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## Determinants of Active Longevity: Results of a Survey of Vologda Long-Livers\*



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**Abstract.** Population ageing is a major demographic challenge for the majority of developed and developing countries. The implications of population ageing are not reduced to purely economic aspects (increasing the burden on the working population, growing deficit of pension funds) and they lead to a change in people's attitude toward the elderly as a social group, the resource potential of which should be disclosed, the task being of major importance for any "ageing" country. At the same time, a priority of population policy in any country is to increase life expectancy of its citizens. Thus, given the forecast reduction in demand on the labor market and possible raise of the retirement age in Russia, authorities at all levels focus not just on the increase in life expectancy, but on active longevity of its citizens, which is reflected in the maintenance of physical and moral health of man for as long as possible. The paper investigates determinants of active longevity. The first part of the paper provides statistical analysis of prevalence of this phenomenon in various regions of the world and Russia. The authors draw a conclusion that here the role of geographical and climatic conditions on a global scale is insignificant. However, it is revealed that the number of long-livers in the vast majority of cases is directly proportional to the level of socio-economic development of the territory. The second part of the paper presents the results of sociological research on the determinants of active longevity based on interviews with long-livers in Vologda. The data obtained show that among the factors under consideration it is not the biological (genetic) or geographic factors that are of the greatest importance to the increase in life expectancy, rather it is the behavioral factors such as physical activity, balanced nutrition and a correct day regimen, absence of bad habits, involvement in social activities and extensive social environment, high labor activity. The revealed "secrets" of longevity are not specific recommendations, they rather represent the elements of the style and lifestyle of an individual on the whole, the compliance with which may significantly increase the chances of survival to older ages and help retain physical and mental activity.

**Key words:** active longevity, long-livers, population ageing.

### **Introduction. Demographic ageing and active ageing**

The twentieth century became a turning point in terms of demographic transformations. During this period, there was a huge increase in world population, scientists first mentioned controlling mortality and fertility, the social model of marriage and family relations was

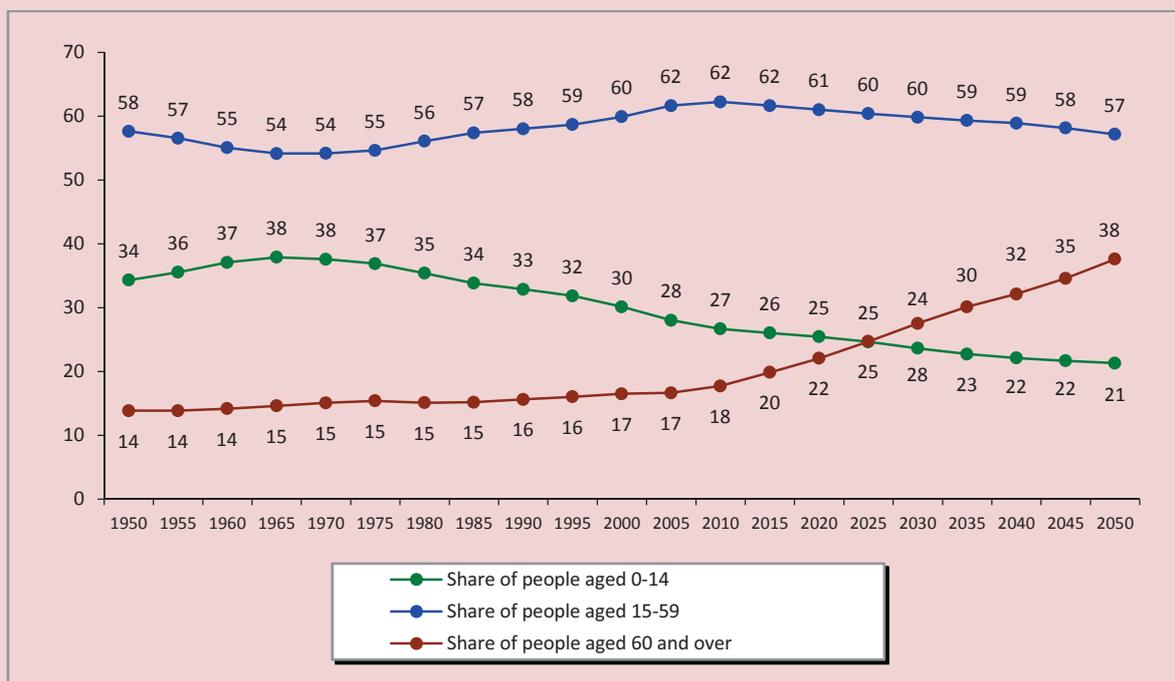
changed, the intensity of migration processes significantly increased [6]. One of the most important quality demographic changes was the transformation of the population's age structure. Changes in the mortality model (especially infant mortality) have led to an unprecedented increase in life expectancy at all ages [5]. At the same time, reducing fertility

became the main factor in decreasing the share of the population of younger age groups. As a result, the population of developed and developing countries which are characterized by the changes described above began to “age”: the proportion of elderly people permanently increased, whereas the proportion of children was declining. This phenomenon was named “demographic ageing”. Later, when the factors in this process were sufficiently studied, the scientists were forced to admit that amid the narrowed

reproduction of the population it is irreversible. This is also evidenced by data of the UN medium variant forecast: *Figure* shows that by 2025 the proportion of the population aged 60 and older will exceed the proportion of children aged 0–14 and this gap will continue to increase. By analogy with the famous “Russian cross” this phenomenon can be called “generation crossroads”.

Despite the decreasing share of children, the proportion of the working age population (15–59 years) has had a

Change of the proportion of main age groups in the total world population, fact and forecast



Source: World Population Prospects 2015. Available at: <http://esa.un.org/unpd/wpp/DataSources/>

tendency to increase until now, which explains the principle of “demographic window” [27]: amid sharp reduction of fertility and, respectively, the proportion of dependency groups, the share of the working age population reaches its maximum and then begins to decline as its increase reserves from the “bottom” (i.e., at the cost of the younger generation) are gradually exhausted. Most developed and developing countries have already received and used their demographic “dividends” and the share of the working age population will only be decreasing in the future.

The aging of the population in terms of its consequences is a very multidimensional phenomenon which impacts practically all spheres of life. In particular, the overall demographic burden on the working age population is significantly increasing [2]. Given the irreversibility of the process of demographic ageing, world’s governments affected by it are forced to seek a solution to this issue by implementing appropriate reforms. Raising the retirement age seems to be the simplest and most effective solution, which artificially reduces the number of pensioners and, in its turn, increases the number of taxpayers. Of course, this reform has a sufficient economic base and provides a positive

financial effect, but it is not always justified from the demographic point of view. For example, in Russia, life expectancy rates are significantly higher than healthy life expectancy rates: in 2013, the difference between them was 13 years [12]. This means that upon reaching the age of 61 the majority of the population can no longer continue working due to poor state of health. In this situation, the increase in the “verge of retirement” may cause even more deterioration in the health of elderly people, the increase in the number of the beneficiary of an invalidity pension, the transition of a certain part of elderly people to the informal economic sector, or unemployment due to pensioners’ inability to find employment [18]. Thus, the decision to raise the retirement age should have a solid demographic basis. In this regard, particular importance is given to the problem of not just longevity, but also *active* ageing, which is reflected in both preservation of a satisfactory state of health of elderly people and the possibility of extending the period of old-age employment. This paper presents the results of a sociological study (a series of interviews with Vologda long-livers), the purpose of which was to identify the most important determinants of active ageing.

### **Longevity in numbers. Where the long-livers reside**

There is a large number of papers [4, 21, 22, etc.] devoted to the study of human longevity, the main factors and conditions of this phenomenon. The papers consider the most prominent of the world's longevity "hot spots" or the so-called "blue zones": Japan (Okinawa Island), China (Tibet, the county of Bama), Italy (Sardinia), Greece (islands of Icaria and Rhodes), the Caucasus (mountain regions of Abkhazia and Georgia), Costa Rica (The Nicoya Peninsula), Cuba (the province of Villa Clara) and others. In this part of the article the authors focus on studying of longevity as a global phenomenon with distinct regional differences. Two indicators have been used in analysis: the number of people aged 90 and over per 100 thousand people (according to the WHO methodology [7]), and a similar indicator for the people aged 100 and over, the increase rates which show the intensification of "ageing depth" in terms of increase rate of the first indicator (*Tab. 1*).

As shown in the table, in 2015 the largest number of long-livers per 100 thousand people was recorded in developed countries. However, if we consider the changing trends, it can be stated growth rates for the age group of people aged 90 and over for the period from 1990 to 2015

in developed countries were somewhat lower than those in developing and least developed countries (2.7 times against 3.1 times and 3.3 times, respectively). This characteristic reaffirms the pattern of global development of the process of demographic ageing: although developed countries are faced with the problem of population ageing much earlier, in developing regions and the third-world countries, this process is more intensive, and territorial differentiation is gradually reducing. However, developed countries are characterized by a greater extent of "ageing depth": growth rate of long-livers aged 100 and over per 100 000 people were the highest in the period specified.

A more detailed study of "longevity map" from the point of view of geographic origins has shown that, according to estimates for 2015, Europe and North America became absolute leaders in all the indicators mentioned above. However, in the US and Canada the distribution of "longevity zones" is relatively homogenous, while in the European region a considerable differentiation is observed. The countries of Western, Southern and Northern Europe take leading places among the "eldest" territories, while Eastern Europe is 3 times inferior to them in the number of long-livers per 100 000 people. The same conclusion applies to the Russian

Table 2. Population dynamics of long-livers per 100 000 people in Russian federal districts, 1995–2015

Federal district	Type of population	Year							
		1995		2005		2015		Growth rate	
		1*	2**	1	2	1	2	3***	4****
Far Eastern	All population	64	2	110	2	146	3	228	150
	Urban population	50	1	116	2	153	4	306	400
	Rural population	105	5	92	2	121	2	115	40
Crimean	All population	-	-	-	-	295	5	-	-
	Urban population	-	-	-	-	343	5	-	-
	Rural population	-	-	-	-	227	4	-	-
Volga	All population	186	1	263	4	293	6	158	600
	Urban population	151	1	224	3	280	6	185	600
	Rural population	272	2	358	6	325	7	119	350
Northwestern	All population	139	2	244	5	369	14	265	700
	Urban population	124	2	239	5	379	16	306	800
	Rural population	208	3	267	4	311	4	150	133
Northern Caucasian	All population	-	-	193	23	184	8	-	-
	Urban population	-	-	164	11	187	5	-	-
	Rural population	-	-	221	34	181	11	-	-
Siberian	All population	123	1	189	3	238	5	193	500
	Urban population	111	1	190	3	242	6	218	600
	Rural population	153	2	186	4	228	4	149	200
Ural	All population	134	1	189	3	230	5	172	500
	Urban population	122	1	165	2	225	5	184	500
	Rural population	183	2	281	4	253	6	138	300
Central	All population	215	2	344	6	408	15	190	750
	Urban population	182	1	291	6	405	16	223	1600
	Rural population	336	3	563	7	418	8	124	267
Southern (up to 2009)	All population	216	5	256	17	-	-	-	-
	Urban population	181	3	238	10	-	-	-	-
	Rural population	264	8	279	27	-	-	-	-
Southern (since 2010)	All population	-	-	332	5	306	9	-	-
	Urban population	-	-	301	5	322	11	-	-
	Rural population	-	-	385	6	279	7	-	-

\* Number of long-livers aged 90 and over, per 100 000 people;  
\*\* Number of long-livers aged 100 and over, per 100 000 people;  
\*\*\* Growth rates of long-livers aged 90 and over per 100 000 people, %;  
\*\*\*\* Growth rates of long-livers aged 100 and over per 100 000 people, %.  
Sources: Unified Interdepartmental Statistical Information System. Available at: <http://fedstat.ru/indicators/start.do>; authors' calculations.

Federation where the indicators are lower than in Eastern European countries and are comparable to those of Central and South America.

Japan leads in the number of long-livers per 100 000 people, it is significantly superior to other countries of the Asian region. In respective regions, Australia, New Zealand and Caribbean island countries are also prominent. Longevity is less prevalent in Africa.

The analysis suggests that the number of long-livers largely correlates with the country's or region's level of socio-economic development and is often directly proportional to this number. For example, despite the extremely small overall prevalence of longevity in Africa, the indicators per 100 000 people are still significantly higher in North African countries and South Africa as the most developed African regions. A similar situation is observed in Australia and New Zealand, the countries far exceeding other Oceania territories in the level of economic and social development. Such examples can be found on any continent and in any climatic zone. Of course, genetic predisposition and place of residence are the most important factors in a long and active life, however, the experience of Western countries has shown [4] that behavioral (lifestyle,

nutrition, etc.) and institutional factors (developed health care system and social infrastructure, high standard of live and the quality of living) on the global scale also make a significant contribution to the increase in the population's active life expectancy.

As mentioned earlier, the Russian Federation is far from leading positions by the studied indicator. Nevertheless, it is also characterized by a territorial differentiation based on the level of longevity (the number of long-livers aged 90 and over per 100 000 people). Contrary to the established opinion about "Caucasian longevity", North-Caucasian Federal District ranks last in the number of long-livers (184 long-livers per 100 000 people; *Tab. 2*), which is significantly less than the national average (253 long-livers per 100 000 people). The leaders are Central and North-Western Federal districts (369 and 408 long-livers per 100 000 people respectively), in which two of the largest mega-cities – Moscow and Saint Petersburg are the biggest contributors (534 and 535 long-livers per 100 000 people, respectively). This reaffirms the conclusion about the correlation between the number of long-livers and the level of socio-economic development of the territory. Longevity as a phenomenon is also characteristic of the rural areas of the

Таблица 2. Динамика изменения численности долгожителей в расчете на 100 тыс. населения в федеральных округах Российской Федерации, 1995, 2005, 2015 гг.

Федеральный округ	Тип населения	Год							
		1995		2005		2015		Темп прироста	
		1*	2**	1	2	1	2	3***	4****
Дальневосточный	Все население	64	2	110	2	146	3	228	150
	Городское население	50	1	116	2	153	4	306	400
	Сельское население	105	5	92	2	121	2	115	40
Крымский	Все население	-	-	-	-	295	5	-	-
	Городское население	-	-	-	-	343	5	-	-
	Сельское население	-	-	-	-	227	4	-	-
Приволжский	Все население	186	1	263	4	293	6	158	600
	Городское население	151	1	224	3	280	6	185	600
	Сельское население	272	2	358	6	325	7	119	350
Северо-Западный	Все население	139	2	244	5	369	14	265	700
	Городское население	124	2	239	5	379	16	306	800
	Сельское население	208	3	267	4	311	4	150	133
Северо-Кавказский	Все население	-	-	193	23	184	8	-	-
	Городское население	-	-	164	11	187	5	-	-
	Сельское население	-	-	221	34	181	11	-	-
Сибирский	Все население	123	1	189	3	238	5	193	500
	Городское население	111	1	190	3	242	6	218	600
	Сельское население	153	2	186	4	228	4	149	200
Уральский	Все население	134	1	189	3	230	5	172	500
	Городское население	122	1	165	2	225	5	184	500
	Сельское население	183	2	281	4	253	6	138	300
Центральный	Все население	215	2	344	6	408	15	190	750
	Городское население	182	1	291	6	405	16	223	1600
	Сельское население	336	3	563	7	418	8	124	267
Южный (по 2009 год)	Все население	216	5	256	17	-	-	-	-
	Городское население	181	3	238	10	-	-	-	-
	Сельское население	264	8	279	27	-	-	-	-
Южный (с 2010 года)	Все население	-	-	332	5	306	9	-	-
	Городское население	-	-	301	5	322	11	-	-
	Сельское население	-	-	385	6	279	7	-	-

\* Численность долгожителей в возрасте 90 лет и старше, в расчете на 100 000 населения.

\*\* Численность долгожителей в возрасте 100 лет и старше, в расчете на 100 000 населения.

\*\*\* Темпы прироста численности долгожителей в возрасте 90 лет и старше, в расчете на 100 000 населения, %.

\*\*\*\* Темпы прироста численности долгожителей в возрасте 100 лет и старше, в расчете на 100 000 населения, %.

Источники: Единая межведомственная информационно-статистическая система [Эл. ресурс]. – Реж. дост.: <http://fedstat.ru/indicators/start.do>; расчеты авторов.

Central Federal District (the Belgorod, Bryansk, Voronezh, Kaluga, Lipetsk, Ryazan, Smolensk, Tula and Yaroslavl oblasts) and the Northwestern Federal District (the Novgorod and Pskov oblasts): in these regions the level of longevity exceeds 400 long-livers per 100 000 people. As rural areas of these two districts are more developed in terms of socio-economic infrastructure and located closer to the growth “poles” (mega-cities and large cities) than similar territories of other federal districts, the number of long-livers in these districts is higher.

Regarding the centenarians, their largest number per 100 000 people is also recorded in the Central and Northwestern federal districts (15 and 14 centenarians per 100 000 people, respectively). In contrast to the age group of people aged 90 and over, centenarians often live in urban areas, probably due to the greater accessibility to health care and social services, which are of particular importance in old age. Moscow and Saint Petersburg (30 and 29 centenarians per 100 000 people respectively) gives the first place to the Astrakhan Oblast in the number of centenarians (32 centenarians per 100 000 people).

The Vologda Oblast is not included in the list of regions with the highest level of longevity (in 2015 the number of long-livers aged 90 and over per 100 000

people accounted for 311), however, this indicator is significantly higher than the national average (253 long-livers per 100 000 people). The gender distribution is normal for this age group: women account for 90% of all long-livers. Two thirds (65%) of the population aged 90 and over lives in urban areas, which also corresponds to the national indicators. In this study the authors attempt to study the phenomenon of active ageing and its determinants in the Vologda Oblast, in particular, as in the case of Vologda, which, on the one hand, is not a “longevity area” in the public perception, on the other hand, demonstrates rather high longevity indicators. Moreover, regional and municipal authorities pay much attention to the issue of active ageing (a unique concept of active ageing was developed in the Vologda territory for the period up to 2035 – “Vologda – a city of long-livers”, which was approved by the decision of the Vologda City Duma No. 129, dated 29th December, 2014 [11]).

#### ***Factors in longevity. How long-livers live***

In 2016, the Institute of Socio-Economic Development of Territories of the Russian Academy of Sciences (ISEDTRAS) on request of the Vologda city administration conducted a sociological research in the territory of the municipal unit (Vologda) of the determinants of active ageing. The study used *the method of*

*semi-structured interviews*<sup>1</sup> with long-livers of Vologda. It is an interview based on a particular plan (guide) with short-answer questions for the respondent. During the study 15 in-depth interviews have been conducted. The respondents' age varies between 77 to 102. It is important to note that the sample was not based on the principles of strict compliance of respondents' distribution with the proportions of long-livers' sex and age composition. The main criterion for selecting respondents was their level of activity in old age.

The structure of determinants defining active ageing was defined on the basis of systematization of scientific approaches [3, 8, 17, 21, 23, 24]:

1. Genetic (heredity).
2. Geographical, natural and climatic.
3. Lifestyle, behavioral stereotypes:
  - physical activity (physical education and sports);
  - eating habits (diet);
  - “bad habits”;
  - medical activity;
  - overcoming stress;
  - labor activity;
  - social activity (public activity, social relations).

<sup>1</sup> A semi-structured interview, along with a structured one, implies a detailed planning of the whole interview, question sequence and structure, possible answers, but the interviewer may change the sequence of questions depending on the situation and reword the questions if necessary.

4. Socio-economic and institutional:
  - standard of living and living conditions;
  - activity of institutions and social services.

The interview guide included questions blocks to identify the impacts of the defined factors on longevity. Scientists' research [1, 13, 14] confirm that different factors unevenly contribute to the population's life expectancy: 50–70% – lifestyle, 10–20% – heredity; 10–20% – environment, 8–12% – level of health care development. Let us consider the interview results in order to assess the influence of each factor on the longevity of Vologda citizens.

#### ***Genetic and geographical factors in longevity***

When assessing a person's predisposition to longevity, genetic factor is considered prior since its relevance determines the influence of behavioral (secondary) and socio-economic/institutional (tertiary) factors. In this study, the authors tested two basic theses: the theory of heterosis (hybrid vigor<sup>2</sup>) and respondents' kinship with long-livers. The phenomenon of heterosis depends on the degree of

<sup>2</sup> According to the theory of heterosis (hybrid vigor), if it turns out that respondent's parents (or immediate relatives) come from geographically distant settlements, genetic factor becomes the most important. If it turns out that respondent's parents (or immediate relatives) are native Vologda citizens, other factors, including behavioral and socio-economic, gain importance.

kinship and geographical remoteness of a child's parents' birthplace: children whose ancestors lived at a considerable distance from each other are more predisposed to longevity [3]. According to the interview results, the theory of heterosis has not been confirmed. The majority of parents of the interviewed long-livers were born and raised either in the same or in a neighboring settlement. This is characteristic of both parents and more distant relatives. Geography of birth of the interviewed long-livers is also not very broad: they mostly come from either the Vologda Oblast or the adjacent territories (present-day Northwestern Federal District).

Almost all respondents mentioned that they had long-livers among their relatives, but they were mainly grandparents, uncles or aunts, overwhelmingly represented by females. No direct inheritance of longevity from parents has been revealed. As for the respondents' opinion, only a few of them note the genetic predisposition to longevity.

The study did not help prove the leading role of genetic or geographical factors. Therefore, additional determinants (which will be later discussed) related to the living conditions and lifestyle become primary.

An important research result is the noticeable difference between psychological

and biological age. Almost all Vologda long-livers feel many years younger than they really are. Only very few were focused on a long life. Some of the respondents mentioned their "dream" to live to be 100, which, however, seemed very difficult for them to imagine. At the same time, the respondents noted that they do not live "in the moment" and constantly set new goals and objectives, always strive to improve, and this, according to them, gives them additional life energy.

#### *Lifestyle and behavioral stereotypes*

Behavioral factors can be different: physical activity (physical education and sports), balanced nutrition, daily regime, absence of bad habits, good emotional and psychological state, medical activity, etc. All these aspects form the basis of the concept "healthy lifestyle" (HLS).

*Physical activity.* All of the interviewed long-livers have been engaged in physical activities and sports: starting with daily morning exercise and finishing with professional sport. If we consider gender specifics, it is worth noting that women more often preferred individual sports (skiing, cycling, skating, gymnastics), while men tend to choose team sports (basketball, volleyball, hockey). Physical exercises were not limited to physical education and sports: each of the interviewed respondents lived through the Great Patriotic War (1941–1945)

and many were engaged in hard physical labor from an early age (working in fields, factories, etc.). Perhaps the events of those years formed a responsible attitude to work, healthy way of life and keeping fit. The study has showed that almost all respondents start their morning with every day exercise and gymnastics. Long-livers pay much attention to walking and other ways of maintaining physical activity in old age (e.g., Nordic walking, skiing), which reaffirms the thesis that “motion is life”. The conducted interviews suggest a conclusion that one of the universal means of keeping feet in old age is working at the dacha. Apart from obvious benefits consisting in the cultivation of natural products, the dacha becomes a healthy hobby for many representatives of the older generation. The obtained results confirm the statement of the Doctor of Biology, Professor G.D. Berdyshev: “At all times, in all countries, in all nations long-livers are mostly those who have been engaged in intensive physical activity during their whole life” [3].

*Diet and eating habits.* An important element in the formation of the active ageing “foundation” is diet and eating habits. Data obtained from the interviews indicate that almost all of the respondents tried to keep to healthy eating habits in varying degrees throughout their live. With aging, more attention is given to

healthy eating. No particular features in eating habits were detected: the majority of long-livers were not limited by the choice of products. At the same time, the respondents note that one should eat in moderation and should not overeat. And yet, some points concerning food should be considered in detail. First, many interviewees said that they ate mostly organic food, often grown in their own backyards. Second, the most important element of nutrition is a breakfast which must contain a lot of protein (eggs, cheese and milk). Garlic also deserves special attention. Several interviewees think that this spicy vegetable is one of the secrets of longevity. It may be used in various ways: from a simple supplement to foods to garlic tinctures.

*Bad habits.* When it comes to behavioral risk factors in old age, low physical activity is often complemented by alcohol and tobacco consumption. The absence of bad habits is one of the secrets of active ageing. This thesis was confirmed during the study: a vast majority of respondents noted that throughout their lives they never abused alcohol and tobacco. Some respondents said that at best, they could consume some alcoholic drinks on holidays and in small quantities. It is important to note that some of the long-lovers are convinced that alcohol and tobacco are the main barriers to active ageing.

*Hobbies and interests.* The study concludes that one of the determinants of active ageing is an elderly person's favorite hobby. The range of hobbies is really wide: amateur artistic talents (dancing, singing, acting), sports, crafts, reading and writing books, intellectual games, participation in various competitions ("Retiree of the year", "Grandma of the year"), gardening, hunting, fishing, etc. The majority of respondents have already acquired computer skills and use the Internet and technical advancements.

Having a hobby motivates long-livers to continuous improvement of their skills, promotes the formation of attitudes of continuous activity.

*Social activity.* Vologda long-livers are characterized by their participation in various public organizations including veteran's councils, groups on the basis of the "Care" leisure center, etc. The respondents' civil activism is worth mentioning: they continue to participate in federal and regional election and, in some cases, were elected to parliamentary positions and were heads or members of electoral commissions.

*Social relations.* Active ageing of Vologda long-livers contributes to expansion and maintaining of a wide range of social liaisons. First of all, it should be noted that the immediate circle of the respondents

includes, as a rule, their relatives. They play an important role in the lives: some live with their relatives, some are regularly visited and assisted by their relative. In almost all cases, families of long-livers include a relatively large number of children, grandchildren and great-grandchildren. Practical wisdom is the basis for one of the most important socio-cultural functions of the older generation – the transmission of experience which is often implemented through the family circle. Long-livers play an important unifying role in their families, which forms family traditions.

In addition, the respondents' social circle includes a large number of people with whom they are connected either by common interests or professional activity. The circle of friends often includes interesting and famous people who owe a lot and are very grateful to long-livers. It is important to note that, regardless of the social circle and sphere of activity, long-livers are highly respected in their environment today.

*The overcoming of stressful situations* was facilitated by strong family and friendly ties. The respondents often turned to their friends and family when they had to overcome negative emotions or problems. Many tried to cope with an emotional crisis by immersing themselves in work or a hobby.

*Labor activity.* The most striking distinctive feature characteristic of the interviewed long-livers is the duration of their working life. Their working life began early, when they had to help their parents on the farm. Many of the respondents were confronted by the Great Patriotic War and had to work 10 hours or more every day. “Forged” in such difficult conditions, they continued their career throughout their long life. The range of occupations is quite wide, but one important feature unites all respondents who, regardless of the scope of activity, loved their work, always occupied leadership positions in their organizations or were highly respected among their colleagues. Apart from leadership qualities, long-livers also have a disciplined, proactive manner. It is important to note that, according to the survey on the quality of life of elderly people<sup>3</sup>, working pensioners highly value their state of health, have a broad circle of friends and are happier than the representatives of the non-working older generation.

<sup>3</sup> A specialized survey “The quality of life of elderly people of the Vologda Oblast” was conducted by ISEDT RAS in 2015. The general population amounted to 427 861 people, the sampling size – 1500 people. The respondents’ distribution by age and sex corresponds to the general population of the Vologda Oblast aged 50 and over (according to age and sex indicator of statistical books), which allows to assess the obtained results as valid. In order to identify territorial features, the study identifies two major cities – Vologda and Cherepovets; other regions of the Vologda Oblast are allocated to a separate group. Maximum sampling error is 4%.

Many respondents were characterized by high labor mobility which is often reflected not only in the change of organizations and sphere of activity within the city limits, but also in frequent moving all over Russia. In such cases, spatial re-locations were favorable because the respondents were given an opportunity to meet new people, see new places and sometimes even new cultures. In absolutely all cases, without exception, they were able to find common ground with their colleagues, which certainly had a positive impact on working conditions assessment, which in most cases were satisfactory. The respondents still keep in touch with many of their colleagues to the present day.

A vast majority of respondents continue to work after retirement and have not experienced any problems concerning retirement. This was accomplished by both maintaining social relations with colleagues and maintaining the same level of income which was complemented by the retirement benefit. It is important to note that long-livers finished their careers due to natural reasons (most often due to health problems), rather than emotional fatigue or lack of competence.

### ***Socio-economic and institutional determinants of active ageing***

*Standard of living.* The long-livers’ financial status and living conditions are

currently considered satisfactory: they do not experience any inconveniences concerning comfortable living; there is no urgent need for any goods or services. Financial and residential well-being of the respondents is explained by socially-oriented nature of the state policy aimed at improving the long-livers' standard of life and the quality of living, as well as their individual merits in professional life, which have ensured a decent life not only for them, but also for their children, grandchildren and great-grandchildren.

*Activity of institutions working with elderly people.* Health care, social security and pension services play the most important role in the work with elderly people. In general, the study has shown that long-livers do not often directly experience the work of these institutions. The respondents said in the interviews that they often use medical services provided by doctors who are their good friends. From the point of view of the long-livers' medical activity, no gender differences were identified: men and women equally care about their health, following all doctors' recommendations.

Sanatorium and resort treatment is also essential for health in young and in old age. Almost all the respondents were or are treated this way; they often noted that this factor positively affected their health in old age.

It is important to note that the majority of long-livers are aware of the attention of city authorities. It is most often expressed in the invitations to various official events, congratulations on anniversaries and other important events, in awards for services to the residents of the city.

Thus, the study has confirmed the importance of behavioral factors in active ageing. The conversations with long-livers make it clear how much attention they have given to exercise, sports and nutrition. Absence of bad habits together with physical activity significantly reduces behavioral risk factors in old age.

Another secret of longevity is a broad social circle which is not limited to relatives, but includes a lot of acquaintances and friends with common interests, as well as former colleagues. Long working life and civil activism distinguish long-livers from an average resident of the city. A significant factor in active ageing, which is characteristic of all respondents, is surprising optimism and the willingness to improve (a hobby), the ability to manage time and life in general and set long-term goals.

### **Conclusion**

According to the results of the research, the authors conclude that among the determinants of active ageing less important are biological (genetic) or geographic (although they are traditionally considered

as primary factors in longevity). Behavioral factors, including physical activity, balanced nutrition, healthy lifestyle, absence of bad habits, involvement in public activity and social relations, active working life, “anti-dependency” attitude, ambitiousness and resilience, are of great importance and contribute most to active longevity.

Factors and “secrets” of active ageing identified during the survey are generally confirmed by the results of modern research [8, 14, 17, 23, 24]. It should be noted that the respondents’ responsible attitude to themselves, their health, setting of short- and long-term goals and objectives, as well as an their inexhaustible motivation for keeping their mental and physical health in a good condition, a broad circle of friends and, which is the most important, high cognitive activity give the long-livers an

opportunity to effectively manage their lives, and therefore have confidence in the future.

Unlike genetic, behavioral factors in active ageing can be regulated; any person can form an attitude of longevity by using both personal experience and the experience of fellow citizens who managed to live up to old age and keeping their physical and spiritual vitality. The population’s behavioral attitudes may be generally influenced by the adoption of strategic documents at the federal, regional and municipal level (for example, the concept of active ageing in the city of Vologda “Vologda – a city of long-livers”). It is important to remember about the institutional determinants of active ageing which include those supervised by the authorities and serve as an important tool for improving the system of cooperation with senior citizens.

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