

Analysis of the State of Practical Interest to Health Demonstrated by People from Different age Groups and Identification of its Connection with Mortality

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The brief exclusive pilot study contemplates the interrelatedness of practical interest to one's health and mortality among people aged 20 to 69 – the most productive age in the life of a contemporary person. It has been revealed that the decline of interest among people to take care about their health, even in presence of the age-related reserves, causes a sharp increase in mortality after 5-10 years. At the same time, work on improving the adaptive capacity of the human organism provides health formation and mortality reduction for the next decade of people's life. Person's own active position on the system-based accumulation of adaptation reserves can change health situation for the better by life prolongation.

Keywords: Health, adaptation reserves, work on health supporting, individual approach to one's health, mortality.

Health status may be defined by occurring in the human normal physiological processes, provided by the adaptation of functional systems of the organism to the environmental impact on a person¹. It is health, as a tool of retaining working ability and social significance of a person, which appears to be a means of life prolongation. A predictor, means of health prognostication, is the reserve of adaptive capacity of the organism^{2,3}. To ensure the accumulation of health reserves, it is necessary for a person himself to work on it systematically and actively^{1,3-7}. As far back as in the eighties of the twentieth century, the health recovery center "Health Workshop by Ustinova O.I.", made it its mission to find ways and methods of the natural recovery of human organism

functions to prolong the able-bodied, physically and socially active life of a person. This goal is achieved by increasing the adaptive potential and enhancing the reserve possibilities of the ecological readiness of a human body to adapt to the constantly changing environment^{3,6,7}. Patients, who come to the Center (usually more than once), work on improving their health and adaptation reserves level under the guidance and with the help of specialists, as well as continue this work at home according to the recommended individual programs⁸. Such people demonstrate real, systematic, and practical interest in their health.

According to an exclusive pilot study we aimed at determining the existence and nature of the relationship between the number of people practically involved in their health (for example, patients of different age groups of the health recovery center "Health Workshop by Ustinova O.I.", Samara, Russia) and the state of human

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mortality. We investigate the most productive and important for society and human life age – from 20 to 69 years. All the data are taken for the population of the Russian Federation for the period of 2011.

Main part. As the study material there were taken ten men and women aged 20 to 69, living in Russia and undergoing a course of rehabilitation at the health recovery center “Health Workshop by Ustinova O.I.” in 2011 (see Table 1):

Table 1. Residents of Russia, who in 2011 took a course of rehabilitation in the health recovery center “Health Workshop by Ustinova O.I.”

Age group	Number of people, persons	Number of people, % of total number
20-24	27	2.55
25-29	64	6.05
30-34	107	10.12
35-39	87	8.23
40-44	136	12.87
45-49	169	15.99
50-54	188	17.79
55-59	132	12.49
60-64	108	10.22
65-69	39	3.69
Total	1057	100.00

Quality and duration of human life, according to WHO, is dependent on the following factors: 10% – on the standard of living; 20% – on the influence of genetics and environment; 50% – on a particular way of life⁹. Thus, the duration of life is surely associated with genetic and environmental heterogeneity. But the most important factor for the life prolongation is the person’s lifestyle. Therefore, we chose to study ten age groups from 20 to 69 years, whose lifestyle strengthens their health (see table 1).

People’s life duration is almost impossible to investigate at the organismal level, so the only way to study the life duration is to use a population-based study. To detect the presence and nature of the relationship between the number of people practically involved in their health and the state of people mortality, let us consider indicators of the Russian population distribution¹⁰ and mortality according to the same ten age groups. Table 2 shows a part of the Russian population aged 20 to 69 for the period of 2011

(this makes 69.04% of the total population of Russia for the same period).

Using the indicators of Russian population distribution according to the age groups we are interested in (see Table 2) and indicators of the number of deaths per person in each respective age group¹¹, we determined the number of deceased in these age groups in 2011. The data obtained are presented in Table 3:

Table 2. Indicators of RF population distribution by age groups in 2011

Age group	Number of people, persons	Number of people, % of total number
20-24	12122	12.29
25-29	12012	12.18
30-34	11016	11.17
35-39	10211	10.35
40-44	9251	9.38
45-49	10561	10.71
50-54	11509	11.67
55-59	10063	10.20
60-64	7982	8.09
65-69	3913	3.97
Total	98 640	100.00

Table 3. Indicators of the deceased in Russia by age groups in 2011

Age group	Number of people, persons	Number of people, % of total number
20-24	20850	2.34
25-29	33754	3.80
30-34	46047	5.18
35-39	48094	5.41
40-44	53101	5.97
45-49	72208	8.12
50-54	128095	14.41
55-59	166241	18.70
60-64	199869	22.48
65-69	120873	13.59
Total	889132	100.00

Let us compare the change of percentage distribution of the number of people within the considered ten age groups in 2011 according to three factors: 1) The population of the Russian Federation; 2) Mortality of the Russian Federation; 3) The number of people who have practical

Table 4. The percentage ratio of distribution within the Russian Federation of the population, of the deceased, and of the people who have a practical interest in their own health, by the example of patients of the health recovery center “Health Workshop by Ustinova O.I.”. The data is for the year 2011

Age group	Distribution of the RF population according to age groups, %	Distribution of The deceased in RF according to age groups, %	Distribution of the RF residents Who participated in the recovery course “Workshop of health by Ustinova O.I.” according to age groups, %
20-24	12.29	2.34	2.55
25-29	12.18	3.80	6.05
30-34	11.17	5.18	10.12
35-39	10.35	5.41	8.23
40-44	9.38	5.97	12.87
45-49	10.71	8.12	15.99
50-54	11.67	14.41	17.79
55-59	10.20	18.70	12.49
60-64	8.09	22.48	10.22
65-69	3.97	13.59	3.69
Total	100.00	100.00	100.00

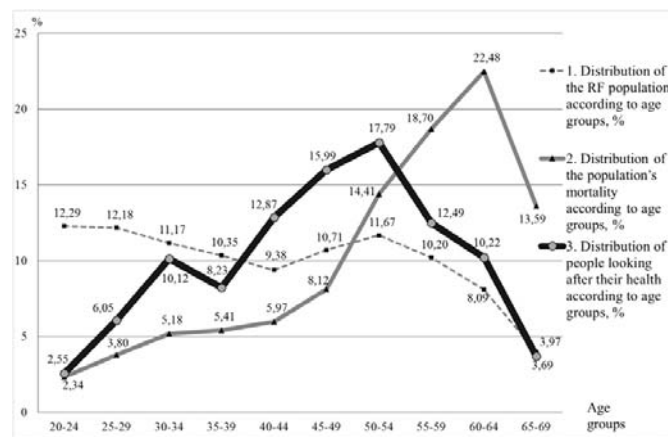


Fig. 1. Curves of distribution within the Russian Federation of the population, of the deceased, and of the people who have a practical interest in their own health, by the example of patients of the health recovery center “Health Workshop by Ustinova O.I.”. The data are given by ten age groups in 2011

interest in health, for example, patients of the health recovery center “Health Workshop by Ustinova O.I.”. Summary data are presented in Table 4, a graphic drawing is shown in Figure 1.

CONCLUSION

The problems of mortality among population are being studied for centuries. As early as in 1825, an English scientist Benjamin Gompertz

published his work, in which he described the identified consistent pattern of exponential increase of mortality with the human age: mortality is increased as a result of chaos (entropy) growing in the body. Mortality and viability were considered by Gompertz as reciprocal variables¹². Conducted in 1986¹³ analysis of the organisms survivability allowed to reject the dominant at that time hypothesis of pre-programmed life duration. It was noticed that some wear of human body systems

can lead to increased load and accelerated wear of its other systems. So in the body appears a cascade of dependent failures. At a rather strong process of the organism destruction, there may further be activated mechanisms of emergency control. In this case, the reserves of the body's strength can be consciously accumulated by a person^{4,5}. The present study, which statistical results are presented in Table 4 and Figure 1, allows us to see some consistent patterns:

1. During the age period from 20 to 30 years, actively grows interest in improving one's health – from 2.55% to 10.12%, which is almost by 4 times higher. After ten years, it gives the effect of inhibiting the process of mortality increase: from 20 to 30 years it increases by 2.21 times (from 2.34% to 5.18%), while from 30 to 40 years the mortality increases only by 1.10 times (from 5.41% to 5.97%).
2. During the age period from 30 to 40 years, starts inhibition of the process of active health improvement: growth is by 1.27 times (from 10.12% to 12.87%). It should be noted a significant *decrease* (!) of the interest in one's own health during the age period from 30 to 35 years (see Figure 1). As a result, ten years later there is recorded a significant increase in mortality by 2.41 times (from 5.97% to 14.41%).
3. It is important to highlight the *decrease* (!) of the interest in one's own health during the period from 30 to 35 years (from 10.12% to 8.23%, i.e. decrease by 1.23 times). After ten years, from 40 to 45 years, it generates a sharp increase in mortality (from 5.57% to 8.12%, i.e. by 1.36 times).
4. During the age period from 40 to 54 years, the level of interest in active health improvement remains high (from 12.87% to 17.79%, i.e. it is growing by 1.38 times), but it is clearly insufficient, and mortality begins to outstrip it (from 5.97% to 14.41%, i.e. the mortality increases by 2.41 times). Thus, the lack of interest in one's own health causes rapid increase in mortality over the next decade.
5. During the age period from 55 to 65 years, the active interest in supporting one's own health *decreases* sharply (!) – from 17.79% to 10.22%, which is by 1.74 times. This gives

rise to a strong increase in mortality – from 14.41% to 22.48%, or by 1.56 times, in spite of the declining number of people in these age groups.

6. During the last, considered by us, five years (from 65 to 69 years), against the falling interest to active support of one's own health, the population in this age group continues to decline, so the percentage of the deceased (relative to the entire cohort of the considered number of people from 20 to 69 years) also decreases.

Summary

The present pilot study identified the interrelatedness of practical interest to one's own health of people from different age groups and mortality in the same age groups. The nature of these interrelatedness leads to the following important for a proper active life conclusions:

1. Active improvement of one's own health stimulates accumulation of health reserves for the next decade of life.
2. Reduced interest in improving one's own health, even in the presence of age-related reserves, after 5-10 years causes a sharp increase in mortality, i.e. loss of viability.
3. It is important to realize that health (or disease) formation is made for the following decade, and the active position of the person himself on the accumulation of adaptation reserves can alter the health situation for the better, and prolong life.

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