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The Demand for Health Services in the Ukraine and In the Karelian Republic, Russia

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Background

The present social situation in the transition societies is characterised by difficult transformation processes both in the health and social situation of the population and in service provision. The changes can be classified in two categories: Firstly, the increase in poverty and income differences among the population and the dramatic changes in the dynamics of the social system as a whole; and secondly financial crisis of the public sector. Because of the income and financial crises the need for health and social services has increased, but the capacity of public health and social services to provide appropriate services has weakened. Due to changes in the social dynamics, the nature of the social problems has also changed (e.g. those connected with unemployment) and the existing service structures, working methods and service provision concepts need critical evaluation and re-adjustment to be able to respond to new large-scale health and social problems.

This report is based on a population survey study, where in both countries, about 800 households (with separate questionnaires for the household, each adult and child, for

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children the information was given by the person who gave also the family information) were interviewed in spring 2000. The aim of the whole project was to examine the health and well being, and health social service utilisation in the Karelian republic and the Ukraine.

The utilisation of health services was measured for each household member by reported utilisation of physician services, and hospitalisation. The need for health services was measured by perceived health, chronic illnesses, perceived symptoms, and health behaviour including tobacco and alcohol consumption. The economic status of the household was measured with reported income, consumption, and with the characteristics of the housing, and the access to a garden plot. The variables used here are described in table 1.

The need for and the utilisation of health services

The health of the population is measured by perceived health or the prevalence of chronic illnesses, and we can see that the health is rather poor, also among children, especially in the Ukraine (tables 2 and 3). There is also a difference between the countries in the relation of poor health and the utilisation of health services (tables 4, 5). In the Ukraine, where to the perceived health is poorer than in Karelia both the children and the adults do less visits to doctor than in the Karelian Republic. The frequency of hospital admissions is about the same. In the Ukraine, the average number of bed days is somewhat higher than in the Karelian republic. Most often the visits to doctor take place in both countries at out patient clinics and at home, and occupational clinics, private practices are used very seldom (table 6.).

The analysis of the utilisation of the health services

The utilisation variables, visits to doctor and hospital stays, are not normally distributed variables, and thus OLS- regression is not appropriate method for modelling the health service utilisation. The models tested were Poisson, negative binomial models, and two-part models, i.e. a logistic regression model explaining whether a person has visited doctor or had been admitted to hospital and secondly zero-truncated negative binomial regression for explaining the number of visits and the number of hospital bed days (Grootendorst 1995). The models were built by choosing explanatory variables that could be expected to have influence on health care

utilisation. These variables were socio-demographic variables, such as gender and age, BMI, and for adults education, and labour market status, need variables, such as perceived health, chronic illnesses and perceived symptoms, health behaviour (alcohol use and smoking), supply variables (in this case the distance to health services), and finally variables describing the resources of the families (income class, the number of conveniences in family's flat or house).

The models can be compared by their log-likelihood ratios (e.g. negative binomial model vs. logistic regression plus zero-truncated negative binomial model). On the basis of the comparisons, it seems that in almost all cases the logistic regression plus zero-truncated negative binomial model are more appropriate. They were used in all models.

Results and discussion

In tables 7–12 are the main results of the statistical modelling. The logit regression part is the first modelling the us/non use of the service, and the zero-truncated negative binomial regression is the second step modelling the number of visits of bed days in a hospital for those who have visited a doctor or been admitted to hospital.

First of all it seems that in the case of all utilisation variables, the utilisation – if a person has used a service - can be explained better with the used variables, than the numbers of visits or the numbers of bed days in a hospital. The doctor visits seem to be easier to explain the hospitalisation and the number of bed days.

For adults, both in Karelia and Ukraine, age, chronic illness, number of various symptoms, perceived health, and smoking seem to explain the doctor visits. In Karelia also the body mass index has a connection to doctor visits. The distance to services seems to have only a small effect on utilisation. The family income has an effect in Karelia and the number on conveniences in the house in Ukraine. Also the labour market status does not seem to affect on health care utilisation.

Hospital admission in both countries seems to be connected with poor perceived health. In Ukraine, good perceived health and chronic illness are connected with hospital admissions.

For children, age, chronic illness and perceived health have an effect on doctor visits. Incomes and the distances don't seem to have an effect.

On hospital admissions for children, chronic illness is almost the only variable having some explanatory power.

The perceived health status in Karelia and in Ukraine seems to be somewhat better than in Russia in general (in 1993/94 and 1998) (Carlson 2000). Carlson (and many others) argue, that the socio-economic factors have a strong influence on individual health. However, the effect of socio-economic conditions to health care demand does not seem to be that large. Brown and Rusinova (1997) report that in St. Petersburg people with lower socio-economic status use more frequently the 'neighbourhood polyclinic' than people in higher socio-economic groups, who visit a larger variety of institutions.

The results of this study can be compared to a Finnish physician utilisation study based on 1996 data (Häkkinen 2001). Häkkinen found that in Finland chronic illness, age, and private insurance were in connection with health care utilisation. For adults, the health care utilisation determinants were similar than in this study: the main determinant are the need variables, such as age, chronic illness, perceived health, but the utilisation was also associated also with gender, education, income, unemployment, and some availability variables. The pattern of health care demand seems quite similar to that of the Finnish pattern. In a recent study about demand for physician services in the European Union, Jiminez-Martin et al. (2002) found that the health stock variables are the major determinants of the utilisation of health services. They did not find any effect of income on the number of visits to the GP, although income affects the decision to contact a specialist. The results we find here are surprisingly similar – in spite of all the differences between the European Union countries or Finland and the Ukraine and the Karelian Republic, the health care utilisation determinants seem to be the same, and the effect of income (or other material well-being variables) is not as large as could be expected on the basis of the large income differences.

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Table 1. The variables

Utilisation:

Doctor visits number of doctor visits during past six months
- out-patient health clinic, hospital
- occupational health clinic, hospital
- private practice
- called to home
- other

Hospitalisation days hospitalised during past six months

Individual:

Gender (male=0, female =1), **Age**

Education primary school to complete secondary (0) vs. technical education after 10-11 classes to higher education (1)

Not working retired, student, conscript serviceman, homemaker/housewife. (Yes=1/no=0)

Unemployed unemployed. (Yes/no)

Chronic illness defect or injury that lowers the general working capacity or functional capacity, or any chronic illness (diagnosed by a doctor or lasted at least 3 months). (Yes/no)

Good health / poor health good or fairly good / poor or rather poor. (Yes/no)

BMI body-mass index

Smoking yes/no

Alcohol use vodka or other alcoholic beverages (excluding beer); daily or nearly daily= 4, once a week=3, 2 – 3 times a month=2, about once a month or less frequently=1, never=0)

Symptoms sum of: exhaustion, depression, irritability, insomnia, pain in the chest, pain in the back, headache, pain in joints, tiredness, dizziness, forgetfulness, difficulties with breathing or agony in rest, pain in stomach, (yes/no)

Household:

Conveniences sum of: central heating, tap cold/hot water, toilet (inside), bathroom/shower, sauna, telephone, television, electricity, washing machine, refrigerator, (yes/no)

Income I – IV dummies for income quartiles (per equivalent consumer) classes (1= poorest, 4= the richest)

Income unknown income unknown

Distance to out-patient clinic or medical attendant centre, in minutes

Distance to hospital, in minutes

Table 2. Perceived health; rather poor or poor, %

Age group	Male		Female		All	
	Karelia	Ukraine	Karelia	Ukraine	Karelia	Ukraine
0-6	4	5	8	6	6	5
7-14	5	8	6	11	6	10
All	5	7	7	9	6	8
15-24	2	9	5	11	4	10
25-44	6	15	9	22	7	19
45-64	18	32	23	50	21	43
65-74	44	57	49	76	47	68
75-	60	79	70	80	67	80
All	13	28	20	41	17	36

Table 3. Chronic morbidity; defect or injury that lowers person's functional capacity, %

Age group	Male		Female		All	
	Karelia	Ukraine	Karelia	Ukraine	Karelia	Ukraine
0-6	25	25	19	18	22	21
7-14	49	44	49	41	49	43
All	41	37	40	32	40	35
15-24	38	45	36	44	37	44
25-44	42	53	48	55	46	54
45-64	66	77	72	82	69	80
65-74	77	82	91	91	86	87
75-	93	88	94	89	93	89
All	52	65	60	69	57	67

Table 4. Visits to doctor, yes %

Age group	Male		Female		All	
	Karelia	Ukraine	Karelia	Ukraine	Karelia	Ukraine
0-6	74	60	71	54	73	57
7-14	65	56	70	66	67	61
All	68	58	70	62	69	60
15-24	49	45	57	51	54	49
25-44	45	35	56	53	52	45
45-64	52	43	54	52	53	48
65-74	59	49	70	55	66	52
75-	80	50	61	46	66	47
All	50	42	58	52	55	48

Table 5. Hospitalisation, yes %

Age group	Male		Female		All	
	Karelia	Ukraine	Karelia	Ukraine	Karelia	Ukraine
0-6	11	9	14	5	12	7
7-14	10	12	13	10	12	11
All	10	11	14	8	12	10
Bed days						
Median	14	20	10	10	14	14
Mean	17	20	18	9	17	16
15-24	9	9	8	7	8	8
25-44	9	8	9	11	9	10
45-64	7	10	10	12	9	11
65-74	15	15	8	12	11	13
75-	13	18	15	7	15	10
All	9	10	9	10	9	10
Bed days						
Median	14	21	12	14	14	18
Mean	18	26	20	20	19	22

Table 6. Visits to doctor during the past six months, yes %

Service	Children		Adults	
	Karelia	Ukraine	Karelia	Ukraine
Out-patient clinic	63	55	45	38
Occupational clinic			6	4
Private practice	1	2	2	2
Doctor called home	24	13	10	8
Something else	2	2	1	1

Table 7. Visits to doctor, adults, Karelia, n = 1524. Regression coefficients

	All visits		Outpatient clinic			Home		
	Logit regression	Truncated negative binomial regression	Logit regression	Truncated negative binomial regression	Logit regression	Truncated negative binomial regression	Truncated negative binomial regression	
Constant	0.63	0.03	0.48	-0.54	-3.10 **	-0.51		
Gender	-0.04	0.33 *	0.13	0.39 *	-0.20	0.17		
Age 25-34	-0.14	-0.34	-0.05	-0.12	0.09	-2.72 ***		
Age 35-44	-0.39	-0.25	-0.43 *	0.03	-0.40	-1.66 **		
Age 45-54	-0.58 *	-0.28	-0.43	-0.03	-0.26	-3.03 ***		
Age 55-64	-0.84 **	0.24	-0.67 *	0.59	-0.28	-1.01		
Age 65-74	-0.59 *	-0.31	-0.68 *	-0.27	0.08	-0.98		
Age 75+	-0.91 *	-0.20	-1.64 ***	-0.02	0.28	-1.79 *		
Education	0.02	0.23	-0.06	0.14	-0.05	0.77 *		
Not working	0.02	-0.13	-0.21	0.02	0.20	-1.31 *		
Unemployed	-0.55 *	-0.06	-0.43	0.15	-0.58	-1.49		
Chronic illness	1.02 ***	0.24	0.84 ***	0.24	0.43	-0.44		
Symptoms	0.08 ***	0.03	0.07 ***	0.03	0.09 **	-0.02		
Good health	-0.30 *	-0.08	-0.30 *	-0.05	-0.25	-0.60		
Poor health	0.53 **	0.75 ***	0.25	0.71 ***	0.59 **	1.41 ***		
Smoking	-0.36 **	0.10	-0.26	0.05	-0.45	0.14		
Alcohol	-0.03	-0.14 *	0.00	-0.12	-0.13	-0.36		
BMI	-0.04 **	-0.03	-0.05 ***	-0.02	0.00	-0.02		
Income I	0.05	0.40 *	0.22	0.38	0.65 *	1.03		
Income II	0.26	0.47 **	0.33 *	0.49 *	0.17	1.16 *		
Income III	0.24	0.30	0.26	0.23	0.44	0.71		
Income unknown	0.09	0.55	0.54	0.34	-0.18	-16.04 ***		
Distance to out-patient clinic	0.00	0.00	0.00	0.00	0.00	0.01		
Distance to hospital	0.00	0.00	0.00	-0.01	0.00	0.00		
Conveniences	0.02	0.08	0.02	0.09	-0.01	0.19		
Overdispersion parameter		1.91 ***		2.09 ***		0.90 **		

Table 8. Visits to doctor, adults, Ukraine, n = 1690. Regression coefficients

	All visits		Outpatient clinic			Home						
	Logit regression		Truncated negative binomial regression	Logit regression	Truncated negative binomial regression	Logit regression	Truncated negative binomial regression					
Constant	-1.17	*	-1.21	*	-1.54	***	-1.54	*	-2.95	**	5.68	
Gender	-0.01		0.09		0.09		0.07		0.11		0.12	
Age 25-34	-0.07		0.18		-0.07		0.23		0.37		-5.51	
Age 35-44	-0.41		0.14		-0.51	*	0.37		0.19		-7.88	*
Age 45-54	-0.42		-0.24		-0.62	**	-0.08		0.10		-7.82	*
Age 55-64	-0.90	***	0.47		-0.80	**	0.76	*	0.49		-6.64	*
Age 65-74	-0.72	**	0.11		-0.73	**	0.29		1.26	*	-6.76	*
Age 75+	-1.03	***	0.44		-0.93	***	0.50		1.39	*	-5.99	
Education	0.12		0.29	*	0.08		0.25		0.24		0.62	
Not working	0.32		0.37	*	0.34		0.50	*	-0.27		-5.27	
Unemployed	-0.14		-0.11		0.09		-0.08		-0.85		-2.42	
Chronic illness	0.76	***	0.80	***	0.73	***	0.72	***	0.58		0.82	
Symptoms	0.05	**	0.02		0.05	**	0.01		0.00		0.04	
Good health	-0.43	**	0.05		-0.43	**	-0.04		-0.13		-0.58	
Poor health	0.42	**	0.53	**	0.33	*	0.51	*	0.46		0.54	
Smoking	-0.39	**	-0.01		-0.43	**	-0.02		-0.09		0.31	
Alcohol	-0.11		-0.11		-0.04		-0.18		-0.22		-0.17	
BMI	0.01		0.01		0.01		0.01		-0.01		0.01	
Income I	-0.16		-0.09		0.05		-0.09		-0.89	*	-0.88	
Income II	-0.19		-0.09		-0.06		0.01		-0.51		0.01	
Income III	-0.18		-0.33		-0.14		-0.27		-0.31		0.01	
Income unknown	-0.40		0.20		-0.46	*	0.52		0.05		-0.12	
Distance to out-patient clinic	0.00		0.00		0.00		0.00		0.01		-0.02	
Distance to hospital	0.00	*	0.00		-0.01	*	0.00		-0.01	**	0.00	
Conveniences	0.10	**	0.05		0.10	**	0.06		0.02		-0.08	
Overdispersion parameter			2.07	***			2.57	***			1.94	

Table 9. Hospital bed days adults, Karelia and Ukraine. Regression coefficients

	Karelia		Ukraine	
	Logit regression	Truncated negative binomial regression	Logit regression	Truncated negative binomial regression
Constant	-2.99 **	2.60 *	-3.09 ***	2.43 ***
Gender	-0.12	0.01	-0.32	0.02
Age 25-34	-0.17	-0.34	0.20	0.21
Age 35-44	-0.02	0.20	-0.04	0.34
Age 45-54	-0.42	0.19	-0.16	0.32
Age 55-64	-0.25	-0.01	-0.35	0.81 *
Age 65-74	-0.72	-0.12	-0.24	0.64
Age 75+	-0.45	0.27	-0.58	0.57
Education	-0.01	0.20	0.11	-0.01
Not working	0.15	-0.34	0.27	-0.01
Unemployed	0.10	0.23	-0.26	-0.22
Chronic illness	0.41	0.48	0.77 **	0.72 *
Symptoms	0.05	-0.03	0.01	-0.04 *
Good health	0.03	0.13	-0.86 **	-0.06
Poor health	1.37 ***	0.21	0.77 ***	0.39 *
Smoking	0.17	0.29	-0.16	0.43 *
Alcohol	-0.02	-0.04	-0.06	0.02
BMI	-0.02	-0.03	0.01	-0.02
Income I	0.52	0.20	0.19	0.15
Income II	0.45	0.22	-0.08	-0.01
Income III	0.39	0.23	-0.58 *	-0.13
Income unknown	0.21	0.23	-0.69	0.27
Distance to out-patient clinic	0.00	0.00	0.01 *	0.00
Distance to hospital	0.00	0.00	0.00	0.00
Conveniences	0.02	0.04	0.05	0.03
Overdispersion parameter		0.67 ***		0.44 ***

Table 10. Visits to doctor, children, Karelia, n= 471. Regression coefficients

Karjala	All visits				Outpatient clinic				Home			
	Logit regression		Truncated negative binomial regression		Logit regression		Truncated negative binomial regression		Logit regression		Truncated negative binomial regression	
Constant	1.20		1.15	*	1.12		0.62		-0.80		0.56	
Gender	0.16		0.12		0.02		0.21		0.31		-0.35	
Age	-0.07	**	-0.09	***	-0.06	*	-0.10	***	-0.07	**	-0.06	
Chronic illness	0.72	**	0.55	***	0.64	**	0.53	**	0.41		0.64	
Good health	-0.67	*	-0.37	*	-0.60	*	-0.25		-0.44		-0.77	*
Poor health	0.81		0.69	**	1.36		0.69	**	0.83		0.21	
Income I	0.09		0.14		-0.14		0.14		0.21		1.08	
Income II	0.38		0.07		0.22		0.03		-0.10		0.91	
Income III	-0.12		0.26		-0.40		0.33		0.35		0.58	
Income unknown	0.09		0.20		-0.09		0.26		-0.74		-0.07	
Distance to out-patient clinic	-0.01		-0.01		-0.00		-0.00		0.00		-0.02	
Distance to hospital	0.01		0.01		-0.01		0.01	*	0.01	*	0.01	
Conveniences	0.02		0.05		0.05		0.07		-0.05		-0.03	
Overdispersion parameter			0.67	***			0.72	***			0.28	

Table 11. Visits to doctor, children, Ukraine, n= 426. Regression coefficients

	All visits		Outpatient clinic			Home		Truncated negative binomial regression
	Logit regression	Truncated negative binomial regression	Logit regression	Truncated negative binomial regression	Logit regression			
Constant	-0.88	1.45 *	-1.29	1.49 *	-1.26		-1.64	
Gender	0.15	0.27	0.04	0.27	0.25		-0.20	
Age	-0.03	-0.08 **	-0.03	-0.07 *	-0.16 ***		-0.07	
Chronic illness	0.63 *	0.70 **	1.07 ***	0.61 *	-0.10		0.58	
Good health	-1.18 ***	-0.47	-0.68 **	-0.60	-1.17 **		-0.31	
Poor health	1.49	0.53 *	1.42 *	0.51 *	-0.03		1.09	
Income I	0.33	-0.47	0.38	-0.41	-1.27 *		-0.57	
Income II	0.02	-0.31	0.01	-0.36	-0.68		0.46	
Income III	0.42	-0.10	0.54	-0.18	-0.16		0.61	
Income unknown	0.27	-0.46	0.06	-0.38	0.25		-0.43	
Distance to out-patient clinic	-0.01	0.00	-0.01	0.00	0.01		0.00	
Distance to hospital	0.00	-0.01	-0.00	-0.00	0.00		-0.01	
Conveniences	0.29 ***	0.00	0.27 ***	-0.03	0.19		0.27	
Overdispersion parameter		0.93 ***		0.89 **			0.56	

Table 12. Hospital bed days, children, Karelia and Ukraine. Regression coefficients

	Karelia		Ukraine	
	Logit regression	Truncated negative binomial regression	Logit regression	Truncated negative binomial regression
Constant	-1.94	1.53 ***	-3.11 *	3.20 ***
Gender	0.25	-0.28	-0.21	-0.80 *
Age	-0.07	0.01	-0.01	0.05
Chronic illness	2.06 ***	0.49	1.84 ***	0.07
Good health	-0.12	0.05	-0.29	-0.19
Poor health	1.19 *	-0.01	0.53	0.20
Income I	0.92	0.17	0.61	-0.31
Income II	0.23	-0.23	-0.22	-0.73
Income III	0.69	0.10	-0.06	-0.38
Income unknown	-0.58	0.82	0.20	0.26
Distance to out-patient clinic	0.01	0.01	0.00	-0.00
Distance to hospital	0.00	-0.00	-0.01	0.00
Conveniences	-0.24 *	0.09	0.02	-0.07
Overdispersion parameter		0.23 *		0.20 **