

As regards community effects distance to the nearest hospital exerts a strong influence on the likelihood of visiting a health care provider, being significant at the 5% level. For every extra kilometre the likelihood of visiting a health care provider decreases by 2%. *Ceteris paribus* every extra kilometre distance to a hospital reduces the probability of visiting any health care provider by 1%. Community size has no influence on the likelihood of use.

Finally, the level of district subsidy significantly influences use. District expenditure on health care per capita is significant at the 5% level, but contrary to expectations the small coefficient has a negative sign. For every additional 100 roubles per capita spent on health care by the district the likelihood of visiting a health care provider decreases by 1%. One explanation for this surprising result is that health status of the population is positively correlated with district health subsidy. Population density has no significant effect on the probability of visiting a health care provider.

3.4.2 Determinants of access to health care

The main interest of this analysis lies in the importance of income and district variables in determining access to health care as measured by out-of-pocket expenditures. The level of out-of-pocket payments incurred in visiting health care providers is assumed to be influenced not only by the type of health care provider visited but also by district of residence, individual, household and community characteristics.

Household characteristics that are assumed to play a role consist of the household head's age and education level as well as household income. With respect to age of the household head, we hypothesise that younger household heads are more willing to pay for health care, but that with increasing age the need for making health care expenditures rises, thus the overall effect of age is expected to be positive. Better-educated people are expected to have lower health care expenditures. Income is expected to have a positive effect, households with high per capita

incomes are assumed to have higher out-of-pocket expenditures as they can afford to purchase more health care. However, in the vast majority of cases the cost of drugs was the only cost incurred in visiting a health care provider, hence the role of income may not be very important. In order to control for the fact that some users are entitled to exemptions from pharmaceutical charges the dummy variable EXEMPT is included. As cost of pharmaceuticals is a major component of health expenditure EXEMPT is expected to have a negative effect on expenditures.

The level of expenditures incurred on visiting a health care provider is also likely to vary with the type of provider. In the survey seven types of health care provider were included; health post, rural hospital, polyclinic, district hospital, enterprise clinic, private clinic and specialist clinic. Visits to a private health care provider will entail higher costs than visits to other providers, while visits to enterprise and specialist clinics will involve lower costs as both are likely to be better funded then ordinary public health care facilities. Health posts are used as the control group as they represent the universal health care provider and the one most utilised in the sample.

The most important variables in the model, apart from income, are district characteristics. Decentralisation of health care to the district level is likely to have an effect on the level of out-of-pocket expenditures. In order to capture these district effects a number of district variables are included in the model. The most important of these is the district health care subsidy (health spending per district resident), which is expected to have a strong negative effect on the level of out-of-pocket expenditures. Population density is expected to have a negative impact on out-of-pocket expenditures as districts with high population densities have lower unit costs of provision thereby increasing public resources available for paying health care workers' salaries and pharmaceuticals. To control for specific local settings a number of community characteristics are included in the model (community size, distance to district centre). The results of the tobit regression are shown in table 3.3. The table reports the marginal coefficients of the regressors, which were calculated using LIMDEP.

Of the fourteen variables included in the model four are significant, income once again is not one of them. The fact that income does not have the theoretically expected positive significant effect in the two models indicates that income does not play an important role in determining access to health care. It therefore indicates that universal access to health care has indeed been maintained in the study regions.

Of the individual household variables education level of the household head and exemption from prescription charges were significant. Contrary to expectations education does not have a negative effect on expenditures. Every additional year of education increases expenditures by nearly 11 roubles, on average. This may be because the better educated are more aware of the need to invest in health status. EXEMPT is significant at the 10% level, and has the expected negative effect. As prescription charges are the largest component of out-of-pocket expenditures it is by no means surprising that individuals with exemption status face lower out-of-pocket expenditures, by 145 roubles on average.

The level of out-of-pocket expenditure appears to be affected by choice of health care provider. Of the seven providers included in the model only two are not public: private clinics and enterprise clinics. Unsurprisingly, patients treated in private clinics have much higher expenditures than those treated in public clinics, *ceteris paribus* a patient at a private clinic spends 1,895 roubles more than one treated at a public facility. Given that private clinics only provide services on a fee basis, while most services are free at public facilities this is only to be expected. None of the other health care facilities have a significant effect.

Interestingly district education subsidy is not a significant determinant of health expenditures, but population density of the district does have an effect. POPDENS, as expected, is negatively

related to expenditures conditional on use, with a one unit increase in population density decreasing expenditures by three roubles.

Table 3.3 Marginal coefficients for the determinants of out-of-pocket expenditures on health care conditional on use

Variable	Marginal Coefficient	
Dependent variable is out-of-pocket expenditure per visit to a health care provider		
Constant	-150.874	(232.821)
AGE	0.047	(1.475)
EDYEARS	10.920*	(6.246)
INCOME	34.685	(25.464)
EXEMPT	-145.360**	(68.209)
RUHOSP	-48.006	(50.147)
CLINIC	15.586	(50.256)
CRH	54.454	(58.335)
ENT	-22.623	(123.981)
PRIV	1895.802	(178.011)
SPECIAL	-43.071	(90.392)
COMPOP	0.011	(0.011)
KMHOSP	-2.175	(2.650)
RAIMEDPC	0.103	(0.198)
POPDENS	-3.611*	(2.110)
Number of observations	104	
Log likelihood	-668.812	

* Significant at 0.1 level ** Significant at 0.05 level *** Significant at 0.01 level.
Standard errors shown in brackets.
Source: own estimation using LIMDEP.

In summary, income does not affect access to health care, as measured by out-of-pocket expenditures, while decentralisation has. Contrary to expectations, it is households in districts with high health subsidies that face higher out-of-pocket expenditures.

3.4.3 Determinants of monthly household expenditures on health care

The above estimation of access and demand for health care indicate that access to publicly provided health care is still universal in the study regions, with income not playing a significant role in determining expenditures. The determinants of expenditure on health are expected to differ substantially from the determinants of demand for outpatient and inpatient care, as in this case health care is treated as a normal private good. If health care is a normal good then we would expect demand to be positively related to income. The dependent variable in this model is household per capita health related expenditures for a one month period, September 2000 (HEALTHPC). Included in HEALTHPC is spending on dental care, opticians, patient fees and pharmaceuticals, with spending on pharmaceuticals accounting on average for more than 75% of monthly health related expenditures. It is hypothesised that expenditure on health care is the outcome of mainly household characteristics, with community and district variables controlling for locational factors.

In addition to the variables used in the previous section this model includes the number of children and number of pensioners present in a household. Both variables are expected to have a positive effect on health spending, as both children and the elderly are more susceptible to illness. Age and education level of the respondent are both expected to have a positive effect, as it is anticipated that with increasing age and education level the need for spending on health increases. Income is expected to play a much more significant role as health is treated as a normal good, and as such investment in health status should be positively correlated with

income. The model controls for high expenditure in case of illness by including a proxy for demand for health care (ILL).

Of the community and district variables, community size is expected to have a positive sign as larger communities offer more opportunities to purchase different types of health care services. The effect of distance to hospital and town is ambiguous. On the one hand the more isolated a community is (i.e. the larger distances are) the greater the need to maintain good health, as high quality health care services are less accessible increasing monthly expenditures. On the other, isolation reduces the potential opportunities for spending, as only few health care services are available, thereby reducing expenditures. At the district level, RAIMEDPC is anticipated to have a positive effect as greater district expenditure should lead to greater access and/or higher quality, which in turn increases use and out-of-pocket expenditures. In contrast urbanisation is expected to have a negative effect as the rural populations access to health care services in more urbanised districts is worse than in more rural districts. An overview of the variables used in the analysis including their means and standard deviations is given by Table 3.4.

Table 3.4 Descriptive statistics of variables included in estimating the determinants of expenditure on health care

Variable	Definition	Mean	
Dependent variable			
HEALTHPC	Health expenditure per capita per month	74.726	(107.752)
Independent variables			
Household characteristics			
AGE	Age of the household head responsible for the household budget.	53.170	(15.290)
EDYEARS	Number of years of education of the household head responsible for the household budget	8.120	(3.240)
INCOME	Log of per capita household expenditure per month.	1124.620	(1114.352)
CHILDREN	Number of household members under 18	0.610	(0.890)
OAPS	Number of pensioners in the household	0.930	(0.840)
ILL	Case of illness in recall period, dummy variable (1=yes)	0.580	(0.490)
Community characteristics			
COMPOP	Population of community	2872.790	(2169.46)
KMTOWN	Distance to the nearest town	20.812	(14.773)
KMHOSP	Distance to nearest hospital	9.340	(8.090)
District characteristics			
URB	Share of district population living in urban areas	36.843	(20.595)
RAIMEDPC	District expenditure on health care per capita	255.793	(103.364)
Number of observations:		297	

Standard deviations are given in brackets.
Source: own calculation using SPSS.

The results of the regression are reported in Table 3.5. The most striking result of the model is the strong significant effect of income on health spending. Income is significant at the 1% level and from the model a one per cent increase in per capita income leads to an increase in expenditure of 0.40 roubles. Thus, health appears to be a normal good. Of the other household variables, OAP is significant but contrary to expectations has a negative sign. It seems that for every additional pensioner in the household monthly per capita expenditure on health care decreases on average by 17 roubles. One possible explanation for this surprising outcome is that households with pensioners are more likely to be poor and hence unable to afford to purchase non-essential health goods. Alternatively the negative sign for pensioners could be a reflection of the fact that pensioners are more likely to have exemption status reducing their expenditure on

health care. The control variable ILL is, as expected, highly significant. Households in which a member was ill in the previous three months clearly have higher health care expenditures than those, which did not report illness.

Table 3.5 Marginal coefficients of the determinants of expenditure on health care

Variable	Coefficient	
Dependent variable is health expenditure per capita per month		
(Constant)	-275.942	(72.757)
AGE	0.699	(0.492)
EDYEARS	1.826	(1.698)
INCOME	40.963***	(6.752)
CHILDREN	-8.583*	(6.599)
OAPS	-17.324**	(7.392)
ILL	37.830***	(9.669)
COMPOP	0.003	(0.003)
KMTOWN	0.669	(0.371)
KMHOSP	0.241	(0.670)
RAIMEDPC	-0.028	(0.066)
URB	-0.746**	(0.309)
Number of observations	297	
Log-likelihood function	-1540.883	

* Significant at 0.1 level ** Significant at 0.05 level *** Significant at 0.01 level.
Standard errors shown in brackets.
Source: own estimation using LIMDEP.

At the community level only distance to the nearest town is significant at the 10% level. It is positively correlated with health expenditure indicating that the further away from a town a household lives, the greater are expenditures for health care. Every additional kilometre distance leads on average to a 0.66 rouble increase in expenditure on health care per capita. This could be an indication of the poorer health status of more isolated rural residents. Finally, while district wealth has no appreciable effect on expenditures, the urbanisation level of the district is significant at the 5% level and has the expected negative effect. A one per cent increase in urbanisation leads to a 0.75 rouble reduction in health spending.

4 Conclusions

We started out with the observation that the transition process has affected the provision of social services in the Russian Federation in general and in rural areas in particular, owing to the overlap with agricultural reforms. Based on this observation we asked how the reduced role of the state and the concomitant decentralization of policymaking has affected access of the rural populace to social services. A review of the available literature on this topic resulted in the formulation of the three hypotheses. We tested these hypotheses on the grounds of a household survey conducted in two districts of Russia in 2000. Based on the econometric analyses the following conclusions can be drawn:

- **Hypothesis 1: Income is an important determinant of access to health care services.**

Contrary to what we expected, income does not have a significant effect on access to health care in the study regions. The analysis showed that income does not affect the level of out-of-pocket payments incurred upon visiting a health care provider. This indicates that health care is still a public good, and that a minimum of social protection is guaranteed. However, investments in the health status of household members seem to be strongly affected by the household's income.

- **Hypothesis 2: Informal – or under-the-counter-payments are another important determinant of access to health care services.**

Informal payments do not play an important role in determining access to health care in the study regions, with only 7% of the sampled households making such payments. This might be due to the persistence of soviet era institutions and practices in rural areas. Health care always was free of charge and therefore the rural population has not started yet to perceive health services as a private good yet.

- **Hypothesis 3: There are large differences in access to health care services between districts.**

Decentralisation has affected the provision of public goods in rural Russia. However, contrary to our expectations out-of-pocket payments are higher in districts with higher public spending on health care services. One possible explanation for this might be that there is supply induced demand. Furthermore, the analysis indicates that access to public health care for the ill has been maintained at relatively high levels in rural areas and that health care continues to be provided as a basic need primarily by the state.

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