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MEASURING ACTIVE AGING FOR GOVERNMENT POLICY PLANNING: A CASE OF RUSSIA

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MEASURING ACTIVE AGING FOR GOVERNMENT POLICY PLANNING: A CASE OF RUSSIA³⁴

Rising life expectancy and an aging population highlight the need for appropriate government policies to transform of the role of the elderly from a dependent part of the population to an economically active one. This paper aims to measure active aging of the elderly in Russia. We review definitions of active aging and base our research on the concept of the World Health Organization. Active aging is characterized by three components: health, participation, and security. We select indicators for these components and aggregate them into three sub-indexes which become the outcome index of active aging. As a result, the sample is divided into two groups of elderly people in Russia, “actively aging” and “inactively aging”. The empirical research is based on the Study of Global Ageing and Adult Health (SAGE). Our findings show that 70% of the elderly population are at the intersection of “health” and “participation in social activities”; 61,2% between “health” and “security”; 73,5% between “security” and “participation in social activities”. Overall, 58,5% of Russian senior citizens meet all three criteria of active aging, thus creating a great challenge for policy response.

Key words: active aging, public policy, the elderly, health, participation, security, Russia.

JEL: J14, J18

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Introduction

Trends in global aging demonstrate the relevance of studying the lifestyles of the elderly and their social roles. Most European countries are experiencing a rise in life expectancy and Russia is not an exception. Policy agendas in developed countries now stress the need for active and healthy aging in terms of improved health and greater degree of activity and autonomy (Zaidi et al., 2013). Developed countries have realized the need for a high-quality evidence base that could be used to formulate policy responses to population aging, resulting in a growing body of theoretical and empirical research on measuring activity of senior citizens.

Traditionally, the process of aging is associated with inevitable changes in physical functions, as well as social changes, such as reduced flexibility and poor adaptation to the environment. Gerontology originally considered “normal aging” as a gradual decline of all functions, degeneration and death. In a biomedical light, aging is a disease that should be treated with a help of a doctor. Aging as a medical problem focuses on health and all related questions. The “medical model” determines all the biological, social and behavioral characteristics of aging. Society and the elderly themselves regard aging as illness and dependence. This has governmental policy consequences in healthcare and education, for example, special training will be needed for work with the elderly (Estes, 1993).

The “medical model” has been criticized by many researchers, since an aging population brings higher incomes for medicine as opposed to reducing costs on social services. Dependence of the elderly is a “social product” which is determined by the labor market, pension system, the rising costs of medical services, social discrimination and stigmatization. At the same time, a growing life expectancy raises the problem of financing expensive health care for the elderly and provokes a conflict between generations. Therefore, demographic trends and the dominant biomedical paradigm of aging are divergent (Estes, Binney, 1989). The World Health Organization (WHO) concept of active aging (adopted by many developed countries) is based on changing our views of aging and the role of the elderly in society and the economy. Older people should not be considered as a dependent population. This group should become an economically active one and contribute to the economic growth of a country (Chansarn, 2012).

Recently, the measurement of active aging has become an important research question, since give an insight into the potential of the elderly. This could inform decision-makers and improve governmental policy aimed at moving the elderly to an economically active part of the population. Measurement of active aging has been made for many countries, for instance countries of the European Union, however there have not been any deep investigations of this problem in Russia. The relevance of this problem for Russia is highlighted by an aging population and their low involvement in useful activities. The potential of older Russians has not been studied yet. With that, it is difficult

to carry out government planning and develop programs devoted to improving the quality of life of the elderly. Moreover, it is impracticable to reveal factors affecting the process of active aging. Therefore, this paper aims to measure active aging in Russia and provide a platform for public sector policy directed to the elderly. We review the definitions of active aging, since there is no clarity about the methodology of estimation, and construct an active aging index for Russia. Our investigation is the first one to contain the measurement of the proportion of older Russians who are active according to the current understanding of the World Health Organization.

Literature review

Despite wide interest in the topic, researchers have not reached a consensus about the definition of active aging. Actually there are many concepts and definitions that are applied in different studies. Economists started to investigate the aging process in 1960s. Two theories were developed: disengagement theory (Cumming, Henry, 1961) and activity theory (Havighurst, 1961). Disengagement theory suggests that older people should retain autonomy. They may be socially inactive and have infrequent contacts with family and friends. Psychological distance from other people might be significant. Giving up of contacts is regarded as a natural process which can be mutual from both an older person and the outside world. During this process, an older person may limit social activity, but remain happy and satisfied with life (Onedera, Stickle, 2008).

Activity theory was originally based on the assumption that the success of senior citizens is supported by participation in various social activities. Any activity that has to be stopped because of old age should be replaced (Adams, et. al., 2011). Despite the fact that the range of possible activities narrows with aging, an older person can stay active. For instance, intense physical activity might be replaced by easier exercises.

In the 1970s researchers identified three main types of active interaction between the elderly and society: formal, informal and solitary (Adams, et al., 2011). Formal interaction implies participation in formal groups and organizations. Informal interaction involves communication with familiar people. Solitary activity is a type of activity that an older person can do alone, such as reading (Adams, et al., 2011). These types of activity may have different effects on subjective well-being in old age. Adams argues that the informal type has the greatest significance. This conclusion is supported by Duay and Bryan (2006) who emphasize that an older person should maintain personal contacts as long as possible. It is important not only to get help but also to assist others. For example, family and friends help the elderly, and the elderly support them with their wisdom and advice (Onedera, Stickle, 2008). Overall satisfaction with life is maintained through discussing the latest news, participation in current events and various activities (Onedera, Stickle, 2008; Adams, et al. 2011). Activity theory suggests that an older person should be involved in social contact, physical or

mental activity, and pleasant experiences. The choice of activities is determined by the opportunities provided to the elderly and limitations associated with the age. Different types of activities reflect the life priorities of an older person (Horgas, et al., 1998).

Activity theory is closely connected with the concept of “successful aging”. This concept derives from Rowe and Kahn’s paper, “Human Aging: Usual and Successful” (1987). According to this paper, external factors that identify “normal” aging can be modified in such a way that aging becomes “successful”. The authors show the role of a diet, physical exercise, memory training, and social factors such as autonomy, family support, presence or death of a spouse / friends, etc. Rowe and Kahn (1987) suggest that successful aging implies a total absence of disease and disability. Subsequent studies modify this concept and suspect minimal disease or active physical functioning. This leads to a significant increase in the number of those persons whose aging is successful. Another way to define successful aging is to consider the daily activity of the elderly. If it does not change much, aging is successful even though an older person has diseases. This results in even greater growth of the number of older people whose aging is successful (Strawbridge, et al., 2002).

In 1998, Rowe and Kahn included in their definition of successful aging three components that should run simultaneously. The first is absence of disease, disability and risk factors such as smoking, drinking and high blood pressure. The second is physical and mental functioning. The third is active social functioning, for example, interactions with other people and involvement in useful activities (Adams, et al., 2011). Successful aging requires not only activities that support existence (eating, washing, dressing, etc.) but also activities aimed at cultural development (Horgas, et al., 1998).

These three components are investigated in all following studies. Furthermore, researchers often add a fourth factor which is different in various papers. For instance, Lee, Lan, and Yen (2011) consider the three basic factors of successful aging mentioned before and add the fourth factor - leisure activity. Examples of leisure activity are exercises or going on vacations. People who have active rest are more likely to have higher levels of life satisfaction. Moreover, researchers confirm a positive relationship between exercises and physical functions of older people.

A similar approach is applied in the paper of Marina and Ionas (2012). They study successful aging through physical, social and mental functions, as well as life quality, longevity and subjective well-being. They define successful aging by factors such as high educational level, personal income, personal development, and control over life.

With all of these it is important to analyze subjective factors that influence the aging process of a person. It might be self-perception, perception of aging, self-esteem (Strawbridge, et al., 2002; Paul, et al. 2012; Romo, et al., 2012). Duay and Bryan (2006) take into account whether an older person keeps friendliness, a positive attitude towards life, sense of humor, and the ability to have fun.

These factors could become key when defining successful aging. In particular, people might consider their aging as successful, despite illness or disability (Romo, et al., 2012; Paul, et al., 2012). Paul and coauthors (2012) reveal that the proportion of people who believe that they are successfully aging is higher than the proportion of those who are classified as “successful” on the basis of educational level, income level, marital status, ethnicity, etc. In terms of successful aging, some of the most significant factors are successful adaptation, the ability to act as an expert, and satisfaction with life. Moreover, an older person may suffer from any physical or functional restrictions, but successfully adapt to new living conditions through selection, optimization, and compensation. This is the “selective optimization with compensation” model of Baltes P. and Baltes M. (1990).

Considering the individual characteristics that influence the aging process, many researchers take into account gender differences (Jorm, et al., 1998; Depp, Jeste, 2006; Garcia, et al., 2011; Marina, Ionas, 2012). For instance, Jorm and coauthors (1998) revealed that in Australia determinants of successful aging for men are educational level and professional status. However, these factors are insignificant for women. Strawbridge, Wallhagen, and Cohen (2002) found that women are more likely to have successful aging. This conclusion is supported by McLaughlin and coauthors (2010). On the contrary, Jang (2009) argues that successful aging is more likely among men.

Researchers usually split the sample of the elderly by age groups. For instance, Lee, Lan, and Yen (2011) distinguish the following groups: 65-74 years, 75-84 years, 85 years and older. Basically, authors conclude that people in the oldest age group are less prosperous (Depp, Jeste, 2006; McLaughlin, et al., 2010; Garcia, et al., 2011).

It should be noted that the concept of successful aging is now being criticized. Due to the huge heterogeneity of the elderly, a variety of things may bring life satisfaction (Ouweland, et al., 2007). Therefore it is extremely difficult to select unified factors of successful aging (Liang, Luo, 2012), (Paul, et al., 2012). Fixing the criteria inevitably leads to the exclusion of many possible ways to achieve well-being in old age (Ouweland, et al., 2007). However, the concept of successful aging is based on western cultural values. In many ways they are opposite to the life of people in eastern countries. Autonomy, activity, productivity are not crucial in Asian countries where the most important factors are relations with relatives and the close link of generations (Liang, Luo, 2012). Chung and Park (2008) revealed for South Korea that successful aging has little connection to personal income and savings. Key factors are positive attitude towards life, success of older children and relations with other people. Paul and coauthors (2012) found that in developing countries socio-economic status and social contacts are more important than biological characteristics of the individual. However, this finding is not relevant to developed countries. Therefore cross-country

differences, as well as institutional and macroeconomic factors should be considered (Zaidi et al., 2013).

Along with the concept of successful aging there are a number of similar definitions related to the aging process. “Healthy aging” focuses on physical and mental health of an older person, as well as an extended active life (Marina, Ionas, 2012). “Productive aging” refers to the social activities of the elderly, such as volunteering, caring, and informal help (Marina, Ionas, 2012). “Harmonious aging” implies that harmony and balance in all spheres of life should form the basis of the aging process (Liang, Luo, 2012).

With all of these, the most widely recognized concept is an “active ageing” concept. According to the definition by the World Health Organization (2002), “active aging is the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age”. Thereby active aging is based on three components that are health, participation, and security. The Organization for Economic Cooperation and Development gives a narrower definition of active aging and concentrates only on the ability of the elderly to lead a productive life in society and the economy. Individuals’ health and autonomy are of secondary importance (Sidorenko, Zaidi 2013). Government agencies in different countries give their own definition of active aging. For instance, in Australia active aging is regarded as an aggregate of well-being, physical activity, mental activity, social activity, and labor activity (Hutchison, et. al., 2006).

The first component of active aging is *health* which refers to the physical and mental health of an older person, as well as self-rated health. For physical health, researchers usually consider chronic disease, disabilities, physical functions, and painful sensations. A list of diseases and disabilities vary in different studies. For instance, McLaughlin and coauthors (2010) include into their analysis the major causes of death among the elderly that are cancer, chronic lung disease, diabetes, heart disease, and stroke. Pruchno and coauthors (2010) add arthritis, hypertension, and osteoporosis to this range. For disabilities, Chansarn (2012) uses the state of blindness and deafness. According to McLaughlin and coauthors (2010), an older person meets the criterion of no disability if he is able to walk across a room, get dressed, take a bath or shower, eat, get in or out of bed, and use the toilet. For physical functions, the authors consider the ability to eat, get dressed, take a bath, walk and go up stairs (Pruchno, 2010; Chansarn, 2012). Lee and coauthors (2011) take into account whether an older person has any pain, physical discomfort, and injuries that would have an impact on daily activities. Pruchno and coauthors (2010) examine whether pain makes it difficult to do usual daily activities.

Assessment of mental health is based on different indicators capturing changes in mood (Chaves et. al., 2009), feelings of anxiety, sadness, depression (Ko, et al., 2007; McLaughlin, et al., 2010; Chansarn, 2012), ability to relax and self-confidence (Bowling, Iliffe, 2006; Lee, et al., 2011). Kahana and coauthors (2005) consider the future plans of an older person. They assume that plans

promote interest in life and a good state of mind. Onedera and Stickle (2008) take into account short-term plans of older people, for example, cooking or cleaning, as well as plans for the next three months (writing a letter to a friend) or a year (reading a certain book).

Self-rated health is another important element of the health status of an older person (Ko, et al., 2007; Chansarn, 2012). Doyle and coauthors (2010) describe it as self-rated changes in health status for a certain period of time. Lee and coauthors (2011) examine a self-rated health status over the previous two weeks.

The second component of active aging is *participation*. Participation is usually estimated by labor activity and social activity. Generally, labor activity is regarded as the presence of paid work (Pruchno et. al., 2010) or volunteering (Duay, Bryan, 2006; Marina, Ionas, 2012). Social activity involves contacts with family and friends, as well as neighbors and the outside world (Duay, Bryan, 2006; Lee et al., 2011). This might include indicators of marital status (Chansarn, 2012), having a close friend (Payne et al, 2006), frequency of meetings with relatives and friends (Lee, et al., 2011), provision of support to family members (Vance, et al., 2005; Chansarn, 2012), leisure and hobbies (Doyle, et al., 2010). Moreover, it involves political participation (Zaidi, et al., 2013), participation in religious activities and attendance of religious meetings (Ng, et al., 2009; Pruchno, et al., 2010; Lee, et al., 2011; Marina, Ionas, 2012).

The third component of active aging is *security* which consists of living safety and financial security. Living safety implies such things as non-slippery ground floor, stair handrail, handrail in bathroom, non-slippery toilet, etc (Chansarn, 2012). Financial security is described by indicators of personal income (Strawbridge, et al., 2002; Jang, et al., 2009; Garcia, et al., 2011), household income (Chaves, et al., 2009; McLaughlin, 2010; Wang, Lin, 2012), sufficiency of income (Duay, Bryan, 2006; Chansarn, 2012), savings and indebtedness (Chansarn, 2012). In addition, Chansarn considers accommodation ownership as a component of security.

The most common way to estimate active aging is to construct an index. For instance, Zaidi and coauthors (2013) present an Active Aging Index which consists of four components: employment; participation in society; independence, healthy and secure living; capacity and enabling environment for active aging. The first three components show the current status of an older person, and the fourth component reflects their development potential later in life. For a measurement of all components, individual indicators are calculated. Aggregation of the selected individual indicators to components and to the overall Active Aging Index is similar to the methodology of Human Development Index of the United Nations Development Program (Zaidi, et al., 2013). The first step is to express all individual indicators as positive indicators, when the highest value means the best active aging outcome. The second step involves the expression of the indicators in percentage terms. The third step calculates the arithmetic weighted average of all indicators for each component. Lastly, Zaidi

and coauthors calculate the overall index as the arithmetic weighted average of the component indices. Weights are assigned by the expert group.

We note that Zaidi and coauthors (2013) developed the Active Aging Index for cross-country comparisons. With that, there is an example of constructing an Active Aging Index with micro data. Chansarn (2012) follows the definition of active aging by WHO (2002) and calculates an active aging index for Thailand. This index consists of three dimensions that are health, participation, and security. All selected indicators are aggregated into indices for dimensions with the help of linear scaling. Then, an Active Aging Index is calculated as an arithmetic average of indices for the three dimensions.

Another way to assess the proportion of people who are active and successful in later life is to conduct latent-profile analysis. This analysis is applied in the research of Pruchno and coauthors (2010). They constructed an “active aging” variable based on two components: health conditions and self-rated health. All respondents were classified as “unsuccessful”, “successful according to an objective definition”, “successful according to a subjective definition”, or “successful according to both definitions”. Examples of objective factors are: having few chronic conditions, maintaining functional ability, and experiencing little pain. Subjective success in an older age is measured by questions where respondents are asked to evaluate themselves using a scale. As opposed to constructing an index, latent profile analysis does not require researchers to choose weights for indicators and components of active aging. However, a researcher still has to define the boundaries of subgroups, based only on the respondents' answers, rather than normative criteria.

Methodology and data

From the very beginning we decided to conduct the empirical research using micro-data as it gives the advantage of splitting the sample by gender and by smaller age groups. As opposed to the Health and Retirement Study in the USA, the English Longitudinal Survey of Ageing in Great Britain, the Irish Longitudinal Study on Ageing in Ireland, the Survey of Health, Ageing and Retirement in Europe (SHARE), there is no special national survey of the elderly in Russia. Recently, the World Health Organization conducted an international research of aging in middle and low income countries – the Study of Global Ageing and Adult Health (SAGE). Countries included in the study were China, Ghana, India, Mexico, South Africa, and the Russian Federation. This research is supported by the US National Institute on Aging, Division of Behavioral and Social Research. The Russian partner of the study is the National Research Institute of Public Health of the Russian Academy of Medical Sciences. SAGE covers adults of 50 years and older with a small control group of younger adults from 18 to 49 years. Samples are representative on a national level. At present, only the first wave (2007-2010) is available for research.

The SAGE database contains answers to questions that enable researchers to measure all three components of active aging: health, participation, and security. Moreover, this database includes the largest number of respondent of an older age in comparison with other bases, for instance, the Russia Longitudinal Monitoring Survey.

The sample of SAGE consists of 4947 respondents. After the exclusion of missing data, the sample retains 4350 people. SAGE was originally designed for the study of the elderly. Therefore, it does not reflect the demographic structure of the Russian population. Individuals older than 55 years dominate the sample. The percentage of younger respondents is 26%.

We note that SAGE includes those who are unable to answer all questions without assistance. In that case another member of a household gave answers about this respondent. For Russia, it was 3% of all respondents.

Table 1 shows the distribution of men and women in the sample by age groups.

Table 1. Gender and age of respondents in SAGE (number of persons)

	Age groups					total
	under 55	55-64	65-74	75-84	85 and older	
men	440	491	378	210	29	1548
women	705	764	752	500	81	2802
total	1145	1255	1130	710	110	4350

Source: authors' calculation

Since our research is focused on the elderly, we include into analysis only those respondents who are 55 and older. Consequently, our sample consists of 3205 respondents.

On the basis of a literature review we have developed a research methodology to perform the selection and organization of active ageing indicators into the three domains (components) discussed above and to incorporate them into an aggregated AAI. The research methodology for this study is divided into three steps. At the first step we explain how the diverse questions from the SAGE database (Appendix 1) were selected and organized to calculate the indicators for the three components of AAI (health, participation in social activity, and security). Thereafter, at the second step we aggregated indicators into the three component-specific indexes, namely: Health component index (HCI); Participation component index (PCI); Security component index (SCI). The resulting component-specific indices were made up of a different subset of indicators (see Table 2). Finally the overall outcome indicator AAI of active ageing of elderly people is calculated. That makes it possible to split the SAGE sample into two subgroups – those who can be considered as “actively aging” and the rest of the sample.

Table 2. Composition of active aging index

Components	Indicators	Variables
Health (HCI)	Physical health:	
	<i>Chronic conditions</i>	<i>Chronic – concentration of chronic conditions</i>
	<i>Physical ability</i>	<i>Physical – concentration of difficulties with physical actions</i>
	<i>Pain and discomfort</i>	<i>Pain1 –bodily pain</i> <i>Pain2 – difficulties due to pain</i>
	Mental health	<i>Emotion – feeling sad, low or depressed</i>
	Physical health condition	<i>Sah – Self-assessed health</i>
Participation in social activities (PCI)	Work participation	<i>Job – Working status</i>
	Community participation	<i>Public activity – participation in public activities</i>
	Family and friends participation	<i>Married – marital status</i> <i>Family-friends – intensity of contacts with friends and relatives</i>
Security (SCI)	Financial stability	<i>Finance – sufficiency of income</i>
	Living conditions	<i>Home – self-assessed accommodation conditions</i>
	Living security	<i>Safe home – feeling safe at home</i>

Step 1. Selection and organization of AAI components

A careful review of existing empirical studies provided us with a mass of diverse indicators that could be potentially used to evaluate AAI components for Russian elderly. When selecting among different indicators, we tried to introduce similar indicators to those that were used in a number of previous studies. Unfortunately, we were limited by the SAGE questionnaire: it has a good set of questions about different dimensions of health, a fair number of questions on participation, and quite a few questions on security.

Following McLaughlin and coauthors (2010), Pruchno and coauthors (2010), Lee and coauthors (2011) and Ko and coauthors (2007) we have composed the indicators that describe HCI.

Physical health

Chronic – concentration of chronic conditions. SAGE has questions about 8 chronic conditions that include arthritis (a disease of the joints, or by other names rheumatism or osteoarthritis), stroke, angina (or angina pectoris), diabetes (high blood sugar), chronic lung disease (emphysema, bronchitis, COPD), asthma (an allergic respiratory disease), high blood pressure (hypertension), and cataracts in one or both eyes. 2378 of elderly respondents (74,8%) had at least one chronic condition. Males were less likely to report that they suffer from any type of chronic condition, while 1616 women (77,8%) pointed out that they had chronic conditions compared with only 338 men (69,3% of male subsample).

To calculate the *Chronic* variable, the positive answers to questions of having chronic conditions were summed up. As we selected questions about 8 chronic conditions the maximum score could be 8 (if a respondent had all chronic conditions) and the minimum score 0 (if they had no chronic conditions). However, in the SAGE sample, the maximum score for *Chronic* variable was equal to 6. Table 3 shows the distribution of individuals by the number of chronic conditions they have reported. The majority of elderly reported one chronic condition or did not report any.

Table 3. Concentration of chronic conditions

<i>Chronic</i>	frequency	%
No chronic conditions	800	25,2
1	935	29,4
2	706	22,2
3	434	13,7
4	213	6,7
5	67	2,1
6	23	0,7
total	3178	100

Source: authors' calculation.

Physical ability

Physical – concentration of difficulties associated with 6 simple actions, including: bathing/washing the whole body, getting dressed, moving around inside the respondent's home (such as walking across a room), eating (including cutting up your food), getting up from lying down, getting to and using the toilet. Respondents were asked to answer how much difficulty they had doing each of these 6 actions. To compose the *Physical* variable, we first created 6 subsidiary binary variables (one for each action), that were equal to 1 if the individual reported that he had severe or extreme difficulties in performing the particular action, and zero if he had none, mild or moderate difficulties. The ultimate *Physical* variable reflects the number of simple actions that cause severe or extreme difficulties for a particular person. It ranges from 0 to 6.

In the SAGE database, 198 respondents (6,3%) had difficulties in bathing/washing the whole body; 111 (3,5%) – in getting dressed; 110 (3,5%) – in moving around inside the respondent's home; 60 (1,9%) – in eating; 67 (8,4%) – in getting up from lying down; 103 (3,3%) – in getting to and using the toilet. Overall 2744 individuals out of 3088 (88,7%) reported that they didn't have any difficulties performing these 6 simple actions; 186 respondents (6%) mentioned only 1 action that was associated with severe or extreme difficulties; 49 respondents (1,6%) – 2 actions; 37 (1,2%) – 3 actions; 20 (0,7%) – 4 actions; 24 (0,8%) – 5 actions; and 28 individuals (0,9%) pointed out that each listed action brings severe or extreme difficulties.

Pain and discomfort

Pain1 – bodily pain. The variable is equal to 1 if the respondent said that he (she) had severe or extreme pain in the last 30 days and 0 if not.

In the SAGE database, 457 individuals (14,3%) reported that they had such a pain.

Pain2 – difficulties due to pain. The variable is equal to 1 if the respondent indicated severe or extreme difficulty in daily life because of pain and zero 0 if not.

404 individuals (17,3%) reported that they had difficulties in their everyday activities because of pain.

Mental health

Emotion – feeling sad, low or depressed. The variable ranges from 0 to 4, depending on how individuals estimate problems they had in the last 30 days with feeling sad, low or depressed. Table 4 describes how individuals vary according to their estimations of these problems.

Table 4. Distribution of answers to the question: “Overall in the last 30 days, how much of a problem did you have with feeling sad, low or depressed?”

<i>Emotion</i>	frequency	%
none	1748	55,7
mild	780	24,9
moderate	439	14
sever	150	4,8
extreme / cannot do	22	0,7
total	3139	100

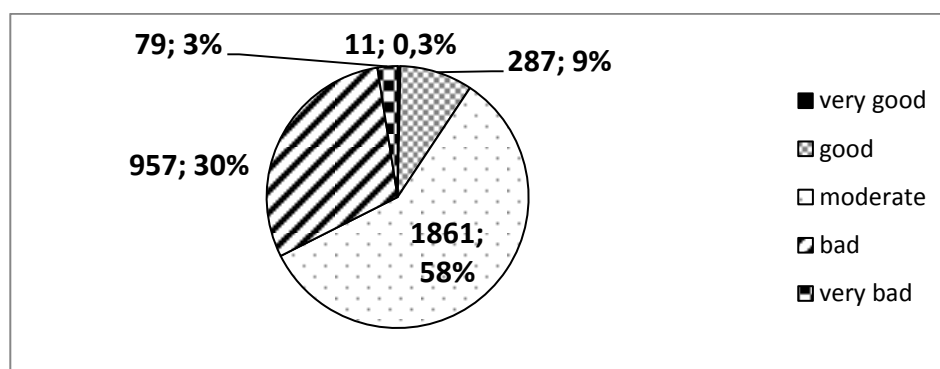
Source: authors’ calculation.

Table 4 shows that the majority of respondents (55,7%) did not have any problems, while 172 (5,5%) had severe/ extreme problems with feeling sad, low or depressed.

Physical health condition

Sah – self-assessed health measured on 5-point scale. The variable ranges from 1 to 5 with 1 meaning “very good” and 5 meaning “very bad”. Figure 1 demonstrates the distribution of self-assessed physical health condition.

Figure 1. Distribution of answers to the question “In general, how would you rate your health today?”



Source: authors' calculation.

The majority of the elderly (58%) reported, that they rate their health condition as moderate, 30% supposed they had bad health, and 2,5% believed they had very bad health. Almost nobody thought their health was very good.

In order to evaluate PCI we composed a number of variables that describe individuals' working status, involvement in public activities, and communication with relatives and friends, similar to indicators that were used by Pruchno et al. (2010), Lee et al. (2011) and Ng (2009).

Working participation

Job – working status. The variable is equal to 1 if a respondent had a job (no matter if paid or voluntary, fulltime or part time) and 0 if not. We calculated this variable for those who have already reached the age of the retirement (55 years for females and 60 years for males) and for those who had not.

There were 719 working senior citizens (22,7% of all) in the SAGE sample.

Community participation

Public activity – participation in public activities. The variable is measured by 5 subsidiary variables, describing how often an individual took part in the 5 listed activities, including: any public meeting with discussion of local or school affairs; personal meeting with a community leader; any group, club, society, union or organizational meeting; participation in any activity with other people in the neighborhood to fix or improve something; and religious services (not including weddings and funerals). Individuals were asked to choose the frequency of participating in each activity from “never” to “daily”. The *Public activity* variable is therefore equal to 1 if the respondent participated in at least one of the 5 activities, no matter how often, and 0 if not. The percentage of individuals who participated in each activity is illustrated in Table 5. It is noteworthy that 35,6% of elderly respondents did not participate in any listed public activity.

Table 5. Rate of participation in different public activities

activity	%
1. Public meeting with discussion of local or school affairs	55,7
2. Personal meeting with a community leader	24,9
3. Group, club, society, union or organizational meeting	14
4. Participation in any activity with other people in the neighborhood to fix or improve something	4,8
5. Religious services	0,7

Source: authors' calculation.

Family and friends participation

Married – marital status. If a person reported that he (she) was married or cohabiting, the variable was equal to 1, and 0 in other cases (never married, widow, separated/divorced). 52,6% of elderly respondents were married (cohabiting).

Family – friends – intensity of contacts with friends and relatives. To compose this variable we studied the frequency of contacts with friends and relatives. Similar to the *Public activity* variable, we introduced 3 subsidiary variables, describing how often in the last 12 months the elderly person had friends over to their home; visited someone who lived in a different neighborhood or had them in at their homes; or socialized with coworkers outside of work. Each subsidiary variable could take 1 out of 5 possible values: (1) never – 0 score; (2) once or twice per year - 1 score; (3) once or twice per month – 2 scores; (4) once or twice per week - 3 scores; (5) daily – 4 scores. To calculate the component *Family–friends* the scores of the subsidiary variables were summed up resulting in a maximum score of 12 (if a person meets his friends, family members and coworkers daily) and the minimum score of 0 (if he/she does not have any contacts). Thereafter, the overall value of *Family–friends* is calculated based on the summed scores of 3 subsidiary variables.

516 respondents (16,3%) had not invited friends to their homes during previous year. 1078 individuals (34 %) had not meet friends/relatives living in other neighborhoods. 1773 respondents (35,8%) did not go out with their coworkers. 330 persons (10,4%) did not have any of these contacts and 418 persons (13,2%) had contacts very seldom (once – twice a year).

The SAGE database does not have many questions to determine the third component of active aging – SCI. Therefore, we have limited our analysis by indicators measuring financial stability and living security in order to estimate the *Security* component. When composing these indicators, we adopted indicators from Chansarm (2012), Duay and Bryan (2006), but modified them according to the data we had.

Financial stability

Finance – sufficiency of income. The variable ranges individuals’ answers on question about sufficiency of their incomes using a 5-level scale, from 0 (none at all) to 4 (completely). Table 6 illustrates the distribution of their answers.

Table 6. Distribution of answers to the question “Do you have enough money to meet your needs?”

<i>Finance</i>	frequency	%
none at all	449	14,3
a little	515	16,4
moderately	992	31,6
mostly	873	27,8
completely	307	9,8
total	3136	100

Source: authors’ calculation.

Table 6 shows only 9,8% of the elderly are completely satisfied with their incomes; 27,8% are mostly satisfied, while more than the one third of the sample report that their incomes are too little or even not enough to meet their needs.

Living conditions

Home – self-assessed accommodation conditions. The variable ranges from 4 (very satisfied) to 0 (very dissatisfied). Table 7 illustrates the distribution of the individuals' assessments.

Table 7. Distribution of answers to the question: “How satisfied are you with the conditions of your living place?”

<i>home</i>	frequency	%
very satisfied	78	2,5
satisfied	311	9,9
neither satisfied nor dissatisfied	518	16,5
dissatisfied	980	63,3
very dissatisfied	246	7,9
total	3133	100

Source: authors' calculation.

The majority of Russian elderlies are dissatisfied with the conditions of their living place with 7,9% being very dissatisfied.

Living security

Safe home – feeling safe at home. The variable describes how safe individuals feel when alone at home with respect to crime and violence. It has 5 values that range from “not safe at all” to “completely safe”. Table 8 illustrates how safe individuals feel at home.

Table 8. Distribution of answers to the question: “In general, how safe from crime and violence do you feel when you are alone at home?”

<i>Safe home</i>	frequency	%
completely safe	432	13,8
very safe	898	28,6
moderately safe	1029	32,8
slightly safe	505	16,1
not safe at all	273	8,7
Total	3137	100

Source: authors' calculation.

About 9% of elderlies feel very unsafe at home when alone and 16,1% feel slightly safe.

Step 2. Composing aggregated indicators

The choice of aggregation methodology was a critical issue in our analysis. Initially, we chose an index method similar to that described in Chansarn (2012). This method has an advantage of ranging all individuals by the “active aging” variable in order to study factors affecting active aging with econometric tools. However, we did not find any explicit explanation about choosing the “activity line” in Chansarn (2012). Moreover, we realized that when all indicators are aggregated in an outcome index of active aging, choosing a correct “activity line” becomes very disputable point. As one of our main goals was to calculate the percentage of actively aging Russians we decided to set

clear criteria of splitting individuals into two groups – “actively aging” and “inactively aging”. Therefore for each component (health, participation, security) we had to introduce “activity lines” based on the indicators that we composed at step 1. Our indicators were measured either by categorical or binary variables. So we decided to set the lines that reflect the most unfavorable values of the indicators.

Thus with respect to indicators composing component *Health* we decided that a person cannot be regarded as “active” if he/she had reported very bad physical or mental health, or he/she estimated his own health as “very bad”. Those individuals who had very bad values of any of these indicators were categorized as “inactive” due to their state of health. To do that we have introduced binary variables for each indicator. These binary variables separate individuals with very unfavorable values from all others.

For the *Chronic conditions* indicator, the binary *Chronic_line* variable measures high level concentrations of chronic conditions. It equals 0 if a respondent has no or a low concentration of chronic conditions (0-3 out of 6) and 1 if high (4 – 6).

For the *Physical ability* indicator, we have created the binary *Physical_line* variable that equals to 0 if a respondent has no problems with any of the six simple actions, and 1 if he has extreme problems with at least one simple action.

For the *Pain and discomfort* indicator, the binary *Pain_line* variable is equal to 0 if the individual did not report extreme pain and problems in daily activities due to pain (i.e. if variables *Pain1* and *Pain2* are equal to 0), and 1 in other cases.

For the *Mental health* indicator, the binary *Emotion_line* variable is equal to 1 if respondents reported extreme (unbearable) difficulties with feeling sad, low or depressed and 0 if not.

For the *Physical health condition* indicator, the binary *Sah_line* variable is equal to 1 if individuals estimate their health as very bad, and 0 in all other cases.

Thus, the sub-index HCI, describing the *Health* component, is equal to 1 if the variables *Chronic_line*, *Physics_line*, *Pain_line*, *Emotion_line*, and *Sah_line*, are equal to 0, (i.e. if a person does not have any serious problems with health) and 0 if he/she has serious problems with any indicator of health.

With respect to the *Participation in social activities* component we decided that those elderlies who had a job or participate in public activities or had contacts with friends and relatives can be regarded as “actively aging”. So for each indicator describing the social activity of a person, we have created binary variables that indicate very unfavorable conditions.

For the *Family and friends participation* indicator, the binary *Family -friends_line* variable describes the availability of contacts. It is equal to 0 if a person did not have (or almost did not have)

contacts with friends, family members and coworkers (i.e. if the *Family – friends* variable is equal to 0 or 1). In other cases, it equals 1.

For other indicators of the *Participation in social activities* component (*Job, Public activity* and *married*), there was no need to create special variables to separate very unfavorable conditions from the others, as these 3 indicators are already binary.

Thus, the sub-index PCI, describing the *Participation in social activity* component, is equal to 1 if at least one indicator (*Social_life_line, Family–friends_line, Job, Public activity* or *married*) is equal to 1 (i.e. if a person is socially active in at least one sphere), and 0 if all of these variables are equal to 0.

With respect to the *Security* component, we decided that those individuals who did not have enough money to meet their needs, or were very dissatisfied with their living conditions or felt very unsafe at home should be regarded as “inactively aging”.

For the *Financial stability* indicator, a binary variable *Finance_line* is equal to 0 if respondent does not have enough money to meet his needs, and 1 in all other cases.

For the indicator describing the level of satisfaction with living conditions (*home*) the binary *Home_line* variable is equal to 0 if the old person was very dissatisfied, and 1 if not.

For the *Safe home* indicator binary *Safe_home_line* variable measures whether a person feels very unsafe at home when alone. It is equal to 0, if he/she reported that he/she felt very unsafe and 1 if not.

Thus, sub-index SCI, describing the *Security* component is equal to 0 if at least one out of three variables (*Finance_line, Home_line* or *Save_home_line*) is equal to 0, and 1 if they all are equal to 1.

Step 3. Composing the outcome index for “active aging”

After we defined the sub-indexes for each component, they were aggregated into “*active aging*” outcome indicator. It is equal to 1 if a respondent meets the criteria of actively aging regarding all components, i.e. if sub-indexes HCI, PCI and SCI are equal to 1. In case any of the sub-indexes equaled 0, the outcome index AAI was also 0.

Results

The results of this study are presented in two sections. The first section reports the contribution of the indicators to the components’ sub-indexes. The second section summarizes the assessment of active ageing of elderly people by presenting the contribution of the three components to the outcome indicator AAI.

Contribution of indicators to sub-indexes

The first component used in the measurement of the AAI regards senior citizen health. The sub-index *Health* contains 3 indicators: physical health, mental health and physical health condition.

We found that 9,5% of respondents had a high level of concentration of chronic conditions; 11,1% experienced extreme difficulties with performing simple daily activities; and 16,7% had severe or extreme pain in the last 30 days, creating problems in their everyday life. Individuals with bad *physical health*, i.e. those who had at least one of the health variables (chronic conditions, physical ability, pain and discomfort) with a very bad status was 25,7% (776 out of 3017 respondents).

It is worth mentioning that many respondents had two *physical health* variables with bad status. For instance, among those who experienced extreme difficulties with simple daily actions, 58,1% suffered from extreme pain. 37% of those having high concentration of chronic conditions mentioned they had extreme pain.

22 individuals out of 3139 (0,7%) reported severe/ extreme problems with feeling sad, low or depressed; 78 individuals out of 3195 (2,5%) assessed their health as very bad. Therefore, overall the sub-index *Health* is mainly determined by the *physical health* indicator. So the overall sub-index *Health* was measured as a number of respondents with at least one unfavorable value of health indicators. It shows that 784 senior citizens of 3017 (26%) were inactively aging due to their health.

Table 9 illustrates the distribution of senior citizens with very bad health in different age groups. It is not surprising that the percent of individuals with very bad health increases with age, resulting in 53% of respondents with bad health in the oldest group.

Table 9. The distribution of individuals with very bad health among age groups, %

	Age groups				
	55-64	65-74	75-84	85 and older	All ages
Respondents with very bad health,% of total in each group	14,0	27,2	41,0	53,0	26

Source: authors' calculation.

The sub-index *Participation in social activity* contains 3 indicators: working participation, society participation and family and friends participation.

According to the findings, senior citizens in Russia are mostly active in family and friends participation – the majority are married and/or regularly meet friends/family members. 47,4% reported that they were not married/cohabited; 24% did not have contacts with friends and relatives. Overall, those who were at the same time single and did not have contacts with friends/family composed 13,2% of all respondents (418 person).

Participation in labor force was quite a rare case – only 22,7% of respondents had a job. However, the share of working senior citizens significantly varies by age and gender (Table 10) partly due to different official ages of retirement (55 years for women and 60 years for men).

Table 10. Distribution of working individuals by age groups, %

	Age groups				
	55-64	65-74	75-84	85 and older	All ages
men	56,7	14,6	3,3	0,0	30,8
women	37,9	11,5	1,6	1,3	18,4

Source: authors' calculation.

Participation in society is also an unpopular form of social activity - 1129 individuals out of 3171 (35,6%) reported they had not participated in any of the listed public activities.

Respondents with all three indicators of the *Participation* component below the “activity lines” formed 8,5% of the sample (267 individuals).

Similarly to the *Health* component the share of socially inactive senior citizens increases with age. (Table 11).

Table 11. Share of socially inactive elderlies in different age groups, %

	Age groups				
	55-64	65-74	75-84	85 and older	All ages
Socially inactive respondents, % of total in each group	2,5	7,1	18,8	25,9	8,5

Source: authors' calculation.

The sub-index SCI contains 2 indicators: financial stability and living security. We discovered that 14,3% of senior citizens (449 out of 3136) did not have enough money to meet their needs. 2,5% (78 out of 3133) were very dissatisfied with their living conditions and 8,7% (273 out of 3137) felt very unsafe at home alone.

The Sub-index, describing *Security* component shows that 20,9% (650 out of 3105 respondents) cannot be regarded as active due to the security component (either because their financial or any of living indicators were extremely low).

In contrast to the *Health* and *Participation in social activities* components, the distribution of senior citizens that had a bad security sub-index did not depend on age (Table 12).

Table 12. Share of elderlies leaving in unsafe conditions in different age groups, %

	Age groups				
	55-64	65-74	75-84	85 and older	All ages
Respondents leaving in unsafe conditions,% of total in each group	20	20,7	23	21,5	20,9

Source: authors' calculation.

Contribution of components to the outcome indicator

The outcome indicator of active aging aggregates three sub-indexes (health, participation in social activities, security) and demonstrates that 58,5% (1712 out of 2927 respondents) can be regarded as actively aging. As two first components vary significantly by age groups, not surprisingly, the outcome indicator is also different in different age groups (Table 13).

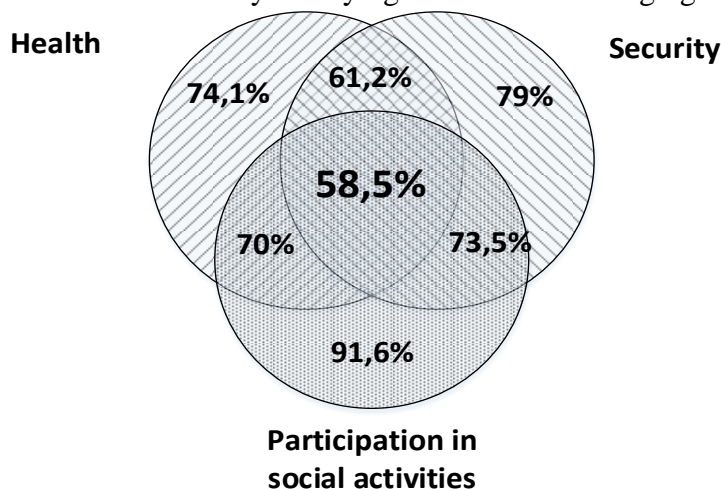
Table 13. Share of actively aging elderlies by age and gender, %

	Age groups				
	55-64	65-74	75-84	85 and older	All ages
Actively aging elderlies, % of total in each group	69,3	58,3	43,7	32,3	58,5
Only men	71,8	67,2	52,5	48	65,8
Only women	67,8	53,9	39,8	26,8	54,6

Source: authors' calculation.

Table 13 demonstrates that the percentage of actively aging elderlies is much higher in younger groups. Overall the share of actively aging women in each age group is lower than that of men. An interesting finding is that the rate of actively aging men to actively aging women increases with age.

Figure 2. Share of elderly satisfying criteria of active aging



Source: authors' calculation.

When looking at Figure 2, the respondents that met the criteria of *Health* and *Security* compose 61,2% of the sample. This means that almost all of the 74% who met the criterion of *Health* had secure financial and living conditions. At the intersection of *Health* and *Participation in social activities* we observe 70% of elderlies, i.e. 11,5% of socially active respondents with satisfactory health, are very much dissatisfied with their financial and/or living conditions. 73,5% of elderlies met both criteria of *Security* and *Participation in social activities*, resulting in almost 15% of respondents, meeting these two criteria, who cannot be regarded as active solely because of the health sub-index.

Overall, we found that 41,5% of elderly respondents were inactive, which is a large number. However, we believe that our estimates show the minimum share of inactively aging Russians as we have introduced very low lines of inactivity for the majority of indicators (corresponding to most unfavorable extreme values). Changing the lines would significantly increase the proportion of inactively aging elderlies.

Discussion

The Active Ageing Index presented in this paper covers diverse aspects of active ageing by measuring three domains – older people’s health, participation in social activities and secure living. This corresponds to the WHO concept of active aging. We have discovered that a minimum of 41,5% of older Russians cannot be regarded as active because of at least one component. However, as almost 70% of elderlies have a low value of only one sub-index, there is a high potential for moving a part of the inactive elderlies to the active group.

The active ageing of elderly people is very important to Russian society, experiencing an increasing proportion of the old-age population dependent on a diminishing proportion of working-age population. Many countries have already recognized the necessity to move elderly people from a dependent population into an active group by introducing an adequate policy response.

For the Russian economy as well as for other aging countries, it is crucial to make elderlies an economic resource for their families and the whole nation. The starting point in doing so should comprise of understanding the criteria of active aging and getting evidence on the proportion of those who can or cannot be regarded as active. The AAI presented in this paper is a tool for measuring the proportion of actively aging individuals. Most importantly it also captures how elderlies differ with respect to three components of active ageing and even with respect to particular indicators, composing each sub-index. Therefore it demonstrates the contributions of each component to the outcome index, and shows which component (and/or indicator) needs specific actions from public policies. It offers the breakdown by gender and different age groups, to be able to develop age-gender specific policy measures.

The methodology employed for the calculation of the AAI for Russian elderlies is a flexible tool making it possible to change indicators, variables, and activity lines. It also makes it possible to introduce different weights to the indicators and sub-indices and divide elderlies into more than just two groups of “active” and “inactive” depending upon the policy goals. Therefore the active aging index presented in this paper gives a start to future research on measuring active aging in Russia. We hope that with the appearance of new data, researchers and policy makers will be able to study the

untapped potential of older people in dynamics, compare regions, and estimate specific policy measures on the criteria of achieving active ageing goals.

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Appendix 1. Questions from SAGE, used to compose indicators for AAI components:

Component "Health"

Q4001 Have you ever been diagnosed with/told you have arthritis (a disease of the joints, or by other names rheumatism or osteoarthritis)?

1 YES 2 NO

Q4010 Have you ever been told by a health professional that you have had a stroke?

1 YES 2 NO

Q4014 Have you ever been diagnosed with angina or angina pectoris (a heart disease)?

1 YES 2 NO

Q4022 Have you ever been diagnosed with diabetes (high blood sugar)?

1 YES 2 NO

Q4025 Have you ever been diagnosed with chronic lung disease (emphysema, bronchitis, COPD)?

1 YES 2 NO

Q4033 Have you ever been diagnosed with asthma (an allergic respiratory disease)?

1 YES 2 NO

Q4060 Have you ever been diagnosed with high blood pressure (hypertension)?

1 YES 2 NO

Q4062 In the last 5 years, were you diagnosed with a cataract in one or both of your eyes (a cloudiness in the lens of the eye)?

1 YES 2 NO 8 DON'T KNOW

Q2037 In the last 30 days, how much difficulty did you have in bathing/washing your whole body?

1 NONE

2 MILD

3 MODERATE

4 SEVERE

5 EXTREME/CANNOT DO

9 N/A

Q2038 In the last 30 days, how much difficulty did you have in getting dressed?

1 NONE

2 MILD

3 MODERATE

4 SEVERE

5 EXTREME/CANNOT DO

9 N/A

Q2041 In the last 30 days, how much difficulty did you have with moving around inside your home (such as walking across a room)?

1 NONE

2 MILD

3 MODERATE

4 SEVERE

5 EXTREME/CANNOT DO

9 N/A

Q2042 In the last 30 days, how much difficulty did you have with eating (including cutting up your food)?

1 NONE

2 MILD

3 MODERATE

4 SEVERE

5 EXTREME/CANNOT DO

9 N/A

Q2043 In the last 30 days, how much difficulty did you have with getting up from lying down?

1 NONE

2 MILD

3 MODERATE

4 SEVERE

5 EXTREME/CANNOT DO

9 N/A

Q2044 In the last 30 days, how much difficulty did you have with getting to and using the toilet?

1 NONE

2 MILD

3 MODERATE

4 SEVERE

5 EXTREME/CANNOT DO

9 N/A

Q2007 Overall in the last 30 days, how much of bodily aches or pains did you have?

1 NONE

2 MILD

3 MODERATE

4 SEVERE

5 EXTREME/CANNOT DO

Q2009 Overall in the last 30 days, how much difficulty did you have in your daily life because of your pain?

1 NONE

2 MILD

3 MODERATE

4 SEVERE

5 EXTREME/CANNOT DO

Q2018 Overall in the last 30 days, how much of a problem did you have with feeling sad, low or depressed?

1 NONE

2 MILD

3 MODERATE

4 SEVERE

5 EXTREME/CANNOT DO

Q2000 In general, how would you rate your health today?

- 1 VERY GOOD
- 2 GOOD
3. MODERATE
- 4 BAD
5. VERY BAD

Component "Participation"

Q6001 How often in the last 12 months have you attended any public meeting in which there was discussion of local or school affairs?

1. NEVER
2. ONCE OR TWICE PER YEAR
3. ONCE OR TWICE PER MONTH
4. ONCE OR TWICE PER WEEK
5. DAILY

Q6002 How often in the last 12 months have you met personally with someone you consider to be a community leader?

1. NEVER
2. ONCE OR TWICE PER YEAR
3. ONCE OR TWICE PER MONTH
4. ONCE OR TWICE PER WEEK
5. DAILY

Q6003 How often in the last 12 months have you attended any group, club, society, union or organizational meeting?

1. NEVER
2. ONCE OR TWICE PER YEAR
3. ONCE OR TWICE PER MONTH
4. ONCE OR TWICE PER WEEK
5. DAILY

Q6004 How often in the last 12 months have you worked with other people in your neighborhood to fix or improve something?

1. NEVER
2. ONCE OR TWICE PER YEAR
3. ONCE OR TWICE PER MONTH
4. ONCE OR TWICE PER WEEK
5. DAILY

Q6008 How often in the last 12 months have you attended religious services (not including weddings and funerals)?

1. NEVER
2. ONCE OR TWICE PER YEAR
3. ONCE OR TWICE PER MONTH
4. ONCE OR TWICE PER WEEK
5. DAILY

Q1012 What is your current marital status?

1. NEVER MARRIED
2. CURRENTLY MARRIED

3. COHABITING
4. SEPARATED/DIVORCED
5. WIDOWED

Q6005 How often in the last 12 months have you had friends over to your home?

1. NEVER
2. ONCE OR TWICE PER YEAR
3. ONCE OR TWICE PER MONTH
4. ONCE OR TWICE PER WEEK
5. DAILY

Q6006 How often in the last 12 months have you been in the home of someone who lives in a different neighbourhood than you do or had them in your home?

1. NEVER
2. ONCE OR TWICE PER YEAR
3. ONCE OR TWICE PER MONTH
4. ONCE OR TWICE PER WEEK
5. DAILY

Q6007 How often in the last 12 months have you socialized with coworkers outside of work?

1. NEVER
2. ONCE OR TWICE PER YEAR
3. ONCE OR TWICE PER MONTH
4. ONCE OR TWICE PER WEEK
5. DAILY

Component "Security"

Q7002 Do you have enough money to meet your needs?

- 1 COMPLETELY
- 2 MOSTLY
- 3 MODERATELY
- 4 A LITTLE
- 5 NONE AT ALL

Q7007 How satisfied are you with the conditions of your living place?

1. VERY SATISFIED
2. SATISFIED
3. NEITHER SATISFIED NOR DISSATISFIED
4. DISSATISFIED
5. VERY DISSATISFIED

Q6018 In general, how safe from crime and violence do you feel when you are alone at home?

1. COMPLETELY SAFE
2. VERY SAFE
3. MODERATELY SAFE
4. SLIGHTLY SAFE
5. NOT SAFE AT ALL

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