Applied
Health Research Support Program
for the years 2024 - 2030

Contents

1. Name of Program

Applied Health Research Support Program for 2024-2030 (hereinafter referred to as the "Program").

2. Legal framework of the Program

The Program will be implemented according to:

- Act No. 130/2002 Coll., on the Support of Research and Development from Public Funds and on the Amendment to Some Related Acts (Act on the Support of Research and Development), as amended (hereinafter referred to as "Act No. 130/2002 Coll.");
- Commission Regulation (EU) No 651/2014 of 17 June 2014, *as amended by Commission Regulation (EU) No 2017/1084 of 14 June 2017, and as amended by Commission implementing Regulation (EU) 2021/1237 of 23 July 2021,* declaring certain categories of aid compatible with the internal market in accordance with Articles 107 and 108 of the Treaty on the Functioning of the EU, Official Journal of the EU L 187 of 26 June 2014, p. 1 (hereinafter referred to as the "Commission Regulation");
- Framework for State aid for research, development and innovation - Official Journal of the European Union of 19 October 2022 (2022/C 414/01) (hereinafter referred to as the "Framework");
- and other related regulations.

The Program is exempted from the notification requirement under Article 108 (3) of the TFEU as it fulfills the conditions of the Commission Regulation.

The Scheme excludes aid to an undertaking which meets the definition of a firm in difficulty in Article 2 (18) of the Commission Regulation. The payment of individual support is also excluded in favor of an enterprise against which an unpaid recovery order has been issued subsequently to a decision of the Commission under which the support received from a provider from the Czech Republic was declared illegal and incompatible with the internal market. According to Article 9 of the Commission Regulation, any individual aid exceeding EUR 500,000 should be disclosed.

The program will be implemented in accordance with the National Priorities of Oriented Research, Experimental Development and Innovation (hereinafter referred to as "R&D&I Priorities"), which were approved by Government Resolution of the Czech Republic No. 552 on 19 July 2012, and in accordance with the document The Implementation of National Priorities of Oriented Research, Experimental Development and Innovation, approved by Government Resolution of the Czech Republic No. 569, on 31 July 2013. The Program reflects the basic strategic orientation of the healthcare system in the Czech Republic, the objectives and thematic priorities for healthcare set out in the Strategic Framework for the Development of Healthcare in the Czech Republic until 2030, approved by Government Resolution No. 27 of 11 January 2021. The Program is in line with the priorities of the National Research and Innovation Strategy for the Smart Specialization of the Czech Republic (RIS3) for 2020-2027, which was approved by Government Resolution of the Czech Republic No. 66 of 25 January 2021, specifically with the domain of specialization of Advanced Medicine and Medicinal

Products. The Provider reserves the option of announcing thematically oriented public tenders focused on the priorities of the National RIS3 Strategy. The Program is also in line with the National Policy of Research, Development and Innovation of the Czech Republic 2021+, which was approved by Government Resolution No. 759 of 20 July 2020, and other strategic documents. The Program should contribute to the implementation of strategic objective 1.7 and measures 17 and 27 of this document. The Program is also based on the current needs of health research arising, for example, from the situation surrounding the Covid-19 pandemic.

As part of the legal requirements to ensure open access to publication results and scientific data financed from public resources, the Program refers in particular to Act No. 106/1999 Coll., the Act on Freedom of Access to Information, as amended, and Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and re-use of public sector information (revised version).

In relation to the prohibition of discrimination and gender equality, the Program is based on the horizontal priority "*to integrate the gender and sex perspective into health research in all its phases (from the design of methodology to its outputs)"* of the Health Research Concept until 2030 and the Strategy for Gender Equality for 2021-2030, approved by Resolution of the Government of the Czech Republic No. 269 of 8 March 2021.

Internationally and in the context of international commitments, the Program correlates with the aims of Agenda 2030 for Sustainable Development in the area of the Sustainable Development goal "Ensuring healthy life and improving its quality for all at any age." The Program also reflects the objectives for the development of the European Research Area and the related objectives to support the Horizon Europe framework program.

3. Provider

The provider of the support is the Ministry of Health, with its registered office at 375/4 Palackého náměstí, 128 01 Prague 2.

4. Program identification code

For the purposes of registration in the research, experimental development and innovation information system, the Program has been assigned the code "NW".

5. Categorization of the nature of research

In particular, the Program will support projects that have the nature of applied research under the Commission Regulation and Framework (including industrial research and experimental development or their combination). According to the definitions of the OECD Frascati Manual, applied research is original research carried out with the aim of obtaining new knowledge. However, it is primarily focused on a specific practical purpose or goal. A partial solution to applied research may be basic research, which is necessary to obtain the results of applied research. In basic research, "new knowledge about the fundamental principles of phenomena or observable facts" will be directed towards the medical sciences, and in applied research, the "specific practical aim and objective" will logically be directed towards the health sector. The

conditions will be described in detail in the tender documents for the research, experimental development and innovation tenders that will implement the Program.

6. Analysis of the issues solved

The Program is a continuation of the ongoing Applied Health Research Support Program for the years 2020 - 2026 with the code NU (hereinafter referred to as the "NU Program"), which was approved under Government Resolution No. 171 of 11 March 2019. In the context of the situation surrounding the Covid-19 pandemic, Government Resolution No. 827 of 20 September 2021 approved an amendment to the NU Program, which consisted in extending the Program to include public tenders for projects addressing the impact of the Covid-19 pandemic on healthcare in the Czech Republic, or Subprogram 3: Impact of the Covid-19 pandemic on healthcare in the Czech Republic.

The NU Program has not yet been evaluated. The first projects supported under the NU Program will be completed by 31 December 2023, so only in the course of 2024 will the first final outputs of these projects be known and then their evaluation will take place.

The NU Program was based on the Health Research Concept until 2022, which was approved under Government Resolution No. 58 of 22 January 2014, as well as the unfinished Applied Health Research Support Program for 2015 - 2023 with the code NV (hereinafter referred to as the "NV Program"), which preceded the NU Program. The NV Program was approved under Government Resolution No. 59 of 22 January 2014 and subsequently extended for 1 year under Government Resolution No. 738 of 23 August 2021. In 2021, an interim evaluation of the NV Program was carried out to evaluate the implementation and management process of the Program, assessing its efficacy, relevance and efficiency. The conclusions of this interim evaluation of the NV Program are attached in an annex to the new Concept for Health Research until 2030, on which this Program is based.

In its specialized focus, the Program will continue to fulfil the National Priorities of Oriented Research, Experimental Development and Innovation, specifically Priority 5: Healthy population, which defines the most common diseases occurring in the population and their possible causes, presenting key challenges for health research, the most important research areas and preferred topics. Given that the area of research, development and innovation has undergone a number of changes in recent years, it is necessary to adequately reflect the changes in the setting and targeting of the Program so that the strategic focus of the Program objectively reflects the current conditions of research, development and innovation and the needs of society. In addition to the thematic priorities reflected and developed in previous programs, based mainly on the R&D&I Priorities, in accordance with the Health Research Concept until 2030 it is necessary to orient the thematic focus of the Program also towards priorities not yet reflected in the supported areas, namely the priority or research area of "public health". This trend is also a logical reflection of the current global fight against the Covid-19 pandemic.

The aim of the Program is not to solve all societal problems related to the health of the population, as it is a matter influenced by many different factors. The intention of the Program is to support applied health research in the form of appropriately defined projects, in order to achieve results that will contribute to a greater or lesser extent to solving some of the problems defined in the R&D&I Priorities, and also to solving the aforementioned emerging issues or

challenges in the field of public health, in particular the epidemiological problems arising in connection with the Covid-19 pandemic.

In terms of statistical data defining basic demographic characteristics and health status of the Czech population, the Program refers to the currently available data published by the Czech Statistical Office for 2017, and consequently on the Strategic Framework for the Development of Healthcare in the Czech Republic until 2030 (especially Chapter 2 "Analytical part"). According to data from the Czech Statistical Office for 2017, the population of the Czech Republic is growing (during 2017 it increased by 31,200 to 10.61 million inhabitants) due to both foreign migration (balance of 28,300) and natural change (3,000). Fertility continues to rise (the fertility rate rose from 1.63 to 1.69 children per woman year-on-year, with specific fertility rates rising at almost every age, and the average age of the mother at childbirth remaining at 30 years for the third consecutive year), and the number of live births also increased (the number rose for the fourth consecutive year, reaching 114,400 in 2017). Indicators of the population's reproductive health are among the key indicators of the health status of the population. Prenatal care for pregnant women is at a high level in the Czech Republic (e.g., more than 80% of pregnant women undergo their first pregnancy-related check-up between the 1st and 12th week of pregnancy), and the comparison of infant mortality rates in the Czech Republic and other European countries is also positive, as the Czech Republic has one of the lowest rates of infant mortality under one year of age. Additionally, infant mortality is declining consistently (in 2017 it reached 2.7 per mille), and a slight decrease was recorded in the proportion of low-birth-weight infants, with low-birth-weight infants at risk being centralized in perinatology and intermediate care centers, which points to a high level of quality care for these infants.

According to the initial statistical data, however, the most important factor determining the health status of the Czech population is the ageing of the Czech population. In 2017, as in previous years, the number of seniors over the age of sixty-five increased, while the number of people of working age decreased year-on-year. The ageing of the population is manifested by an annual increase in the average age of the population, the value of the age index and an increase in the percentage of persons over sixty-five years of age in the structure of the Czech population, and the index of economic dependence is also increasing in line with this trend.

Within the population structure, the increasing proportion of the elderly (both women and men) represents an important factor determining and predicting the development of the Czech health system and the expected increasing needs for health and social services. Demographic forecasts for the next thirty years are based on the assumption of a significant increase in the currently most dynamically developing age group of people over sixty and sixty-five years of age (the share of people over sixty years of age currently represents approximately 25% of the population structure). The predicted rise will be the result of a shift in time of the currently strongly represented generation of people aged 30 to 50 years. Hence, a higher incidence of diseases associated with the elderly population is objectively expected. Population models operate with higher increases in patients with malignant tumors, circulatory musculoskeletal diseases, lung diseases, connective tissue diseases, diabetes mellitus, neurodegenerative diseases and others. The gradual ageing of the population is associated with the assumed need to also target healthcare on the area of health and social services provided at the end of life (long-term, possibly also day-care, development of palliative medicine), the need for which will

multiply significantly in connection with the ageing population. The expected trend of population ageing, which is associated with the expected future orientation towards health and social services linked with the generation of older people, is further reinforced by the prediction of a gradual increase in life expectancy, which, according to the year of birth, has been rising in the Czech population over the long term, although the observed values are still lower than the average in European Union countries. In 2017, life expectancy at birth for women was found to be 82.0 years (1.8 years more than in 2007), and in 2050, the figure is expected to be 86.7 years. Life expectancy for men in 2017 was 76.1 years (2.3 years more than in 2007), and life expectancy for men in 2050 is projected to be 82.1 years.

The parameter of healthy life expectancy, which should increase in proportion to the increasing life expectancy, is also inherent in the question of life expectancy. In this context, it is necessary to emphasize both health literacy and the emphasis on citizens' responsibility for their health. Although the Czech Republic has made significant progress in this respect in previous years, there is still room for improvement compared to other developed countries in the European Union. However, the positive development in life expectancy and healthy life expectancy is clearly the result of improving healthcare in the Czech Republic.

In terms of overall mortality in the Czech population, the available data show a slightly increasing trend.

However, this is largely due to the aforementioned phenomenon of population ageing. Deaths of long-term patients without an acute cause represent about 62% of the total number of deaths in the Czech Republic (about 66,600 patients potentially requiring long-term or palliative care annually). More than a quarter of the total number of deaths in the Czech Republic (25.9% of deaths, about 285 deaths per 100,000 inhabitants) can be assessed as premature or preventable (typically e.g., deaths from diabetes mellitus before the age of 49). Such mortality rates from preventable diseases are significantly higher than the EU average (216 deaths per 100,000 inhabitants). In addition to demographic ageing, unhealthy lifestyles combined with the influence of risk factors (alcohol consumption, tobacco use, poor eating habits, etc.) are also to blame for premature deaths. The proportion of preventable deaths in the total number of deaths shows a marked imbalance between men and women, with men having a higher proportion of premature deaths 31.9%, compared to 16.7% for women. The observed trend of a slight decrease in premature deaths in the last decade of the analyzed period can be perceived positively, with the share of premature deaths decreasing in both male and female mortality. An adequate option to reduce the proportion of premature deaths in the overall number of deaths in a targeted and effective manner appears to be the process of increasing health literacy and effective prevention programs.

Data from the Czech Statistical Office for 2017 show that globally, the three most common causes of mortality are diseases of the circulatory system (44.3% of deaths), followed by neoplasms (25.0% of deaths), and the third most common cause of death is respiratory disease (7.2%). The three most common groups of causes of death have been the same for men and women over the long term, but the first two groups of causes of death have shown a slight decline over the long term (between 2006 and 2016, the proportion of circulatory diseases fell on average by 6% and the incidence of neoplasms by 1.2% on average). Other causes of mortality include external causes (which predominate in men and account for 6.7% of all deaths), endocrine and metabolic diseases (predominant in women - 4.5% of all deaths) and

diseases of the digestive system (3.7% of all deaths). However, an increase (by more than 4% on average) was recorded for other causes of death between 2006 and 2016, which include diseases of the nervous system, infectious and parasitic diseases and, last but not least, mental illnesses and behavioral disorders such as Alzheimer's disease and dementia. In terms of premature or preventable deaths, the most common cause of death is coronary heart disease (7% of total deaths), followed by lung cancer (3.7%) and accidents (2.7%). The overall hospital mortality rate can be considered relatively low in the Czech Republic, which, according to the most recent data, does not exceed 3%; it is a constant value over time (fluctuating between 2.7 and 2.9%).

The available statistical data show that the targeting of applied health research towards the "Healthy population" priority is still relevant several years later, and this priority will continue to play a key role in the future direction of health research. As already mentioned above, especially in view of the current global epidemiological situation, the area of "public health" cannot be significantly overlooked. The fundamental mission of health research remains the systematic investigation of the causes of death. Research into the healthcare system should therefore be directed towards the most common and most dangerous diseases occurring in the population, which have a potentially significant negative impact on the health status of the living population and mortality rates, both in terms of the effective treatments available and in terms of prevention of the diseases in question. An open area offering room for research activities is the above-mentioned issue of population ageing and the related continuous improvement of the quality of life in old age. According to the temporal development of the population health indicator values, healthcare in the Czech Republic can be comprehensively considered as an area characterized by permanent improvement. Healthcare in the Czech Republic shows consistently positive results, as evidenced by the aforementioned increase in life expectancy and healthy life expectancy. This claim is also supported by international comparative studies indicating, among other things, that the level of healthcare provided in the Czech Republic is generally ahead of Central and Eastern European countries (e.g. studies quantifying the survival rates of cancer patients show positive reports for Czech oncology - the success rate of cancer patient treatment is generally increasing, in the vast majority of diagnoses the five-year relative survival rates are close to or just below the European average, while at the same time being significantly above the rates achieved in other Central and Eastern European countries). Despite the improving level of healthcare in the Czech Republic, however, it must be emphasized that there is still significant room for further improvement in a number of population health indicators, but this does not mean only an absolute improvement in population averages.

In relation to the ageing of the Czech population analyzed above, it is also necessary to take into account the fact that the process of continuous ageing also affects health researchers. It is therefore desirable to target support for health research specifically on the younger generation of researchers, and this effort is reflected in the Subprogram of this Program.

Last but not least, it is essential to respond to the needs and priorities at the EU level in order to achieve strategic objectives, as well as to maintain the resilience and competitiveness of the European industry in relation to health research in the Czech Republic. The efforts of Subprogram 3, focused on European Partnerships in the field of health (hereinafter referred to as "EP"), aim to fulfill these endeavors.

7. Duration of the Program

The duration of the Program is set between 2024 and 2030, i.e., 7 years.

The duration of a project will be at least 3 years and no longer than 7 years, with the duration in the individual public tenders in research, experimental development and innovation set in such a way that the available state budget expenditures are used optimally. Projects implemented under the Program must be completed by 31 December 2030 at the latest. Further specifications will be provided in the public tender dossier.

The timeframe according to the Commission Regulation has been set until 2030, given that no new projects will be launched between 2028 and 2030, but multi-annual projects launched by 2027 will be finalized.

In the case of Subprogram 3, the duration of the program differs depending on the year in which the respective EP was established. Generally, the duration of Subprogram 3 is from 2025 to 2030, i.e., 6 years. The duration of the projects will typically be 36 months/3 years, and the projects implemented must be completed no later than a period, which will depend on the defined conditions set by the individual EP. This means either by the end of the respective EP or by the end of the specified timeframe for the implementation of individual calls under that EPs.

8. Deadline for the announcement of Program public tenders

A total of 4 one-stage public tenders are planned to be announced under the Program. The tender will be announced for the first time in 2023 with aid being provided from 2024. Subsequently, annual public tenders are to be announced in 2024, 2025 and 2026, with the provision of aid starting in 2025, 2026 and 2027, whereas projects with a maximum duration of 4 years can apply for the tenders announced in 2026, so that they are completed by 31 December 2030 at the latest. In the first or second public tender of this Program, it will be possible to support projects of up to 7 years' duration, which will be focused on addressing issues of so-called translational medicine (i.e., preclinical research requiring a subsequent clinical trial; a more detailed specification of these projects, including the required outputs, will be provided in the public tender dossier). Public tenders will be implemented with regard to financial possibilities and needs related to the achievement of the Program's objectives.

In the case of Subprogram 3, a public tender will not be announced, as according to Act No. 130/2002 Coll., on the Support of Research and Development, targeted support must be provided by the provider following a public tender, with the exception of those projects of international cooperation in research, development, and innovation, where the project selection was conducted at the international level. Given that projects within the EP undergo international evaluation, the support is provided in accordance with Section 7, Paragraph 4 of the Act on the Support of Research, Development, and Innovation (ZPVV), based on the selection of project proposals at the international level, and no subsequent public tender is announced. At the national level, only a formal eligibility check will be conducted based on predefined conditions set by the national provider.

Under Subprogram 3, a total of 6-7 co-funded transnational calls with EC contribution are planned to be launched within each EP. Given the Czech Republic's accession to the relevant

EPs in 2024, these transnational calls will be further announced in 2025, with the provision of support starting in 2025. Subsequently, it is planned to launch annual Joint Transnational Calls in 2025, 2026, 2027, 2028, and 2029, with the start of support in 2026, 2027, 2028, 2029, and 2030. The projects are expected to be completed by the end of the total duration of the respective EP.

9. Total Program Expenditure

The total expenditure for the duration of the Program between 2024 and 2030 is expected to be CZK 6 378,5 million, of which CZK 5 837,5 million will come from state budget expenditure on research, development and innovation, while the Program will be financed according to the possibilities of the state budget. The average intensity of the Program support is 90% due to the anticipated representation of research organizations and enterprises in the Program projects.

The total Program expenditure for the duration of the Program is allocated in accordance with the expected gradual announcement of tenders and in relation to the expected average duration of projects. The budget for the individual tenders was planned according to the current development and with regard to the growth of the Czech economy in recent years, during which both wages and the prices of goods and services increased, thus increasing also the costs of the projects.

Table 1: Total Program Expenditure and State Budget Expenditure (in millions of CZK)

year	2024	2025	2026	2027	2028	2029	2030	total
Total expenditure	330	850	1230	1505	1230	820	422,5	6387,5
State budget expenditure	300	775	1125	1375	1125	750	387,5	5837,5
Non-public sources	30	75	105	130	105	70	35	550

10. Form, Intensity and Amount of Support

Support will be provided in the form of a subsidy for eligible costs to legal or natural persons, as an increase in the expenditure of state organizational units or organizational units of ministries.

The intensity of support, set as a percentage of the project's eligible costs, will be calculated for each Program project and for each beneficiary and other participant separately under the Commission Regulation. The maximum allowable support intensity per project in accordance with Act No. 130/2002 Coll. and the Commission Regulation for projects involving only research organizations may be up to 100% of the total eligible costs, *for the non-economic activities of research organizations under point 20 et seq. of the Framework*. For projects involving enterprises, the maximum allowable intensity of support for applied research[1] and

[1] In accordance with Article I, paragraph 1.3. (16) (e) of the Framework, applied research is defined as industrial research, experimental development or a combination of the two.

individual categories of beneficiaries and other participants will be specified in the dossier for each tender according to current European Union regulations.

The maximum amount of aid allowed for the project (without a notification obligation detailed assessment by the EC), which is stipulated in Article 4 (1) (i) of the Commission Regulation, will not be exceeded. The amount of aid will be assessed individually for each project. The amount of aid requested must be justified and proportionate to the objectives, duration and expected results of the project.

The following table shows the maximum allowable support intensities for basic and applied research by category of participants (according to Article 25, paragraphs 5 and 6 of the Commission Regulation).

Table 2: Permitted intensity of support according to research and enterprise category

<table>
<tr><th></th><th>Small enterprise</th><th>Medium enterprise</th><th>Large enterprise</th></tr>
<tr><td>Basic research</td><td>100%</td><td>100%</td><td>100%</td></tr>
<tr><td>Industrial research</td><td>70%</td><td>60%</td><td>50%</td></tr>
<tr><td>Industrial research in the case of:</td><td rowspan="5">80%</td><td rowspan="5">75%</td><td rowspan="5">65%</td></tr>
<tr><td>• effective cooperation between enterprises;
for large enterprises: cross-border cooperation with at least one small or medium-sized enterprise</td></tr>
<tr><td>or</td></tr>
<tr><td>• cooperation with a research organization</td></tr>
<tr><td>or</td></tr>
<tr><td>• the public dissemination of results</td><td></td><td></td><td></td></tr>
<tr><td>Experimental development</td><td>45%</td><td>35%</td><td>25%</td></tr>
<tr><td>Experimental development in the case of:</td><td rowspan="5">60%</td><td rowspan="5">50%</td><td rowspan="5">40%</td></tr>
<tr><td>• effective cooperation between enterprises;
for large enterprises: cross-border cooperation with at least one small or medium-sized enterprise</td></tr>
<tr><td>or</td></tr>
<tr><td>• cooperation with a research organization</td></tr>
<tr><td>or</td></tr>
<tr><td>• the public dissemination of results</td><td></td><td></td><td></td></tr>
</table>

Under Subprogram 3, a project will typically be supported for a duration of 36 months/3 years, with funding up to CZK 6.25 million per project. The amount of national support will be assessed for each project individually. The amount of national budget allocation for each transnational call announced within the relevant EPs may vary depending on the results of a survey of the Czech research community, as well as the motivation or interest of Czech researchers to participate in these calls. In this regard, if there is a high potential for the Czech research community to participate in a call within one of the EPs, national financial resources for that call may be increased at the expense of other EPs, where the interest of the Czech research community does not reflect their research needs. The additional expenditures of the Ministry of Health's budget chapter will be ensured within the expenditure limits of the approved medium-term outlook.

11. Beneficiaries

The candidate for, or beneficiary of support from the Program for a project under Act No. 130/2002 Coll., the Commission Regulation and the Framework, as well as other participants of the project, may be:

1. Organizations for research and the dissemination of knowledge (hereinafter referred to as "Research Organizations") – legal entities that meet the definition of a research organization under the Commission Regulation[2] and which address the project individually or in cooperation with other participants and demonstrate the ability to co-finance the project from non-public funds.
2. Enterprises – legal and natural persons who, according to Annex 1 of the Commission Regulation, carry out an economic activity and handle the project independently or in cooperation with other participants and demonstrate the ability to co-finance the project from non-public funds. The beneficiary of the support in accordance with Article 1 (4) (a) of the Commission Regulation cannot be an enterprise for which a recovery order has been issued.

The assessment of whether the candidate or other participant fulfils the definitions of a research organization pursuant to Act No. 130/2002 Coll., the Commission Regulation and the Framework will be performed by the provider individually for each candidate or other participant during the assessment of the project proposal and during the project itself. The fulfillment of the definition of a research organization will be verified by submitting the documents specified in the tender dossier.

Based on long-term experience, the provider assumes that the main beneficiaries will be universities (especially medical faculties), contributory organizations of the Ministry of Health (university hospitals and specialized institutes) and professional institutes of the Academy of Sciences of the Czech Republic. To a lesser extent, legal entities registered in the Commercial Register or healthcare service providers established by regions or other organizational units of the state will probably also be involved in the projects.

12. Eligibility of Candidates for Support

Only those candidates who meet the eligibility conditions set out in Section 18 of Act No. 130/2002 Coll. may receive project support in this Program. If more than one candidate is jointly involved in a single project, the obligation to demonstrate eligibility applies to all such

[2] In accordance with Article 2 (83) of the Commission Regulation, "an organization for research and the dissemination of knowledge" is an entity (e.g. university or research institute, technology transfer agency, innovation intermediary, a physical or virtual cooperating research-oriented entity) irrespective of its legal status (established by public or private law) or the method of financing, whose main objective is to independently conduct basic research, industrial research or experimental development or to disseminate publicly the results of such activities through teaching, publishing or knowledge transfer. If the entity also carries out economic activities, separate accounts should be provided for the financing, costs and income associated with these activities. Enterprises that may exercise a decisive influence on such an entity, such as shareholders or members, must not have preferential access to the results it has achieved.

candidates. The candidate demonstrates eligibility through the submission of documents according to Act No. 130/2002 Coll. in a manner stipulated by the provider in the tender dossier.

Compliance with the eligibility condition will be evaluated by the committee for the acceptance of project proposals before the project proposals are assessed. Failure to comply with any of the eligibility conditions is a reason for not including the project proposal in the tender.

13. Cooperation between Enterprises and Research Organizations

Effective cooperation on a project between an enterprise and a research organization is understood, in accordance with the Commission Regulation, as their share in the project design, their (joint) contribution to project implementation and in the (joint) risk and their sharing in the project results. Contracted research and the provision of research services are not considered to be forms of cooperation. The fulfilment of the conditions set out in Article 25(6) of the Commission Regulation (i.e., the required minimum share of the research organization in the eligible costs and the right of the research organization to publish the results of the research project) allows the provider to grant the undertaking a supplement for effective cooperation with the research organization. The basis for assessing whether the project proposal involves effective cooperation between an enterprise and research organization will be the draft cooperation agreement between the tenderer(s) and the proposed additional participants from which compliance with the above conditions of effective cooperation will be apparent. This evaluation will be carried out during the assessment of the project proposals.

14. Eligible and Recognized Program Costs

Support will be provided for recognized project costs defined in accordance with Act No. 130/2002 Coll. and the Commission Regulation (Article 25(3)). Recognized costs are those eligible costs that the provider approves, are justified, accountable, and their necessity for the project must be evident from the project proposal. Recognized costs must be reasonable (they must be in line with the usual prices at the given time and place) and be spent in accordance with the principles of economy, efficiency and effectiveness.

The eligible costs of a Program project are those costs or expenditures in research, development and innovation that can be incurred by the beneficiary for research, development activities and innovation, or in connection therewith, in particular:

a) personnel costs or expenses, including scholarships for research, development and innovation under the Universities Act,
b) costs or expenses of acquiring tangible and intangible assets,
c) other operating costs or expenses,
d) costs or expenses for services,
e) additional costs or expenses.

15. Program Focus

In general, the mission of the health sector is to ensure and maintain access for the entire population

to the prevention, treatment, promotion and protection of their health, to foster motivation for a healthy lifestyle and to consistently apply the rules of effective disease prevention. The current very good level of Czech healthcare needs to be promoted through targeted research interventions arising from both basic and applied health research.

Within its thematic focus, the Program is based, inter alia, on the R&D&I Priorities, specifically on Priority 5: Healthy population, which is a crucial prerequisite for an economically, socially and humanly successful society. A fundamental aspect of "health" is the dynamics of change and processes, the effects of which are, however, delayed in society. This opens the way for numerous disparities to arise, the most significant manifestations of which can be seen in the comparison of the development of medical science and the economic possibilities of the country. The dynamically changing external influences of the environment cannot be ignored either; on the other hand, the significant changes in the external world also require due attention (see below).

The Program also reflects the RIS3 priorities outlined in the Advanced Medicine and Medicinal Products specialization domain. The Program will explore and develop applications based on all Key Enabling Technologies (KETs) and develop strategic themes in this domain, namely Personalized and Precision Medicine; Telemedicine, eHealth and AI; Medical Devices; Innovative Products and Solutions for the Pharmaceutical and Biotechnology Industries; Prevention, Public Health Protection and Health System Resilience. The Program will also support the social sciences and humanities themes listed in RIS3, such as ethics, legal and social aspects, societal impacts, social and cultural barriers, organization of healthcare, etc.

The health system and related areas must be set up to adapt to the dynamic development of knowledge. The ability of the health sector to fully adapt to potential changes in the environment, knowledge and society is central to its meaningful functioning.

The first key area targeted by the Program is "**Public Health**". However, the public health issue itself is a very broad area and is comprehensively interconnected with diverse spheres of public life. Hence, public health cannot be reduced to the sphere of healthcare. In the context of public health, it is essential effectively to implement interventions with significant economic and social impacts in different areas. In the area of public health, the Program includes in particular the issues of **health economics**, **the digitalization of healthcare**, **demographic changes and care for the elderly**, **healthcare**, **health literacy and orientation on the patient**, as well as **health promotion and prevention** and **global health** issues.

Prevention plays a key role in the context of the riskiest population diseases, and is one of the most effective tools for achieving the goal of a healthy population. The focus of health research should therefore be not only on treatments applicable to individual diseases, but also on ways to prevent them. Health research should reflect the behavior of the population at large, especially with regard to their poor nutritional, addictive, exercise and other negative behavioral patterns that contribute significantly to the spread of chronic non-communicable civilizational diseases. The issue of prevention, however, also needs to be considered on a broader scale in relation to the changing influences of the external environment. Many diseases are largely determined by the quality of the living and working environment, where the importance of primary prevention is unquestionable. In practical terms, the issue is represented by the fields of hygiene, occupational medicine, epidemiology and public health in general.

The second coherent group of interventions of the Program is the area of "**Pathogenesis and development of diseases**". Within this thematically closed unit, there is a separate area for **metabolic and endocrine diseases**, as well as **diseases of the circulatory system**, **cancer**, **chronic lung diseases**, **blood diseases**, **nervous and psychological diseases**, **musculoskeletal diseases and inflammatory diseases**, **immunopathological diseases**, **infectious diseases** and finally **diseases in the perinatal period and childhood**. Within the thematic priorities of the Program, it is impossible not to mention the current issue of the Covid-19 pandemic and infectious diseases in general. Newly emerging infectious diseases and the ever more present resistance of new agents need continuous and adequate attention. The growing importance of virology is undeniable nowadays, and the promotion of this branch of medicine is a long-term research task. However, despite the existence of the pandemic and its reflection in the thematic focus of health research, it is necessary to focus on other areas characterized by the highest incidence of disease, and therefore the riskiest and safety-sensitive areas. Health research should focus continuously on the issues and challenges associated with the continuous monitoring of morbidity and mortality, but it cannot be based on demographic mortality data alone. A long-term challenge for health research is to focus on the inter-causality of morbidity and mortality, i.e., to address the most common (health) causes of death, i.e., diseases leading to death, and to address the causes of these diseases that most threaten the quality of life of the living population. Topping the list of the riskiest and most dangerous groups of diseases are chronic non-infectious diseases such as cardio- and cerebrovascular diseases, lung diseases, oncological diseases, metabolic diseases, neurodegenerative diseases, dementia and other psychiatric diseases, chronic musculoskeletal diseases and others. Research on these most common and dangerous diseases for the health of the population cannot be narrowly focused only on diseases in adulthood with a high incidence, but should cover all ages represented in the population, including perinatal and pediatric patients, patients suffering from rare diseases, pediatric patients, adolescents and polymorbid seniors. health research also includes equally important support for the creation and development of new medical technologies, such as genetics or nanotechnology.

The Program's third major thematic area of focus is "**Innovative Solutions for Medicine**". This includes a total of nine separate thematic sub-areas offering the potential for innovative solutions for medicine, namely **personalized medicine and new diagnostic and theranostic procedures**, research into **low molecular weight drugs**, **drugs for modern therapies** (somatic cell therapy, gene therapy, tissue engineering products), **biologics including prophylactic and therapeutic vaccines**, research into **new drug formulations**, **development and research into new medical devices and equipment**, **innovative research in surgery including transplantation**, research into **telemedicine and eHealth**, or research focused on **innovative palliative care practices and supportive care**. The area of personalized medicine is at the forefront of cross-cutting themes that are characterized by their innovative potential in addressing major medical questions and challenges, and should be given adequate attention through health research given their growing importance. Through the use of high-throughput molecular biology methods, modern imaging methods and with the development of bioinformatics approaches, a more detailed characterization of disease at an individual level can be achieved, leading to a higher degree of personalization of medicine and a better understanding of human disease. Moreover, the knowledge of personalized medicine through

downstream translational research opens up new possibilities and opportunities for the development of innovative diagnostic, therapeutic and theranostic procedures and tools applicable in clinical practice both at the individual level and within stratified sets of patients of individual diagnostic units. The wider application of personalized medicine principles across the health system is a long-term challenge for technological development.

16. Compliance of the Program with R&D&I Priorities

R&D&I priorities represent the basic framework for the thematic direction of targeted support for research, development and innovation in the Czech Republic. The focus of the Program and its main objective is compliant with the R&D&I Priorities, specifically with Priority 5: Healthy Population. Priority 5: Healthy Population is divided into three areas (1. Emergence and development of diseases, 2. New diagnostic and therapeutic methods; 3. Epidemiology and prevention of the most serious diseases), which are further divided into 21 sub-areas and 43 sub-objectives. Within its comprehensive thematic scope, the Program not only fully reflects and respectively fulfils the key areas set by the R&D&I Priorities, but goes beyond them to a certain extent (especially within the broadly defined first area of the "public health" Program, which includes the digitalization of health and the promotion of health literacy). Thematically, the Program contributes to the fulfilment of the research objectives defined in the R&D&I Priorities and focused on elucidating the emergence and development of diseases, the development of new diagnostic and therapeutic methods and the development of epidemiology and prevention of the most serious diseases. The objectives based on the R&D&I Priorities are included and elaborated in the Program in three priority thematic areas on the basis of which the Program is structured (1. Public Health, 2. Pathogenesis and development of diseases, 3. Innovative solutions for medicine). Targeting science and research towards the fulfilment of the given thematic priorities and their set objectives will help both to improve quality in the field of prevention, diagnosis and treatment of diseases and to strengthen the flexibility and resilience of the Czech health system.

The following table shows the relationship of the structure of Priority 5: Healthy Population, R&D&I priorities and the Program framework. The right column of the table lists the specific thematic points of the Program corresponding to each area/sub-area of the R&D&I Priorities. As can be seen, although the concept of the Program breakdown is not entirely identical to the structure of the given priority, the Program breakdown is based on the structure and objectives of the priority, reflects all the topics raised by the priority and fulfils them in content.

Table 3: Compliance of the Program with R&D&I Priorities

R&D&I Priority 5: Healthy population	Program
Area 1. Emergence and Development of Diseases	**Area 2. Pathogenesis and development of diseases**
Sub-area 1.1. Metabolic and endocrine diseases • Priority sub-objective 1.1.1. Etiology and Pathophysiology of Insulin Resistance	Sub-area 2.1. Metabolic and endocrine diseases

• Priority sub-objective 1.1.2. Etiology and pathogenesis of immune-mediated endocrine diseases • Priority sub-objective 1.1.3. Pathogenesis and treatment of diabetes complications	
Sub-area 1.2. Circulatory diseases • Priority sub-objective 1.2.1. Clarification of etiological factors and pathophysiological processes affecting the onset and course of cardiovascular and cerebrovascular diseases • Priority sub-objective 1.2.2. Development of early diagnosis of cardiovascular and cerebrovascular diseases and finding treatment modalities and procedures in the treatment of cardiovascular and cerebrovascular diseases with higher therapeutic efficacy and greater patient friendliness	Sub-area 2.2. Circulatory diseases
Sub-area 1.3. Cancer • Priority sub-objective 1.3.1. Tumor biology in relation to diagnostic and therapeutic targets • Priority sub-objective 1.3.2. Host-tumor relationship analysis as a means of individualizing diagnosis and treatment	Sub-area 2.3. Cancer
Sub-area 1.4. Nervous system and mental illnesses • Priority sub-objective 1.4.1. Mental and neurological diseases • Priority sub-objective 1.4.2. Diagnosis of nervous system diseases • Priority sub-objective 1.4.3. Increased effectiveness of treatments for nervous system diseases • Priority sub-objective 1.4.4. Ensuring quality of life in patients with nervous system diseases	Sub-area 2.6. Nervous system and mental illnesses
Sub-area 1.5. Diseases of the musculoskeletal system and inflammatory and immunological diseases • Priority sub-objective 1.5.1. Etiology and pathogenesis of degenerative and metabolic diseases of the musculoskeletal system • Priority sub-objective 1.5.2. Defining risk factors for allergic diseases and identifying new objectives for the targeted treatment of these diseases	Sub-area 2.7 Diseases of the musculoskeletal system and inflammatory diseases (Sub-area 2.8 Immunopathological diseases)
Sub-area 1.6. Infection • Priority sub-objective 1.6.1. Etiology and treatment of major infectious diseases	Sub-area 2.9 Infectious diseases
	+ Sub-area 2.4 Chronic lung diseases + Sub-area 2.5 Blood diseases

	+ Sub-area 2.10 Diseases of the perinatal period and of childhood
Area 2. New Diagnostic and Therapeutic Methods	**Area 3. Innovative solutions for medicine**
Sub-area 2.1. In vitro diagnostics • Priority sub-objective 2.1.1. To deepen knowledge in the field of omic and high-capacity methods • Priority sub-objective 2.1.2. New IVD technologies	Sub-area 3.1 Personalized medicine and new diagnostic and theranostic procedures
Sub-area 2.2. Low molecular weight drugs • Priority sub-objective 2.2.1. New low molecular compounds • Priority sub-objective 2.2.2. Identification of new therapeutic targets, new methods and procedures for biological testing	Sub-area 3.2 Low molecular weight drugs
Sub-area 2.3. Biological drugs including vaccines • Priority sub-objective 2.3.1. New vaccines for the prevention and treatment of diseases and addictions	Sub-area 3.4. Biological medicines, including prophylactic and therapeutic vaccines
Sub-area 2.4. Drug delivery systems • Priority sub-objective 2.4.1. Development of new carriers for the controlled release and delivery of drugs • Priority sub-objective 2.4.2. Systems for overcoming biological barriers and chemo-resistant diseases	Sub-area 3.5. New drug formulations
Sub-area 2.5. Gene, cell therapy and tissue replacements • Priority sub-objective 2.5.1. Sources for cell and tissue therapy • Priority sub-objective 2.5.2. Methods for the differentiation and gene modification of cells/tissues • Priority sub-objective 2.5.3. Biomaterials	Sub-area 3.3. Medicinal products for advanced therapies
Sub-area 2.6. Development of new medical devices and equipment • Priority sub-objective 2.6.1. Electrical and magnetic mapping and stimulation • Priority sub-objective 2.6.2. Endovascular procedures • Priority sub-objective 2.6.3. Navigation and robotic systems, neurostimulators. Refinement and control of invasive techniques	Sub-area 3.6. Sub-area 2.6: Development of new medical devices and equipment
Sub-area 2.7. Innovative surgical procedures including transplantation	

• Priority sub-objective 2.7.1. Surgical procedures and transplantation • Priority sub-objective 2.7.2. Non-invasive treatment	Sub-area 3.7. Innovative research in surgery including transplantation
	+ Sub-area 3. 8 Telemedicine and eHealth + Sub-area 3.9 Innovative practices in palliative and supportive care
Area 3. Epidemiology and prevention of the most serious diseases	**Area 1. Public health** **Sub-area 1.6 Health promotion and prevention**
Sub-area 3.1. Metabolic and endocrine diseases • Priority sub-objective 3.1.1. Evaluation of the impact of preventive measures on the occurrence of the most common metabolic disorders	Sub-area 1.6.1. Metabolic and endocrine diseases
Sub-area 3.2. Circulatory diseases • Priority sub-objective 3.2.1. Population study: disease data • Priority sub-objective 3.2.2. Population intervention, assessment of the impact of preventive measures	Sub-area 1.6.2. Circulatory diseases
Sub-area 3.3. Cancer • Priority sub-objective 3.3.1. Tumor screening and prevention • Priority sub-objective 3.3.2. Identification of risk factors and individuals in populations	Sub-area 1.6.3. Cancer
Sub-area 3.4. Nervous system and mental illnesses • Priority sub-objective 3.4.1. Population study: disease data • Priority sub-objective 3.4.2. Population intervention, assessment of the impact of preventive measures	Sub-area 1.6.4. Nervous system and mental illnesses
Sub-area 3.5. Diseases of the musculoskeletal system and inflammatory and immunological diseases • Priority sub-objective 3.5.1. Epidemiology of degenerative and metabolic diseases of the musculoskeletal system	Sub-area 1.6.7. Diseases of the musculoskeletal system and inflammatory and immunological diseases
Sub-area 3.6. Addictions • Priority sub-objective 3.6.1. Links • Priority sub-objective 3.6.2. Social impact	Sub-area 1.6.8. Addictions
Sub-area 3.7. Infection • Priority sub-objective 3.7.1. Epidemiology of infectious diseases • Priority sub-objective 3.7.2. Domestic and imported food as a source of infections	Sub-area 1.7 Global health

	+ Sub-area 1.1 Socio-economic aspects of health + Sub-area 1.2 Digitization of healthcare + Sub-area 1.3 Demographic change and care for seniors + Sub-area 1.4 Healthcare + Sub-area 1.5 Promoting health literacy and patient orientation + 1.6.4. Chronic lung diseases + 1.6.5 Blood diseases

17. Program objectives

The main objective of the Program is to contribute, through the outputs and impacts of the supported projects, to the provision and further development of internationally competitive health research in the Czech Republic, the level of which will be comparable to that of the developed countries of the European Union. The implementation of the Program will subsequently contribute to the development of practically usable results for the needs of healthcare, in the field of public health, elucidation of the pathogenesis and development of diseases, or the search for innovative solutions for medicine, taking into account the maximum efficiency of using public funds. As part of the supported projects, new findings will be achieved, whose specific aim or objective will contribute to the improvement of clinical procedures in the diagnosis, treatment and prevention of the most common, but also rare or completely new diseases. In the medium and long term, the implementation of the Program will have a positive impact on the provision of current healthcare needs in the Czech Republic and will contribute to the overall improvement of human health, whether in the context of the Czech population or on a global scale.

The Program is divided into three main thematic units reflecting the strategic areas of health research in the Czech Republic: *Public Health*; *Pathogenesis and Development of Diseases*; *Innovative Solutions for Medicine*, which are further subdivided into 25 sub-areas (*Public Health* - 7 sub-areas, *Pathogenesis and Development of Diseases* - 9 sub-areas, *Innovative Solutions for Medicine* - 9 sub-areas), which may be further subdivided into more specific sub-areas (see the *Public Health* sub-area *Health Promotion and Prevention* sub-divided to 7 specific sectors). The thematic sub-areas are characterized by their own narrowly defined specific objectives, always with one obligatory main objective and other optional secondary objectives (each sub-area is further defined by up to 6 secondary objectives). The Program's thematic definition is fully consistent and based on the National Priorities of Research, Experimental Development and Innovation, namely on Priority no. 5: Healthy Population.

Projects proposed in this Program must be assigned to one or more of the following sub-areas and ensure that one or more of the Program's sub-objectives are fulfilled. **A detailed description of the sub-areas and individual sub-objectives is given in the Health Research Concept until 2030, in Chapter 7.** The provider reserves the right to support also projects that do not fall into these sub-areas. The provider shall specify the requirements for the professional focus of the project proposals, i.e., the characteristics of the individual objectives, in the tender dossiers during the announcement of individual public tenders.

Area 1. Public health

Sub-area 1.1: Socio-economic aspects of health

Main objective

The emergence of an institutional background in which a new type of interdisciplinary collaboration between medical and social science disciplines takes place

Given the current undeveloped state of the field of public health including health economics in the Czech Republic, addressing research topics in the field of public health and health economics requires the creation of a new institutional background that would enable researchers from clinical, social sciences and technical disciplines to collaborate, e.g. in experiments and clinical studies, data collection on (un)healthy behavior, administrative data on the impact of public policies, personal preferences and the influence of health communication, obtaining and using information from specific patient groups and care providers. Related to this is the need to develop educational and research capacities in the field of public health, health economics and related disciplines in order to strengthen staff capacity in this area in the coming decades: strengthen the capacity of existing institutions in the field of public health (the State Institute of Health, Regional Public Health Authorities, etc.) and modernize their structure and focus, as well as create new study programs that will produce experts for this system with an overview not only in epidemiology, hygiene and prevention, but also in the economics of healthcare, its management and evaluation. Due to the current staff shortage (resulting from many years of lack of support in this sphere), the establishment of large research centers in the first half of this period is not very realistic; it is first necessary to expand the base by educating a new generation of experts. It will be advisable to closely link key existing institutions (e.g., the State Institute of Health and the Institute of Health Information and Statistics) and, by strengthening their role and cooperation, provide a basis for the development of the whole field.

Sub-objective 1.1.1: Collection, quality and application of healthcare and behavioral data

Sub-objective 1.1.2: Program impact measurement and analysis of new programs or legislative proposals by government and independent experts

Sub-objective 1.1.3: Developing new methodologies and interdisciplinary collaboration in healthcare

Sub-objective 1.1.4: Social determinants of health and the gender dimension

Sub-area 1.2: Digitalization of healthcare

Main objective

The research and development of digital technologies will lead to improved population health, patient empowerment and quality of patient services. Innovative solutions for integrating digital technologies into health services will improve their accessibility and efficacy. The use of

available data sources will enable the improvement and streamlining of healthcare development and the improvement of care quality. There will be a development at the level of innovative tools using artificial intelligence.

Sub-objective 1.2.1: Digitization will improve population health and the quality of health services

Sub-objective 1.2.2: Digitization will lead to improved accessibility and efficiency of health services and higher levels of data integration within the healthcare provider system

Sub-objective 1.2.3: Increased use of data sources in the Czech health system

Sub-area 1.3: Demographic changes and care for the elderly

Main objective

Deliver the highest possible standard of quality health and social care at every point of contact (primary care, outreach services, inpatient acute and follow-up care, respite care), including through the use of data-based and evidence-based decision making and evaluation of health outcomes using smart data and applied knowledge. A robust data base, analysis of available resources and identification of stakeholder needs along with the implementation of intelligent virtual care tools, which also include mental health care and chronic condition management, leading to the protection and support of health and improving the quality of life for all involved:

- aging population;
- chronically ill;
- non-professional carers (especially caring seniors and the so-called sandwich generation);
- professional carers (health and social workers).

Sub-objective 1.3.1: Analysis of the structure of providers and social healthcare among the elderly (senior population)

Sub-objective 1.3.2: Analyzing and addressing the social and healthcare needs of the elderly (especially the very elderly)

Sub-objective 1.3.3: Early prevention and mitigation of the impacts of invasive changes, including the use of modern technologies

Sub-objective 1.3.4: Promoting quality and safe patient care with regard to age-specific risks and the prevention of adverse events in the provision of long-term medical and nursing care

Sub-area 1.4: Healthcare

Main objective

A key goal of healthcare research is to provide patients with evidence-based, timely, high-quality healthcare that is delivered in a cost-effective manner. An important aspect to assess the availability and quality of health service provisioning is the adequate provision of material

capacity. In our conditions, this refers especially to the qualified capacities of health professionals. Healthcare must be provided with respect for the patient's human rights, on the basis of equality, taking into account their limited social and financial resources.

Sub-objective 1.4.1: Analysis of the need for and use of healthcare among people with chronic diseases

Sub-objective 1.4.2: Measurability of healthcare outcomes

Sub-objective 1.4.3: Capacity, consumption and access to healthcare

Sub-objective 1.4.4: Human resources in healthcare

Sub-objective 1.4.5: Patients' participation rights and respect for the autonomy of their will

Sub-objective 1.4.6: Means of protecting the rights of persons in healthcare malpractice

Sub-area 1.5: Promoting health literacy and patient orientation

Main objective

Based on research and using the experience of other European countries, a National Health Literacy Program will be developed. The program will contribute to optimizing government processes through strategic planning and the strategic management of organizations to ensure increased health literacy. This goal will be achieved by ensuring systemic support for the development of health literacy in the Czech Republic through the newly created strategic management of state administrative organizations at all the relevant ministries and a strategically defined system of long-term awareness and education of the Czech population in this area. The implementation of the National Health Literacy Program will be monitored through representative surveys and validation studies of the individual components of the program.

Sub-objective 1.5.1: Monitoring the level of health literacy in the Czech Republic

Sub-objective 1.5.2: Research on the competences and needs of health literacy actors

Sub-objective 1.5.3: Research on specific target groups of the National Health Literacy Program

Sub-objective 1.5.4: Research on specific areas of health literacy

Sub-objective 1.5.5: Health literacy competencies of health professionals

Sub-objective 1.5.6: Combating unscientific views in healthcare

Sub-objective 1.5.7: Strengthening health literacy unencumbered by gender stereotypes

Sub-area 1.6: Health promotion and prevention

1.6.1. Metabolic and endocrine diseases

Main objective

Obtain validated epidemiological data on (i) the prevalence, trends, health and economic consequences of, in particular, mass-onset metabolic and endocrine disorders and their complications, (ii) their treatment and its effectiveness in preventing complications and (iii) their social, socio-economic, behavioral, biological determinants and consequences. These data are the key to basic preventive practices in influencing the development of the group of diseases under study and their complications.

In diabetology and other disciplines, the flow of patients between GPs, specialists and specialized centers will be analyzed, as well as the possibilities of detecting the first markers of the disease and its complications. The priority is monitoring not only the genetic determinants of the disease, but also the interaction of genetic makeup with the environment, e.g., diet and exercise. In view of the ongoing pandemic, research on the prevention of infectious complications and analyses of immune disorders and cytokine deficiencies in diabetics and patients with metabolic syndrome is also a priority. Research into the prevention of increased cardiovascular complications after infection is important. In the coming years, health research on diabetes prevention will focus on the following topics, for example: artificial intelligence - e.g., screening for early forms of disease e.g., diabetic retinopathy. Personalized medicine, enabling the detection of predictors of type 2 diabetes treatment efficacy in relation to diabetes complications. Diabetes prevention and research on early stages of prediabetes - detection of early pathogenetic markers including the use of imaging methods. Longitudinal pathogenetic research in the prevention and treatment of diabetes complications. Nutritional interventions in the prevention of diabetes, including research on nutrigenetic and nutrigenomic factors.

Sub-objective 1.6.1.1: Definition of a set of monitored markers for the emergence of the most common metabolic disorders and their complications

1.6.2. Circulatory diseases

Main objective

Identifying and influencing risk factors for cardiovascular and cerebrovascular diseases in order to reduce the incidence of these diseases in the Czech Republic and to lower their mortality and morbidity. Prevention programs need to be made more attractive and accessible to the general population. It is necessary to focus on both primary prevention (which alone can reduce the prevalence and incidence of these diseases in the population) and secondary prevention (which can reduce mortality and morbidity very significantly). Primary prevention must be targeted at the whole population and should start from school age - promoting healthy eating habits, encouraging sports and physical activity, combating smoking and obesity. Secondary prevention is aimed at reducing mortality and morbidity in people who have already developed the disease. The goal must be to slow or stop the progression of the disease. This can be achieved by modern procedures, both regimen-based (analogous to primary prevention procedures) and pharmacological and interventional (catheterization or surgical methods). Public health should work closely with epidemiologists, hygienists, cardiologists, diabetologists, neurologists, and other specialists to maximize the implementation of a wide range of practices affecting primary and secondary prevention.

Sub-objective 1.6.2.1: Population studies: data on the evolution of key diseases over time

Sub-objective 1.6.2.2: Population intervention, assessment of the impact of preventive measures

1.6.3. Cancer

Main objective

Cancer epidemiological data will be collected and analyzed in a regional, national and international context. Risk factors in individual populations will be identified and specific and non-specific methods of their prevention (primary prevention) will be proposed. Methods of accurate and specific screening will be further developed and tested, ultimately leading to the identification of at-risk individuals, the early detection of tumors, their recurrence and side effects of treatment, with an impact of reduced mortality, morbidity and costs of anticancer treatment with respect to the subjective assessment of the patient's quality of life. The need for specialized palliative care for patients with exhausted options for specific anti-cancer treatment will be recognized. The number of high-quality clinical trials in the above areas and the availability of their outputs will increase.

Sub-objective 1.6.3.1: Screening and secondary prevention

Sub-objective 1.6.3.2: Identification of risk factors and individuals at risk in populations

1.6.4. Chronic lung diseases

Main objective

Early detection of serious chronic lung diseases - research into risk factors for these diseases and their prognosis, whether COPD, severe asthma, lung cancer or fibrotic pulmonary processes. Combat factors that affect lung health and causally contribute directly to the development of chronic lung disease, especially tobacco smoking. Improving the lung health of the Czech population.

Sub-objective 1.6.4.1: Increase awareness of lung health and factors affecting it

1.6.5. Blood diseases

Main objective

Additional epidemiological data on blood diseases will be collected and analyzed in a regional, national and international context. Risk factors will be identified, new treatment strategies will be tested, and strategies to reduce the risk of disease relapse (including follow-up after treatment) will be tested.

Sub-objective 1.6.5.1: Identification of risk factors and individuals at risk in populations

1.6.6. Nervous system and mental illnesses

Main objective

The main demographic and epidemiological characteristics of diseases of the nervous system will be mapped, their linkages (e.g., age, gender, geographical and environmental, developmental, genetic, and comorbidities) and the linkages to health services will be found and identified, and preventive measures evaluated, as well as new services and programs to reduce the prevalence and incidence of diseases of the nervous system, including mental disorders, reduction of recidivism (frequency and length of hospitalization), reduction of the socioeconomic burden and impairment of quality of life that diseases of the nervous system represent. At the same time, research on the efficiency and efficacy of the interventions and services provided (services research) will be carried out in order to optimize the supply and coordination of these interventions.

Sub-objective 1.6.6.1: Population study: disease data

Sub-objective 1.6.6.2: Population intervention, assessment of the impact of new services and preventive measures

1.6.7. Diseases of the musculoskeletal system and inflammatory and immunological diseases

Main objective

Not only prevalence and incidence factors, but also other important environmental factors involved in the etiopathogenesis of these diseases will be known. Among the most important are the relationship of infection to the development of autoimmune diseases, endocrine factors, the effects of ageing, environmental pollution, and the effects of smoking and other addictive substances.

Sub-objective 1.6.7.1: Epidemiology of degenerative and metabolic diseases of the musculoskeletal system and autoimmune-mediated diseases of the gastrointestinal tract

1.6.8. Addictions

Main objective

The aim of the Program is to reduce the prevalence and incidence of addiction and its health and socio-economic impacts, reducing harm associated with substance use (including smoking and alcohol use), gambling, digital addiction and other addictive behaviors, and testing the efficacy of treatment and preventive interventions. A prerequisite for achieving these goals is to map the epidemiology, development risks, societal burden and predictors of addiction treatment and to prepare the basis for preventive measures and programs and for political, legislative and economic decisions.

Sub-objective 1.6.8.1: Links

Sub-objective 1.6.8.2: Social impact

Sub-objective 1.6.8.3: Use of eHealth and ICT-assisted technology in addiction treatment and prevention

Sub-area 1.7: Global Health

Main objective

Use objective indicators to characterize the state of global health, describe trends and quantify the health impact of different interventions and policy approaches. Recognize the risky effects of new technologies, new chemicals, exponential increases in electromagnetic fields, increased noise pollution, light emissions, etc., just like biological agents, physical and psychosocial environmental and working environment factors on health and their mitigation through a combination of preventive and corrective protective measures.

Describe toxic chemicals and mixtures of chemicals from the living and working environment or everyday objects, where they are added to maintain and improve performance. Developmental and organ toxicity, reprotoxicity, neurotoxicity, carcinogenicity and sensitizing and endocrine disrupting effects have been demonstrated for a number of these substances.

Using disease surveillance and biological monitoring, which is the link between all exposure pathways, it is possible to assess levels of not only toxic contaminants, to assess the magnitude of health impacts as a basis for necessary action. Improve the assessment of health risks and health impacts arising mainly from chronic exposure of the population to environmental and dietary toxicants, thus providing an objective, evidence-based foundation for health risk management. It is the most effective route towards targeted action for the protection of public health in terms of reducing and/or phasing out the most serious exposures and thereby improving the health of the population. While, for example, health risks from outdoor air are relatively well known, little is known about the health effects of a mixture of substances in indoor air, where people spend the vast majority of their time. Drinking water from public water supplies and outdoor recreational water can be a source of exposure to health-risk contaminants. However, in addition to the monitored quality indicators, drinking water and bath water can contain a range of other potentially hazardous substances that may pose a health hazard. Adaptation to and mitigation of climate change refers in particular to research, monitoring and issuing measures to prevent infectious and non-infectious diseases and the prevention of health risks caused by extreme weather events. Due to many natural and anthropogenic influences, the human living and working environment is continuously changing, and while some traditional and well-known health risks are becoming irrelevant, many new ones are emerging or waiting to be discovered.

Sub-objective 1.7.1: Living and working environment effects on health

Sub-objective 1.7.2: Impact of nutrition and eating habits on health

Sub-objective 1.7.3: Infectious diseases

Sub-objective 1.7.4: Toxicology and health safety

Sub-objective 1.7.5: Occupational medicine and occupational diseases

Sub-objective 1.7.6: Innovative approaches to health promotion and intervention programs in primary prevention

Area 2. Pathogenesis and development of diseases

Sub-area 2.1: Metabolic and endocrine diseases

Main objective

The etiology and pathogenesis of major metabolic and endocrine disorders in the current population will be elucidated, thereby preventing their progression, mitigating their course and, in particular, reducing their consequences, which affect almost all medical areas and contribute to the overall mortality. This will not only increase the length, but also improve the quality of active life of a wide group of the population with an adequate social and economic impact.

Sub-objective 2.1.1: Etiology and pathophysiology of metabolic syndrome

Sub-objective 2.1.2: Etiology and pathogenesis of immune-mediated endocrine diseases

Sub-objective 2.1.3: Pathogenesis and treatment of diabetes complications

Sub-area 2.2: Circulatory diseases

Main objective

Major progress in the prognosis, diagnosis, and therapy of coronary heart disease, its risk factors, and other CVDs would be unthinkable without the close cooperation of theoretical and clinical cardiologists, cardiac surgeons, angiologists, and vascular surgeons. This cooperation has a long tradition in our country and is the driving force of scientific progress. The aim of the research will be to contribute to the elucidation of etiological factors and molecular and cellular pathogenetic mechanisms involved in the development of coronary heart disease and its risk factors, heart failure, heart rhythm disorders, structural and inflammatory heart disease, congenital heart defects and diseases of the arterial and venous system, with particular attention to improving their prevention, early diagnosis and highly individualized treatment. New etiological factors and new pathophysiological mechanisms will be identified, affecting the onset and progression of cardiovascular diseases, in particular: ischemic heart disease, heart failure, heart rhythm disorders, hypertension, structural heart disease, CIHD, aortic aneurysms, chronic venous insufficiency, inflammatory heart disease and other diseases of the arterial and venous system; with a clear impact on improving their prevention, early diagnosis and highly individualized treatment.

Etiopathogenetic mechanisms, which are the cause of stroke, and possibilities of their influence, especially from the area of “non-traditional” risk factors, will be recognized. In addition, mechanisms that lead to neurological disability in patients with cerebral infarction, spontaneous cerebral hemorrhage, and spontaneous subarachnoid hemorrhage will be recognized and the potential for their influence will be elucidated. The reasons for the success and failure of therapeutic procedures in patients with strokes will be explained. Regeneration mechanisms, which are responses to nervous system disability, including mechanisms of cerebral plasticity and the regeneration of brain tissue within neurorehabilitation, will be understood.

Sub-objective 2.2.1: Clarification of etiological factors and pathophysiological processes affecting the onset and course of cardiovascular and cerebrovascular diseases

Sub-objective 2.2.2: Development of early diagnosis of cardiovascular (CVD) and cerebrovascular diseases (CVO) and finding treatment modalities and procedures in the therapy of cardiovascular and cerebrovascular diseases with higher therapeutic efficacy and greater patient friendliness

Sub-area 2.3: Cancer

Main objective

The main goal of health research in the field of cancer is to deepen knowledge of the pathogenesis of cancer, improve diagnosis and treatment, and improve the quality of life of cancer patients. The individual projects will focus on the possibility of the rapid implementation of research results into clinical practice. Research projects should be directed towards developing new diagnostic methods and algorithms and new therapeutic and preventive procedures.

Sub-objective 2.3.1: Deepening knowledge in the field of pathogenesis and the development of cancer and identification of new therapeutic targets

Sub-objective 2.3.2: Improvement of diagnosis and treatment of cancer, especially through the implementation of precision medicine, pharmaceuticals for modern therapies, targeted drugs and modern radiotherapy

Sub-objective 2.3.3: Improving the quality of life of cancer patients through a better understanding of the factors that accompany cancer and its treatment

Sub-area 2.4: Chronic lung diseases

Main objective

An improved understanding of the pathogenesis of COPD, pulmonary fibrosis and severe asthma leading to the better targeting of existing treatments, including biologic therapy. Precise phenotyping of individual patients based on distinct biomarkers addressing individually specific pathogenesis.

Sub-objective 2.4.1: Influencing previously untreatable and progressive chronic diseases in the sense of stopping progression or finding ways to reverse the process.

Sub-objective 2.4.2: Establishing new therapies by repurposing or combining existing drugs with known targeted drugs. Proposals for new treatment modalities based on phenotype-specific markers of pathogenesis.

Sub-area 2.5: Blood diseases

Main objective

The main goal of health research in the field of blood diseases is to deepen the knowledge of the pathogenesis of blood diseases, improve the diagnosis and treatment, and improve the quality of life of patients. The individual projects will focus on the possibility of the rapid implementation of research results into clinical practice. Research projects should be directed

towards developing new diagnostic methods and algorithms and new therapeutic and preventive procedures.

Sub-objective 2.5.1: Deepening knowledge in the field of pathogenesis and development of blood diseases and identification of new therapeutic targets

Sub-objective 2.5.2: Improvement of diagnosis and treatment of blood diseases, especially through the implementation of precision medicine, pharmaceuticals for modern therapies, targeted drugs and modern radiotherapy

Sub-objective 2.5.3: Improving the quality of life of blood disease patients through an understanding of the factors that accompany cancer and its treatment

Sub-area 2.6: Nervous system and mental illnesses

Main objective

The main objective is basic and applied research to elucidate the etiology and pathogenesis of major nervous system diseases to the extent that a correct diagnosis can be established as soon as possible and causal personalized treatment initiated. The final outcome is to cure or minimize the difficulties and improve the functional capacity and quality of life of patients. This will reduce the psychological, social and economic burden on the families of patients and for society. Part of the main objective is the early identification of individuals at risk and preclinical conditions, so that the most effective prediction and early prevention of nervous and psychological diseases is possible.

Sub-objective 2.6.1: Mental and neurological diseases

Sub-objective 2.6.2: Diagnosis of nervous system diseases

Sub-objective 2.6.3: Increased effectiveness of treatments for nervous system diseases

Sub-objective 2.6.4: Ensuring quality of life in patients with nervous system diseases

Sub-area 2.7: Diseases of the musculoskeletal system and inflammatory diseases

Main objective

Etiopathogenetic factors, both genetic and environmental, of autoimmune, inflammatory, rheumatic and metabolic diseases will be evaluated. Individual factors in the pathogenesis of these diseases will be evaluated and targets for new biological and targeted therapies will be identified. Biomarkers will be evaluated for the early diagnosis and assessment of treatment efficacy. In degenerative diseases, the factors of metabolic failure of chondrocytes and the influence of genetic factors will be evaluated, as well as biomechanical factors from the area of external factors. Research in musculoskeletal traumatology will answer key questions in the field of trauma prevention and innovative therapies for selected target groups.

Sub-objective 2.7.1: Etiology and pathogenesis of degenerative and metabolic diseases of the musculoskeletal system

Sub-objective 2.7.2: Research in the field of musculoskeletal traumatology

Sub-area 2.8: Immunopathological diseases

Main objective

Research will focus on identifying the mechanisms leading to the development of immunopathological diseases, and will investigate genetic and external triggers of disease. A more precise understanding of these mechanisms will enable the more targeted diagnosis and treatment of immunopathological diseases, in the development of which the immune system plays an important role.

Sub-objective 2.8.1: Defining the determinants of immunopathological diseases and identifying new objectives for the diagnosis and targeted treatment of these diseases

Sub-area 2.9: Infectious disease

Main objective

Clarify the etiology, epidemiology, pathogenesis, treatment and prevention of diseases in relation to new, re-emerging, opportunistic and overlooked infections, enabling the individualization of treatment and improving the quality of life of patients and the population as a whole. The development of new diagnostic methods for the early detection of infections and new treatments for important infectious diseases. Characteristics of molecular mechanisms of antimicrobial resistance, including the analysis of molecular-epidemiological markers of resistance. The development of new antimicrobial agents and the determination of alternative targets for the rational treatment of infectious diseases.

Sub-objective 2.9.1: Etiology and treatment of major infectious diseases

Sub-objective 2.9:2: Epidemiology of antimicrobial resistance

Sub-objective 2.9.3: New diagnostic methods

Sub-objective 2.9.4: New anti-infectives

Sub-area 2.10: Diseases of the perinatal period and childhood

Main objective

The main goal of health research in this area is to deepen knowledge of the etiopathogenesis of serious rare diseases, developmental diseases of the prenatal period and perinatal complications, as well as immunopathological diseases with an environmental component. The individual projects will be directed towards the possibility of rapid implementation of research results into clinical practice. The monitoring of longitudinal cohorts will require the continuous evaluation of results and the refinement of further research progress. The research will include the development of new diagnostic methods and algorithms and the development of new therapeutic and preventive procedures.

Sub-objective 2.10.1: Prenatal, perinatal and early childhood diseases

Sub-objective 2.10.2: Rare diseases

Sub-objective 2.10.3: Chronic immunopathological diseases with an environmental component

Area 3. Innovative solutions for medicine

Sub-area 3.1: Personalized medicine and new diagnostic and theranostic procedures

Main objective

The use of high-throughput molecular biology methods and modern imaging techniques, the development of systems biology and bioinformatics approaches in the field of "big data" will enable a more detailed characterization of disease at the individual level, which will also enable a better understanding of individual human diseases. Further translational research will lead to the effective use of the acquired knowledge for the development of innovative diagnostic, therapeutic and theranostic tools usable in clinical practice both at the individual level and for more stratified sets of patients within individual diagnostic units. Technological developments will enable the wider application of personalized medicine principles across the health system.

Sub-objective 3.1.1: High-throughput molecular biology methods and bioinformatics tools for personalized medicine

Sub-objective 3.1.2: Genome sequencing (WGS) of a selected sample of the Czech population

Sub-objective 3.1.3: Research and development of innovative diagnostic and theranostic tools

Sub-objective 3.1.4: Personalized disease prevention

Sub-objective 3.1.5: Personalized treatment

Sub-area 3.2: Low molecular weight drugs

Main objective

New biologically active low molecular weight substances with therapeutic potential demonstrated in proof-of-concept studies will be prepared. More effective procedures in monitoring the biological activity of drugs using a comprehensive approach to assessing the desirable, undesirable and toxic effects of new low molecular compounds (the improvement of biological tests, introduction of new testing methods, biological activity prediction, toxicity and side effects in silico) will lead to the timely elimination of non-active or toxic molecules. Through the identification of new leading structures and their modification or the modification of clinically proven drugs, their pharmacotherapeutic utility will be enhanced. An essential part of the strategy must be the principle of investing in basic and technological research in parallel, without which support will only be reflected in interesting basic research results.

Sub-objective 3.2.1: New low molecular compounds

Sub-objective 3.2.2: Identification of new therapeutic targets, new methods and procedures for biological testing

Sub-area 3.3: Medicinal products for modern therapies

Main objective

The research, development and manufacture of advanced therapeutic medicinal products (ATMPs) with therapeutic potential validated in proof-of-concept phase I/II clinical trials. The innovative monitoring of the biological activity of drugs using a comprehensive laboratory and clinical approach to assess safety and efficacy in clinical trials, evaluate the effectiveness in real clinical practice. Predicting the effect of ATMP drugs and introducing precision genomics in selecting suitable patients with the aim of the optimal identification of patients suitable for personalized ATMP treatment. Innovative solutions in the areas of pharmacoeconomic reimbursement models for advanced therapies, especially on the principle of outcome-based models; research in the field of ATMP drug regulation, ethical and legislative aspects of personalized ATMP pharmacotherapy.

Sub-objective 3.3.1: Research and development of medicines for gene therapies

Sub-objective 3.3.2: Research and development of medicinal products for somatic cell therapies

Sub-objective 3.3.3: Research and development of tissue engineered medicines

Sub-objective 3.3.4: Precision genomics as a tool for the optimization and stratification of patients suitable for gene and somatic cell therapies

Sub-objective 3.3.5: Supporting proof-of-concept phase I/II clinical trials to evaluate the safety and efficacy of medicines for advanced therapies

Sub-objective 3.3.6: Ethical, legal, regulatory and socio-economic aspects of research and development and treatment of patients using ATMP medicines

Sub-area 3.4: Biological medicines, including prophylactic and therapeutic vaccines

Main objective

The research will mainly lead to the development of biological drugs and immunotherapy, especially in the field of monoclonal antibodies or other humanized protein/polypeptide drugs. In the field of vaccines, research will focus mainly on prophylactic vaccines, especially against new infectious diseases, also comprising innovative technologies including mRNA vaccines.

Sub-objective 3.4.1: New biological medicines

Sub-objective 3.4.2: New vaccines to prevent and treat disease

Sub-area 3.5: New drug formulations

Main objective

Innovative formulation approaches will be used to create and exploit new drug transport and application systems for drugs and their combinations, and possibly also genes in the form of modern dosage forms, enabling therapy of the target tissues or cells, the time-specific release of active substances and penetration of drugs in therapeutically significant concentrations into difficult to reach organs, tissues, cellular or subcellular structures.

Sub-objective 3.5.1: Development of new carriers for time- and site-specific drug release

Sub-objective 3.5.2: Systems for pharmacotherapy-resistant diseases and for overcoming biological barriers

Sub-objective 3.5.3: Introduction of new formulation technologies into research, development and production of dosage forms

Sub-area 3.6: Research and development of new medical devices and equipment

Main objective

The main objective will be research and development in the field of diagnostic and therapeutic devices, the improvement of their function, especially in the sense of defining modern procedures, the development of software and hardware and the interpretation of results. An important parameter will be the comparison of modern minimally invasive approaches with conventional methods.

Sub-objective 3.6.1: Development and research of medical imaging techniques

Sub-objective 3.6.2: Development of minimally invasive treatment techniques and their comparison with conventional procedures

Sub-objective 3.6.3: Development in the field of navigation and robotic systems

Sub-objective 3.6.4: Research and development in the field of medical implants - neurostimulators and cardiac implants

Sub-area 3.7: Innovative research in surgery including transplantation

Main objective

Of the foregoing, the appropriate focus of applied research in surgical disciplines is as follows: (i) clinical and experimental research of new surgical procedures with regard to optimal preparation for surgery (pre-habilitation depending on the surgical and post-surgical risk), minimizing the surgical burden, complications and length of hospital stay, (ii) clinical and experimental research aimed at close collaboration with frontier clinical and paraclinical disciplines, (iii) clinical and experimental research in oncology aimed at optimizing complex care within multi-disciplinarity with the increasing role of genetics and molecular biology, monitoring not only survival time but especially quality of life, (iv) clinical and experimental research on hybrid procedures, the role of individual disciplines, (v) clinical and experimental research in transplantology focused on tissue culture, the creation of biological organ substitutes, tolerance to transplants.

Sub-objective 3.7.1: Non-invasive treatment

Sub-objective 3.7.2: Hybrid performance

Sub-objective 3.7.3: Tissue and organ replacement

Sub-objective 3.7.4: Treatment procedures

Sub-area 3.8: Telemedicine and eHealth

Main objective

Research and development in the field of eHealth and telemedicine will enable progress in the implementation of telemedicine monitoring in healthcare. New computational procedures will be developed and clinically validated, which will allow the determination of the patient's current status from the measured data and other clinical information, including data from imaging systems in the care system, and recommending/adjusting the further course of healthcare according to the expected development. These innovations will also enable remote consultations, which will increase the efficiency and quality of healthcare. The field of eHealth interventions, i.e., web-based and smartphone-based interventions, also represents a tool to support treatment and prevention, or a stand-alone segment of health and preventive care. In the use and development of telemedicine and eHealth technologies, an emphasis will be placed on ensuring that these technologies are reliable for measuring different groups of people, while avoiding the introduction of bias based on e.g. gender, age or ethnicity.

Sub-objective 3.8.1: Creation of a data environment enabling the main objective

Sub-area 3.9: Innovative practices in palliative and supportive care

Main objective

The aim is to develop and validate innovative and methodologically robust procedures in palliative and supportive care to ensure effective symptom management and good quality of life for patients with an advanced and severe disease and their families, promoting models of care that lead to more effective use and coordinate individual health services and the resources of the health system as a whole, and to create evidence-based programs to strengthen health professionals' competencies in communicating about end-of-life care, working with emotions and dealing with ethically challenging situations.

Sub-objective 3.9.1: Effective organization of health services for patients in palliative care

Sub-objective 3.9.2: Competence of health professionals in communication and ethics

Sub-objective 3.9.3: Innovative approaches to symptom management in palliative care

18. Subprograms

The Program is divided into three Subprograms, whereunder the first two Subprograms the criterion for division is the time since the researcher earned their PhD degree or its equivalent. The career path and experience of the provider shows that the age of the project investigators is continuously increasing. Therefore Subprogram 2 is aimed at favoring projects whose investigators will be young researchers who meet the condition that, at the time of submitting

the project proposal to the public tender, no more than 8 years have passed since they earned their PhD academic degree or its equivalent. Both Subprograms will fulfil the objectives of this Program as stated in the previous chapter. Subprogram 3 focuses on health research in the areas defined by each EP.

18.1. Subprogram 1

The main objective of Subprogram 1 is to further develop the existing platform of applied health research in the Czech Republic, focusing more on improving the conditions for the development of international cooperation.

Subprogram 1 will support projects whose solver may only be a natural person engaged in research, with a Ph.D. or its equivalent at the time of submitting the project proposal for the public tender. Further conditions will be described in the dossier for public tenders.

Of the earmarked support allocated to this Program, approximately 90% will be allocated to Subprogram 1.

Table 4: Subprogram 1 Expenditures (in millions of CZK)

year	2024	2025	2026	2027	2028	2029	2030	total
Total expenditures	297	743	1039	1287	1039	693	347	5445
State budget expenditures	270	675	945	1170	945	630	315	4950
Non-public sources	27	68	94	117	94	63	32	495

Objectives of Subprogram 1:

1) to support the development of new preventive measures or practices in healthcare and public health;

2) to support the development of new diagnostic and therapeutic methods;

3) to support the development of international cooperation in applied health research;

4) to support multidisciplinary cooperation in applied health research;

5) to promote excellence in applied health research;

6) to ensure that the results of applied health research are used as inputs for the development and updating of clinical guidelines in the Czech Republic;

7) to support research in the field of translational medicine, i.e., pre-clinical research requiring a subsequent clinical trial.

The fulfillment of the set objectives of Subprogram 1 will be evaluated on an ongoing and final basis by means of partial and final reports on project solutions, in which primarily the indicators listed in Table no. 5 will be monitored.

Table 5: Indicators of Subprogram 2 Objectives

Objective	Indicator

1) to support the development of new preventive measures or practices in healthcare and public health,	number of Program results (increase)
2) to support the development of new diagnostic and therapeutic methods	number of relevant N, P results and Jimp (increase)
3) to support the development of international cooperation in applied health research,	number of results solved in the framework of international cooperation (increase)
4) to support multidisciplinary cooperation in applied health research	number of projects solved by workplaces from various fields of health research (increase)
5) to promote excellence in applied health research	number of Jimp publications in the 1st quartile of the relevant field (increase)
6) to ensure that the results of applied health research are used as inputs for the development and updating of clinical guidelines in the Czech Republic.	number of results applied in clinical guidelines in the Czech Republic (increase)
7) to support research in the field of translational medicine, i.e., pre-clinical research requiring a subsequent clinical trial	number of long-term projects focused on translational research

18.2. Subprogram 2

The main objective of Subprogram 2 is to support the development of young researchers in their junior research activities and the associated rejuvenation of the healthcare research community in order to maintain the continuity of applied health research for future generations.

Subprogram 2 will support projects whose solver can only be a natural person engaged in research who, at the time of submitting the project proposal, has fulfilled the condition that, at the time of submitting the project proposal to the public tender, no more than 8 years have passed since they earned their PhD academic degree or its equivalent, or that they will earn this degree no later than before conclusion of the contract/issuing of the decision on the project solution. If the proposer (researcher) has been on maternity or parental leave, has suffered a long-term illness, or has interrupted their scientific career for similar objective reasons, the time limit of 8 years from earning the academic degree of Ph.D. or its equivalent is extended by this period. Further conditions will be described in the dossier for public tenders.

Approximately 10% of the funds allocated for this Program will be allocated to projects of young scientists.

Table 6: Subprogram 2 Expenditures (in millions of CZK)

year	2024	2025	2026	2027	2028	2029	2030	total
Total expenditures	33	82	116	143	116	77	38	605

State budget expenditures	30	75	105	130	105	70	35	550
Non-public sources	3	7	11	13	11	7	3	55

Objectives of Subprogram 2:

1) support the development of new diagnostic and therapeutic methods;

2) to encourage young researchers to be more interested in research, development and innovation activities in the health sector;

3) by supporting the integration of young professionals into domestic and international research, to contribute to the slowing of their outflow from the Czech Republic, respectively to their return to the Czech Republic from stays abroad;

4) to increase the number of jobs for young researchers;

5) to rejuvenate the scientific community in healthcare and support young researchers in their continuing vocational training;

6) to extend the personnel base of research organizations dealing with applied health research.

The fulfillment of the set objectives of Subprogram 2 will be evaluated on an ongoing and final basis by means of partial and final reports on project solutions, in which primarily the indicators listed in Table 7 will be monitored.

Table 7: Indicators of Subprogram 2 Objectives

Objective	**Indicator**
1) to support the development of new preventive, diagnostic and therapeutic methods	number of Program results (increase)
2) to encourage young researchers to be more interested in research, development and innovation activities in the health sector	number of projects led by young researchers (increase)
3) by supporting the integration of young professionals into domestic and international research to contribute to the slowing of their outflow from the Czech Republic, respectively to their return to the Czech Republic from stays abroad;	number of young researchers involved in project solutions (increase)
4) to increase the number of jobs for young researchers	number of young researchers involved in project solutions (increase)
5) to rejuvenate the scientific community in healthcare and support young researchers in their continuing vocational training	number of young researchers involved in project solutions (increase)
6) to extend the personnel base of research organizations dealing with applied health research	number of newly registered authors of project results (increase)

18.3. Subprogram 3

The main objective of Subprogram 3 is to enable the relevant Czech research community to participate in transnational calls launched within the EPs, covering topics that are not included in other programs of the Horizon Europe Framework Program. This will allow them to join large consortia seeking support through other implementation instruments of Horizon Europe, with the aim of addressing complex challenges requiring the cooperation of a large number of actors and countries. Additionally, the aim is to obtain dedicated EC funding for the implementation of the EPs, as well as financial contributions for transnational co-funded transnational calls. Further conditions will be described in the context of the call documents in relation to the launch of a specific co-funded transnational call.

Table 8: Subprogram 3 Expenditures (in millions of CZK)

year	2025	2026	2027	2028	2029	2030	total
Total expenditures	25	75	75	75	50	37,5	337,5
State budget expenditures	25	75	75	75	50	37,5	337,5

From the targeted support funds allocated to Subprogram 3, 100% will be budgeted, with the EC contribution consisting of 5% to 20% of the actual national funds spent by successful Czech applicants in the calls (the so-called top-up EC contribution for co-funded transnational calls). This contribution will be budgeted accordingly as state budget revenue. The foreign funds account of the Ministry of Health will be used to receive the EC contribution through the coordinator and to further distribute these funds to national applicants as targeted support for research and development.

Additional expenditures of the Ministry of Health chapter will be secured within the expenditure limits of the approved medium-term outlook.

In the event that the Ministry of Health is unable to secure the funding for the contribution to the EP in the field of health, the Czech Republic will still participate in EPs, but only, for instance, in discussions on the thematic focus of the supported research, not through the involvement of research organizations in the calls announced under the program.

Objectives of Subprogram 3:

The objectives of Subprogram 3 are based on strategic documents such as the Strategic Research Agenda or the Roadmap, which are developed in collaboration with all participating Member States/Associated Countries in the respective EPs. These documents align with the National Priorities for Oriented Research, Experimental Development, and Innovation. These strategic documents contain both the main and specific objectives related to the six co-funded EPs, including their successors or alternatives:

ERA for Health Research (ERA4Health)

1) To support the involvement of public healthcare system sponsors within the European Research Area, including the participation of young researchers, depending on the topic of the co-funded transnational call.

2) To support the implementation of a common funding strategy for best practices in priority areas of various health interventions addressing crucial public health needs.

Transforming Health and Care Systems (THCS)

1) To support the implementation of cost-effective technological and service innovations.

2) To develop guidelines on how to transform healthcare systems in order to create new solutions for healthcare.

3) To strengthen the research and innovation community in the field of health and care systems across Europe, including the involvement of young researchers in the proposed consortium projects.

Personalised Medicine (PerMed)

1) To improve health outcomes within sustainable healthcare systems through research, development, and innovation.

2) To implement personalised medicine approaches for the benefit of patients, citizens, and society.

3) The involvement of young researchers in addressing research tasks depending on the topic of the co-funded transnational call.

European Rare Diseases Alliance (ERDERA)

1) To address unmet medical needs through medicinal products for rare diseases, focusing on patients in the EU.

2) The involvement of early-career researchers to more effectively achieve the goals and outcomes in international research projects.

3) To coordinate and fund transnational research through an innovation strategy for the effective utilization of research results and activities related to EU clinical trial readiness.

4) To optimise research infrastructures and resources, including networking, training and dissemination of information.

One Health Antimicrobial Resistance (OH AMR)

1) To support the coordination and consistency of activities and funding in relation to antimicrobial resistance.

2) To facilitate coherence among different states between various departments and ministries responsible for different areas of health.

3) The involvement of young researchers in addressing research tasks based on the topic of the co-funded transnational call.

Pandemic Preparedness (BE-READY)

1) To improve the EU's preparedness, predict, and respond to emerging infectious health threats, including the involvement of young researchers in addressing research tasks based on the topic of the co-funded transnational call.

2) To design and conduct clinical studies in addressing public health emergencies, including the implementation of new approaches.

3) To develop pandemic plans to reflect needs and highlight research gaps in this area.

The achievement of the set objectives for Subprogram 3 will be continuously and finally monitored through interim and final project reports, with a particular focus on the indicators listed in Table 9.

Table 9: Indicators of Subprogram 3 objectives according to the goals of the individual EPs in the field of health.

ERA for Health Research objective (ERA4Health)	**Indicator**
1) To support the involvement of public healthcare system sponsors within the European Research Area, including the participation of young researchers, depending on the topic of the co-funded transnational call.	number of projects conducted by departments from various fields of medical research with the participation of young researchers in international research projects (increase)
2) To support the implementation of a common funding strategy for best practices in priority areas of various health interventions addressing crucial public health needs.	number of projects focused on international cooperation (increase)
Transforming Health and Care Systems objective (THCS)	**Indicator**
1) To support the implementation of cost-effective technological and service innovations.	number of Jimp publications in the relevant field (increase)
2) To develop guidelines on how to transform healthcare systems in order to create new solutions for healthcare.	number of relevant N, P results and Jimp (increase)
3) To strengthen the research and innovation community in the field of health and care systems across Europe, including the involvement of young researchers in the proposed consortium projects.	number of projects focused on international cooperation with the participation of young researchers in projects submitted under announced transnational calls (increase)
Personalised Medicine objective (PerMed)	**Indicator**
1) To improve health outcomes within sustainable healthcare systems through research, development, and innovation.	number of Jimp publications (increase)

2) To implement personalised medicine approaches for the benefit of patients, citizens, and society.	number of relevant N, P results and Jimp (increase)
3) The involvement of young researchers in addressing research tasks depending on the topic of the co-funded transnational call.	number of projects focused on international cooperation with the participation of young researchers in projects submitted under announced transnational calls (increase)
European Rare Diseases Alliance objective (ERDERA)	**Indicator**
1) To address unmet medical needs through medicinal products for rare diseases, focusing on patients in the EU.	number of projects focused on international cooperation (increase)
2) The involvement of early-career researchers to more effectively achieve the goals and outcomes in international research projects.	number of projects with the participation of young researchers in international research projects (increase)
3) To coordinate and fund transnational research through an innovation strategy for the effective utilization of research results and activities related to EU clinical trial readiness.	number of results applied in clinical guidelines in the Czech Republic (increase)
4) To optimise research infrastructures and resources, including networking, training and dissemination of information.	number of Jimp publications (increase)
One Health Antimicrobial Resistance objective (OH AMR)	**Indicator**
1) To support the coordination and consistency of activities and funding in relation to antimicrobial resistance.	number of relevant N, P results and Jimp (increase)
2) To facilitate coherence among different states between various departments and ministries responsible for different areas of health.	number of projects focused on international cooperation (increase)
3) The involvement of young researchers in addressing research tasks based on the topic of the co-funded transnational call.	number of projects involving young researchers (increase)
Pandemic Preparedness objective (BE-READY)	**Indicator**
1) To improve the EU's preparedness, predict, and respond to emerging infectious health threats, including the involvement of young researchers	number of projects focused on international cooperation with the participation of young researchers in projects submitted under

in addressing research tasks based on the topic of the co-funded transnational call.	announced transnational calls (increase)
2) To design and conduct clinical studies in addressing public health emergencies, including the implementation of new approaches.	number of results applied in clinical guidelines in the Czech Republic (increase)
3) To develop pandemic plans to reflect needs and highlight research gaps in this area.	number of results applied in areas focused on pandemic challenges (increase)

19. Comparison of the current situation in the Czech Republic and abroad

A detailed analysis of the current state of research and development in the Czech Republic is provided in Annex No. 2 to the Concept (Analysis of support for health research in the Czech Republic), which also includes a comparison of the state of research and development in the Czech Republic and abroad. The content of Annex No. 3 to the Concept (Foreign Approaches to Supporting Health Research) is a detailed analysis of support for health research and development abroad, where four economically developed countries with well-functioning research systems producing results of the highest global quality, namely Germany, Austria, the Netherlands and the USA, were selected for a more detailed comparison of the status and trends in support for health research abroad. Annex No. 1 to the Concept consists of the conclusions of the interim evaluation of the Applied Health Research Support Program for 2015-2022 (hereinafter the "NV Program") and the Health Research Concept until 2022.

The interim evaluation of the NV Program focused on evaluating the implementation and management process, its effectiveness, relevance and efficiency. The evaluation of the Health Research Concept until 2022 focused on assessing the fulfilment of the set objectives and their relevance in relation to the potential of health research in the Czech Republic and current approaches to supporting health research in the world. Both evaluations included feedback and recommendations for improving the preparation and implementation of the follow-up health research concept and related programs to support health research in the Czech Republic (see Annex No. 1 to the Concept for the specific conclusions of both evaluations).

An evaluation of the ongoing NU Program has not yet been carried out. Under the NU Program, four single-stage public tenders in research, experimental development and innovations have been announced so far. The first tender (VES 2020/J) for special-purpose support from the Ministry of Health for the years 2020 - 2023 was announced on 15 May 2019 (completion of projects by 31 December 2023), the second public tender for the years 2021 - 2024 (VES 2021/J) was announced on 13 May 2020 (completion of projects by 31 December 2024), the third tender for the years 2022 - 2025 (VES 2022/J) was announced on 13 May 2021 (completion of projects by 31 December 2025). Due to the ongoing fight against the Covid-19 pandemic, an ad hoc public competition for special-purpose support from the Ministry of Health (VES COVID) in the framework of the NU Program was announced on 11 October 2021 for the solution of health research and development projects fulfilling Subprogram 3 of the NU Program: Impact of the Covid-19 pandemic on healthcare in the Czech Republic (completion of projects by 31 December 2023). The fourth (i.e., the last) tender VES 2023/J was announced

during 2022, the provision of aid will start in 2023 and will be concluded no later than on 31 December 2026. The projects arising from the first NU 2020-2023 Program public tender will therefore be completed at the earliest by 31 December 2023. The provider does not yet have the results of these projects to evaluate the benefits and effectiveness of the funds spent. Only ongoing data on evaluated tenders, the amount of support provided, the number of solved projects and data on the structure of solved health issues are available. In total, estimated earmarked aid amounting to EUR 5,500 million from state budget expenditures for research, development and innovation is expected to be provided through all the already implemented and planned NU Program tenders. The financing of the NU Program is implemented according to the possibilities of the state budget. The projects selected for support from the NU Program are currently supported through four ongoing public tenders, VES 2020/J, VES 2021/J, VES 2022/J and VES COVID. The total approved cost of the earmarked aid for the entire duration of the projects financed by VES 2020/J is CZK 1,150,501,000. The total approved cost of the earmarked aid for the entire duration of the projects financed by VES 2021/J is CZK 1,351,878,250. The cost of the earmarked aid for the entire duration of the projects in 2022 - 2025 financed from VES 2022/J was approved at the total amount of CZK 1,070,397,000. The cost of the earmarked support for the entire duration of the projects (i.e., for the years 2022 and 2023) financed by VES COVID represents the approved amount of CZK 118,984,000. Thus, according to the budget approved by the provider, a total of CZK 3,691,760,000 will be allocated under the four already announced public tenders within the NU Program. At present, the four single-stage public tenders announced so far support a total of 334 research projects (295 standard and 39 junior), selected from a total of 1,399 project proposals received. The average financial allocation per public tender, that is, the success of the project, is thus 23.9%, which suggests that only the highest quality project proposals are selected for support. With the exception of the projects to be implemented in the framework of the VES COVID public tender, which is highly specialized in the Covid-19 issue, most of the project proposals are focused on addressing cancer issues. The issue of cancer is usually the subject of about one fifth of the solved projects, a trend that has remained unchanged over the long term. This is followed by projects focusing on biomedical technologies. Other projects include those on neuroscience and mental health, projects focused on immune disorders and infectious diseases, preventive medicine, nursing, metabolic and endocrine diseases and circulatory diseases.

The most important providers of support for health research are, first of all, the Ministry of Health of the Czech Republic, which is the exclusive provider of earmarked aid for projects addressing the issue of diseases in the population comprehensively (thus contributing to the maximum extent possible to fulfilling the objectives of the National Priority Healthy Population), and the Ministry of Education, Youth and Sports of the Czech Republic (hereinafter referred to as "MEYS"). In 2015-2019, the two ministries together allocated almost 70% of the total aid for health research and development from the state budget, and 12% of the funds for health research and development were channeled through the Academy of Sciences of the Czech Republic, through institutional support of the individual research institutes. An important instrument of special-purpose aid are the grant projects of the Grant Agency of the Czech Republic (hereinafter referred to as the "GA CR"), which supports health research projects. The GA CR allocates an additional 11% of the total amount of aid for health research and development in the Czech Republic in grants for health research from the state budget. The

group of GA CR grant projects (categories e.g., "Standard projects", "Junior STAR" projects, "EXPRO" projects, etc.) show the greatest synergies with the special-purpose aid programs of the Ministry of Health of the Czech Republic. Although basic research projects are supported through the grant projects of the GA CR, while the special-purpose aid programs of the Ministry of Health should be perceived as a tool for supporting health research that is directed towards applications, it must be emphasized that the boundary between basic and applied health research is blurred, to say the least. The division of special-purpose aid into basic and applied research can be seen as a certain institutional definition of competences in the support of health research between the GA CR and the Ministry of Health of the Czech Republic. Especially in the process of evaluating health research projects, these categories should not be considered, and rather than assessing the share of basic and applied research in individual projects, an emphasis should be placed on the expected benefits and impact of the projects on the prevention, diagnosis and treatment of diseases.

As a provider of special-purpose aid in the field of health research, MEYS acts both through the operational programs it provides, and currently holds the role of the coordinator responsible for the implementation of the "Program to Support Excellent Research in Priority Areas of Public Interest in Healthcare - EXCELES" (hereinafter referred to as the "EXCELES Program"). As far as the operational programs are concerned, in 2014 - 2020 it was mainly the Operational Program Research, Development and Education (hereinafter as "OP RDE"), which was aimed at increasing the quality of education, ensuring conditions for quality research, linking education and research with the labor market and strengthening the principle of equal access to education. The Operational Program Jan Amos Komenský for the 2021 - 2027 programming period (hereinafter the "OP JAK") currently follows up on the OP RDE. Its aim is to support cutting-edge research and development, especially in those areas that have the potential to contribute to the further development of society and the economy and that will solve societal problems not only at the national but also at the European level.

The EXCELES Program is an implementation tool of the National Recovery Plan (hereinafter the "NRP") funded by the EU through the Recovery and Resilience Facility. The MEYS is both the responsible program coordinator and the provider of support for the projects (implementation of the projects is set for 2022-2026). The program is complementary to the National Recovery Plan, with linkage concerning in particular component 5.1 Excellent research and development in priority areas of public interest in the health sector. The aim of component 5.1 of the NRP is to modernize and renovate the scientific infrastructure in the Czech Republic to meet European standards. Another objective is to develop a network structure in the field of research and development, to reduce fragmentation in the research sector in the Czech Republic in order to improve its management, and to support basic research in specific, state-defined health fields. Investment into the scientific base in priority areas of health research will also bring about a systemic change in the form of research consortia focusing on areas with high mortality rates, in particular infectious disease research, neuroscience, cancer research, research on metabolic disorders and cardiovascular disease, including research on the socio-economic impact of health risks. The supported areas of research, development and innovation in the EXCELES Program are specific biological, medical and social science disciplines, or other related scientific, technical and technological disciplines (e.g., specifically focused on the study of infectious diseases and virology, oncology, social and economic

impacts of systemic health risks, etc.). The objectives of the EXCELES Program are based on analytically identified national needs to support research and achieve excellence in narrowly defined, specific priority areas of health research. In 2022, a total of 5 projects were selected for support under the EXCELES Program, which will be allocated a total of approximately CZK 5 billion from EU funds. Within the selected projects, the following 5 national scientific authorities will be established in the Czech Republic: National Institute of Virology and Bacteriology, National Institute of Cancer Research, National Institute of Neurological Research, National Institute of Metabolic and Cardiovascular Diseases Research, National Institute of Socioeconomic Impacts of Disease and Systemic Risk Research. The risk of possible duplication between the health research carried out under the EXCELES Program and the research carried out at the level of departmental providers of support for health research is minimized by the different initial conceptual approach to research. The EXCELES Program builds on the cooperation of leading research organizations within the established infrastructural consortia in specifically defined priority areas of excellent research. The ministerial programs of applied health research are targeted at a specific thematic aspect/problem within a broadly defined health area. The research teams of projects supported through these ministerial programs are formed by a narrow group of staff from a research organization, or several research organizations (investigators and co-investigators). Hence, the overarching objective of the EXCELES Program is to create centers of excellence in priority research areas at the national level, on which the projects arising from the ministerial applied health research programs will be based and with which they will correlate. The issue of possible overlapping of the focus and objectives of the ongoing research and the related risk of double funding is already addressed in the Program at the level of evaluation bodies, i.e., the provider's expert advisory bodies/panels in the framework of evaluating the project proposals, and consequently also in the evaluation of partial and final reports, see also chapter 24 of the Program and the subsequent amendment in the texts of the individual public tender dossiers. Within the tender dossier for each research tender, the conditions for project applicants submitting proposals for public tenders will also be regulated, in particular to prevent them from participating in parallel projects with a similar research focus in all the health programs. Similarly, another key control mechanism is the fact that representatives of the Ministry of Health also sit on the advisory bodies of the EXCELES Program, which, among other things, draw attention to possible overlaps within other health research programs and eliminate potential risks of double funding. The advisory bodies also mediate communication between MEYS as the responsible EXCELES Program coordinator and the relevant ministry with responsibility for health research.

Projects dealing with the issues of applied health research can be marginally found in national programs of the Ministry of Industry and Trade (hereinafter the "MIT"), currently e.g., "The Country for the Future" innovation support program (duration from 1 January 2020 to 31 December 2027), whose main objective is, *inter alia*, to achieve the greater exploitation and deployment of research and development results, with particular support for projects developing new technologies and materials, increasing the level of automation and robotization and the use of digital technologies. The MIT is also the guarantor of the "TREND" Industrial Research and Experimental Development Support Program (duration from 1 January 2020 to 31 December 2027), whose provider is the Technology Agency of the Czech Republic

(hereinafter the "TA CR"). Within its scope, the TREND Program also aims to support enterprises carrying out their own research and development activities and to strengthen the orientation of research organizations towards internationally competitive applied research with benefits for industry and society. In addition to the focus on enterprises and their competitiveness, the TREND Program will also enable the involvement of research organizations, including universities or institutes of the Academy of Sciences of the Czech Republic. Health research is not the dominant theme in The Country for the Future and TREND Programs but is instead just one of the many topics that can be touched upon by the implemented projects (in real terms, these are on the order of single units of projects). Other providers of special-purpose aid in the field of applied health research include the aforementioned TA CR, which is responsible within the framework of applied health research, for example, for the "GAMA 2" Program aimed at supporting the verification of applied research results in terms of their practical application and the preparation of their subsequent commercial use or use for the needs of society; and the Applied Research, Experimental Development and Innovation Support Program "National Centers of Competence" aimed at supporting cooperation between research and the application sphere and strengthening the institutional base of applied research. In this context, we must not omit the Program of Applied Research, Experimental Development and Innovation "Environment for Life". The Environment for Life Program is implemented under the coordination of the Ministry of the Environment of the Czech Republic, which can be considered another actor in the field of applied health research in the role of a provider of special-purpose aid. Although the Environment for Life Program is an environmental program whose focus reflects the priority thematic areas of the state environmental policy, the outputs and results of the projects supported under the program have a high potential for application in many areas of Czech society, with the aim of ensuring a healthy and high-quality environment and thus improving the quality of life of the Czech population. The Environment for Life Program therefore reflects, within its content focus, the impact on human health through monitoring the condition of all relevant environmental components and minimizing the negative effects of pollution, and in this respect, it is synergistic and complementary to the Program. Currently, the latest TA CR program aimed at supporting applied research and innovation is the SIGMA Program (duration set for 2022 to 2029, i.e. 8 years), which is designed as a kind of comprehensive long-term instrument to support applied research projects focused on fulfilling and addressing a number of objectives and measures set out in the key strategic and conceptual documents for research, development and innovation in the Czech Republic, and which should enable a flexible response to the needs of society and the economy. The purpose of the SIGMA Program is to bring greater stability and predictability to the system of support for applied research and innovation on the one hand, the simplification of administrative procedures and requirements, increased flexibility and the ability to respond quickly to current needs and challenges on the other. This program should subsequently consolidate some of the TA CR's own programs into one program, thus gradually implementing the current programs activities and EU instruments.

At the European level, synergies in the Program's focus can be traced in particular with reference to the 9th Research and Innovation Framework Program Horizon Europe, which is a key EU program in terms of international and interdisciplinary cooperation for research and innovation funding running from 2021-2027. The separate "Health" cluster under Pillar II of

the program aims to contribute to improvements in the health sector and to ensure comparable living conditions and access to good quality healthcare for all EU citizens without distinction. It is also necessary to respond to the increase in certain types of diseases (e.g., cancer, infectious or mental illnesses, etc.) and to promote disease prevention. Horizon Europe is based on the idea of a more cost-effective, equitable and sustainable public health system, while at the same time declaring that the EU should become a very strong partner in a rapidly developing global market focused on the provision of care for health and well-being.

In terms of the individual legal forms of participants in health research projects, the main recipients of aid for health research and development include three key types of recipients, namely universities (38% of the funds for health research and development from the state budget), public health facilities, i.e. state allowance organizations of the Ministry of Health and the regions - hospitals, etc. (32% of the funds), and public research institutions, mainly those that are part of the Academy of Sciences of the Czech Republic (24% of the funds). A marginal part of the recipients of aid for health research and development are other legal forms, i.e., mainly private enterprises. The structure of project participants is relatively constant in the long term, changing only in terms of their share.

As for health research results, in the period under review (from 2015 until 2019), a total of 14,000 publications were produced in the Czech Republic in individual fields. The largest representation was in the field of clinical medicine (more than 60% of the total number of publications), with a significant contribution from basic medicine (about 25% of the total number of publications), and health sciences (more than 11% of the total number of publications).

The total number of publications in the monitored fields of health research increased by about a quarter over the period (the largest increase was in basic medicine, where the number of publications approximately doubled). The monitored fields of health research are characterized by industry-standardized citation rates exceeding the world average. In terms of individual sectors, the highest number of publications in the broader fields of health research was produced by public and state universities, followed by teaching hospitals and institutes of the Academy of Sciences of the Czech Republic, while the remaining sectors contribute to a significantly lower extent (other research organizations, departmental public research institutions, business sector). Approximately one-sixth of publications with a Czech author have at least one other co-author from a foreign institution (the highest proportion of publications with foreign co-authors is characteristic for the field of medical biotechnology, a high proportion of publications with participating foreign co-author(s) is also found in the field of health sciences). Cooperation is established mainly with research institutes in the USA and also with other countries with high publication activity and quality research, especially Germany, Great Britain, Italy, France and Spain. There are a number of research institutes in the Czech Republic that are intensively involved in health research and through which high quality publications with citation rates far exceeding the world average are produced. The given workplaces also have the potential to engage in international cooperation in science and research.

As a civilized country with developed and high-quality healthcare, the Czech Republic should continue to provide adequate financial support for health research to capitalize on the years of building high-quality research teams and workplaces, whether for clinical or primarily research. In the light of comparisons with selected European countries, state support for health research

and development in the Czech Republic lags behind not only the developed countries of the European Union (e.g., the Netherlands, Sweden, Austria or Germany), but also, in relative terms, the neighboring countries of Central and Southern Europe (namely Slovakia, Slovenia and Croatia). In the Czech Republic, the share of state budget expenditure on health research and development in the total state budget expenditure for research and development is 12%, the lowest percentage among the compared countries. Slovenia, Slovakia and Croatia also show a higher share of support for health research and development (17% in Slovakia, 18% in Germany, 20% in Austria and 28% in the Netherlands).

Support for health research in the Czech Republic is implemented through institutional support and targeted support, whereas their share in the structure of support for health research and development is broadly balanced (52.8% dedicated support, 47.2% institutional support in health and medical sciences). Of the total amount of state budget funds flowing into the sphere of institutional support, 4% of institutional support is directed to health, and approximately 11% of the total earmarked support allocated to research and development was spent on health (data for 2019).

Reflecting on foreign approaches, it can be noted that health research policy objectives and instruments focus on supporting other areas of health research, whether oriented towards specific population groups (e.g., the elderly or socio-economically disadvantaged groups), or defined as systemic themes (health services, digital technologies, ethics in healthcare, support for research education, etc.). There is a clear orientation of health research towards new solutions for the application of digital technologies in healthcare and health systems, the development of artificial intelligence applications in healthcare, the use of the potential of big data in prevention and diagnostics and research into new materials for healthcare. The development of personalized medicine and e-Health is a major area in its own right. Emphasis is placed on the importance of supporting projects that will clearly define their application focus already at the application and approval stage, and where the emphasis will be primarily on the potential and method of transferring research results into clinical practice.

In relation to Subprogram 3, the comparison of the current state of the Czech Republic in relation to foreign countries is more specific, as it is a new area of cooperation. Therefore, it is necessary to define it individually in order to reflect all essential factors.

EPs represent an important mechanism for targeting support and coordinating public and private investments in research and innovation activities in the EU's priority themes. Involvement in these partnerships strengthens both the position of Member States and individual research and innovation entities within the European Research Area, as well as creates a better starting position for involvement in specific calls announced under Horizon Europe. In all types of EPs – co-programmed, institutional, and co-funded – the Czech Republic is not fully utilizing its potential for active engagement. The integration of the Czech Republic into EP structures is still insufficient. Active participation of Czech entities in these EPs will improve the starting position of Czech research organizations and enterprises in the early preparation of project proposals and consortia.

The participation of the Czech Republic in the EPs that are part of the Horizon Europe Framework Program, specifically under Pillar 2 “Global Challenges and European Industrial Competitiveness”, is insufficient. The Czech Republic is one of the EU Member States that have not yet managed to transform relatively good initial conditions in the field of research and

innovation into greater participation. On the contrary, Czech participation in EPs is perceived as low or at least inadequate, both in absolute terms and in relation to the size of various research and innovation indicators. Compared to other countries, the Czech research and innovation systems do not fully exploit their potential to participate in systems focused on excellence and innovation. Foreign institutions have strong international connections or their own foreign research centers, and therefore their involvement in the EP is of different importance to them than it is to smaller countries, which allows them to address problems whose demands exceed the capabilities of their national R&D&I system. The implementation of national priorities in relation to EPs is progressing very slowly in practice.

However, based on publicly available analyses and statistics, the Czech Republic's international cooperation agenda in R&D&I has recently been strengthened. Nevertheless, the representation in EPs in the field of health has not yet been adequately taken into account at the national level. The main purpose of these types of projects is to complement the budgets of calls for EC-funded programs with funds provided by national and regional R&D&I support providers, thus contributing to the alignment of national and European priorities, while creating and expanding contacts for international cooperation. According to national indicators, the EP call format attracts the interest of Czech applicants. In terms of past success rates of project proposals, ERA-NET Cofund calls, which EPs build upon, have shown significantly better results for Czech participants than Horizon 2020 calls, both in the share of project proposals with Czech participation in the total number of submitted proposals and in the number of funded projects. Furthermore, the financial share of Czech participants in the total budget of funded projects is more favorable than in Horizon 2020 projects. The available data indicate that the overall success rate in ERA-NET Cofund instruments is higher than in standard Horizon 2020 calls. In order to strengthen and increase the success rate in the follow-up EP scheme, it is necessary to set up national conditions that will enable the Czech research community to participate in projects under transnational calls launched by individual EPs, which will ultimately lead to an overall improvement in the success rate at the national level.

Thanks to the existence of relevant programs and their thematic focus, the Czech Republic is involved in some of the EPs through the Technology Agency of the Czech Republic in cooperation with the Ministry of Industry and Trade, the Ministry of Transport, the Ministry of the Environment, and the Ministry of Education, Youth, and Sports. This indicates that the Czech Republic participates in a number of relevant EPs; however, the budget allocation for participation often does not reflect the absorption capacity of the R&D&I ecosystem in the Czech Republic. The representation in EPs in the medical field in the Czech Republic is currently lacking due to the absence of a relevant program. As a result, the Czech Republic not only loses the opportunity to participate in calls launched within EPs covering topics not included in other programs of the Horizon Europe, and to join broad European consortia applying for support under other implementation tools of Horizon Europe, but also deprives it of the hypothetical possibility of receiving funding from the Horizon Europe dedicated by the EC specifically for the implementation of EPs. Not joining EPs has a direct negative impact on the Czech Republic's participation in the Horizon Europe and the financial gain of the Czech Republic from its budget. For this reason, the creation of a national program to ensure the implementation of these EPs in the field of health is a necessity in order to enable Czech researchers to participate in European project consortia. It is expected that these proven

international contacts will be further utilized by applicants in consortium project proposals for Horizon Europe calls, as well as for other initiatives and programs.

20. Expected results

Following the set objectives, only those projects that justify the achievement of at least one main[3] and one secondary R&D result will be supported. It is also acceptable to achieve at least two main results, or one result published in a prestigious international journal, ranked in the 1st quartile according to the Methodology of Evaluation of Research Organizations and Programs of Targeted Support for Research, Development and Innovation. A higher number of results will be required for projects requiring special-purpose support over CZK 12 million for the entire period of resolution (detailed conditions will be described in the dossier of public tenders).

Individual types of results are defined in the separate Annex no. 4 – Methodology of Evaluation of Research Organizations and Programs of Targeted Support for Research, Development and Innovation, approved by Government Resolution No. 107 on 8 February 2017, entitled "Definition of the Types of Results" (approved by Government Resolution No. 837 on November 29 2017).

A main result is one of the following types of results:

- J_{imp} – peer-reviewed scientific article - an original article in a peer-reviewed scientific journal that is included in the Web of Science database with the attribute "Article"[4]
- F - utility model, industrial design
- G - prototype, functional sample
- N - methodology, treatment procedure, specialized map with specialized content
- P - patent
- R - software
- Z - pilot operation, proven technology

A secondary result is one of the following types of results:

- J_{imp} – peer-reviewed scientific article - an article in a peer-reviewed scientific journal that is included in the Web of Science database with the attribute "Review" or "Letter"
- J_{sc} – peer-reviewed scientific article - an original/review article in a peer-reviewed scientific journal which is included in the SCOPUS database with the attribute "Article", "Review" or "Letter"
- B - professional book
- C - A chapter in a professional book
- V - research report, summary research report

[3] Note: Classification as main results (only reported in the Program) and secondary results (also reported in other activities or programs) is proposed for the future evaluation of the Program – in the absence of main (separate) results, the project will be evaluated as unsuccessful.

[4] During the assessment, an emphasis will be placed on the applicability of this type of result in practice.

Other results are one of the following types of results:

- J_{ost} - peer-reviewed article - original/reviewed article in a peer-reviewed journal that does not fall into the J_{imp} or J_{sc} results category. (The list of peer-reviewed non-impacted journals is not used. The decisive factor is whether the peer-reviewed article meets the general requirements for this type of result and went through the proper peer review process.)
- D - essay in a symposium
- H - results reflected in legislation and standards, results reflected in into directives and regulations of a non-legislative nature binding within the competence of the relevant provider, results reflected in approved strategic and conceptual documents of state or public authorities
- S - specialized public database
- A - audiovisual production
- E - organization of an exhibition, organization of an exhibition with a critical catalog
- M - organization of a conference
- W - organization of a workshop
- O - other results

For the purposes of this Program, a main, secondary and other result of R&D&I is defined as a new result obtained through a project supported by this Program and in the information registry on results in the R&D&I Information System, it is regarded as a result of this project. At least one main or secondary result of each completed project must be registered in the R&D&I Information System information registry on results solely as a result of this project (except for a result published in a journal ranked in the 1st quartile according to the Methodology of Evaluation of Research Organizations and Programs of Targeted Support for Research, Development and Innovation).

The users of the results will be predominantly healthcare providers, in particular general or specialized hospitals, specialized institutes and laboratories, outpatient doctors, social and nursing facilities, specialized private healthcare facilities, and/or other important institutions in the health sector, e.g., health insurance companies.

21. Expected benefits

Meeting the Program objectives should provide, in particular, the following expected benefits:

1) continuing the development of clinical research in the Czech Republic as a basic source of new clinical procedures in diagnosis, treatment and prevention in healthcare,
2) achieving the higher quality prevention, early diagnosis and treatment of human diseases,
3) reducing long-term healthcare costs in connection with the promotion of new preventive procedures,
4) ensuring the development of new preventive, diagnostic and therapeutic methods,
5) a favorable influence on mortality and chronic morbidity of serious diseases,
6) providing treatment for currently untreatable diseases,

7) helping to reduce the side effects of current therapies,
8) expanding collaboration with leading foreign workplaces and teams,
9) ensuring the continuity of health research in the Czech Republic with the development of world science,
10) creating conditions that support a wider involvement of young researchers.
11) interventions with significant economic and social impacts in the field of public health.

The benefits of the Program can only be evaluated several years after its completion. Indicators for verifying the long-term impact of the achieved results are also described in the 2030 Health Research Framework in Chapter 10. *Monitoring and Evaluation of Concept Implementation*, subchapter 10.1. *Concept Monitoring.* This information will subsequently be used for a comprehensive assessment of the benefits of public support. The following table describes examples of specific indicators to monitor some of the benefits of the Program.

Table 10: Method of Monitoring Program Benefits/Impacts

Benefits of the Program	**Indicator**
quality of health research	- number and quality of health research results (citation response, percentage of publications in Q1 journals according to the WoS database), - number of registered results of applied research (realization of a prototype, functional sample, software, utility/industrial design, semi-production, proven technology, certified methodologies and procedures, patent application, patent, license), - international awards - membership in international bodies,
increasing the international prestige of health research	- the amount and volume of international cooperation, - the number and quality of co-publications with international workplaces, - membership in international bodies
strengthening the personnel base of health research	- the number and quality of research results carried out by young researchers - the proportion of women and men involved in projects solution and in the evaluation process, share of projects that address the gender dimension of research
strengthening interdisciplinary cooperation in health research	- the intensity of interdisciplinary research activities
long-term development of research activities	- the number of projects directly linked to projects implemented in the program

22. Incentive effect

The Program will contribute to increasing, streamlining and improving activities in the field of applied health research. To meet the objectives of the Program and the conditions of the

Commission Regulation as part of the evaluation process of project proposals, the provider will assess the presence of the incentive effect of the aid under Article 6 of the Commission Regulation for all applicants cumulatively for the whole project. The assessment of the incentive effect will be part of the evaluation report prepared by the provider's expert advisory body. In accordance with the Commission Regulation, the incentive effect of the aid is automatically demonstrated for an SME when it starts working on the project solution after the contract for the provision of support becomes effective and meets the conditions set out in the tender dossier. According to Article 2 (23) of the Commission Regulation, the commencement of work means *either the start of construction work on the investment or the first legally enforceable commitment to order equipment or another commitment which makes the investment irreversible, whichever occurs first. The purchase of land and preparatory work, such as obtaining permits and preparing feasibility studies, is not considered to be the commencement of work. In the case of a takeover, "start of work" is defined as the moment when the property directly related to the purchased establishment is acquired.*

If the beneficiary or other participant is a large enterprise, in order to meet the incentive effect in accordance with the Commission Regulation in the project proposal, it must comply with the requirements of Article 6 (3) of the Commission Regulation, particularly demonstrating that the support will contribute to a significant increase in the scope of the project or activities as a result of the support, or significantly increase the total amount spent by the beneficiary on the project or activity as a result of the support, or a significant acceleration of the completion of the project or activity.

In relation to Subprogram 3, no motivational effect can be expected due to the fact that the evaluation process of project proposals will only take place at the transnational level. At the national level, only the formal eligibility check of project proposals will be carried out by the national provider according to predetermined national conditions. In the subsequent phase, project proposals will be assessed by international evaluators/independent experts based on the quality and content of the project. Project proposals will be evaluated by at least two independent experts. Following their expert peer review, an international evaluation panel consisting of scientific experts nominated by representatives of national/regional funding organizations will be convened. The key evaluation criterion will be the level of excellence. As a result of the peer review, a "project list" will be drawn up. The members of the evaluation panel will communicate their recommendations to the coordinator of the respective EP.

In relation to Subprogram 3, no incentive effect can be expected due to the fact that the evaluation process of project proposals will only take place at transnational level. At the national level, only a formal eligibility check of project proposals will be conducted according to predefined national conditions by the national provider. In a subsequent phase, project proposals will be assessed by international evaluation experts/independent specialists based on the quality and content of the project. Project proposals will be evaluated by at least two independent experts. Following their peer review, an international evaluation panel composed of scientific experts nominated by representatives of the national/regional funding organisations will be convened. The key evaluation criterion will be the level of excellence. As a result of the peer review, a 'project list' will be drawn up. The members of the evaluation panel will communicate their recommendations to the coordinator of the relevant EP. The requested

funding for selected projects should not exceed the total budget of the co-funded call by more than three times. The exact treshold is determined by representatives of the national/regional funding organizations participating in the co-funded calls. The maximum national budget allocations will also be fully within their competence. In cases where projects are of high quality but financial resources are insufficient, the final selection of projects is made by a group of representatives from the national funding providers. These representatives will then commit the provider to fund the selected projects, ensuring that the commitment does not exceed the available funds allocated by the provider for this purpose. For this reason, prior to the meeting of national providers´ representatives, each representative will consult the available funds for this purpose with the person responsible for the budget for international cooperation in research and development. Based on the evaluation results and selection criteria, the group of national providers´ representatives will decide on the participation of the applicant in the EP, and the national provider will confirm the commitment to fund the selected projects by sending a declaration of the availability of national funds to the coordinator in both paper and electronic form.

23. General criteria for the evaluation of project proposals

In accordance with the rules laid down in Act No. 130/2002 Coll., the provider appoints a committee to receive project proposals. The received proposals are reviewed by the committee for the acceptance of project proposals for the fulfillment of all the requirements set out in the tender dossier for project proposals.

The provider decides on whether to accept the project proposal into the public tender or eliminate it in accordance with Section 21 paragraph 3 of Act No. 130/2002 Coll. on the basis of a protocol prepared by the committee for the acceptance of project proposals, that is, the expert advisory body. Project proposals excluded from the tender are not further evaluated.

In the case of Subprogram 3, the provisions regarding the general criteria for the evaluation of project proposals are relevant only in relation to the formal eligibility check, as described above (see Chapter 22).

24. Project Proposal Evaluation Process

The evaluation will take place within a three-tier system based on the Project Evaluation System:

- The deciding authority is the provider.
- The Scientific Council is an expert advisory body pursuant to Section 21 (4) of Act No. 130/2002 Coll.
- Expert evaluation panels are expert bodies of the Scientific Council under the Project Evaluation Process.

The Project Proposal Evaluation Process, which is a mandatory annex to the tender dossier for each announced public tender, is designed to reduce the scope for influence and avoid conflicts of interest on all levels of assessment.

Assessment criteria for project proposals

The evaluation and selection of project proposals is carried out by the provider's advisory bodies on the basis of the following criteria:

1. The applicant's eligibility, in particular the applicant's technical and institutional background.
2. The solver’s abilities and groundwork. In particular, the solver’s professional abilities and results achieved so far are assessed.
3. Economic complexity of the project - project proposals exceeding the requirement for the amount of earmarked support exceeding CZK 12 million for the entire duration of the solution will have to declare the achievement of a higher number of results, with an emphasis also being placed on their higher quality. The specific conditions will be described in the tender dossier, which will set out stricter criteria for the evaluation of both the project proposals and the final reports on the implementation of these projects.
4. Quality of the proposed project:
    a. project objectives - whether clear project objectives, their novelty, difficulty, significance and feasibility were defined;
    b. proposal for solution - how the solver intends to achieve the set objectives and results (clarified concept, preparation and adequacy of the proposed methodology, including consideration of the sex and gender dimension);
    c. outputs - relevance of the overview of expected results; this will form the basis for solving known or anticipated, current or future problems or options; the application potential of the expected results;
    d. foreign cooperation - the involvement of foreign workplaces in the solution is evaluated; the mutual use of devices of cooperating workplaces; using complementary approaches and methodologies;
    e. compliance with R&D&I Priorities - it is assessed whether the proposal contributes to their fulfillment in the section of oriented research, or whether the National Strategy for Rare Diseases for 2010-2020 is complied with.
5. Concurrence of the focus and objectives of the proposed project with other ongoing health research projects.

The specific procedure for the evaluation of proposals will be set out in the tender dossier for the individual public tenders of the Program, which will also regulate the conditions of incompatibility of the researchers’ participation in parallel health research projects of a similar focus.

The process of peer review of project proposals will not apply in the case of Subprogram 3; however, it will be necessary to carry out partial monitoring of the ongoing projects.

The interim report contains information on the progress made in the project so far, the results achieved, and the management of the provided targeted support for the period covered by the report. The interim report must include attachments, which are an integral part of the report and will always be specified. The provider is entitled to request additional documents related to the project's implementation at any time. When completing the interim report, the guidelines published on www.mzcr.cz or www.azvcr.cz and the instructions in the application shall be followed. **An exception applies to the interim report after the first year of the project,**

where information on the progress of the project is only required if there is a deviation from the schedule or planned project implementation.

The interim report must be drawn up for each calendar year of the project implementation, and the beneficiary is obliged to deliver it by the date specified on the websites www.mzcr.cz or www.azvcr.cz.

If, in exceptional cases, the beneficiary is unable to prepare and submit the interim report (or its attachments) within the specified deadline due to serious objective reasons, it must be obliged to inform the provider in writing before the deadline and state the reason why the interim report cannot be submitted on time. The provider is entitled to decide to extend the deadline for delivery of the relevant interim report.

Following the interim review of project proposals, the final review of the project proposals will take place.

The final report contains information on the project outcomes over the entire implementation period and on the results of the management of the allocated targeted support for the last year of the project.

The beneficiary is obliged to deliver the final report to the provider no later than the date specified on the websites www.mzcr.cz or www.azvcr.cz. The final report must be accompanied by attachments, which will always be specified, as an integral part of the final report. The provider is entitled to request additional documents related to the project at any time. When completing the final report, the instructions published on the websites www.mzcr.cz or www.azvcr.cz, as well as the instructions in the application, shall be followed.

The beneficiary is entitled to request an extension of the deadline for submitting the final report by completing the Part ZO form, which shall be submitted within the deadline referred to in paragraph 2 of this Article, together with those parts of the final report that can already be processed and delivered in their final form.

If the contract has been cancelled by withdrawal or has ceased to be effective for any other reason, or if the decision to provide support has been revoked, the beneficiary is required to draw up a final report and deliver it no later than 30 calendar days from the date the contract ceased to be effective or from the date of the decision to revoke the budget increase. Other obligations of the beneficiary remain unaffected.

25. Interim Evaluation of Solved Projects

The provider evaluates the progress of the project every year based on an assessment by expert advisory bodies (the expert evaluation panel and Scientific Council), on the basis of submitted partial reports and results of the provider's inspection activities.

The provider evaluates the project resolution procedure using the following main criteria:

- the progress of work and its compliance with the set objectives;
- the provision of professional and personnel solutions;
- the use of technical and instrumental equipment acquired from the project;
- personnel, organizational and technical procedures for building a new team;

- achieving the objectives of the solution compared to the plan set out in the project proposal, the prerequisites for the overall time and material performance of the task;
- evaluation of the current management of allocated funds, possibly the proposed budget for the following period (checking the drawing of allocated funds, the effectiveness of their spending and the maintenance of their composition, proper justification of possible transfers or changes);
- assessment of results according to categories defined in Section 18 of the Program.

The expert advisory bodies shall draw up a written report on the outcome of the evaluation and submit it to the provider.

If the conditions for continuing project support are met and the provider decides to continue with the project support, it will provide the beneficiary with funding for the following year of the project.

If the preconditions for continuing with the project support are not met, the provider is entitled to withdraw from the contract on support or issue a decision to terminate the support.

The interim evaluation will also assess the fulfillment of obligations on the submission of information to the research, experimental development and innovation information system (pursuant to Section 31 of Act No. 130/2002 Coll.).

26. Result Evaluation of Projects (ex post):

The evaluation of the completed project is carried out on the basis of an assessment by the expert assessment panel, the Scientific Council, based on the final report and the result of the audit activity on the management of funds.

The provider evaluates the final report and the procedure for solving the project according to the following main criteria:

- the fulfillment of the main objective of the Program;
- the progress of work and its compliance with the set objectives;
- the provision of professional and personnel solutions;
- the use of technical and instrumental equipment acquired from the project;
- evaluation of the current management of the allocated funds (checking the drawing of allocated funds, the effectiveness of their spending and the maintenance of their composition);
- assessment of results according to categories defined in Section 18 of the Program, especially in terms of the application potential of the achieved results and the way they are implemented in practice. When evaluating project results, an emphasis will be placed not only on the publication of results in reputable magazines, but also on their use in practice. Stricter evaluation criteria will be set for projects more costly than CZK 12 million.

The Scientific Council and the expert assessment panel also take into account compliance with the conditions for managing the allocated funds in the overall evaluation of the completed project.

The expert advisory bodies will draw up a protocol on the outcome of the evaluation of the completed project and submit it to the provider, who will discuss and decide on the assessment proposal.

The project solution is evaluated as follows:

- **fulfilled** - the declared objectives of the project have been achieved, the applied results from the project and publications, or other results, are excellent or very good in terms of their number and potential response or possibilities of use in solving issues stated by the project, and will significantly affect development in the field, especially in the international context.
- **not fulfilled** - the published or otherwise applied results from the project (publications or other results) are not excellent or very good in terms of their number and potential response or possibilities of use in solving the issues stated by the project, and they will probably not significantly affect development in the field.

Exceptional project results judged to be outstanding may be nominated by the Scientific Council for a special award, the so-called Minister of Health Award for Health Research and Development.

After the end of the Program, the provider will monitor and evaluate the implementation of "data management plans", including the application of the results in "open access" mode on FAIR principles and their protection, the benefits and impacts of the Program, and the subsequently applied results of the projects. The protection and dissemination of results in the academic and user communities, including the application of "open access" mode and FAIR principles, are an essential indicator of the effectiveness of the Program and the achievement of its objectives. Due to the progressive nature of the subject of requirements to ensure open access to publication results and scientific data financed from public funds, these requirements will be specified in more detail within the tender dossier for each currently announced public tender.

27. Presumed Program Parameters

In relation to the focus of the Program and from the experience of the previous program to support applied research from public funds, the average amount of support per project is expected to be CZK 11 million, i.e., the average expenditure per project is CZK 12.1 million. Considering the total Program budget, a minimum of 400 projects are expected to be supported, with at least 25 projects (i.e., about 5%) expected to be solved in cooperation between research organizations and enterprises.

28. Criteria for Meeting the Program Objectives

Achievement of the main and sub-objectives of the Program will be evaluated in accordance with the Methodology for the Evaluation of Research Organizations and the evaluation of programs for the targeted support of research, development and innovation applicable at the time of the evaluation of the Program, or other conditions specified by the provider, as well as

according to definitions for the submission of results to the R&D&I Information System valid at the time of the Program evaluation. Achieving the Program objectives (Subprograms 1 and 2) will be evaluated on the basis of a set of indicators designed to monitor the progress of the Program and assess its overall performance and success.

The indicators are classified into four categories according to their nature, namely Program Implementation Indicators, Program Result Indicators, Indicators of Scientist Motivation and Indicators for Meeting Program Objectives.

Table 11: Program Indicators

Indicator	Number
Program Implementation Indicators	
Minimum number of project proposals received in tenders	1600
Minimum number of selected (supported) projects[5]	400
Minimum number of completed projects in total	300
Minimum number of projects cooperated on between companies and research organizations	20
At least 75% of the projects will be successfully completed	
Program Result Indicators	
Minimum number of main Program results	500
Minimum number of secondary Program results	500
Minimum number of other Program results	1000
Minimum number of all Program results	**2 000**
Indicators of Main Program Results	
J_{imp} – an original article in a peer-reviewed scientific journal that is included in the Web of Science database with the attribute "Article"	460
N - methodology, therapeutic procedure	20
P - patent	10
R - software	10
Indicators of Secondary Program Results	
J_{imp} – an article in a peer-reviewed scientific journal that is included in the Web of Science database with the attribute "Review" or "Letter"	300
J_{sc} – an original/review article in a peer-reviewed scientific journal that is included in the SCOPUS database with the attribute "Article", "Review" or "Letter"	150

[5] The minimum number of selected projects is dependent on the funds available for the implementation of the Program projects from the state budget.

Indicator	Number
B - professional book	25
C - A chapter in a professional book	25
Result Quality Indicators	
Number of results (proportion of all publications) published in an international journal that is ranked by Web of Science - in the Journal Citation Report (JCR) module - in the first quartile (Q1) within the relevant subject group based on its impact factor.	45%
Indicators of Scientist Motivation	
Number of projects for young researchers	50
Minimum number of awards awarded for outstanding results	15
Indicators for Meeting Program Objectives	
We assume that 65% of the Program's sub-objectives will be addressed in the projects	

The indicators of Subprogram 3 are categorized into four groups based on their nature: implementation indicators of Subprogram 3, results indicators of Subprogram 3, quality indicators of Subprogram 3, and motivation indicators for young scientists of Subprogram 3.

Table 12: Indicators of Subprogram 3

Indicator	Number
Subprogram 3 Implementation Indicators	
Minimum number of received project proposals	27
Minimum number of selected (supported) projects[6]	24
Minimum number of successfully completed projects in total	24
Minimum percentage of successfully completed projects	90 %
Minimum number of projects cooperated on between companies and research organizations	1-2
Indicators of Third Program Results	
Minimum number of main results of Subprogram 3 (Jimp, N, P)	24
Result Quality Indicators of Subprogram 3	
The number of results (proportion of all publications) published in an international journal that is ranked by Web of Science - in the Journal	45 %

[6] The minimum number of selected projects depends on the funds available for the Program projects according to the possibilities of the state budget.

Indicator	Number
Citation Report (JCR) module - in the first quartile (Q1) within the relevant subject group on the basis of its impact factor.	
Indicators of motivation of Young Scientists in Subprogram 3	
Number of projects for young researchers	12
Minimum number of all Subprogram 3 results	**24**

29 Risks Associated with the Implementation of the Program

Based on its many years of experience, the provider has identified the most probable risks that could jeopardize the proper implementation of the Program and meeting the set objectives and indicators:

1) not allocating sufficient funds from the state budget;

2) little interest in public tenders from research institutes (Subprograms 1 and 2) and translational calls (Subprogram 3) by research institutes;

3) a low number of project proposals received in tenders meeting the quality requirements of the provider;

4) an insufficient number of enterprises involved in cooperation with research organizations;

5) lack of interest or reluctance of young researchers to engage in projects within 8 years or less of earning their PhD or equivalent degree (Subprograms 1 and 2)

6) objective reasons preventing researchers from providing a statistically significant research and control population in population studies;

7) staffing and technical issues of the provider with ensuring the proper announcement and management of tenders (in particular a functional online application for tender management);

8) legislative changes.

9) duplication and overlaps in the subject of support, focus and objectives of the project and the potential risk of double funding

10) limited staffing capacity both within the evaluation of the provider’s expert advisory body and potential opponents of the project plans, and within the members of the research team, i.e., quantitatively insufficient professional staff to implement the research, and the associated risk of conflicts of interest (Subprograms 1 and 2).

11) limited staffing capacity both for the review of interim and final reports and for reporting at European level (Subprogram 3).

Measures to eliminate selected risks:

All of these potential risks are difficult for the provider to control. Risks 2 to 5 can be eliminated by ensuring greater publicity for health research. A significant increase in the budget for earmarked support in the health sector could also help, because the success rate of supported projects out of the total number of submitted project proposals in public tenders has consistently

been around 20%. Risk 6 can be avoided by quality evaluation of project proposals during the assessment period of the public tender or during the ongoing evaluation of the projects solved in the form of partial reports. Risk 7 is difficult to regulate to a certain extent by the provider, e.g., the internet application for managing public tenders is usually managed by external suppliers, so objectively the completely trouble-free non-stop functioning of the information system by the provider cannot be guaranteed. Risks 9 and 10 can be eliminated by introducing an effective mechanism for their regular evaluation throughout the entire evaluation process phase, and by ensuring constant cooperation with representatives of other providers of support in the area of health science and research and representatives of the individual coordinators of the components of the National Recovery Plan of the Czech Republic.

30. Method of Monitoring and Evaluating the Program

The Program will be continuously monitored through the collection of project information, their implementation and results. The fulfilment of all set objectives will be continuously and finally evaluated through the partial and final project reports[7]. In the year following the end of the Program, an evaluation of the Program will be carried out, including an assessment of the achieved results, and an evaluation report will be prepared, which will include a comparison of the actual results achieved by each project with the assumptions set out in the Program, and an evaluation of the Program benefits.

As part of the assessment of the Program, the following indicators will be evaluated and the benefits of the Program at the level of individual projects will be monitored and evaluated. In approximately five years after the completion of the projects, a survey will be carried out on the implementation of the achieved results into practice and their potential impact on the health sector. Indicators for verifying the long-term impact of the achieved results are also described in the 2030 Health Research Framework in Chapter 10. Monitoring and Evaluation of Concept Implementation. This information will subsequently be used for a comprehensive assessment of the benefits of public support. The provider expects that a rather extensive study will have to be prepared and elaborated for this purpose.

Table 13: Program Assessment Schedule

Year	Subject of assessment	Objective of assessment
2023	Continuous assessment of the NU Program	Evaluation of Program implementation processes, project orientation in relation to program objectives and existing outputs and results in relation to Program objectives. The evaluation will be the basis for the 2nd public tender.

[7]The evaluation reports will also include information on the implementation of the Concept's horizontal priority "*to mainstream sex and gender in health research at all stages (from the design of the methodology to its outputs)"*, which will also be regulated in the public tender dossier.

2024	Assessment of the results of the 1st tender	Evaluation of processes of the 1st public tender and the focus of the projects in relation to the objectives of the Program. It will be the basis for the 2nd public tender.
2025	Assessment of the results of the 2nd tender /transnational calls	Evaluation of processes of the 2nd public tender/transnational calls and the focus of the projects in relation to the objectives of the Program. It will be the basis for the 3rd public tender (Subprograms 1 and 2).
	Continuous assessment of the Program	Evaluation of Program implementation processes, project orientation in relation to program objectives and existing outputs and results in relation to Program objectives. It will be the basis for the 3rd public tender (Subprograms 1 and 2).
2026	Assessment of the results of the 3rd tender/transnational calls	Evaluation of processes of the 3rd public tender/transnational calls and the focus of the projects in relation to the objectives of the Program. It will be the basis for the 4th public tender (Subprograms 1 and ě) and for drafting the new Program.
2027	Assessment of the results of the 4th tender/transnational calls	Evaluation of processes of the 4th public tender/transnational calls and the focus of the projects in relation to the objectives of the Program.
2031	Assessment of the Program results	Final assessment of the results achieved by the Program and implementation processes. It will form the basis for the preparation of a concept and follow-up programs.
2034	Program Benefit/Impact Assessment	Assessment of the benefits and impacts of the Program. It will form the basis for the preparation of a concept and follow-up programs.