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ORIGINAL ARTICLE

Urban-rural differences in social capital in relation to self-rated health and subjective well-being in older residents of six regions in Poland

Beata Tobiasz-Adamczyk[1], **Katarzyna Zawisza**[1]

[1] *Department of Medical Sociology, Chair of Epidemiology and Preventive Medicine, Jagiellonian University Medical College, Cracow, Poland*

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Abstract

The aim of the study was to assess the differences between rural and urban areas as regards the role of social capital and its effect on self-rated health and subjective well-being among older people in Poland. The sample was selected on the basis of multi-stage clustered design from the non-institutionalized adult population. Analysis was based on 1,299 elderly people aged 65 and over from the general Polish population who participated in the COURAGE in Europe project. Six regions of Poland were distinguished according to first level of *Nomenclature of Units for Territorial Statistics (NUTS) classification*. As an indicator of social capital, the COURAGE Social Network Index, the OSLO-3 Social Support Scale, and the three item UCLA Loneliness scale were used, as well as social participation and trust was assessed. Self-rated health (SRH) was measured by WHO-Europe recommended version (ranging from 'very good' to 'very bad'). Well-being was assessed by the Day Reconstruction Method.

Results: The results showed that in urban areas, social network and social participation supported positive self-rated health; in rural, older residents the number of years of education and social support played the same role, while self-rated health decreased with an increasing level of loneliness. Self-rated health decreased in both groups of older people with a growing number of diseases. The multivariate linear regression model of predictors of well-being in older age also confirmed differences between urban and rural elderly residents. In rural residents, subjective well-being significantly increased with the positive effect of the social network. In both urban and rural areas, poor assessment of subjective well-being in older age increased with a higher level of loneliness and growing number of chronic diseases.

Key words

social capital, urban-rural, older residents, self-rated health, well-being

INTRODUCTION

Sociologists have a long-standing interest in studies of local communities and the effects of industrialization on interpersonal relationships [1, 2]. The related concepts 'community lost' and 'community saved' as well as contemporary formulations of the rural/urban contrast, are based on a set of assumptions about the organization and content of interpersonal ties in traditional societies, assumptions which have themselves been the object of study [2].

In several studies focused on social capital and its relationship with different aspects of health, the concept of social capital as developed and defined by Putnam and Cooleman in the 1990's has been used. To quote Robert Putnam regarding social capital, it is the property of a collectivity and refers to 'features of social life – networks, trust and norms – that enable participants to act together more effectively to pursue shared objectives' [3], which suggests that 'social capital needs to be distinguished from other properties of individuals, families and communities' [4].

Mohan and Mohan [5] ascertained that social capital should be distinguished from Bourdieu's concept of cultural capital, which he defined as the possession of cultural resources and skills necessary to participate in elite social interactions, and which was itself wholly the property of the individual actor in the culture, i.e. a person. The concept of social networks has often been used to describe the access to resources of a material or nonmaterial kind. Bourdieu defined social capital as 'an aggregate of the actual or potential resources which are linked to the possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition' [6]. Woolcook and Narayan [7] mentioned that this formal definition stresses that social capital refers to the social norms and networks that enable people to act collectively; this definition focuses on resources, rather than the consequences, therefore recognizing that important features of social capital, such as trust and reciprocity, are developed in an iterative process. The classical definition of social capital presents the community as a primary unit of analysis, and individuals and households are perceived as significant elements of the community [7].

An important predictor of social capital and its related processes is community type, especially the differences between rural and urban communities [8]. Hofferth and Iceland [9] discussed the traditional approach to differences in social capital in rural and urban areas in relation to effects of urbanization and industrialization on social ties. In classical sociology, rural communities has been described as a networks of close personal ties that significantly influenced all dimensions of personal life. These relationships usually

Address for correspondence: Beata Tobiasz-Adamczyk, Department of Medical Sociology, Chair of Epidemiology and Preventive Medicine, Jagiellonian University Medical College
e-mail: mytobias@cyf-kr.edu.pl

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gave strong social support, but in some way may limit mobility. The process of industrialization and urbanization disrupted traditional systems of control and exchange among kin, and rural to urban migration decreased the frequency and intimacy of contacts among kin and weakened intergenerational ties [9]. Many studies confirmed that in urban areas social contacts have become impersonal and transitory, but many migrants from rural to urban areas establish close ties in the urban environment, and urban residents have as many social ties as small town residents, even if the nature of these ties differ [10].

The situations of people in rural and urban areas have converged over the past few decades. Rural and urban populations continue to differ along several dimensions [9]. These authors noticed that rural American residents have more children and seniors, and fewer young and middle-age adults, and are characterized by a more traditional household structure, and the *per-capita* income level is also lower (77%) than those living in metropolitan areas. [9].

Differences in social network and the nature of interpersonal relationships as a basis of local communities has been well studied in relation to such aspects as the types of exchange relationships between parents and children, and nature of social networks (rural participants of social networks had known each other longer, and were more likely to be related than were the members of metropolitan networks).

As mentioned above, sociological studies until recently have primarily been concerned with the causes of observed changes over time in the nature of social capital in rural and urban areas; in the last decades, the interest of socio-medical researchers has shifted to the role of the different dimension of social capital on health outcomes. Relationships between social ties, social support social trust in older ages, and the risk of mortality, have been well documented [11]. Of particular importance has been the discovery that the absence of social ties has a very important impact on health. The role of social networks on health and the influence of social ties on mental health has also been well-documented [12, 13]. Several studies confirmed the role of supportive social networks in self-rated health and well-being.

A review of the literature shows that only in a few studies have analysed the role of social capital in rural and urban areas in relation to subjective indicators of health, such as self-rated health and well-being. Less is known about regional differences in social participation, and social integration in relation to the self-rated health and well-being of older people on the local level in such countries as Poland. In this case, patterns of social participation of older people, as well as the perception of social trust and social integration, should be analyzed as a consequence of past circumstances experienced by older people, and associated with the stability of place of residence, or as an effect of different forms of migration caused by the political conditions (changes of west-east national borders) or influenced by processes of industrialization and urbanization which took place in the second half of 20th century.

The purpose of the presented study was to assess the differences between rural and urban areas as regards the role of social capital (social support, social network, trust) and its effect on self-rated health and subjective well-being among older persons in Poland.

MATERIALS AND METHOD

Study design and sampling. The cross-sectional study *COURAGE in Europe* was conducted in 2011–2012 [14]. The sample was selected on the basis of a multi-stage clustered design from the non-institutionalized adult population. Analysis was based on 1,299 elderly people aged 65 and over from the general Polish population. Face-to-face interviews were performed by specially trained interviewers at the homes of the individuals under study. The individual response rate was 66.5%. Data were weighted to generalize the study sample to the reference population.

Measurements. Place of residence was measured as a dichotomized variable with the categories: urban and rural. An area was defined as urban when it has been legally proclaimed as being urban. Such areas include towns, cities and metropolitan areas. All other areas that are not classified as being urban, were defined as a rural area. This includes commercial farms, small settlements, villages, and other areas which are further away from towns and cities.

Six regions of Poland (south-west, south, east, central, north and north-west) according to the first level of *Nomenclature of Units for Territorial Statistics (NUTS) classification* were distinguished [15].

Age was calculated as the difference between date of birth and date of final interview; next, missing data was imputed from variables concerning age declared by respondent. Information about gender and total household income was also included. Level of education was assessed by the total number of years completed at school. Perceived social support was measured by the OSLO-3 Social Support Scale [16]. Loneliness was assessed by means of the Three-item UCLA Loneliness Scale [17]. Trust was measured as a factor score of 5 items. Four questions were measured on the 5-point Likert scale and concerned the extent of trust towards people from neighbourhood, those with whom the respondents work and strangers and members of their families. One question was related to general trust towards people measured by a dichotomous variable.

Participation was assessed as a global factor score of 8 items, where the results support hierarchical factor structure consisting of 2 lower order factors and one higher order factor. Questions concerned the frequency of attendance at public meetings, meetings with a community leader, attendance at any group or organizational meeting, work with people from the neighbourhood to fix or improve something, having a friend visit the home, visiting or hosting someone who lives in a different neighbourhood, attendance at sport competitions or performing sport with someone else, and getting out of the house to attend social meetings. All questions were measured with 5-point Likert scale, ranging from never to daily.

In order to measure the social network – the COURAGE Social Network Index (SNI) was used [18]. The COURAGE-SNI assesses elements of the function of social networks (frequency of direct contact, ties and social support) provided by structural components (spouse or partner, parents, children, grandchildren, other relatives, neighbours, friends, co-workers). The score was obtained by Item Response Theory procedure and the results interpreted as social networks saturation.

All the aforementioned scales ranged from 0 – 100, where 0 indicated the lowest level of support, loneliness, participation,

trust and social network saturation, while 100 the highest one.

Self-rated health was assessed by question: *In general, how would you rate your health today?* with 5-point response categories ranging from 'very good' to 'very poor'. The variable was recoded into reverse order. Chronic health conditions were measured with self-reported information. Respondents were asked whether they have ever been diagnosed with: arthritis, angina or angina pectoris, diabetes, chronic lung disease, asthma, depression, hypertension, and have they ever been told by professionals that they have had a stroke. For the analysis, the continuous variable of the total number of chronic diseases was created.

Subjective well-being was measured by the abbreviated version of the Day Reconstruction Method (DRM) [19]. Respondents were asked to systematically reconstruct their activities related to one of the 3 parts of the previous day: morning, afternoon, and evening, and report the strength of feeling accompanying the activities on a scale ranging from 0 (not at all) – 6 (very much). It was shown that the results provided by the abbreviated version of the DRM combining the afore-mentioned sets aggregated over the population and the results from the full day version, where respondent were asked about the activities performing during the whole previous day, gave a similar profile of the population [20]. As a result, the *net-affect* index was computed as the difference between the average assessments of intensity of the 2 positive moods (*calm or relax* and *enjoy*), and the average assessment of intensity of the 5 negative responses (*worry, rushed, irritation or anger, depression* and *tension or stress*), weighted by the activity duration. Scores ranged from minus 6 to 6, and a higher score indicated a higher level of subjective well-being.

Statistical analysis. Statistical analyses were performed using IBM SPSS Statistics 20 and Mplus 7. Data were tested for normality using the Kolomogorov-Smirnov test (with Lilliefors correction). The differences in socio-demographic characteristics, social capital, health status and well-being between urban and rural older people were verified by the *Student's t*-test or Mann-Whitney U-test. Chi-square test was used to assess gender and regional differences between the urban and rural population.

Identification of the determinants of self-rated health among urban and rural older people was done by the ordered probit regression model, performed under the assumption that the ordered categorical variable measure of the self-rated health is a proxy for a true underlying latent variable, which is normally distributed. For independent continuous variables, probit coefficients from Mplus are normal linear regression coefficients [21]. Subsequently, similar analysis was performed across the 6 NUTS regions of Poland. Model 1 estimated the association between age, gender, level of education and total number of chronic diseases as determinants of self-rated health; models 2–6 assessed social network, social support, loneliness, social participation and trust as determinants of self-rated health controlling for age, gender, level of education and total number of chronic diseases.

Possible determinants of subjective well-being among urban and rural elderly people in the whole country and across the 6 NUTS regions of Poland were assessed using the multivariate linear regression model.

RESULTS

Generally 66.1% older people were residents of urban areas and 33.9% of rural areas. Demographic and social characteristic of respondents showed differences between urban and rural elderly residents in relation to the number of years of education, total household income and social participation. A higher level of subjective well-being was also observed among urban older people. Differences among divided regions were observed in relation to the structure of urban and rural residents. The highest proportion of urban older residents was noticed in the north-western and south-western regions and the lowest in eastern region; as a consequence of this structure of urban citizens, the highest rural older residents were observed in the eastern region and the lowest in the north-western region (Tab. 1).

Table 2 presents the differences in socio-demographic characteristics, social capital, subjective health and well-being between older people living in urban and rural areas across the regions of Poland. In the eastern region, statistically significant differences between urban and rural areas were observed in relation to age and social participation. In the northern region, urban and rural older residents differed in relation to self-rated health and subjective well-being. Moreover, significant differences were found between urban and rural older people in the level of social participation, as well as self-rated health and total number of chronic diseases,.

In urban areas, the social network and social participation supported positive self-rated health; in rural older residents, the number of years of education and social support played the same role, while self-rated health decreased with increasing level of loneliness. Self-rated health decreased in both groups of older people with a growing number of diseases (Tab. 3).

Multivariate linear regression model of predictors of well-being in older age also confirmed differences between urban and rural elderly residents. In rural residents, subjective well-being significantly increased with the positive effect of social network; whereas, both in urban and rural areas, poor assessment of subjective well-being in older age increased with a higher level of loneliness and growing number of chronic diseases (Tab. 4).

Differences in determinants of self-rated health in urban and rural elderly residents across the mentioned 6 regions was shown, based on multivariable models of ordered probit regression. In the eastern region, self-rated health decreased with an increasing of number of diseases, and increased with social support in rural residents, while self-rated health decreased with level of loneliness. Data from the south-western region confirmed a worse assessment of self-rated health depended on a higher number of diseases, independently of the type of area of the residents. In urban areas of this region, positive self-rated health in the urban citizens increased with the number of years of education and social network index, whereas social participation and social trust and decreased with the higher level of loneliness. In the central region, significantly worse self-rated health in urban older residents was found for females, which was related with a lower level of the social network index. Comparatively, in the rural areas, not only the social network index but other indicators of social capital, such as social support and social participation, predicted positive self-rated health. Also in this region, the risk of poor self-rated health increased with higher a number of chronic diseases. In the

Table 1. Differences in socio-demographic characteristics, social capital and health status between people living in urban and rural areas

	Urban (66.1%)		**Rural (33.9%)**	
	Mean(SD)	Median(Q1;Q3)	Mean(SD)	Median(Q1;Q3)
Age	74.5 (6.6)	73.4 (69.1; 79.0)	74.7 (6.8)	74.3 (69.0; 79.4)
Female n(%) (weighted %)	427(61.3) (56)		367(61) (53.8)	
No. of years of education *	10.7 (3.6)	11.0 (7.0;13. 0)	8.9 (3.8)	7.0 (7.0; 11.0)
Total household income (PLN/month) *	2474 (1693)	2289 (1233;3346)	2458 (7274)	1937 (1233;2641)
Three-item UCLA Loneliness Scale	14.7 (21.9)	0 (0; 16.7)	15.8 (23.9)	0(0; 16.7)
COURAGE Social Network Index	63.5 (12.7)	63.6 (54.8; 72.7)	64.8 (13.3)	66.0 (57.1; 72.6)
OSLO-3 Social Support Scale	64.4 (17.1)	63.6 (54.6;72.7)	64.3 (17.3)	63.6 (54.6; 72.7)
Social participation*	18.9 (13.8)	15.5 (9.5; 27.5)	17.3 (13.7)	13.3 (7.4; 26.5)
Trust	47.5 (15.8)	46.6 (36.5; 55.1)	47.6 (14.2)	46.6 (37.9; 56.3)
Self-rated health status	2.8 (0.8)	3 (2;3)	2.8 (0.8)	3 (2; 3)
Total number of chronic diseases	1.5 (1.4)	1 (0;2)	1.3 (1.2)	1 (0;2)
Subjective well-being* (net affect)	4.0(2.1)	4.7(3; 5.9)	3.7(2.4)	4.5(2.6; 5.5)
NUTS1 regions of Poland*	n(%) (weighted %)		n(%) (weighted %)	
South-West	45 (73.8) (61.0)		16 (26.2) (39.0)	
South	88 (65.7) (60.0)		46 (34.3) (40.0)	
East	64 (47.8) (34.7)		70 (52.2) (65.3)	
Central	101 (70.1) (42.3)		43 (29.9) (57.7)	
North	73 (67.6) (62.2)		35 (32.4) (37.8)	
North-West	80 (79.2) (65.2)		21 (20.8) (34.8)	

* p<0.05; SD-standard deviation; Q1-first quartile; Q3-third quartile.

Table 2. Differences in socio-demographic characteristics, social capital and health status between people living in urban and rural areas across the 6 NUTS regions of Poland.

		Urban		**Rural**	
		Mean (SD)	*Median (Q1;Q3)*	*Mean (SD)*	*Median (Q1;Q3)*
South-West	Age	76.4 (6.7)	75.4 (70.7;82.2)	76 (6.5)	74.7 (71.2;80.7)
	No. of years of education	7.9 (17.1)	10 (8;12)	4.4 (25.4)	10 (8;12)
	OSLO-3 Social Support Scale	67 (18.7)	63.6 (54.5;81.8)	68.8 (18.3)	72.7 (63.6;81.8)
	Three-item UCLA Loneliness Scale	10.9 (19.1)	0 (0;16.7)	12.4 (24)	0 (0;16.7)
	Trust	46.3 (17.2)	43.8 (32.8;56.7)	47.2 (14.7)	46.6 (37.4;55.1)
	Social participation	20.7 (15.7)	18 (7.4;30.1)	21.6 (14.9)	22.3 (7.4;30.3)
	COURAGE Social Network Index	63.7 (13.8)	65.8 (56.5;73)	69.3 (13.1)	68.7 (61.5;79.2)
	Self-rated health	2.9 (0.9)	3 (2;3)	3.1 (0.8)	3(3;4)
	Total No. of chronic diseases	1.8(1.2)	2 (1;3)	1.5(1.2)	1(1;2)
	Subjective well-being (net affect)	3.6 (2.7)	4.5 (0.9;6)	3.7 (2.7)	5 (1.8;6)
South	Age	76.3 (7.3)	76 (69.5;82.3)	75.5 (6.7)	75.1 (70.4;80.6)
	No. of years of education	8.4 (13.5)	10 (7;12)	8.6 (3.7)	7 (7;10)
	OSLO-3 Social Support Scale	64.4 (16.7)	63.6 (54.5;72.7)	61.8 (18.5)	63.6 (50;72.7)
	Three-item UCLA Loneliness Scale	15.2 (22.8)	0 (0;33.3)	19.6 (30.1)	0 (0;33.3)
	Trust	47.5 (15.9)	48.7 (37.4;56.3)	45.6 (16.7)	44.2 (34.1;55.7)
	Social participation	18.9 (13.6)	17.3 (8.2;25.8)	18.7 (14.2)	15.5 (8;28.6)
	COURAGE Social Network Index	63.5 (12.3)	63.6 (56.1;71.5)	66.7 (13.4)	68.2 (58.8;75.3)
	Self-rated health	2.7(0.9)	3(2;3)	2.9(0.7)	3(3;3)
	Total No. of chronic diseases	1.8(1.4)	2(1;3)	1.4(1.2)	1(1;2)
	Subjective well-being (net affect)	3 (9)	4.5 (2.4;5.9)	4 (1.9)	4.5 (2.8;5.7)
East	Age*	75.5 (7.4)	74.1 (69.2;81.8)	77.3 (7.4)	77.3 (70.9;83.6)
	No. of years of education	8 (17.4)	11 (7;13)	5 (17.3)	7 (6;10)
	OSLO-3 Social Support Scale	62.9 (15.7)	63.6 (54.5;72.7)	63 (16.4)	63.6 (54.5;72.7)
	Three-item UCLA Loneliness Scale*	21.7 (25.1)	16.7 (0;50)	14.9 (23.4)	0 (0;16.7)
	Trust	41.7 (13.1)	42.1 (32.8;50.3)	42.9 (13.4)	43.4 (30.4;52.6)
	Social participation*	16.9 (13.1)	12.5 (7.8;23.4)	14.9 (13.2)	9.7 (4.8;22.6)
	COURAGE Social Network Index	60 (12.2)	59.6 (49.7;69)	65.7 (12.6)	65.1 (57.8;72.8)
	Self-rated health	3.8(0.8)	3 (2;3)	2.7(0.8)	3 (2;3)
	Total No. of chronic diseases	1.5(1.5)	1(0.2)	1.4(1.3)	1(0;2)
	Subjective well-being (net affect)	4 (2.2)	4.6 (3;5.7)	4.1 (1.9)	4.5 (3;5.7)

Table 2. Differences in socio-demographic characteristics, social capital and health status between people living in urban and rural areas across the 6 NUTS regions of Poland

		Urban		Rural	
Central	Age	76.3 (7.4)	75.4 (69.4;82.7)	76.8 (6.9)	77.1 (70.8;81.8)
	No. of years of education	6.7 (22.2)	11 (7;13)	8 (10.1)	7 (7;11)
	OSLO-3 Social Support Scale	63.1 (19.1)	63.6 (45.5;72.7)	61 (19.3)	63.6 (45.5;72.7)
	Thee-item UCLA Loneliness Scale	17.3 (21.2)	16.7 (0;33.3)	19.3 (22.9)	16.7 (0;50)
	Trust	48.2 (17.2)	46.7 (34.4;55.1)	51.6 (14.5)	50.7 (42.5;59.6)
	Social participation	19.4 (14.4)	16.9 (7.9;28.7)	19.4 (13.7)	15.5 (9.7;26.5)
	COURAGE Social Network Index	61.3 (13.2)	62.1 (51;71.4)	62 (14.2)	61 (55.4;70.8)
	Self-rated health	2.8(0.8)	3 (2;3)	2.7 (0.7)	3 (2;3)
	Total No. of chronic diseases	1.2(1.3)	1(0;2)	1.1(1.1)	1(0;2)
	Subjective well-being (net affect)	3.1 (2.3)	3.7 (1.9;5)	3.1 (2.5)	4 (0.4;5)
North	Age	76.9 (7.3)	77.5 (70.3;82.5)	76.3 (7.3)	75.8 (70.2;81.9)
	No. of years of education	10.3 (3.5)	10 (7;12)	8.6 (3.2)	8 (7;10)
	OSLO-3 Social Support Scale	66.2 (16.8)	72.7 (54.5;81.8)	67.1 (14.8)	63.6 (63.6;72.7)
	Three-item UCLA Loneliness Scale	15.7 (22.9)	0 (0;16.7)	20.2 (25.5)	16.7 (0;33.3)
	Trust	49.8 (14.3)	50.7 (40.1;56.3)	52.7 (14.2)	50.7 (45.9;60.5)
	Social participation	18.2 (13.9)	12.9 (9.4;27.7)	16 (12.8)	12.5 (8.2;24.2)
	COURAGE Social Network Index	61.3 (12.5)	61.3 (52.5;70.2)	62.3 (12.3)	62.1 (54.7;71.8)
	Self-rated health*	3.1 (0.7)	3 (3;4)	2.8 (0.7)	3 (2;3)
	Total No. of chronic diseases	1.2(1.2)	1(1;2)		1(0;1)
	Subjective well-being (net affect)*	3.6 (8.9)	5 (3.9;5.8)	2.1 (11.4)	4.3 (1.5;5.5)
North-West	Age	75.8 (6.8)	75.4 (70.1;81.2)	76.6 (7.5)	76.5 (69.6;82.9)
	No. of years of education	9.5 (9.6)	10 (7;12)	8.4 (3.7)	7 (7;10)
	OSLO-3 Social Support Scale	59.8 (15.3)	63.6 (45.5;72.7)	64.6 (16.5)	63.6 (54.5;72.7)
	Three-item UCLA Loneliness Scale	20.9 (28.4)	0 (0;33.3)	20 (22.3)	16.7 (0;50)
	Trust	42 (13.2)	39.9 (33.6;49.8)	47.7 (15.8)	46.3 (35.4;58.9)
	Social participation*	14.6 (12.7)	11.1 (5.7;21.7)	19.4 (14.7)	18.8 (9.4;27.6)
	COURAGE Social Network Index	62.9 (12.2)	63.4 (55;71.8)	63.4 (13.5)	63.1 (55.3;71.6)
	Self-rated health*	2.8 (0.9)	3 (2;3)	2.9 (0.8)	3 (2;3)
	Total No. of chronic diseases*	1.5(1.4)	1(1;2)	1.0(1.1)	1(0;1)
	Subjective well-being (net affect)	3.8 (2.3)	4.8 (2.1;5.8)	3.4 (2.4)	3.9 (2.1;5.6)

*p<0.05; SD-standard deviation; Q1-first quartile; Q3-third quartile.
In the case of the COURAGE Social Network Index, t-student test was used; otherwise,U Man-Whitney test was performed

Table 3. Ordered probit regressions of self-rated health across place of residence

	Urban	Rural
	B (95%CI)	*B (95%CI)*
Age	-0.007 (-0.023; 0.009)	-0.019 (-0.038; 0.000)
Gender (female vs. male)	-0.158 (-0.397; 0.081)	0.068 (-0.198; 0.335)
No. of years of education	0.014 (-0.018; 0.046	**0.060 (0.017; 0.103)**
COURAGE Social Network Index	**0.010 (0.000; 0.021)**	0.006 (-0.004; 0.016)
OSLO-3 Social Support Scale	-0.003 (-0.010; 0.004)	**0.012 (0.005; 0.020)**
Three-item UCLA Loneliness Scale	-0.004 (-0.009; 0.002)	**-0.006 (-0.011; -0.002)**
Social participation	**0.015 (0.007; 0.024)**	0.005 (-0.006; 0.015)
Trust	-0.002–0.010; 0.005)	-0.003 (-0.012; 0.006)
Total No. of chronic diseases	**-0.338 (-0.425; -0.252)**	**-0.376 (-0.462; -0.289)**

Model adjusted for total household income

Table 4. Multivariate linear regressions of subjective well-being (net-affect) across place of residence

	Urban	Rural
	B (95%CI)	*B (95%CI)*
Age	-0.025 (-0.053; 0.003)	-0.010 (-0.043; 0.024)
Gender	0.158 (-0.264; 0.580)	-0.035 (-0.623; 0.553)
No. of years of education	-0.044 (-0.103; 0.015)	-0.090 (-0.186; 0.007)
COURAGE Social Network Index	0.018(-0.005; 0.041)	**0.023 (0.001; 0.045)**
OSLO-3 Social Support Scale	-0.004 (-0.020; 0.011)	-0.005 (-0.023; 0.013)
Three-item UCLA Loneliness Scale	**-0.023 (-0.033; -0.013)**	**-0.021 (-0.035; -0.007)**
Social participation	0.010 (-0.004; 0.025)	-0.001 (-0.023; 0.021)
Trust	-0.006 (-0.021; 0.010)	-0.011 (-0.034; 0.011)
Total No. of chronic diseases	**-0.159 (-0.310; -0.008)**	**-0.238 (-0.438; -0.039)**

Model adjusted for total household income

Table 5. Ordered probit regressions of self-rated health across place of residence and NUTS1 level regions of Poland

	Self-rated health	
East	**Urban** B(95%CI)	**Rural** B(95%CI)
Age	-0.002 (-0.057; 0.054)	-0.051(-0.078; -0.023)
Gender (female vs. male)	-0.190 (-0.820; 0.439)	0.054 (-0.457; 0.564)
No. of years of education	0.042 (-0.072; 0.156)	0.080 (-0.004; 0.163)
Total No. of chronic diseases	-0.216 (-0.057; 0.054)	**-0.363 (-0.078; -0.023)**
COURAGE Social Network Index[1]	0.006 (-0.018; 0.030)	0.010 (-0.006; 0.026)
OSLO-3 Social Support Scale[1]	-0.001 (-0.017; 0.015)	**0.018 (0.005; 0.031)**
Three-item UCLA Loneliness Scale[1]	**-0.016 (-0.030; -0.001)**	-0.012 (-0.023; 0.000)
Social participation[1]	-0.004 (-0.030; 0.023)	0.006 (-0.013; 0.025)
Trust[1]	-0.003 (-0.028; 0.021)	0.012 (-0.005; 0.029)
South-West	**Urban** B(95%CI)	**Rural** B(95%CI)
Age	-0.040 (-0.082; 0.002)	0.000 (-0.077; 0.076)
Gender (female vs. male)	0.054 (-0.534; 0.641)	0.205 (-0.609; 1.018)
No. of years of education	**0.090 (0.018; 0.162)**	0.091 (-0.013; 0.195)
Total No. of chronic diseases	**-0.389 (-0.618; -0.161)**	**-0.435 (-0.754; -0.116)**
COURAGE Social Network Index[1]	**0.027(0.006; 0.047)**	-0.008(-0.040; 0.024)
OSLO-3 Social Support Scale[1]	0.009 (-0.007; 0.025)	0.017(-0.011; 0.046)
Three-item UCLA Loneliness Scale[1]	**-0.022 (-0.038; -0.006)**	0.013 (-0.022; 0.047)
Social participation[1]	**0.029 (0.011; 0.047)**	0.001 (-0.033; 0.035)
Trust[1]	**0.027 (0.012; 0.043)**	0.028 (-0.011; 0.066)
Central	**Urban** B(95%CI)	**Rural** B(95%CI)
Age	0.009 (-0.043; 0.060)	-0.019 (-0.057; 0.018)
Gender (female vs. male)	**-0.775(-1.448; -0.101)**	0.455 (-0.044; 0.954)
No. of years of education	0.008(-0.053; 0.069)	0.057(-0.008; 0.122)
Total No. of chronic diseases	**-0.355 (-0.578; -0.133)**	**-0.485 (-0.703; -0.266)**
COURAGE Social Network Index[1]	**0.023 (0.002; 0.044)**	**0.024 (0.008; 0.039)**
OSLO-3 Social Support Scale[1]	0.007 (-0.008; 0.023)	**0.021 (0.008; 0.033)**
Three-item UCLA Loneliness Scale[1]	-0.003 (-0.019; 0.012)	-0.009 (-0.019; 0.001)
Social participation[1]	0.008 (-0.014; 0.029)	**0.036 (0.018; 0.053)**
Trust[1]	-0.007 (-0.028; 0.014)	0.005 (-0.015; 0.025)
North	**Urban** B(95%CI)	**Rural** B(95%CI)
Age	-0.019 (-0.049; 0.012)	0.050 (-0.005; 0.105)
Gender (female vs. male)	-0.159 (-0.643; 0.325)	-0.160 (-0.877; 0.556)
No. of years of education	0.032 (-0.039; 0.104)	0.124 (-0. 028; 0.276)
Total No. of chronic diseases	**-0.373 (-0.554; -0.192)**	**-0.422 (-0.654; -0.189)**
COURAGE Social Network Index[1]	0.008 (-0.013; 0.030)	**0.040 (0.014; 0.067)**
OSLO-3 Social Support Scale[1]	-0.001(-0.015; 0.014)	**0.020 (0.001; 0.039)**
Three-item UCLA Loneliness Scale[1]	-0.002 (-0.013; 0.009)	**-0.014 (-0.024; -0.004)**
Social participation[1]	**0.034 (0.014; 0.054)**	0.015 (-0.014; 0.044)
Trust[1]	0.004 (-0.016; 0.024)	-0.002 (-0.024; 0.021)
North-West	**Urban** B(95%CI)	**Rural** B(95%CI)
Age	-0.019 (-0.049; 0.012)	0.050 (-0.005; 0.105)
Gender (female vs. male)	-0.15(-0.643; 0.325)	-0.160 (-0.877; 0.556)
No. of years of education	0.032 (-0.039; 0.104)	0.124 (-0.028; 0.276)
Total number of chronic diseases	**-0.373 (-0.554; -0.192)**	**-0.422 (-0.654; -0.189)**
COURAGE Social Network Index[1]	0.008 (-0.013; 0.030)	**0.040 (0.014; 0.067)**
OSLO-3 Social Support Scale[1]	-0.001 (-0.015; 0.014)	**0.020 (0.001; 0.039)**
Three-item UCLA Loneliness Scale[1]	-0.002 (-0.013; 0.009)	**-0.014 (-0.024; -0.004)**
Social participation[1]	**0.034 (0.014; 0.054)**	0.015 (-0.014; 0.044)
Trust[1]	0.004 (-0.016; 0.024)	-0.002 (-0.024; 0.021)
South	**Urban** B(95%CI)	**Rural** B(95%CI)
Age	**-0.035 (-0.068; -0.002)**	-0.052 (-0.112; 0.007)
Gender (female vs. male)	-0.454 (-1.028; 0.120)	0.561 (-0.238; 1.361)
No. of years of education	-0.050 (-0.127; 0.026)	0.008 (-0.103; 0.120)
Total number of chronic diseases	**-0.318 (-0.524; -0.113)**	**-0.574 (-0.810; -0.339)**
COURAGE Social Network Index[1]	0.014 (-0.009; 0.036)	0.006 (-0.020; 0.032)
OSLO-3 Social Support Scale[1]	0.002 (-0.011; 0.014)	**0.024 (0.004; 0.045)**
Three-item UCLA Loneliness Scale[1]	0.000 (-0.014; 0.014)	-0.006 (-0.015; 0.004)
Social participation[1]	0.010 (-0.011; 0.032)	0.012 (-0.010. 0.034)
Trust[1]	-0.007 (-0.025; 0.011)	-0.008 (-0.030; 0.015)

[1] Models adjusted for age, gender, level of education, total number of diseases

northern region, in both areas, poorer self-rated health by older people increased with the number of chronic diseases. In urban areas, social participation supported the positive self-rated health, while in rural areas the social network index and social support significantly influenced positive self-rated health, and the level of loneliness increased with poor evaluation of health. In the north-west, similarly, the number of diseases influenced poorer self-rated health in older people living both in urban and rural areas. In urban citizens, social participation increasing positive self-rated health; in rural citizens, the same role was played by the social network and social support, while loneliness predicted poor evaluation of health. In the southern region, significantly better self-rated health was related with a higher level of social support among rural older people, which was also related with a lower number of chronic diseases in both groups of residents (Tab. 5).

Table 6 shows the assessment of the socio-demographic characteristics and indicators of social capital as determinants of subjective well-being among rural and urban older individuals across the 6 regions. In the south-western region, as significant determinates of a higher level of subjective well-being, a better social network and lower number of chronic diseases were found for both areas. Besides, social participation increased the level of well-being among rural residents. In the southern region, loneliness predicted poorer health among rural and urban older individuals; additionally, a higher level of social networks and lower

number of chronic conditions were significant predictors of well-being. Comparatively, in the eastern region, a better assessment of social networks was related with a higher level of well-being among urban older people, similarly to being younger and having fewer chronic diseases. In the central region, a higher social network was a determinant of well-being in both areas, a higher level of social participation and being younger only among urban individuals, while there was a lower level of loneliness among rural older people. Higher subjective well-being in the northern region was related with a decrease in loneliness for both urban and rural areas, and being younger among urban individuals and a growing number of chronic diseases among rural older people. Finally, indicators of social capital, such as social network, social support and loneliness, were found to be significant determinants of well-being among urban participants, whereas among rural older people only the total number of chronic diseases was indicated as a predictor of well-being (Tab. 6).

DISCUSSION

Characteristics of urban and rural older residents of the 6 regions in Poland confirmed significant differences not only between older people living in urban and rural areas, but also

Table 6. Multivariate linear regressions of subjective well-being (net-affect) across place of residence

	Net-affect	
South-west-1	**Urban** B(95%CI)	**Rural** B(95%CI)
Age	-0.037 (-0.120; 0.046)	-0.060 (-0.220; 0.101)
Gender (female vs. male)	0.709 (-0.444; 1.862)	0.075 (-1.371; 1.522)
No. of years of education	0.008 (-0.114; 0.129)	-0.225 (-0.483; 0.034)
Total number of chronic diseases	**-0.561 (-1.066; -0.056)**	**0.294 (-0.342; 0.931)**
COURAGE Social Network Index[1]	**0.039 (0.004; 0.074)**	**0.088 (0.020; 0.155)**
OSLO-3 Social Support Scale[1]	-0.025 (-0.057; 0.007)	0.016 (-0.021; 0.053)
Three-item UCLA Loneliness Scale[1]	-0.039 (-0.083; 0.005)	-0.019 (-0.044; 0.006)
Social participation[1]	-0.002 (-0.037; 0.034)	**0.071 (0.029; 0.112)**
Trust[1]	0.002 (-0.028; 0.032)	-0.032 (-0.100; 0.037)
South	**Urban** B(95%CI)	**Rural** B(95%CI)
Age	-0.023 (-0.069; 0.022)	-0.080 (-0.155; -0.005)
Gender (female vs. male)	0.982 (-0.244; 2.208)	0.798 (-0.134; 1.730)
No. of years of education	-0.001 (-0.167; 0.166)	-0.080 (-0.271; 0.111)
Total No. of chronic diseases	-0.086 (-0.373; 0.200)	**-0.165 (-0.540; 0.211)**
COURAGE Social Network Index[1]	0.006 (-0.046; 0.058)	**0.042 (0.003; 0.082)**
OSLO-3 Social Support Scale[1]	0.008 (-0.024; 0.040)	0.018 (-0.013; 0.049)
Three-item UCLA Loneliness Scale[1]	**-0.031 (-0.052; -0.015)**	**-0.028 (-0.046; -0.010)**
Social participation[1]	-0.017 (-0.054; 0.020)	-0.014 (-0.053; 0.024)
Trust[1]	-0.016 (-0.046; 0.014)	-0.014 (-0.047; 0.019)
East	**Urban** B(95%CI)	**Rural** B(95%CI)
Age	**-0.016 (-0.076; 0.044)**	0.039 (-0.005; 0.083)
Gender (female vs. male)	-0.602 (-1.490; 0.287)	0.171 (-0.506; 0.849)
No. of years of education	-0.108 (-0.228; 0.013)	0.098 (-0.009; 0.205)
Total No. of chronic diseases	**-0.454 (-0.715; -0.192)**	0.066 (-0.151; 0.284)
COURAGE Social Network Index[1]	**0.046 (0.011; 0.082)**	0.008 (-0.014; 0.029)
OSLO-3 Social Support Scale[1]	0.014 (-0.011; 0.039)	0.012 (-0.004; 0.029)
Three-item UCLA Loneliness Scale[1]	-0.010 (-0.026; 0.007)	-0.003 (-0.014; 0.009)
Social participation[1]	0.025 (-0.011; 0.061)	-0.012 (-0.033; 0.010)
Trust[1]	0.004 (-0.019; 0.028)	0.012 (-0.010; 0.035)
Central	**Urban** B(95%CI)	**Rural** B(95%CI)
Age	**-0.081 (-0.144; -0.019)**	-0.037 (-0.129; 0.055)
Gender (female vs. male)	-0.245 (-1.196; 0.705)	-1.105 (-2.670; 0.461)
No. of years of education	-0.046 (-0.155; 0.063)	-0.093 (-0.290; 0.103)
Total No. of chronic diseases	-0.118 (-0.562; 0.326)	-0.740 (-1.657; 0.177)
COURAGE Social Network Index[1]	**0.038 (0.000; 0.075)**	**0.056 (0.021; 0.092)**
OSLO-3 Social Support Scale[1]	0.008 (-0.023; 0.040)	-0.011 (-0.044; 0.022)
Three-item UCLA Loneliness Scale[1]	-0.001 (-0.029; 0.026)	**-0.039 (-0.072; -0.006)**
Social participation[1]	**0.051 (0.019; 0.084)**	0.022 (-0.024; 0.067)
Trust[1]	0.025 (-0.008; 0.058)	0.049 (-0.028; 0.126)
North	**Urban** B(95%CI)	**Rural** B(95%CI)
Age	**-0.042 (-0.080; -0.003)**	-0.027 (-0.112; 0.068)
Gender (female vs. male)	0.205 (-0.373; 0.783)	0.465 (-1.227; 2.156)
Numbers of years of education	-0.029 (-0.112; 0.054)	-0.058 (-0.275; 0.159)
Total number of chronic diseases	-0.089 (-0.336; 0.159)	**-0.713 (-1.188; -0.238)**
The COURAGE Social Network Index[1]	0.010 (-0.013; 0.033)	0.056 (-0.028; 0.141)
The OSLO-3 Social Support Scale[1]	0.004 (-0.015; 0.022)	0.021 (-0.030; 0.072)
The three-item UCLA Loneliness Scale[1]	**-0.021 (-0.035; -0.008)**	**-0.052 (-0.082; -0.022)**
Social participation[1]	-0.003 (-0.028; 0.023)	-0.019 (-0.066; 0.028)
Trust[1]	-0.011 (-0.033; 0.011)	-0.002 (-0.063; 0.059)
North-West	**Urban** B(95%CI)	**Rural** B(95%CI)
Age	-0.019 (-0.079; 0.042)	-0.065 (-0.134; 0.005)
Gender (female vs. male)	-0.681 (-1.560; 0.198)	0.207 (-0.860; 1.274)
No. of years of education	0.050 (-0.086; 0.186)	-0.142 (-0.329;0.045)
Total No. of chronic diseases	-0.339 (-0.701; 0.024)	**-0.637 (-1.203; -0.072)**
COURAGE Social Network Index[1]	**0.057 (0.025; 0.089)**	-0.010 (-0.052; 0.032)
OSLO-3 Social Support Scale[1]	**0.027 (0.000; 0.053)**	-0.007 (-0.037; 0.023)
Three-item UCLA Loneliness Scale[1]	**-0.049 (-0.062; -0.035)**	-0.012 (-0.038; 0.013)
Social participation[1]	0.006 (-0.023; 0.034)	-0.011 (-0.054; 0.032)
Trust[1]	0.002 (-0.030; 0.034)	-0.020 (-0.062; 0.022)

[1] Models adjusted for age, gender, level of education, total number of diseases

in the mentioned regions in relation to social characteristics between urban and rural residents. Chronic conditions significantly influenced self-rated health and subjective well-being, and these data correspond with those of other authors [22, 23].

General results show twice as many older people in urban than in rural areas, also confirmed differences in the social status between urban and rural residents. It should also be mentioned that significant differences were noted in the proportion of urban and rural residents across the regions in Poland: the lowest proportion of urban citizens and the highest proportion of rural residents was noted in the eastern region. The highest proportion of urban citizen in the north-west and south-west was significantly associated with higher social participation which positively influenced self-rated health.

Loneliness significantly influenced self-rated health in urban areas. Data presented by other authors showed that rural areas in American society are characterized by isolation, compounded by lack of public transportation, difficult weather conditions, heavy seasonal demands of farming, and the lesser availability of public services in rural areas. These conditions increase the need for intra-family cooperation and exchange, and as a consequence, rural residents have a greater sense of responsibility to others, especially to family members in comparison to urban residents [9].

In general, different predictors of self-rated health in urban and rural Polish older residents have been found. A relationship between loneliness and poor self-rated health was observed only in rural residents. In urban residents, the social network and social participation significantly predicted positive self-rated health.

Nummela et al. [24] examined the association between self-rated health and combinations of social participation and trust among ageing people living in three areas of Finland. The highest rate of good self-rated health was found among the high social capital group, but after adjusting for background variables, statistical significance remained only in the urban area.

A study which concentrated on comparing the relationships between social capital and health for rural and urban residents of South Australia showed that higher levels of networks, civic participation and cohesion existed in rural areas. Mental health was better among rural participants, but there were no significant differences for physical health. Social capital was associated with good mental health for both urban and rural participants, but with better physical health only for urban participants [25].

It is necessary to stress that loneliness, both in urban and rural elderly people, was associated with poorer subjective well-being, additionally in rural residents a better social network significantly influenced positive well-being. In most of the regions, the social network was significantly associated with subjective well-being in both rural and urban older residents (south-west, central), but this relationship was observed only in urban citizens in the eastern and north-western regions.

The presented results correspond with other data. Mechakra-Tahiri et al. [26] performed a study focused on the prevalence of depression within elderly Quebec population residing in a rural area, an urban area and metropolitan Montreal, and assessed the association between social relationships and depression across these urban and rural setting. Data showed that the prevalence of depression was higher in rural (17%) and urban area (15%) than in Montreal (10.%3), which indicated that social support and lack of conflict in intimate relationships were associated with a lower prevalence of depression in all areas [26].

Hofferth and Iceland [9] found that families in rural areas are more likely than families in urban areas to exchange exclusively with kin, supporting the notion that family ties are stronger in rural areas where families are less mobile and more strongly connected to their kin networks. Data showed that some of urban-rural differences in patterns of exchange are explained by different family characteristics, but key urban-rural differences remained due to differences in norms and the availability of institutional support services in different areas [9].

Longitudinal studies of neighbourhood life may have some implication for understanding social ties, because the degree of social interaction among neighbours is a key indicator of the strength of localized communities in urban society [27]. A study performed by Guest and Wirzebicki [27], based on 22 years' observation, confirmed a decline in the importance of social ties on the basis of neighbourhood, and upward growth in the importance of non-neighbourhood social ties.

The presented results show the role of social loneliness as a predictor of poor assessment of subjective well-being, and the positive role of the social network on well-being in rural residents. The results also confirm the role of social capital in self-rated health and well-being between urban and rural areas, as well as across the analyzed regions.

Van Oorschot and Gelissen [28] used various aspects of social capital (networks, trust, civism) to construct an instrument for measuring its multi-facetedness, based on data from the 1999 – 200 European Values Study, showed how social capital, by its mentioned aspects is distributed geographically among European countries and regions (north, west, south, east), and socially among social categories of European citizens. Among the eastern countries, Poland, Bulgaria, Croatia, the Czech Republic, Estonia, Latvia, Lithuania, Hungary were clustered.

Data coming from the European Values Study survey (1999–2000) showed differences in the country's scores in trust and networks. For example, generalized trust for Finland – 1.6, for Spain – 1.4, for Poland – 1.2 (score 1–3); for friends network: Finland – 2.2, for Spain – 2.1, for Poland – 1.7 (score 1–3), and for the family network in Finland – 1.6, Spain – 2.5, Poland – 2.6 (score 1–3). These data show that in the Scandinavian countries social capital levels tend to be slightly higher with the exception of family bonding [28].

Studies by Pichler and Wallace [29] focused on the relationship between 2 types of social capital (formal associative behaviour or informal social relations – networks). The authors analyzed the relationship between social networks, social and family support (informal social capital) and associational behaviour along with social trust (formal social capital). The results of a representative sample of 27 countries in relation to regions showed that Scandinavian countries and the Netherlands had the highest levels of all forms of social capital. In southern and eastern Europe, informal social capital was more important, (in the south this came mainly in the form of family support). In the east, informal support outside the family was also important. The concept of social capital regimes gives better understanding of the various cultures in participation and cohesion across Europe [29].

In conclusion, it is necessary to mentioned that such analysis as that presented gives the opportunity to carefully describe the regional differences in the social context of ageing, and open the field for discussion and action on how to cope with such negative outcomes of ageing as loneliness, and shows the necessity for improving social participation and the role of the social network in older residents of rural areas.

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