

# The association of sociodemographic and social capital with self-rated health: a microdata analysis of North Sumatera 2021

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## ABSTRACT

Current research suggests a possible connection between social capital and its effect on self-reported health. However, this relationship has not been extensively studied in urban and rural regions of Indonesia. This research aimed to evaluate the differences in sociodemographic factors, social capital, and self-rated health between rural and urban populations and to identify sociodemographic and social capital elements related to self-rated health in the urban and rural areas of Sumatra Utara Province, Indonesia. This study makes use of secondary data from the Happiness Level Measurement Survey Report 2021. A two-stage, one-phase sampling method was employed for sample selection. The Chi-square test was utilized to examine the distribution of factors related to respondents in both urban and rural settings. Multivariable Cox regression analysis was conducted to determine associations with self-rated health. Our findings indicate that rural inhabitants exhibit a higher rate of poor self-rated health compared to their urban counterparts ( $p\text{-value} < 0.001$ ). Significant differences were observed between urban and rural areas in terms of sex, education, trust, social participation, and feelings of safety. The multivariable Cox regression analysis revealed that being younger, having higher education, possessing greater trust, and engaging in high social participation was associated with a lower risk of poor self-rated health for both urban and rural residents. Consequently, trust and social participation could reduce the occurrence of poor self-rated health.

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## 1. INTRODUCTION

Self-rated health (SRH) is an important measure that reflects an individual's personal assessment of their overall health status [1]. Assessing self-rated health is a subjective, straightforward, and easily conducted process at the individual level [2], [3]. When an individual holds a positive self-perception, it suggests excellent or good health, while a negative self-perception may indicate poor health [3]. The evaluation of self-rated health is an important consideration that can positively impact research initiatives, policy development, and clinical practices [4].

Several studies have examined self-rated health with sociodemographic factors (age, sex, and education) and social capital as one of its predictor factors [5]–[10]. Over the past 20 years, social capital has emerged as an important concept in the fields of public health and social epidemiology studies [11]. A meta-

analysis study indicates that social capital is significantly associated with various outcomes [12]. Social capital offers advantages to individuals and groups through the connections they build within their social relationships. Social capital is defined as the total of actual or potential resources connected to a stable network of relationships characterized by mutual acquaintance or recognition [13]. It highlights the advantages individuals gain from their social networks [14]. Putnam defines social capital as essential elements of social organization, which encompass networks, norms, and social trust. These components play a vital role in fostering coordination and cooperation for the mutual benefit of individuals and communities [15]. Social capital in the community manifested in collective action can be used to fulfill common needs and solve various health problems [16], [17]

Multiple studies have noted variations in the connection between social capital and health can vary depending on whether a resident lives in an urban or rural area [18], [19]. A previous study conducted in China demonstrated statistically significant disparities in self-assessed health between city and countryside residents, with urban residents exhibiting better health statuses than their rural counterparts [20]. These distinctions in resident types may contribute to differing health assessments.

Indonesia, the world's fourth most populous country, comprises 8,488 urban villages and 74,953 rural villages [21]. BPS - Statistics Indonesia established the 2020 criteria for urban villages, which includes three indicators: population density per km<sup>2</sup>, percentage of agricultural families, and access to urban facilities [22], [23]. A study in Indonesia asserts that the health contentment of Indonesians is linked to their place of residence, with individuals in rural areas tending to report lower self-rated health [24]. Various studies conducted across different regions of Indonesia, such as in East Java and Aceh Provinces, have revealed similar findings, highlighting the important connection between social status and health in Indonesia concerning safety, psychological wellness, and overall standard of life [25], [26].

North Sumatra is Indonesia's fourth most populous province, comprising three times larger rural than urban areas [21]. This province probably encounters obstacles concerning self-rated health. Yet, there is scarce research on the correlation between social capital and self-rated health in both urban and rural areas of North Sumatra Province. Therefore, this study aims to identify the sociodemographic and social capital elements that are connected to self-rated health and compare sociodemographic, social capital, and self-rated health factors across rural and urban locations in North Sumatra Province, Indonesia.

## 2. METHOD

### 2.1. Study design and data source

This study is a quantitative study using a cross-sectional design. The main data utilized from Statistics Indonesia (BPS), the Happiness Level Measurement Survey, was conducted in 2021. BPS surveyed from July 1 to August 27, 2021, covering 75,000 households as the analysis unit spread across 34 provinces in Indonesia, including 4,740 from Sumatra Utara Province. The head of the home or the head of the family's spouse (wife or husband) was chosen as the responder to represent the household in each sample household. This study was authorized by the Universitas Indonesia Faculty of Public Health Ethical Committee under No. Ket-67/UN2.F10.D11/PPM.00.02/2024.

### 2.2. Study's participation selection

The research included 4,734 household heads or their spouses residing in North Sumatra with valid identity cards. Stratification of the population of census blocks and households was carried out to ensure a more accurate representation of the region's populace in the sample. The urban or rural classification of the entire population of regular census blocks from SP2020 was determined. Moreover, households were categorized according to the head of the household's educational attainment to guarantee diverse socioeconomic representation.

### 2.3. Data collection

Interviews were used to gather data using a structured questionnaire. For our purposes, the following variables are the main focus of this study: sociodemographic factors (sex, age, education, marital status), social capital (trust, social participation, tolerance, feeling of safety), and self-rated health. The self-rated health was measured using the question: "How satisfied are you with your health?". The answer with a scale value between 1–10, where 1 indicates "very unsatisfied" and 10 indicates "very satisfied". We developed a dichotomous outcome measure (0=excellent health and 1=bad health) based on this question. They dichotomized the scores of self-rated health by taking the mean value as the cut-off, good health (>7.47) and poor health (≤7.47).

Sex (male or female), age (>64, 41-64, 25-40, <25 years), education level (primary school, junior high school, middle high school, junior college and above), and marital status (married, divorced, widowed, or single) were among the sociodemographic factors that were included in this study. Responses to a variety

of questions were compiled to get an overall score for each social capital category. Better social capital status was reflected by higher scores. In our analysis, we categorized the scores for each dimension of social capital by using the mean value as a cutoff. The categories were defined as follows: trust: high (score >72.73) and low (score ≤72.73), social participation: high (score >73.51) and low (score ≤73.51), tolerance: high (score >24.85) and low (score ≤24.85), the feeling of safety: high (score >30.34) and low (score ≤30.34).

## 2.4. Statistical analysis

IBM SPSS version 22.0 statistics software was used to conduct the statistical analysis. To illustrate the participants' sociodemographic, social capital, and self-rated health characteristics, descriptive statistics such as frequency and percentage were used. The Chi-square test was used to evaluate the differences between urban and rural locations in terms of sociodemographic characteristics, social capital, and self-rated health. Multivariable Cox regression was used to identify the variables affecting the participants' self-rated health in both urban and rural areas. Statistical significance was set at  $p < 0.05$  in all analyses.

## 3. RESULTS AND DISCUSSION

The sample's descriptive details and the variations in sociodemographic characteristics, social capital, and self-rated health between respondents who lived in urban and rural regions in North Sumatra Province are shown in Table 1. Of 4,734 total respondents, 2,134 (45.1%) lived in cities, while 2,600 people (54.9%) lived in rural regions. We found that 42.0% of the respondents had poor health. In urban areas, it was 41.9%, and 58.1% in rural areas. This discrepancy is similar to the previous finding where the prevalence of poor health was found 7% higher in rural areas compared to urban counterparts [26].

This study involved a higher proportion of rural respondents were male, 1,150 (58.9%) compared to the urban respondents, 803 (41.1%). The age group 41-64 had the larger representation in the urban residence, 1,164 (46.8%), while those aged >64 years had the higher frequency of 361 (58.9%) among the rural residents. The majority of the respondents, 1,181 (66.8%) in the rural areas, had below or graduated from primary school compared to about half, 586 (33.2%) of the urban respondents. Over two-thirds, of the respondents were married (78.6%) in urban and rural areas, 1,694 (45.5%) and 2,028 (54.5%) respectively.

Table 1. Differences in sociodemographic, social capital, and self-rated health between people living in urban and rural areas

Variable		Total (%)	Urban (%)	Rural (%)	p-value
Sample size		4,734	2,134 (45.1)	2,600 (54.9)	
Self-rated health	Poor health	1,986 (42.0)	833 (41.9)	1,153 (58.1)	0.001*
	Good health	2,748 (58.0)	1,301 (47.3)	1,447 (52.7)	
Sex	Female	2,781 (58.7)	1,331 (47.9)	1,450 (52.1)	0.001*
	Male	1,953 (41.3)	803 (41.1)	1,150 (58.9)	
Age (years)	<25	100 (2.1)	45 (45.0)	55 (55.0)	0.056
	25-40	1,532 (32.4)	673 (43.9)	859 (56.1)	
	41-64	2,489 (52.6)	1,164 (46.8)	1,325 (53.2)	
	>64	613 (12.9)	252 (41.1)	361 (58.9)	
Education	Junior college and above	528 (11.2)	336 (63.6)	192 (36.4)	0.001*
	Middle high school	1,512 (31.9)	798 (52.8)	714 (47.2)	
	Junior high school	927 (19.6)	414 (44.7)	513 (55.3)	
	Below or primary school	1,767 (37.3)	586 (33.2)	1,181 (66.8)	
Marital status	Married	3,722 (78.6)	1,694 (45.5)	2,028 (54.5)	0.264
	Single, divorced, or widowed	1,012 (21.4)	440 (43.5)	572 (56.5)	
Trust	High	2,521 (53.3)	1,079 (42.8)	1,442 (57.2)	0.001*
	Low	2,213 (46.7)	1,055 (47.7)	1,158 (52.3)	
Social participation	High	2,427 (51.3)	1,059 (43.6)	1,368 (56.4)	0.044*
	Low	2,307 (48.7)	1,075 (46.6)	1,232 (53.4)	
Tolerance	High	2,447 (51.7)	1,118 (45.7)	1,329 (54.3)	0.399
	Low	2,287 (48.3)	1,016 (44.4)	1,271 (55.6)	
Feeling of safety	High	1,956 (41.3)	996 (50.9)	960 (49.1)	0.001*
	Low	2,778 (58.7)	1,138 (41.0)	1,640 (59.0)	

Note: \*Significantly difference at  $p\text{-value} \leq 0.05$

Regarding social capital, the high trust had a bigger proportion in rural residences, 1,442 (57.2%), than in urban residences, 1,079 (42.8%). Qualitative evidence from a study in Kenya provided a similar conclusion, that bonding capital is significantly more prevalent in rural areas, whereas bridging social capital is comparatively higher in urban regions [27]. We also found that a higher proportion was found in rural areas for high social participation and high tolerance, 1,368 (56.4%) and 1,329 (54.3%), respectively,

compared to the urban areas, 1,059 (43.6%) and 1,118 (45.7%). A Canadian longitudinal study supported the differences between rural and urban settings in terms of social participation frequency, indicating that rural residents exhibit more tolerance and social participation [28]. Meanwhile, the feeling of security in the low category was reported to have a higher proportion, 1,640 (59.0%) in rural areas compared to urban areas, 1,138 (41.0%), as stated in a previous investigation that rural respondents feel more psychologically comfortable and secure than urban [29].

Urban and rural inhabitants' self-rated health, sex, education, trust, social involvement, and sense of safety differed significantly, according to the Chi-square tests, see Table 2. Additionally, there were substantial differences between urban and rural people in three social capital indices. Nevertheless, no statistically significant variations in tolerance were found. The evaluation of sociodemographic characteristics and social capital indicators as drivers of self-rated health among respondents in urban and rural areas is demonstrated using multivariable Cox regression. Results from multivariable Cox regression are reported in Tables 2 and 3. Among urban respondents, the analysis revealed that the respondents who had younger ages (<64 years old), education above primary school (middle-high school), had a high trust, and had high social participation) were less likely to be in poor health compared to the reference group (PR=1.00). Sex was a significant risk factor for self-assessed health (PR=1.184, 95% CI: 1.023-1.369,  $p<0.05$ ). According to the findings of the multivariate analysis of urban sociodemographic characteristics, self-rated health was substantially correlated with sex, age, education, trust, and social involvement.

Table 2. Multivariable Cox regression analysis of poor self-rated health (urban respondents)

Variable		PR	SE	Z	p-value	95% CI	
						Lower	Upper
Sex	Female	1.184	0.074	5.146	0.023	1.023	1.369
	Male	1.00 <sup>a</sup>					
Age (years)	<25	0.485	0.291	6.166	0.013	0.274	0.859
	25-40	0.501	0.113	37.160	0.001	0.401	0.626
	41-64	0.688	0.94	15.868	0.001	0.573	0.827
	>64	1.00 <sup>a</sup>					
Education	Junior college and above	0.659	0.122	11.575	0.001	0.519	0.838
	Middle high school	0.785	0.088	7.552	0.006	0.660	0.933
	Junior high school	0.870	0.098	2.028	0.154	0.718	1.054
	Below or primary school	1.00 <sup>a</sup>					
Trust	High	0.704	0.079	19.833	0.001	0.604	0.822
	Low	1.00 <sup>a</sup>					
Social participation	High	0.717	0.080	17.247	0.001	0.613	0.839
	Low	1.00 <sup>a</sup>					

Notes: PR=prevalence ratio, SE=standard error, CI=confidence interval, <sup>a</sup>= reference group, p-value<0.05

Table 3. Multivariable Cox regression analysis of poor self-rated health (rural respondents)

Variable		PR	SE	Z	p-value	95% CI	
						Lower	Upper
Age (years)	<25	0.330	0.311	12.753	0.001	0.179	0.606
	25-40	0.554	0.095	38.710	0.001	0.460	0.667
	41-64	0.793	0.077	9.006	0.003	0.681	0.923
	>64	1.00 <sup>a</sup>					
Education	Junior college and above	0.656	0.154	7.506	0.006	0.485	0.887
	Middle high school	0.794	0.082	7.975	0.005	0.677	0.932
	Junior high school	0.861	0.080	3.495	0.062	0.735	1.007
	Below or primary school	1.00 <sup>a</sup>					
Trust	High	0.775	0.064	15.653	0.001	0.683	0.879
	Low	1.00 <sup>a</sup>					
Social participation	High	0.690	0.067	30.334	0.001	0.605	0.788
	Low	1.00 <sup>a</sup>					
Tolerance	High	1.199	0.060	9.129	0.003	1.066	1.349
	Low	1.00 <sup>a</sup>					

Notes: <sup>a</sup> = Reference group, p-value<0.05

Furthermore, in the rural areas, the respondents who had younger ages (<64 years old), higher education (above primary school), high trust, and high social participation were protective against poor self-rated health. Tolerance was a significant risk factor for self-rated health, as indicated by a prevalence ratio of 1.199 (95% CI: 1.066-1.349) at a  $p<0.05$  significance level. Thus, multivariate analysis of respondents in rural areas showed that age, education, trust, social participation, and tolerance had a significant association with self-rated health.

This study conducted in Indonesia explores the difference between countryside and town concerning

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sociodemographic, social capital, and self-assessed health. The goal is to identify the social capital and sociodemographic variables associated with self-rated health in both urban and rural contexts. The study identified notable differences in sociodemographic characteristics among people in cities and villages in North Sumatra Province, particularly in terms of gender and education. These findings correspond with those of the Brazilian National Health Survey, indicating that sociodemographic factors such as age, gender, ethnicity, and education significantly contribute to urban-rural health gaps. It was observed that women, individuals with lower education, older adults, and minority populations are prone to perceive their health as poor, irrespective of their place of residence [27].

Additionally, the study uncovered significant distinctions in social capital between urban and rural residents, particularly in trust, social participation, and feelings of safety [18], [28]. These findings are consistent with initial studies and are ascribed to informal social networks, as well as the geographical and historical contexts of communities [29], [30]. While metropolitan settings provide opportunities for individual choices in social networks, rural locations are typified by close-knit, family-oriented social networks [30]. Individuals residing in densely populated urban areas encounter various challenges in their daily lives, including feelings of insecurity and the necessity to be cautious in trusting others due to the neighborhood environment [31]. This differs from the situation in rural areas, where communities have stronger network ties, higher levels of trust, safer environments, and greater participation in social organizations [32], [33].

Our study showed that compared to urbanized populations, a greater percentage of rural resident's self-report having bad health. It aligns with the studies in other developing countries, such as Brazil and China, which suggest that people who live in rural areas have a higher risk of perceiving their health as poorer than people in urban areas [27], [34]. This might be caused by inequalities in facilities' readiness across rural and urban areas in all public sector facilities, no exception in the field of health [35]–[36]. Most rural communities have a low level of education, causing the socioeconomic status of rural communities to be poor. Socioeconomic status is closely related to disease patterns and is indirectly related to community access to healthcare facilities such as hospitals [37].

The results of the multivariable analysis demonstrated that in both urban and rural locations, sociodemographic characteristics including younger age and greater education were associated with a lower likelihood of having poor self-rated health. Sex is a risk factor for poor self-rated health in urban areas, which is in line with previous studies [38]–[40]. This might be due to the difference in evaluating health [41], food insecurity [42], lifestyle, and cardiovascular risk [43]. In this paper, no matter whether in urban or rural areas, trust, and social participation were significantly associated with poor self-rated health. This result was similar to study findings from Poland [18], and South Africa [44]. Meanwhile, in rural areas, high tolerance is a risk factor for poor self-rated health. Indonesia is one of the most ethnically diverse countries in the world. A study on diversity in Indonesia shows that ethnic diversity in Indonesia is related to subjective well-being and social capital. The literature suggests that diversity increases tolerance. Higher subjective well-being is shared by the ethnic majority in fractionated districts compared to polarized districts [30]. This is different from the results of the study, which found that high tolerance is a risk factor for poor quality of life. This may be because people in rural areas are ethnically homogeneous.

This study revealed that those with high trust and high social participation reported a lower risk of poor self-assessed health among city and village people. A study indicated that a one-unit increase in both familial and non-familial particularized trust correlates with a 20% and 18% increase in the likelihood of individuals reporting very good health, respectively [45]. Increasing trust not only impacts an improved self-assessment of good health but also impacts mental and physical wellbeing [46]. There is a need for various interventions at both individual and community levels to increase trust in healthcare providers for better health status. Furthermore, this study also revealed that high social participation is a lower risk for poor self-rated health. Some studies support social participation as an essential component of healthy aging [47]–[50]. Low social participation can be caused by urban and rural disparities, such as the lack of public transportation infrastructure in rural areas [47], [48].

The study is subject to certain limitations. Firstly, it relied on cross-sectional survey data, and thus, any association identified in the study does not necessarily indicate a causal relationship. Secondly, self-reported bias may exist because all of the questions were self-reported. Nevertheless, the study's strengths are underscored by its utilization of a large and representative survey sample. A study focusing on youth indicates that limited social participation is linked to poverty. When young individuals can actively engage in their social spheres, they stand to gain numerous benefits for their social well-being [50].

#### 4. CONCLUSION

This study highlights that urban-rural differences are significantly by sociodemographic attributes (sex and education) and social capital (trust, social participation, and feeling of safety). Furthermore, rural residents have major poor self-assessed health than urbanized residents. The people's self-rated health in North Sumatra Province was related to various factors. Younger age, higher education, high trust, and high social participation were found to be more likely to show a lower risk of poor self-rated health both in rural and urban areas. These findings highlight the need for targeted interventions that address the underlying factors contributing to increasing trust and social participation to decrease poor self-rated health.

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