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EVALUATING SOCIO-ECONOMIC VARIATIONS IN THE PREVALENCE OF CHRONIC DISEASES: SOME EVIDENCE FROM ROMANIA

Adrian Vasile HORODNIC¹, Cristian ÎNCALTĂRĂU²,
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Abstract

The purpose of this study is to explore whether socio-economic variations exist in the prevalence of chronic diseases in Romania. To evaluate the level of variations, this article reports a European Quality of Life Survey (EQLS) conducted in Romania. Using logistic regression analysis, results suggest that while some weaker and more vulnerable socio-economic groups are significantly more likely to report a chronic illness or disability (e.g. women, older people, retired or unable to work), others are not (e.g. people with low educational level, living in rural areas or in poorer regions). Showing a disproportionately prevalence of chronic conditions amongst socio-economic groups, the study emphasises the need for a policy that takes into account socio-economic variations when addressing the impact of chronic diseases.

Keywords: chronic disease; socio-economic variations; vulnerable groups, health inequalities.

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Background

Like in other developed or developing countries, in Romania chronic diseases are also important contributors to premature mortality. According to World Health Organisation data, in 2012, more than 70 percent of European Union deaths were caused by chronic diseases (World Health Organisation, 2014). Moreover, adding the constantly increasing costs of chronic diseases management, as a result of ageing (European Commission and the Economic Policy Committee, 2012), decreasing the prevalence of chronic diseases and improving chronic diseases management are becoming important goals for all countries.

Addressing this issue, a large number of studies focused on the fact that the prevalence of chronic diseases varies between different socio-economic groups. Referring to the health status, some studies focused on the relationship between social gradient and mortality (Stirbu *et al.*, 2010; Leinsalu *et al.*, 2009; Martinez *et al.*, 2009; Kohler *et al.* 2008, Spoerri *et al.*, 2006) while other studies examined socio-economic inequalities (represented mostly by educational level) in early-life morbidity and mortality (Petersen *et al.*, 2009; Mortensen *et al.*, 2009; Mortensen *et al.*, 2008). Moreover, several studies have examined socio-economic inequalities in relation with some specific chronic diseases, like cancer (van Boeckel *et al.*, 2010; Menvielle *et al.*, 2008; Menvielle *et al.*, 2007; Leclerc *et al.*, 2006; Pukkala and Weiderpass, 2002), cardiovascular disease (Avendano *et al.*, 2006; Kolegard *et al.*, 2002) or diabetes (Espelt *et al.*, 2008; Geyer *et al.*, 2006).

Socio-economic inequalities in self-reported chronic illness or disabilities have been also evaluated in recent studies (Gaume and Wunsch, 2010; Avendano *et al.*, 2009; Cooper *et al.*, 2008; Hernandez-Quevedo *et al.*, 2008; Helasoja *et al.*, 2006).

Therefore, examining The European Community Household Panel data set, in 13 European countries, Cooper *et al.* argued that socio-economic status does affect the likelihood of individuals entering bad health. For instance, it was shown that while unemployment increases, educational level decreases the probability of entering bad health. The effect of income on chronic physical or mental health were weak and less significant (Cooper *et al.*, 2008). Using the same database (but different time periods), Hernandez-Quevedo *et al.* (2008) gained similar results (Hernandez-Quevedo *et al.*, 2008). Examining self-reported chronic diseases according to educational level in Latvia, Lithuania, Estonia and Finland, Helasoja *et al.* (2006) found that people with lower level of education have a weaker health condition as compared to better-educated ones (Helasoja *et al.*, 2006). In a more recent study by Gaume and Wunsch (2010), reporting data for Estonia, Latvia and Lithuania, the same results were obtained: better self-reported health status among people with high level of education (Gaume and Wunsch, 2010). Also, a study conducted by Avendano *et al.* (2009), analysing the impact of educational level on changes in health outcomes (including chronic diseases), among Europeans aged over 50 years from 11 countries, showed that lower educational level is associated with poor health status and the prevalence of chronic diseases.

Studies examining the prevalence of chronic diseases in different socio-economic groups have generated similar findings. For instance, using individual-level data, Orueta *et al.* (2013) found that most chronic diseases are disproportionately concentrated among individuals living in more deprived areas. However, the degree of imbalance varies according with gender and the type of the disease (Orueta *et al.*, 2013). Evaluating also the prevalence of chronic diseases in different socio-economic groups, using micro-level data from eight European countries, Dalstra *et al.* (2005) showed that most diseases have higher prevalence among the lower education groups (Dalstra *et al.*, 2005).

Being demonstrated that health inequalities exist between regions, countries, and within countries (European Commission, 2013; Friel and Marmot, 2011) and also between different socio-economic groups (European Commission, 2013; Stringhini *et al.*, 2011), socio-economic health gradient became one of the main concerns of health policy across the world. For Romanian specific, even if socio-economic health gradient was found to be an important subject in the literature (Precupetu *et al.*, 2013; Iacobuță *et al.*, 2013; Burlea and Muntele, 2013; Bulgaruliescu *et al.*, 2012; Dragomiristeanu, 2010) we are not aware of a study evaluating socio-economic variations in the prevalence of chronic diseases, using individual-level data.

Therefore, according to most of the studies cited above, the prevalence of chronic diseases fall disproportionately on more deprived individuals and geographical areas. Hence, this study aims to evaluate this hypothesis in Romania's case.

Data and methods

In order to evaluate the socio-economic variations in the prevalence of chronic diseases in Romania, we here used data from European Quality of Life Survey (EQLS), 2011-2012 (European Foundation for the Improvement of Living and Working Conditions, European Quality of Life Survey, 2011-2012). According to the survey methodology, between 19 September 2011 and 15 February 2012 data referring to a range of issues were collected, including socio-economic and health characteristics. Also known as the third European Quality of Life Survey, the study used face-to-face interviews in the national language with residents aged 18 and over from 28 EU countries, as well as Iceland, Kosovo, Macedonia, Montenegro, Serbia and Turkey.

The sampling procedure used a multi-stage stratified random sample to ensure that for Romania (as well as for each country surveyed) the sample is representative for the universe to be covered. In other words, by using probability sampling procedure to select individuals, the entire Romanian population had a known non-zero probability to be included in the sample (Eurofound, 2012a). According to EQLS methodology, in order to obtain representative results in terms of gender, age, urbanisation level, region and household size, we used EQLS national weighting scheme as a result of the design weight and the post-

stratification weight (Eurofound, 2012b). As long as there is a debate in literature on using weighting schemes for multivariate analyses (Solon *et al.*, 2013) we decided to use the weighting scheme only for univariate analysis.

To test if the prevalence of chronic illness or disability varies depending on socio-economic and spatial characteristics, we first provided a descriptive analysis on the prevalence and perceived difficulties regarding the costs of seeing the doctor by Deprivation Index, gender, age, marital status, education, employment status and by area where the respondent lives and Romanian NUTS II-level region. Similar variables were used in studies discussed in the first section of the paper. Secondly, to test the hypothesis using multivariate analysis, we used a dichotomous dependent variable with recorded value 1 for persons who answered “yes” to the question “Do you have any chronic (long-standing) physical or mental health problem, illness or disability? By chronic (longstanding) I mean illnesses or health problems which have lasted, or are expected to last, for 6 months or more.” and with recorded value 0 otherwise. Therefore, given the nature of the data, we here employed a logistic regression. The independent variables used along with the dependent variable were as follows:

(a) *socio-economic characteristics:*

- *Deprivation Index:* constructed index consisting of the number of items people report they cannot afford (even if they would like them). Considered items (six): (1) “Keeping your home adequately warm”, (2) “Paying for a week’s annual holiday away from home (not staying with relatives)”, (3) “Replacing any worn-out furniture”, (4) “A meal with meat, chicken, fish every second day if you wanted it”, (5) “Buying new, rather than second-hand, clothes”, (6) “Having friends or family for a drink or meal at least once a month”. The index is measured from 0 to 6, with value 0 – can afford if want, value 1 – one item cannot afford, value 2 – two items cannot afford, value 3 – three items cannot afford, value 4 – four items cannot afford, value 5 – five items cannot afford, and value 6 – six (all) items cannot afford.
- *Gender:* dummy variable with value 1 for males and value 0 for females.
- *Age:* categorical variable for the age of the respondent with value 1 for those aged 18 to 24 years old, value 2 for those aged 25 to 34, value 3 for those aged 35 to 49, value 4 for those aged 50 to 64, and value 5 for those 65 or over 65 years old.
- *Marital status:* categorical variable for the marital status of the respondent with value 1 for married/ living with partner, value 2 for separated/ divorced (and not living with partner), value 3 for widowed (and not living with partner), and value 4 for those never married (and not living with partner).
- *Education:* categorical variable for the respondent’s highest level of education completed with value 1 for primary or less, value 2 for secondary education, and value 3 for tertiary education.

- *Employment Status*: categorical variable for the employment status of the respondent with value 1 for employed people, value 2 for unemployed, value 3 for unable to work (due to long-term illness or disability), value 4 for retired, value 5 for homemaker, value 6 for student, and value 7 for other employment status.

(b) spatial characteristics:

- *Area respondent lives*: categorical variable for the area where the respondent lives with value 1 for open countryside, value 2 for village/ small town, value 3 for medium to large town, and value 4 for city or city suburb.
- *NUTS II Region*: categorical variable for the region where the respondent lives with value 1 for North-West, value 2 for Bucharest-Ilfov, value 3 for South-West Oltenia, value 4 for West, value 5 for North-East, value 6 for South Muntenia, value 7 for South-East, and value 8 for Center region.

The following section reports socio-economic variations identified in Romania, in the prevalence of chronic diseases.

Results: socio-economic variations in the prevalence of chronic diseases

Regarding the prevalence of self-reported chronic illness or disability (lasted or expected to last for 6 months or more) in Romania, of the 1,368 face-to-face interviews, 29 percent of Romanians said that they have a chronic (long-standing) physical or mental health problem, illness or disability. As table 1 displays, in terms of accessibility, of those who self-reported a chronic condition, more than a half (51 percent) found not difficult at all when it comes to the perceived difficulties regarding the costs of seeing a doctor in Romania. However, the same table shows that 41 percent of chronic-ill Romanians are facing difficulties in terms of 'cost of seeing a doctor'. A further 6 percent of those reporting a chronic illness or disability never needed to see a doctor.

Chronic conditions are not evenly spread across Romania. Even more, according to table 1, the proportions vary largely across NUTS II-level regions. On the one hand, chronic conditions are more widespread in South East and South-West Oltenia (with 36 percent of respondents reporting a chronic condition), West (35 percent) and North-East (31 percent) and, on the other hand, lower rates are found in Bucharest-Ilfov (17 percent) and North-West (25 percent).

Analysing the share of chronic-ill persons facing difficulties in terms of costs for seeing a doctor, table 1 also reveals that there are regional differences across NUTS II-level regions. Therefore, the percentage of chronic-ill persons facing difficulties in terms of costs for seeing a doctor is ranging between 41 percent in West and 58 percent in South-East.

Table 1: Prevalence of chronic illness or disability and perceived accessibility, by Romanian NUTS II region

N = 1,368 Country/ region	Self-reported chronic condition (%)	Accessibility/ Perceived difficulties regarding the costs of seeing the doctor				
		Very difficult (%)	Difficult (%)	Not difficult at all (%)	Never needed to see a doctor (%)	Don't know/ Refusal (%)
Romania	29	16	25	51	6	2
North-West	25	25	26	48	0	1
Bucharest-Ilfov	17	11	25	54	6	4
South-West Oltenia	36	23	15	54	5	3
West	35	25	29	41	3	2
North-East	31	11	26	51	9	3
South Muntenia	27	13	25	47	11	4
South-East	36	15	22	58	4	1
Center	27	8	37	52	3	0

Source: Authors' calculation using 3rd EQLS data and STATA Software

Turning to the socio-economic variations in the prevalence of chronic diseases, figure 1 uses Deprivation Index as a proxy to assess the economic situation of a chronic-ill individual comparing with individuals with no chronic conditions. Overall, in Romania the Deprivation Index recorded higher values for chronic-ill persons, comparing with individuals having no chronic conditions (3.35, comparing with 2.05). Indeed, Deprivation Index evaluate the number of selected items people reported they cannot afford (even if they would like them) with higher values representing a difficult economic situation.

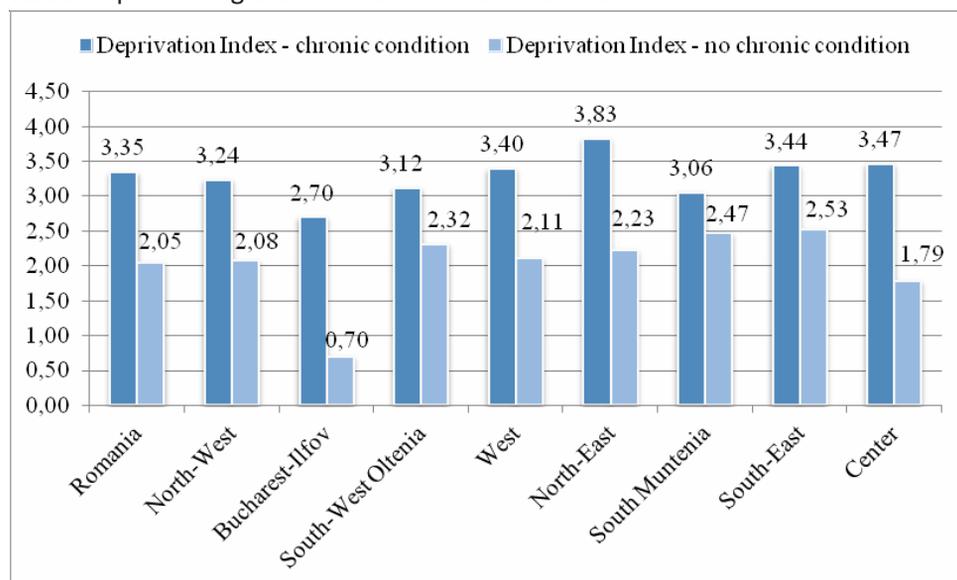


Figure 1: Deprivation Index, by Romanian NUTS II region

Source: Authors' calculation using 3rd EQLS data and STATA Software

Analysing the results presented in figure 1, when comparing with individuals having no chronic condition, the finding is that chronic-ill Romanians have been struggling with higher levels of material deprivation regardless the NUTS II-level region where they belong. However, regarding Deprivation Index in the case of people reporting chronic conditions, we notice that North-East, Center, South-East and West regions recorded values above the mean (3.83, 3.47, 3.44, respectively 3.40).

The descriptive analysis shows that chronic health problems are more likely to be found in some regions and also, that it has a socio-economic specific, as it can be seen in table 2. Overall, the health status of Romanians in terms of prevalence of chronic diseases seems to have a low level in the case of those struggling with material deprivation (43 percent in the case of a Deprivation Index above the mean and only 16 percent in the case of a Deprivation Index below the mean). Not surprisingly, ‘cost of seeing a doctor’ created difficulty for 45 percent of people facing material deprivation, on the last occasion when they needed to see a doctor.

Table 2: Prevalence of chronic illness or disability and perceived accessibility, by socio-economic and spatial characteristics

N = 1,368 Country/ region	Self- reported chronic condition (%)	Accessibility/ Perceived difficulties regarding the costs of seeing the doctor				
		Very difficult (%)	Difficult (%)	Not difficult at all (%)	Never needed to see a doctor (%)	Don't know/ Refusal (%)
Deprivation Index (mean = 2.43)						
Below mean	16	11	21	61	6	1
Above mean	43	18	27	47	5	3
Gender						
Female	35	19	24	50	5	2
Male	23	11	28	52	7	2
Age						
18 - 24	8	0	24	65	11	0
25 - 34	7	7	26	62	5	0
35 - 49	18	17	30	50	1	2
50 - 64	46	18	24	50	6	2
65 +	64	17	24	49	7	3
Marital status						
Married/ Living with partner	29	18	26	49	5	2
Separated/ Divorced ¹	24	17	16	62	3	2
Widowed ¹	63	15	26	50	6	3
Never married ¹	9	0	30	56	7	7
Education						
Primary or less	62	20	26	46	4	4
Secondary	28	16	25	53	5	1
Tertiary	16	13	24	45	14	4

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N = 1,368 Country/ region	Self- reported chronic condition (%)	Accessibility/ Perceived difficulties regarding the costs of seeing the doctor				
		Very difficult (%)	Difficult (%)	Not difficult at all (%)	Never needed to see a doctor (%)	Don't know/ Refusal (%)
Employment status						
Employed	14	17	31	47	4	1
Unemployed	21	40	16	44	0	0
Unable to work	75	15	28	57	0	0
Retired	63	15	25	51	6	3
Homemaker	23	19	20	57	1	3
Student	2	0	0	0	100	0
Other	5	52	21	27	0	0
Area respondent lives						
Open countryside	34	18	24	50	5	3
Village/ Small town	27	17	29	52	1	1
Medium to large town	27	18	27	45	7	3
City or city suburb	25	11	22	59	6	2

¹And not living with partner

Source: Authors' calculation using 3rd EQLS data and STATA Software

Table 2 reveals that chronic conditions are more common among women than men: 35 percent of female population reported a chronic illness or disability, while only 23 percent of male did so. More than a half of male population reporting chronic conditions (52 percent) did not face any difficulties in terms of the 'cost of seeing a doctor'.

As expected, table 2 displays that chronic illnesses or disabilities are more prevalent amongst people older than 50 years (46 and 64 percent of people aged 50-64 years, respectively over 65 years). As a pattern, the percentage of chronic-ill people increases with age and the percentage of people having no difficulties regarding the 'cost of seeing a doctor' decreases with age. Therefore, while among the youngest age group (15 to 24 years) 65 percent of Romanians did not face any difficulties considering the 'cost of seeing a doctor', the share is only 49 percent for those older than 65 years. Regarding marital status, widowed and not living with partner, Romanians reported chronic conditions in a higher percentage (63) as compared with never married, separated/ divorced or those married/ living with partner (9 percent, 24 percent, respectively 29 percent).

Furthermore, other socio-economic groups are not equally likely to report a chronic condition. Having a disability or a chronic physical or mental health problem is more common in the case of people with low education level (primary or less – 62 percent). Regarding employment status, 75 percent of people unable to work, 63 percent of retired people, 23 percent of homemakers, 21 percent of unemployed and 14 percent of employed people reported a chronic physical or mental health problem. It is worth to mention that in both education and employment status groups the share of Romanians did not face any difficulties considering the 'cost of seeing a doctor' is around 50 percent.

Spatial analysis in table 2 shows that Romanians living in open countryside are more likely to report a chronic physical or mental health problem than those living in villages/ small towns, medium to large town, cities or city suburbs (34 percent comparing with 27 and 25 percent). Among those who reported a chronic illness or disability stands a high share of Romanians living in city or city suburb who are not facing any difficulties in terms of 'cost of seeing a doctor' comparing with those living in other areas (59 percent comparing with 52, 50 and 45 percent).

Table 3 further evaluates the socio-economic variations in the prevalence of chronic diseases in Romania. Therefore, analysis presented in table 3 aims to evaluate if the differences regarding socio-economic variations identified in the descriptive statistics above are to remain statistically significant when analysed using logistic regression models. Using two additive models, table 3 reveals if the differences remain significant when other socio-economic and spatial variables are taken into account and held constant. Therefore, the first stage model examines the association between the presence of a chronic illness or disability and socio-economic characteristics (Deprivation Index, gender, age, marital status, education level and employment status). In the next stage, model 2 adds spatial variables (area respondent lives and NUTS II-level regions).

Model 1 in table 3 reveals that the prevalence of chronic diseases remains strongly associated with higher level of Deprivation Index when the other socio-economic characteristics are introduced and held constant. As material deprivation improves, the propensity to self-report a chronic illness or disability significantly declines. Table 3 shows that here is a statistically significant difference, however, in terms of prevalence of chronic conditions and gender, age, marital and employment status. Therefore, chronic illnesses or disabilities are significantly more likely amongst women and older people. Also, divorced or separated people are significantly less likely to report a chronic condition than those married or living with partner. Having a chronic illness or a disability is also associated with employment status: people retired or unable to work are more likely to report a chronic condition than employed people.

When adding spatial variables model 2, no major changes were identified in the significance levels of socio-economic variables preserved from model 1. Moreover, model 2 shows that people living in South-West Oltenia are more likely to report a chronic condition than those living in North-West region. However, no statistically significant differences were identified in respect with education and the area where the respondent lives.

Overall, considering the results, it can be stated that some of the variations identified in the prevalence of chronic diseases in the descriptive statistics above (e.g. education level, area where the respondent lives) are not statistically significant when analysed in a logistic regression.

Table 3: Logistic regressions of the propensity to report a chronic (long-standing) physical or mental illness or disability by socio-economic and spatial characteristics

	Model 1				Model 2			
	β	se(β)		Exp(β)	β	se(β)		Exp(β)
Deprivation Index	0.165	0.041	***	1.179	0.174	0.042	***	1.190
Gender (CG: Female)								
Male	-0.366	0.144	**	0.693	-0.361	0.146	**	0.697
Age (CG: 18 - 24)								
25 - 34	-0.415	0.489		0.661	-0.435	0.491		0.648
35 - 49	0.443	0.442		1.557	0.459	0.444		1.582
50 - 64	1.050	0.450	**	2.857	1.036	0.450	**	2.817
65 +	1.096	0.490	**	2.991	1.055	0.490	**	2.871
Marital status (CG: Married/ Living with partner)								
Separated/ Divorced ¹	-0.594	0.236	**	0.552	-0.645	0.238	***	0.525
Widowed ¹	-0.175	0.194		0.840	-0.170	0.196		0.844
Never married ¹	-0.432	0.358		0.649	-0.485	0.359		0.616
Education (CG: Primary or less)								
Secondary	0.013	0.209		1.013	0.045	0.217		1.046
Tertiary	0.022	0.295		1.022	0.077	0.309		1.080
Employment status (CG: Employed)								
Unemployed	0.203	0.501		1.226	0.220	0.506		1.246
Unable to work	2.830	0.831	***	16.94	2.951	0.846	***	19.13
Retired	1.293	0.223	***	3.644	1.354	0.228	***	3.874
Homemaker	0.106	0.230		1.111	0.092	0.235		1.097
Student	-1.379	1.088		0.252	-1.241	1.091		0.289
Other	-0.690	0.636		0.502	-0.635	0.640		0.530
Area respondent lives (CG: Open countryside)								
Village/ Small town					-0.297	0.209		0.743
Medium to large town					-0.253	0.177		0.776
City or city suburb					0.073	0.218		1.075
NUTS II Region (CG: North-West)								
Bucharest-Ifov					-0.117	0.330		0.889
South-West Oltenia					0.471	0.268	*	1.602
West					0.428	0.280		1.534
North-East					-0.070	0.236		0.932
South Muntenia					-0.156	0.249		0.855
South-East					0.215	0.263		1.240
Center					0.105	0.283		1.111
Constant	-2.124	0.498	***	0.120	-2.186	0.532	***	0.112
N				1,368				1,368
Pseudo R ²				0.2287				0.2370
Log likelihood				-687.4522				-680.0572
χ^2				407.63				422.42
p>				0.0000				0.0000

*** p<0.01, ** p<0.05, * p<0.1.

¹And not living with partner

All coefficients are compared to the benchmark category, shown in brackets.

Source: Authors' calculation using 3rd EQLS data and STATA Software

Conclusion

Grounded on the thesis that supports the burden of chronic diseases on people with lower socio-economic status, this paper has advanced an analysis for the Romanian case confirming, for most variables introduced in the evaluation that the prevalence of chronic illness and disabilities fall disproportionately on more deprived individuals. Chronic conditions are largely concentrated amongst weaker and more vulnerable, the result being also translated in the fact that 41 percent of chronic-ill Romanians are facing difficulties in terms of 'cost of seeing a doctor'. Hence, it has been here displayed that chronic-ill Romanians have been struggling with higher levels of material deprivation comparing with individuals having no chronic conditions (a recorded value of 3.35 for Deprivation Index, comparing with 2.05). This applies, for all NUTS II-level regions. Therefore, the greater the level of material deprivation the greater the propensity to self-report a chronic illness or disability. This is the case not only at individual level, but also at the level of selected socio-economics groups.

The analysis also reveals that chronic illnesses or disabilities are significantly more likely amongst women, elderly and retired or unable to work population. Also, divorced or separated people are significantly less likely to report a chronic condition than those married or living with partner. Surprisingly, no statistically significant variations were identified in the prevalence of chronic diseases by educational level and urbanization degree.

In sum, using a nationally representative sample for Romania, this paper confirms the disproportionately prevalence of chronic conditions amongst socio-economic groups. Therefore, policy interventions addressing the impact of chronic diseases in Romania, need to consider these socio-economic variations.

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