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**PREVENTIVE MEDICINE IS THE BASIS OF PUBLIC  
HEALTH AT THE TURN OF THE CENTURY**

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**Introduction**

The prevention is a system of scientifically based measures in medicine, aimed at preventing diseases, their development and improving health. The modern interpretation of this term sounds like "actions aimed at reducing the probability of the occurrence of a disease or disorder, interrupting or slowing down the progression of the disease, reducing the probability of incapacity"<sup>1</sup>. Indeed, prevention is one of the extremely important directions of medicine, which includes a complex of hygienic, medical, socio-economic and sanitary-technical measures aimed at eliminating risk factors that affect human health, preventing the occurrence of diseases and ensuring a high level of health. i population Preventive measures will be effective only if they are implemented at all levels – both public and individual<sup>2</sup>. All over the world, three types of prevention are distinguished: primary, secondary and tertiary. Primary prevention is used to prevent the disease as such. It is also of two types: social and individual, often they complement each other. Public prevention measures cover all or most of the population, since the goal of such prevention is to reduce the risk of developing diseases in general. An example of it can be vaccination of children and adults, informing the population about the impact of bad habits on the human body or about the importance of a healthy lifestyle, etc. The task of the individual is the prevention of diseases among risk groups (for example, among people who smoke and use narcotic drugs, excessive amounts of alcohol, or abuse food, etc.). Secondary prevention is aimed at early detection and treatment of the disease at the preclinical stage. An example of this is the early identification of patients with the help of screening tests (examination of mammary glands, or mammography, test for phenylketonuria, electrocardiography, etc.). For effective secondary prevention, adequate means and methods of diagnosis, availability of medical care for all segments of the population, provision of health care facilities with

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<sup>1</sup> Кондратюк В. А., Сергета Б. Р., Бойчук Б. Р. Загальна гігієна з основами екології. Тернопіль. Укрмедкнига, 2003. 592 с.

<sup>2</sup> Слабкий Г.О., Миронюк В.І., Качала Л.О., Ратаніна О.М. Основні терміни, які вживаються у сфері громадського здоров'я. Україна. Здоров'я нації. 2017. Т. 3. № 44. С. 235–245.

the necessary medical equipment are necessary. And this already depends on the state and society as a whole. Tertiary prevention is measures aimed at preventing the development of complications and deterioration of the course of the disease, as well as dynamic monitoring of patients to prevent the occurrence of such undesirable consequences of diseases as: death, disability, transition of the disease into a chronic form. An example of tertiary prevention is lowering cholesterol, prescribing beta-blockers for patients with myocardial infarction, rehabilitation measures in the post-stroke period, etc.<sup>3</sup>.

Noting the great importance of preventive medicine in the public health system, it is worth remembering such an important component of it as lifestyle, which forms 50% of a person's health. Very often the prevention of diseases is related to the rules of a healthy lifestyle and many ailments can be prevented with the help of simple hygienic methods. For example, studies have shown that regular hand washing with soap can prevent many infectious diseases<sup>4</sup>. Unfortunately, in Ukraine, the level of education of the population on healthy lifestyle is very low. Often, advertising of unhealthy products (high-calorie and low-nutrition) in addition to unhealthy habits (for example, in food) negatively affects the health of the population, especially children and young people. The formation of a healthy lifestyle should start from kindergarten and school. Health fashion should be introduced in society as a whole. If the state creates conditions where it is profitable to be healthy, then there will be many more such people. Today, unfortunately, most doctors are mainly engaged in the treatment of diseases. Not everyone is interested in information about how not to get sick, they cannot always answer patients' questions about what is useful and what is harmful, especially when it concerns ecology. Newly established public health centers should accumulate such information and make it available to doctors. The appearance of a larger number of well-trained and motivated specialists to promote a

healthy lifestyle will positively affect the level of health of the population.

## 1. Health care in the world

The world community has repeatedly emphasized that the main criterion for the expediency and effectiveness of all spheres of human activity, without exception, should be the health of the population. Achieving a decent level of public health is possible only with the implementation of appropriate policies of the state, society, and their institutions, which ensured the prevention of diseases. Today, the principles of preventive medicine have been formed – scientific and practical work that determines the levels of morbidity and

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<sup>3</sup> Слабкий Г. Профілактика – не тільки здоровий спосіб життя. Ваше здоров'я. 17/18. 2017. С.6–7.

<sup>4</sup> World Bank. 2010. <http://documents.worldbank.org/curated/en/595521468314084067/The-global-public-private-partnership-to-promote-handwashing-with-soap>

prevalence of diseases, disabilities and mortality of the population and can scientifically justify measures to prevent these negative phenomena. Hygiene is the art of preserving human health, and who among us is not interested in personal and public health? Knowledge of this art is related to the concept of nature and its laws. In the conditions of modern health- and life-threatening pressure of anthropogenic factors of the environment (domestic, industrial, social), the role of hygiene among other disciplines, as a science that provides justification for preventive actions aimed at preserving the health of the population, must constantly grow. In general, at every stage of the formation of the state, preventive science always answered the questions posed by life. And today, among the main tasks that are solved in scientific institutions of the hygienic direction are the organization and improvement of the primary link of the state medical service, the preservation and strengthening of public health, current problems of the environment and living conditions, current issues of occupational medicine, hygiene of children and adolescents, radiation security, problems of population nutrition, military hygiene and many others. All these questions are generally aimed at solving the problems of impact on public health, defining carcinogenic and non-carcinogenic risks, clarifying the mechanisms of their influence on the formation of morbidity and developing preventive measures. Today in the country, the general morbidity of the population has sad statistics. Over the past two decades, there has been an increase in adverse trends in the health of the population: a worsening of the course of diseases, synchronization of pathology, an increase in the prevalence of a number of specific diseases with a typical combination of symptoms and functional and morphological changes, as well as certain etiology and pathogenesis and classes of diseases. So, for example, among the working population, 1,3–1,4 diseases are registered for every 1,0. Regarding the distribution of certain classes of diseases, the first place is occupied by diseases of the circulatory system, the second – diseases of the respiratory organs, and the third – diseases of the digestive organs. A significant place in the incidence structure is occupied by diseases of the class "Psychological and behavioral disorders", which depend not only on the action of genetic factors, but also on social factors (alcoholism, drug addiction, drug addiction, etc.), and for the children's contingent – informational and educational overload in modern general education and extracurricular institutions. Reproductive health is an important component of the demographic prospects of the population of Ukraine, which is related to the action of a number of external factors. Among the diseases registered in women, the most worrying is the spread of diabetes, rheumatism, rheumatoid arthritis, diseases of the circulatory system, infertility, etc., which lead to direct reproductive losses. The biggest concern of society as a whole, and of doctors in particular, is the systematic deterioration of the health of the child population – the future labor

and intellectual potential of the state. Scientific substantiation, development of a regulatory framework and effective control over the creation and observance of optimal conditions for children's life should become the primary task of both scientists and practitioners. Recently, in our country and abroad, there have been individual attempts to systematize and effectively use information about man-made factors of environmental pollution in preventive work by monitoring the processes of their formation and distribution. To solve the primary preventive tasks in the coming years, scientists and practitioners need to develop a system for monitoring the environment and public health using biomonitoring data, the results of comprehensive disease diagnostics and reproductive health indicators; to improve the methodology of risk assessment for the analysis of the formation of health under the influence of various factors. Epidemiological studies of non-communicable diseases received a new stimulus, despite the objective difficulties of conducting them, primarily related to costs. This renewed interest in epidemiological studies can be attributed to many reasons, but primarily to the growing interest in such studies and greater confidence in them by the world scientific community, as well as the revision of the basic concepts of hygiene in relation to the study of health risks, which is impossible without epidemiological studies.

Fundamentally new in the field of environmental protection and industrial environment are studies devoted to so-called biomarkers. The biomarker approach should be used when assessing the toxicity of various factors. The development of this direction makes it possible to determine the prevalence of pre-pathological conditions in the population in general and individual professional groups depending on the nature and levels of active factors, to predict the state of morbidity, the probability of the transition of pre-pathological conditions to nosological forms of diseases, as well as the probable value of active factors. Even an incomplete list of the main results of research obtained by hygienists in recent years shows their undoubtedly significant contribution to priority scientific developments. Scientists have always and invariably taken principled positions and skillfully defended them when solving complex scientific problems of national importance. Today, we cannot help but remember the path that our predecessors took, namely society, taking into account the ecological situation, is more interested in reliable preventive medicine than ever before. Now, when the health problem is worsening all over the world, summing up the achievements over a long period, let's evaluate the development of preventive medicine in an evolutionary section. Recently, there has been a dubious tendency to consider the past exclusively from negative positions, hence the unjustified, conscious, at best false, desire to destroy what was created in previous years, in order to then, as it were, start from scratch, create revolutionary innovations without the experience and lessons of the past.

Public health and preventive services play a critical role in the health care system, focusing on population-level interventions to prevent disease, promote health, and protect society from health threats. These services include immunization programs, infectious disease control, chronic disease prevention, health education, and community health initiatives. By addressing the underlying causes of ill health and health inequities, health and preventive services contribute to the overall well-being of populations and reduce the burden on health systems. This component also involves efforts to raise awareness, provide information and encourage behavior change to improve health outcomes and reduce health risks, focusing on areas such as nutrition, physical activity, mental well-being, etc.<sup>5 6 7 8 9</sup>.

Table 1

**Countries with the largest deductions for health care  
in the 20th century**

1960	1970	1980	1990
Denmark 3,85	Denmark 6,22	Denmark 7,35	Denmark 6,66
New Zealand 3,41	Sweden 4,44	Sweden 7,07	Iceland 6,51%
WestGermany 3,17	Canada 4,32	WestGermany 6,29	Canada 6,15%
UK 2,93	WestGermany 4,18	Ireland 6,02	France 6,07
Italy 2,76	Italy 4	France 5,36	WestGermany 6,06
Austria 2,64	New Zealand 3,96	Norway 5,31	Sweden 5,88
Sweden 2,51	Netherland 3,93	Iceland 5,23	Norway 5,79
Ireland 2,46	France 3,78	New Zealand 5,08	Finland 5,66
France 2,23	Finland 3,58	Italy 5,06	Italy 5,57
Canada 2,12	Ireland 3,5	Canada 5	New Zealand 5,46

Statistics of deductions for health care have been officially kept since 1960. Thus, in the period 1960–1990, the first ten were made up of the following countries – table 1. Let's consider how many percent of the country's total income is spent, and how the dynamics have changed over 40 years of the 20th century. The first place has remained unchanged for decades, the remaining places are mainly occupied by the countries of Western Europe. If we consider the numerical value, then at the end of the 20th century, the

<sup>5</sup> Fowler T., Garr D., Mager N., Stanley J. Enhancing primary care and preventive services through Interprofessional p&education. *Israel Journal of Health Policy Research*. 2020. T. 9. № 1. p. 12. doi:10.1186/s13584-020-00371-8.

<sup>6</sup> Temple N.J., Wilson T., Jacobs D.R., Bray G.A. *Nutritional Health: strategies for disease prevention*. Springer, Humana. 2023. 393 p.

<sup>7</sup> Humphries D. L., Scott M. E., Vermund S. H. *Nutrition and infectious diseases: shifting the clinical paradigm*. Oxford. PubMed. 2021. 242 p. doi: 10.1007/978-3-030-56913-6

<sup>8</sup> Marmot M., Wilkinson R. *Social determinants of health*. Second edition. Oxford. PubMed. 2006. P. 100–109. doi:10.1093/ije/dy1121.

<sup>9</sup> Frieden, Thomas R. *A Framework for Public Health Action: The Health Impact Pyramid*. *American Journal of Public Health*. 2010. T. 100, № 4. P. 590–595. doi:10.2105/AJPH.2009.185652.

indicator doubled, at that time the quantitative value by place had little difference, and in 1990 it even decreased, although before that it was growing. The 21st century was marked by the primacy of the United States, and the increase doubled, with the countries of Africa, South America and Australia entering the top ten. If we consider the interval from 2000 to 2020, then the increase is 2–3%, although a good standard of living does not always correspond to a high level of the health care system.

Table 2

**Countries with the largest deductions for health care in the 21th century**

2000	2010	2020
USA 12,59	USA 16,2	USA 17
Sierra Leone 11,43	Moldova 11,49	Germany 11,93
Lebanon 10,79	Cuba 11,3	Lesotho 11,63
Sao Tome and Principe 10,56	France 11,25	Armenia 11,61
Germany 9,89	Germany 11,15	Switzerland 11,51
Namibia 9,62	Sierra Leone 11	France 11,32
France 9,6	Burundi 10,92	Cuba 11,31
Jordan 9,38	Canada 10,71	Canada 11,17
Uruguay 9,3	Denmark 10,63	Sweden 11,05
Australia 9,21	Ireland 10,52	Japan 10,97

**2. Achievements of preventive medicine in Ukraine**

Analyzing the achievements of research, in the field of safety for the health of the air environment of populated places, scientific studies were conducted, devoted to the improvement of the methodology for substantiating the approximately safe action levels (ABLD) of pollutants in the atmospheric air of populated places – the most numerous group of hygienic standards used to substantiate environmental protection measures. The revealed data on the difference between the values of OBRD and maximum permissible concentration (MPC) of maximum single use in groups of substances of inorganic and organic nature and assigned to different hazard classes made it possible, based on the study of correlations between these values, to propose a method of adjusting standards in order to bring them closer to the experimentally established (MPK of maximum single use). Calculations of the exposure load on the health of the population of priority atmospheric air pollutants of industrial, regional centers were carried out, as well as non-carcinogenic and carcinogenic risks from this pollution for the health of the population of the specified cities were determined. In the process of studying the living conditions of people in multifunctional high-rise residential and public complexes, methodical approaches were developed to assess the influence of organized and unorganized emissions of chemical pollutants from built-in and attached objects on the state of the air environment of residential

premises. It has been established that intensive motorization in Ukraine has the main negative impact on the environment, which leads to a crisis state of the air pool in large cities. The scientific and methodical principles of long-term monitoring of suspended finely dispersed particles and pollen pollution of atmospheric air have been developed; an assessment of social losses caused by increased risks from the effect of polluted atmospheric air on the health of the population was carried out. In the field of safety for the health of drinking water, the regularity of the formation of trihalomethanes and certain volatile organochlorine compounds in drinking water (on the model of water stations) has been established, depending on the dose of chlorine introduced for disinfection, the content organic pollution and its composition at various stages of water treatment (primary chlorination, coagulation, filtration, secondary chlorination). The dependence of the level of organochlorine compounds in the drinking water of the distribution networks of various districts of town on the specific gravity of Dnipro, Desnia and artesian water was established, as well as the factors that determine the increase in the concentration of organochlorine compounds in the spring and summer periods of the year. For the first time in Ukraine, the quality of bottled drinking water consumed by the population has been established according to microbiological indicators. Shown the need for its conditioning to obtain a product of guaranteed quality. The possibility of using coliphages as a model for purifying water from enteroviruses, and therefore for the prevention of infectious diseases among consumers, has been proven. A comparative hygienic evaluation of traditional and modern chlorine agents of the new generation is given regarding the ability to form carcinogenic organochlorine compounds in the process of water treatment, and recommendations are developed to minimize their entry into drinking water; results were obtained at the population level regarding the effect of chlorinated drinking water contaminated with organochlorine substances (chloroform) on the development of oncology in the population (bladder and colon cancer), and monitoring of chlorinated drinking water for the content of volatile and non-volatile carcinogenic organochlorine compounds was introduced for the purpose of disease prevention. The hygienic principles and methodical approaches to the development of industrial technologies for cleaning mine water to the level of drinking water are substantiated. A hygienic assessment of household filters and collective systems of the new generation proposed for further purification of drinking water was carried out, and justification of their choice was carried out. loads with these substrates. For the first time in Ukraine, a calculation method for determining the total influx of heavy metals into the soil with various types of waste, pesticides and agrochemicals has been proposed. The regulatory document "Technological and agro-ecological standards for the use of sewage sludge from urban sewage treatment plants in

agriculture" was developed and approved. A fundamentally new classification of soils is proposed, which takes into account hygienic criteria for soil condition assessment "Comprehensive sanitary and hygienic assessment of soil quality in populated areas". An analytical review of the current situation in Ukraine in the field of biocides management was conducted and recommendations were developed for the safe handling of biocides (pesticides and disinfectants) to reduce the impact on public health in Ukraine". In the field of public health safety of carcinogenic factors, the "List of maximum permissible concentrations of benzopyrene in food products" has been substantiated and submitted to the Committee on Hygienic Regulation of the Ministry of Health of Ukraine for approval. The state hygiene standard "List of substances, products, production processes, household and natural factors carcinogenic to humans" and "List of carcinogenic substances of unidirectional action" was prepared and implemented. The contribution of individual carcinogens and the importance of the path of their entry into the body of a resident of a modern city in the formation of risks of the probable development of oncological diseases have been established. Scientifically based short-term tests for the hygienic assessment of carcinogenic factors. Quantitative and temporal morphological manifestations of different stages of carcinogenesis (diffuse and focal hyperplasia, benign and malignant tumors) under the action of chemicals, depending on the dose and route of their introduction, were established. A method of studying the features of the immune response to the action of carcinogenic nitrosamines and their precursors has been developed. A study of the carcinogenic risk caused by air pollution in residential premises was conducted, and ways of reducing it were determined. The influence of the level of pollution by chemical carcinogens on the formation of aerogenic load on the population, the contribution of chemical carcinogens to the formation of cancer in various locations was determined<sup>10 11 12 13 14 15 16</sup>.

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<sup>10</sup> Даценко І. І., Габович Р. Д. Профілактична медицина: Підручник. 2-ге вид. К.: Здоров'я, 2004. 792 с.

<sup>11</sup> Тимченко Ю.І., Сердюк А.М., Турос О.І. Гігієна довкілля: політика, практика, перспективи. Київ, 2000. 127 с.

<sup>12</sup> Ластков Д. О., Сергета І. В., Швидкий О. В. Основи екології та профілактична медицина. К. МК, 2017. 472 с.

<sup>13</sup> Кундієв Ю. І., Варивончик Д. В. Професійний рак: мезотеліома. Київ. Авіцена, 2015. 191 с.

<sup>14</sup> Кундієв Ю. І., Андрейчин М. А., Нагорна А. М., Варивончик Д. В. Професійні інфекційні хвороби. Київ: Авіцена, 2014. 527 с.

<sup>15</sup> Кундієв Ю. І., Басанець А. В. Пневмококіоз: епідеміологія, рання діагностика, профілактика. Київ. Авіцена, 2012. 192 с.

<sup>16</sup> Кундієв Ю.І., Нагорна А.М. Професійне здоров'я в Україні. Епідеміологічний аналіз. К. Авіцена, 2006. 316 с.



Shown stable atmospheric air pollution with a number of carcinogenic compounds with dynamic changes in their level over 10 ... 20 years; according to the indicators of non-carcinogenic risk, a number of compounds that have the greatest negative impact on the health of the urban population are identified – these are benzopyrene, formaldehyde, cadmium. A conceptual scheme for determining the contribution of chemical carcinogens to the formation of cancer incidence in the population is formulated. In the field of ensuring radiation safety, a draft of separate sections of the Sanitary Rules of Ukraine for handling radioactive waste has been prepared, which deals with the issues of collection, processing, preservation, and burial of radioactive waste, as well as ways to improve the ecological state of the environment, reduce the exposure of facility workers and the population that lives

there in the zone of exposure to radioactive substances. The "Basic control levels, release levels and action levels regarding radioactive contamination of objects in the exclusion zone", which regulate the working conditions of personnel, have been developed. A long-term comprehensive study of the territories of Ukraine affected by the accident at the Chernobyl nuclear power plant revealed that the environment in the areas of Kyiv and adjacent regions is contaminated with radionuclides from the emergency release; the state of health of children and adults in the zone of enhanced radioecological control was studied. Reliable differences in the levels of general morbidity of the population and the prevalence of certain types of pathology were also established. The obtained results made it possible to develop recommendations for minimizing the harmful effects of the environment on the health of the population living in the zone of enhanced radioecological control. For the first time in Ukraine, the quantitative parameters of the transfer of natural radionuclides from their important sources to the human body through air, food and water were investigated. The need to implement a national strategy for the restoration of regulatory control over abandoned sources of ionizing radiation has been scientifically substantiated, methodological guidelines have been developed for the investigation of accidents involving radiation sources used in the national economy. In the area of public health safety, the use of polymeric materials and household chemicals shows that some common building materials are potentially dangerous to human health. Thus, polyvinyl chloride materials are a source of phthalate emission into the air; the deterioration of their sanitary and hygienic properties is inherent in paint and varnish materials that were made from unpurified solvents. At the same time, polystyrene materials are chemically stable and have a reliable margin of safety for the body. This also applies to polyethylene terephthalate, but the distribution of this material on the territory of Ukraine requires solving the issue of disposal of products made from it. On the basis of scientific generalizations, it was concluded that for Ukraine, the

creation of a legislative framework for the regulation of the method of disposal of polymer materials and the conduct of research on scientific substantiation and the introduction into practice of the methods of their safe ecological and hygienic disposal are of primary importance. Testing of alternative methods continues for establishing the toxic effect of household chemicals and products of the perfumery and cosmetics industry. It has been proven that with the combined effect of surface-active substances (surfactants) and enzymes on the body, its character primarily depends not on the surfactant, but on the nature and dose of the enzymes. The influence of surfactants on the state of the protective function of human skin has been established<sup>17 18 19 20 21</sup>.

The toxicological and hygienic characteristics of modern surface-active substances have been established and preventive measures regarding their possible impact on the human body have been proposed. In the area of safety planning of modern populated cities, hygienic recommendations have been developed to improve the state of atmospheric air, water resources, the electromagnetic and radiation situation, as well as prospects for the territorial development of the city in accordance with the General Plan of its development for a certain period. State sanitary rules for the arrangement and operation of gas stations (complexes) have been developed. According to the materials of the project examination and the results of field studies, the peculiarities of the influence of the activities of small-capacity food, wood-working, construction, and metalworking industries on the state of the environment have been established. Reasoned regulatory sizes of sanitary protection zones (SZZ) for specified enterprises, which must be at least 50% of the sizes of SZZ for the relevant industries according to the current sanitary classification. The main sanitary and hygienic problems of modern planning and development of cities with different city-forming bases according to their master plans are defined; the territorial and temporal trends of changes in the state of atmospheric air pollution in the studied cities with different economic complexes were established; a set of preventive measures is proposed for

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<sup>17</sup> Кундієв Ю. І., Нагорна А. М., Варивончик Д. В. Професійний рак: епідеміологія та профілактика. Київ. Наукова думка, 2008. 336 с.

<sup>18</sup> Польша Н. С., Платонова А. Г. Физическое развитие школьников Украины: пространственно-временные и морфофункциональные особенности. Київ. Генеза, 2015. 272 с.

<sup>19</sup> Сердюк А. М., Зербино Д. Д. Экологические катастрофы: вина человека? Тернопіль. УкрМК, 2015. 290 с.

<sup>20</sup> Сердюк А. М., Кундієв Ю. І., Нагорна А. М., Ширококов В. П. Стратегія розвитку профілактики в охороні здоров'я в Україні. Журн. АМН України. 2012. Т. 18. № 2. С. 358–371.

<sup>21</sup> Сердюк А. М., Лось І. П., Павленко Т. О. Стан радіаційної безпеки в Україні як лімітуючий чиник подальшого розвитку ядерних і радіаційних технологій. Ядерні та радіаційні технології в Україні: можливості, стан і проблеми впровадження: зб. наук. ст. Київ: РНБО. 2011. С. 95–103.

executive authorities regarding the adoption of management decisions to create safe conditions for human life. In the field of safety of the influence of physical factors, for the first time, the regularities of the spatio-temporal distribution of electromagnetic radiation, which is created by basic communication radio-relay stations, as well as the end terminals of cellular mobile communication systems of the NMT and GSM standards, were established. The parameters of electromagnetic and ionizing radiation created by means of trunking communication have been established, projects of improved regulatory and methodological documents for the hygienic regulation of such radiation have been developed. The basic regularities of the body's reactions to the influence of the electromagnetic field 450 MHz, which is created by cellular radio telephones of the NMT standard have been substantiated. The main regularities of the formation of the load on the human body in living conditions from a complex of the main external sources of acoustic pollution have been determined. In the conditions of large cities, the patterns of distribution of electromagnetic radiation levels created by the network of cellular mobile communication base stations and civil aviation radio navigation facilities have been established. It has been proven that the radio technical means of cellular mobile communication, placed on the technical floors of multi-story residential buildings and their antennas on the roofs, do not create dangerous levels of the electromagnetic field in the living quarters of these buildings. The hygienic assessment of bioeffects in the case of isolated and combined action of electromagnetic radiation standard cellular mobile communication and ionizing radiation was studied; a description of the radiation status of individual settlements in the region where cellular base stations and its mobile terminals operate. For the first time, the sanitary-hygienic characteristics of the effect of the combined action of the magnetic field of industrial frequency and carcinogens of the nitrosamine class on the population were given, and their synergistic effect on the manifestation of the carcinogenic effect was established. In the field of ensuring the health of the population in modern conditions, the patterns of the emergence of the body's immune response under the combined and compatible action of anthropogenic factors are substantiated.<sup>22 23</sup>

The studied regularities of the physical development of children in Ukraine during the last century revealed epochal changes in the processes of growth and development of children, which until the middle of the century were characterized by processes of acceleration, and at the end of the 20th century

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<sup>22</sup> Сердюк А. М., Полька Н. С., Гулич М. П. Профілактика неінфекційних захворювань вагомий напрям національної стратегії охорони здоров'я населення України. Журн. АМН України. 2010. Т. 16. № 2. С. 107–114.

<sup>23</sup> Сердюк А. М., Полька Н. С., Коблянська А. В. Оцінка профілактичної спрямованості науково-дослідних робіт, які виконуються за міжгалузеву комплексною програмою "Здоров'я нації". Довідлля та здоров'я. 2. 2011. С. 9–15.

there was stagnation, suspension of these processes, and the formation of gracefulness in the morphological and functional indicators of physical development of children. Comprehensive system of measures for the prevention of congenital and hereditary pathology has been created at the level of primary health care institutions. Complex of methods for determining the mutagenicity of environmental factors has been developed for use in the genetic monitoring system. Methodical approaches to the identification of genetic risk in the system of genetic monitoring of the population of Ukraine, models of electronic registries of hereditary and congenital pathology were developed and implemented in health care practice. The reasons for the prevalence of defects in the provision of medical care and their consequences in Ukraine were studied, in comparison with international experience, and a methodology for their prevention and a number of regulatory and methodological documents on the prevention of non-infectious diseases were developed. In the field of ensuring the health of children and adolescents, scientifically based principles and criteria for the safe use of computer equipment and information technology in the process of children's education have been formulated. The regularities of dynamic changes in the general working capacity, visual functions and central nervous system of schoolchildren with different health conditions depending on the duration of work on a PC and the conditions of the educational process were established, on the basis of which hygienic standards were approved regarding the regulation of the duration of work of schoolchildren on computers. The calculation of complex indicators and integral assessment of the formation of the health of the children's population was carried out. A multi-vector orientation of age-related changes in various comprehensive indicators of health has been established: against the background of an increase in the prevalence of chronic pathology and with high characteristics of somatic health is observed. Measures have been developed for assessing the degree of probability of the formation of acute and chronic pathology depending on age, gender, the presence of medical-biological, environmental, social risk factors

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<sup>24</sup> Сердюк А. М., Полька Н. С., Махнюк В. М. Сучасні проблеми гігієни планування та забудови населених місць. Київ, 2014. 173 с.

<sup>25</sup> Сердюк А.М., Полька Н.С., Махнюк В.М., Савіна Р.В., Могильний С.М. Гігієна планування та забудови населених місць на варті громадського здоров'я. Київ. Медінформ, 2017. 271 с.

<sup>26</sup> Сердюк А. М., Полька Н. С., Сергета И. В. Психогигиена детей и подростков, страдающих хроническими соматическими заболеваниями: монография. Винница. Новая книга, 2012. 332 с.

### 3. Directions and achievements of preventive medicine

The studied regularities of the physical development of children in Ukraine during the last century revealed epochal changes in the processes of growth and development of children, which until the middle of the century were characterized by processes of acceleration, and at the end of the 20th century there was stagnation, suspension of these processes, and the formation of gracefulness in the morphological and functional indicators of physical development of children \. It has been proven that the constant reorganization of the education system, which has taken place over the past 30 years, does not provide favorable conditions for children's adaptation to the new content and forms of education. On the basis of the established patterns and forecasting of the development and working capacity of students depending on the factors of educational load, lifestyle and physical education, conceptual approaches to preserving the health of children of different ages, norms of educational and physical workload of students in accordance with age-related morpho-functional capabilities have been developed. The criteria for the safe stay of children in computer gaming facilities have been argued, the relevant state sanitary norms and rules have been approved. EMF levels generated by computers with built-in Wi-Fi devices from various portable devices were studied, EMF distribution was modeled based on the results of actual values, and the degree of biological effects in the experiment was studied. It has been proven that studying with a netbook or tablet causes a number of functional disorders in the body, safety criteria have been defined, which are outlined in the draft regulatory document. The principles of hygienic regulation were substantiated and a control system was developed for the safety indicators of textbooks on paper and electronic media. In the field of ensuring the health of the population with a complete and balanced diet, the effectiveness of the radioprotective properties of dietary supplements with a high protein content (milk-yeast composition, biologically active composition, black food albumin, lupine protein concentrate, etc.), which are manufactured according to new technologies. The urgent need for the introduction of new types of food products and food compositions of targeted action has been proven, the criteria for their quality and degree of safety in the nutrition of people with various somatic diseases have been established. The possibility of using carboxylates of biogenic metals obtained by nanotechnology in the production of food products is substantiated. An analysis and generalization of the organization and nutritional status of servicemen of the Armed Forces of Ukraine, who participated in the anti-terrorist operation, was carried out. The need to make changes in the organization and state of nutrition, as well as the energy and nutritional value of individual combat rations of servicemen to ensure the optimal functioning of the body of servicemen when they perform their assigned tasks, is argued. The correction of the individual combat ration of servicemen of the Armed Forces of Ukraine has been scientifically substantiated, taking into account the experience and standards of NATO. In the field of industrial safety and occupational medicine, special studies on soil

contamination in the 30-km zone of the Chernobyl NPP and beyond with lead compounds formed as a result of extinguishing a fire at the reactor have been developed, methodological recommendations have been developed for agricultural work in conditions of radiation pollution, substantiated ergonomic requirements for cabs of tractors and agricultural machines intended for use in pollution zones, according to which the Kharkiv Tractor Plant produced more than 600 tractors. Dynamic psychophysiological studies of the main groups of liquidators-operators of heavy construction machines, motor vehicle drivers, decontaminators, operational personnel of the fourth power unit, forestry workers of the exclusion zone were developed, patterns of the development of fatigue and the appearance of signs of overfatigue in the studied contingents working in shifts was determined. Preventive measures were recommended, which became the basis of the concept of the combined effect on the health of liquidators and the population of territories contaminated with radionuclides and other factors, primarily lead, pesticides, psychogenic stress. According to monitoring data on the content of organochlorine pesticides in biological environments (umbilical cord blood, breast milk), it has been proven that exposure to pesticides against the background of radiation pollution is an additional risk factor for reproductive health disorders. The zoning of contaminated territories was carried out according to the level of radiation pollution ( $Ku/km^2$ ) and pesticide load (kg/ha) of arable land<sup>27 28 29 30 31 32 33 34 35</sup>.

For about 10 years, the epidemiological study of occupational radiation diseases of liquidators of the accident at the Chernobyl nuclear power plant

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<sup>27</sup> Сердюк А. М., Стусь В. П., Ляшенко В. І. Екологія довкілля та безпека життєдіяльності населення у промислових регіонах України: Монографія. Дніпропетровськ. Пороги, 2011. 486 с.

<sup>28</sup> Сердюк А. М., Тимченко О. І., Брезницька Н. В. Генофонд і здоров'я: відтворення населення України. Київ. Медінформ, 2006. 272 с.

<sup>29</sup> Трахтенберг І. М. Книга о ядах и отравлениях. Київ. Наукова думка, 2000. 366 с.

<sup>30</sup> Трахтенберг І. М., Тычинин В. А., Сова Р. Е. Основные показатели физиологической нормы у человека: руководство для токсикологов / под ред. И. М. Трахтенберга. Киев. Авиценна, 2001. 372 с.

<sup>31</sup> Трахтенберг І. М., Коршун М. М., Дмитруха Н. М. Промислова токсикологія: науки прироти, досвід, підсумки. Київ. Авіцена, 2012. 160 с.

<sup>32</sup> Чернобыльская катастрофа / НАН України, МЗ України і др.; ред. совет: В. Г. Барьяхтар, Г. А. Готовиц, Ю. И. Кундиев и др. Киев. Наук. думка. 1995. 560 с.

<sup>33</sup> Occupational Health and Safety Measures in Agricultural Areas Contaminated by Radionuclides: The Chernobyl Experience. Encyclopedia of Occupational Health and Safety. Geneva: ILO. 1998. № 7. 17 p.

<sup>34</sup> Ocular radiation risk assessment in populations exposed to environmental radiation contamination / Eds. A. K. Junk, Yu. Kundiev, P. Vitte, B. V. Worgul. Dordrecht; Boston; London: Kluwer Acad. Publ. 1999. 226 p.

<sup>35</sup> Serdyuk A., Turos O., Petrosian A. Risk Assessment Capacity Building Program in Zaporizhzhia Ukraine: 32. Emissions Inventory Construction, Ambient Modeling, and Hazard Results. Journal of Environmental Protection, 4. 2013. P. 1476-1487. <http://dx.doi.org/10.4236/jep.2013.412169>

with the participation of employees of world universities continued. As a result, the hygienic standards of radiation exposure of certain organs in production conditions, which were approved as part of the International Basic Standards of Radiation Safety of the IAEA and put into effect for the member states of the European Union by the relevant EURATOM directives, were substantiated. Formulated provisions regarding the relationship between general and specific in the reaction-response of the organism to long-term exposure to chemical pollutants in relatively low concentrations. It has been established that against the background of apparent well-being under such influence, various functional shifts are revealed: neurohumoral, biochemical, hematological, immunological and others. The usual consequence of such exposure is a violation of homeostasis (antioxidant deficiency), secondary immunodeficiencies, which can serve as the basis for the formation of environmentally dependent chronic somatic diseases. A new direction of preventive toxicology – nanotoxicology – has developed. The main regularities of the accumulation and distribution of heavy metal nanoparticles in target organs, the mechanisms of the development of toxicity manifestations (stimulation of lipid peroxidation processes and inhibition of the antioxidant defense system, cytotoxic action with the development of cell necrosis and apoptosis, disruption of the structure and function of proteins), which are due to special physical and chemical properties of nanoparticles (shape, size, surface area). Possible mechanisms of penetration of nanoparticles through intact skin have been determined. This acquires medical and biological significance when assessing the safety of nanomaterials, including when they are used for targeted delivery of medicines. Methodological recommendations have been issued, which substantiate the principles, methods and indicators for assessing the safety of nanoparticles and nanomaterials using an exclusive domestic SQUID gradiometer (Superconducting Quantum Interference Device), the approbation of which was carried out in order to assess the danger of nanomaterials in their production and use in various branches of production, as well as various types of products created with the use of new materials and nanotechnologies. Mathematical modeling of the process of permeation of pesticides through the skin using the basic provisions of Fick's diffusion theory is proposed for the purposes of determining the risk of percutaneous penetration of pesticides during their application. Reverse modeling of determining the permissible level of percutaneous action of pesticides as an alternative method of hygienic rationing of chemical substances has been developed. Based on the application of modern innovative technologies of instrumental, clinical and genetic research, the standards of diagnosis of occupational diseases of the bronchopulmonary system in coal miners have been developed and improved,

which opens up new opportunities for early detection of disease manifestations and timely application of preventive measures.

#### 4. Public health is the basis of a healthy nation

During the last decade, a new area of occupational medicine has been successfully developed – the determination of the role of the genetic component in the development of occupational and production-related diseases, which opens fundamentally new possibilities for the primary prevention of pathology. The scientific and methodological bases of professional psychophysiological selection of workers in extreme professions (with increased danger to life) were developed and adequate methods of psychophysiological testing based on modern innovative technologies were proposed. It has been proven that in shift workers with high neuro-emotional stress after 40 years, the intensity of adaptation-adaptive reactions increases significantly, which is manifested by the exhaustion of bioenergetic activity of the brain and the growth of sympathotonic regulatory influences on the activity of the cardiovascular system. The stressogenicity of night shifts and their high danger in relation to the formation of cardiovascular pathology in workers have been proven. It has been proven that biological summation under the combined action of physical factors of different energetic nature (electromagnetic fields, air temperature, noise) can be carried out at different structural and functional levels of the systemic organization of the organism, among which the systems of antioxidant protection and lipid peroxidation are universal links in the systemic reactions of a whole organism. The prevalence and peculiarities of the impact of new factors of the industrial environment – the geomagnetic field and LED lighting on the human body – have been investigated, and hygienic recommendations have been proposed for optimizing the light environment from new LED lighting sources (taking into account their color temperature) and the geomagnetic background in industrial and office premises. In creative cooperation with the Institute of Electric Welding named after Paton developed a new recipe for welding electrodes with a low manganese content, which made it possible to eliminate the occupational incidence of manganese parkinsonism among welders of Ukraine. In this direction, research on the development of a new generation of welding electrodes with a low content of hexavalent chromium, which is a recognized carcinogen, is ongoing. The implementation of these developments will make it possible to significantly reduce the risk of occupational cancer among electric welders. A highly effective demercurization technology has been developed for cleaning soils, building structures and other environmental objects. The new technology, based on the use of ultrasound vibrations, allows to remove up to 99.9% of mercury, thereby providing the possibility of returning land plots for further



exploitation. National epidemiological monitoring of carcinogenic risks and oncological incidence of asbestos-cement production workers in Ukraine, workers from underground mining of uranium ores was established, which became the basis for the development of new approaches to the prevention of oncological pathology. The possibility of managing the population carcinogenic risks of cancer and melanoma of the skin and the organ of vision among those working outdoors and predicting the exposure carcinogenic dose of ultraviolet radiation based on global territorial space satellite observations has been proven.

The preventive strategy of medical science is a way to increase the efficiency of health care. The constant decline in the state of health in Ukraine necessitated the need for permanent improvement and reform of the Ukrainian health care system, which until now has been carried out in the usual administrative-bureaucratic way – through the adoption of laws, amendments to them and various departmental instructions. However, bureaucracy is at best guided by business planning technologies and does not always take into account scientific recommendations. In combination with economic troubles, the already generally recognized and obvious inability of the modern "Ukrainian model" of POPs to overcome numerous health problems of citizens threatens the existence of society and the state. Of course, the situation must be corrected as soon as possible by developing a set of systemic measures that can affect the factors, and not only the consequences of their action. The futility of the current POPs has already been realized at the level of the highest state bodies, where the understanding has matured that only the strengthening of the preventive direction can break the vicious circle of interrelated factors and really improve the health of the nation, contribute to the reproduction of genetic potential. It is obvious that the orientation of POPs in the preventive direction needs scientific support and support. Research on preventive medicine is of primary importance for Ukrainian medical science. Thus, the presidium of the National Academy of Sciences of Ukraine formulated and approved the main directions important for theoretical and practical medicine, according to which research works are carried out in the institutes of the academy: study of the fundamental mechanisms of the body's vital activity and the development of pathology; development of fundamentally new methods of diagnosis, treatment and prevention of the most common diseases, search for ways to strengthen health and prolong life; disclosure of mechanisms and prevention of adverse effects on the body of environmental factors, including radiation, and working conditions. However, the 2008 Annual Report on the Performance of the Health Care System of Ukraine states that the formation of a healthy lifestyle and hygienic education of the population is hindered by a weak scientific base. In medical science, we are witnessing a gradual impoverishment of development topics, a loss of personnel, and an impoverishment of the intellectual environment. The

reduction of science in general and medicine in particular, compared to Soviet times, is undesirable, forced, but necessary under the condition of reduced funding. However, in no case should research be reduced to social prevention. Public prevention creates not only objective prerequisites for improving the health of the nation, but also contributes to the formation of a socio-psychological state of society in which individuals are motivated to follow individually oriented preventive recommendations. After all, the formation of medical and social activity and motivation for a healthy lifestyle in the population is the main task and goal of any socio-economic reforms. Therefore, in order to achieve a synergistic effect, medical science should develop socially oriented recommendations and social preventive measures in close connection with individually oriented ones. Scientific recommendations on individual prevention are addressed to an individual person, who carries them out by his own choice, putting all the difficulties on his shoulders – spending money and time, overcoming mental inertia and habits in case of a change in lifestyle. She also personally benefits from a "prevention-oriented" lifestyle in the form of health benefits. Objectively, most of the factors harmful to public health are beyond the scope and influence of POPs, medicine in general and medical science. For example, anthropogenic pollution, a decrease in the quality of water and food products (environmental factors); low incomes and purchasing power of the population, lack of funds for the development of POPs and medicine (economic); weak motivation for a healthy lifestyle (psychological), etc. Therefore, in modern conditions, the recommendations of scientists should be aimed primarily at social preventive measures, the scientific justification of which stems from medical and social factors. Some ways of overcoming the problems were clearly formulated by Ukrainian scientists at the seventh Marzev readings. In order to correct the situation and focus on the search for and scientific substantiation of methods and measures of socio-medical prevention, medicine should expand interdisciplinary interaction with other sciences that deal with living and working conditions, the state of the environment, and socio-economic conditions. To understand the connection between the individual and society, between society and the biosphere and, on this basis, to develop ways of harmonizing personal and social goals regarding the state of health is a task where a significant (or rather leading) role belongs to medical science. Preservation and reproduction of the nation's health should become a national idea. Most of the nation's health problems will be systematically solved only by scientifically based social recommendations for the implementation of non-specific and special disease prevention measures, which should create, change and preserve a favorable human habitat. Such measures are planned and carried out only at the level of local communities or at the national level. Or, as a system of labor safety, they are strictly regulated by legislation and controlled by competent state bodies. Therefore, the primacy

of the preventive direction of medicine cannot be separated from the solution of the main socio-economic problems. The lack of a centralized complex information system of medical facilities, educational and research institutions has many negative consequences, the worst of which for medical science is the lack of a single information space, the impossibility of large-scale clinical and epidemiological studies based on the principles of evidence-based medicine. Under such circumstances, developing a strategy for the development of Ukrainian medical science is not easy. Given the focus of POPs on prevention, it is necessary to concentrate resources on fundamental and applied research in those areas where Ukraine still has significant scientific potential. It will also make it possible to focus on the education of high-quality scientific personnel, which requires changes in the system of professional training<sup>36 37 38 39 40</sup>.

## 5. Recommendations on the prevention of chronic diseases

According to WHO statistics, chronic diseases – including heart disease, stroke, diabetes and cancer – are among the most common health problems in the world. However, many of these chronic diseases are preventable because they are linked to poor diet and lifestyle choices, including tobacco use, excessive alcohol consumption, and insufficient physical activity. A healthy diet emphasizes fruits, vegetables, whole grains, dairy products, and protein. The scientists' recommendations for dairy products include low-fat or skimmed milk, lactose-free milk, and fortified soy beverages (other plant-based beverages do not have these nutritional benefits). Protein food recommendations include seafood, lean meats and poultry, eggs, legumes (beans, peas, and lentils), soy products, nuts, and seeds. Most people in Ukraine need to adjust their diet to increase their intake of dietary fiber, calcium, vitamin D and potassium. At the same time, we need to consume less added sugar, saturated fat, and sodium. Here are some ways to get started: reduce sodium intake, eating too much sodium can increase your risk of high blood pressure, heart attack, and stroke. The main source of sodium is table salt. In addition, a lot of sodium is found in beets, celery, carrots, sea cabbage, seafood, beef, and kidneys. More than 70% of the sodium you consume comes from packaged and prepared foods. To reduce sodium intake: instead of using salt, add flavor to your dishes with the help of squeezed lemon juice, a mixture of spices without salt or fresh herbs; eat less processed and packaged foods

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<sup>36</sup> Stuart Farrimond *The Science of cooking* DK (Dorling Kindersle). 2017. 256 p.

<sup>37</sup> *Medicine, health and being humane*. Edited by Lesa Scholl Taylor and Fransis. 2018. 453 p.

<sup>38</sup> Michale Greger *How Not to Age. The Scientific Approach to Getting Healthier as You Get Older* Pan Macmillan. 2023. 640 p.

<sup>39</sup> Andrew Chevallier *The Home Herbal. Restorative Herbal Remedies for the Mind, Body, and Soul* DK (Dorling Kindersle). 2023. 256 p.

<sup>40</sup> Gemma Ogston *The Healing Cookbook: Nourishing plant-based recipes to help you feel better and stay well* Vermillon. 2023. 192 p.

with a high sodium content (many common foods, including bread, pizza and deli meats, are high in sodium); read the nutrition label at the grocery store to find low-sodium foods; buy unprocessed foods such as fresh or frozen vegetables to prepare at home without salt. Potassium helps the normal functioning of the kidneys, heart, muscles and nerves. Not getting enough potassium can raise blood pressure, deplete calcium in your bones, and increase your risk of kidney stones. However, be aware that people with chronic kidney disease and people taking certain medications may have too much potassium in their blood.

Leafy green vegetables such as spinach, parsley and lettuce, as well as broccoli, peas, tomatoes and potatoes, especially the skins, contain significant amounts of potassium. Fruits containing this mineral include oranges and other citrus fruits, bananas, apples, avocados, raisins and apricots, especially dried ones. To add more potassium: try new recipes that use beet greens, lima beans or swiss chard; diversify your drinks with a cup of 100% prune juice or 100% pomegranate juice; snack on a banana; enjoy 100% orange juice or a recommended dairy product with meals. Limit added sugar, excess added sugar in your diet can contribute to weight gain, obesity, type II diabetes, and heart disease. Some foods, such as fruit and milk, contain natural sugars. Added sugars are sugars and syrups that are added to foods and beverages during processing or preparation. Added sugars go by many different names, such as cane juice, corn syrup, dextrose, and fructose. Table sugar, maple syrup, and honey are also considered added sugars. Sweetened beverages are a common source of added sugar. To limit sugar in the diet: drink water instead of sweet drinks, you can add berries or slices of lemon, lime or cucumber to improve the taste; to add sweetness to cereal or yogurt, add fruit instead of sugar; don't stock up on sugary drinks and snacks, instead drink water and keep pieces of fruit and vegetables handy for snacks; in cafes, refuse flavored syrups and whipped cream, and ask for low-fat or skimmed milk or an unsweetened, soy-enriched drink or just black coffee; read food labels carefully and choose foods with no or less added sugar.

Replacing saturated fats with healthier unsaturated fats can help protect your heart. Common sources of saturated fat are fatty meats such as beef ribs and sausages, whole milk, low-fat cheese, butter, and cream cheese. Unsaturated fats include avocados, nuts, and vegetable oils such as canola and olive oils. We need a certain amount of dietary fat to give us energy, help develop healthy cells, and absorb certain vitamins and minerals. But unsaturated fats are more useful for us than saturated fats. To replace saturated fats with unsaturated fats: replace whole milk in a smoothie with low-fat yogurt and avocado; sprinkle salads with nuts or seeds instead of cheese; use beans or seafood instead of meat as a protein source; cook with sunflower,

corn, olive, peanut, safflower, soybean or rapeseed oil instead of butter or margarine; replace skimmed milk and cheese with low-fat or low-fat.

Fiber helps maintain a healthy digestive system and help you feel fuller for longer. Fiber also helps control blood sugar and lowers cholesterol. Fiber is highly available and found in grains, legumes, fruits, vegetables and nuts. You just need to eat more of it. Therefore, our Ukrainian superfoods will come in handy: beets, carrots, wheat, oatmeal, flax seeds, pumpkin, etc. To get fiber: cut up raw vegetables to use as quick snacks. If you store celery and carrots in water in the refrigerator, they will stay crisp longer; start your day off with a whole grain cereal such as oatmeal, or a meal made with bulgur or teff for even more fiber, top your cereal with berries, pumpkin seeds or almonds; add half a cup of beans or lentils to your salad to add fiber, texture and flavor; enjoy whole fruit – perhaps a pear, apple, cantaloupe or passion fruit – with a meal or as a dessert. A good practice is to strive for a variety of colors on your plate. Fruits and vegetables such as dark leafy greens, oranges and tomatoes, even fresh greens, are rich in vitamins, fiber and minerals. Try this: sprinkle fresh greens on a salad or whole grain pasta; make a red sauce from fresh tomatoes (or low-sodium or no-salt canned tomatoes), fresh herbs and spices; add diced vegetables like peppers, broccoli or onions to stews and omelets to add color and nutrients; put your favorite fruits on top of low-fat, unsweetened yogurt.

### Conclusions

It is extremely important to create public health centers and provide conditions for their activities preventive medicine specialists, primarily hygienists and epidemiologists, who would carry out large-scale promotion of a healthy lifestyle, provided practical assistance to medical and educational institutions and, certainly, were materially interested in the results of their activities. Prevention of various types of diseases and promotion of a healthy lifestyle should become economically beneficial for the state and population of Ukraine. Prevention is one of the extremely important areas of medicine, which includes a complex hygienic, medical, socio-economic and sanitary-technical measures aimed at eliminating risk factors affecting human health, preventing the occurrence of diseases and ensuring a high level of public health. There are three types of prevention: primary – used to prevent the disease as such, secondary – aimed at early detection and treatment of the disease in the preclinical stage, and finally tertiary – these are measures aimed at preventing the development of complications and deterioration of the course of the disease, as well as dynamic monitoring of patients to prevent the occurrence of such undesirable consequences of diseases as: death, disability, the transition of the disease into a chronic form. All of them play an important role in the public health system, from the point of view of preventive medicine, although now individual prevention is also distinguished.

The most important component of all preventive measures is the formation of a person's activity and attitude towards a healthy lifestyle. According to the WHO classification, prevention is divided into primary, secondary and tertiary. Primary prevention is a set of measures that prevent the occurrence of a disease by eliminating its causes. This type of prevention is the most effective and includes a number of measures, including vaccination, a rational regime of work and rest, rational nutrition, physical activity, improving the environment, using plants to strengthen immunity, etc. Primary prevention measures can also be implemented at the state level (for example, water chlorination, production of iodized table salt). Secondary prevention is a set of measures that make it possible to detect the disease in the early stages of development, when it runs without symptoms, and timely treatment can stop it. Secondary prevention measures are based on preventive examinations. An effective method of this prevention is also dispensation as a comprehensive method of early disease detection, observation, treatment and rehabilitation of patients. An example of measures of individual secondary prevention of cardiovascular diseases is the use of acetylsalicylic acid as prescribed by doctors. Tertiary prevention is a set of measures that prevent the worsening or complications of a disease after it has been detected. This type of prevention is also aimed at the rehabilitation of the sick person, at the return her to the family and to socially useful activities. An example of tertiary prevention measures is prevention of contact with an allergen for patients with bronchial asthma. Considering the annual growth of infectious and somatic diseases, cases of food poisoning, often the sale of low-quality food products, lack of control over working conditions, etc., it is extremely important to create centers public health, to ensure their conditions for the activities of preventive medicine specialists, primarily hygienists and epidemiologists, who would carry out large-scale propaganda of healthy way of life and work, provided practical assistance to medical and educational institutions and, without a doubt, were materially interested in the results of their activities. Prevention diseases and promotion of a healthy way life should become economically beneficial to the state and funder of public health for our compatriots.

### Summary

Lifestyle has a significant influence on the formation of health. Very often the prevention of diseases is related with the rules of a healthy lifestyle and many ailments can be prevented with the help of simple hygiene methods. Unfortunately, in Ukraine, the level of education of the population on this issue is very low. The appearance of more is good professionals trained and motivated to promote a healthy lifestyle will have a positive effect on the level of health people. Since ancient times, mankind has always done attempts to focus the attention of one or another system health care on issues of disease prevention. Even in ancient China, the assessment the doctor's work and its payment were not based on the number of cured patients, but on the effectiveness of disease prevention measures. In more late times Hippocrates

emphasized that "it is necessary to take care of health healthy, so that they do not get sick". On preventive measures were emphasized a lot outstanding doctors of practical medicine, especially during the period of intensive development of natural sciences and hygiene in particular. More than a century ago, said that "...the future belongs to preventive medicine". Today, the issue of prevention not only remains relevant, it already goes far beyond the scope medicine and is an important solution tool of the most acute social problems associated with further existence and development of mankind. Appreciating the importance of preventive measures, the who declared the 21st century the century "preventive medicine". Governments of civilized countries and society understand that investing in health ultimately increases economic level of any state. For this not only a disease prevention strategy per se is needed, but also promotion measures health, that is, its support and strengthening.

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