

10 November 2020

BACKGROUND NOTE ON CANCER RESEARCH

Context

[Article 168 TFEU](#) empowers the EU to support, coordinate or supplement the actions of the Member States for the protection and improvement of human health. EU action shall cover the fight against the major health scourges, *by promoting research into their causes, their transmission and their prevention*, as well as health information and education, and monitoring, early warning and combating of serious cross-border threats to health. To accomplish its task, the EU has been working in close cooperation with the Member States, the World Health Organisation, the Joint Research Centre and the International Agency for Research on Cancer.

Cancer is not a single disease, but a family of more than two hundred diseases. The number of cancer diagnoses is increasing annually; currently it is 2.7 million new diagnoses per year in the EU-27, which is expected to increase by 25% by 2035 under the current trend. Even more alarming is the fact that one quarter of all cancer cases occur in Europe, while Europe represents only 10% of the world's population. Basic cancer research, translational research (i.e. building on basic research to create new therapies, medical procedures or diagnostics) and clinical research (in which people, data or samples of tissue from people, are studied) are crucial for the continuous advancement in cancer prevention, diagnosis, treatment and follow-up care.

Research and innovation on cancer is a high priority for the EU; however, disparities exist within and between the Member States, which leads to inequalities in outcomes, cancer research and control. Designating cancer as one of the mission areas of Horizon Europe, the next research and innovation funding programme, and putting cancer research high on the agenda of the upcoming Europe's Beating Cancer Plan will help to address the disparities across the EU.

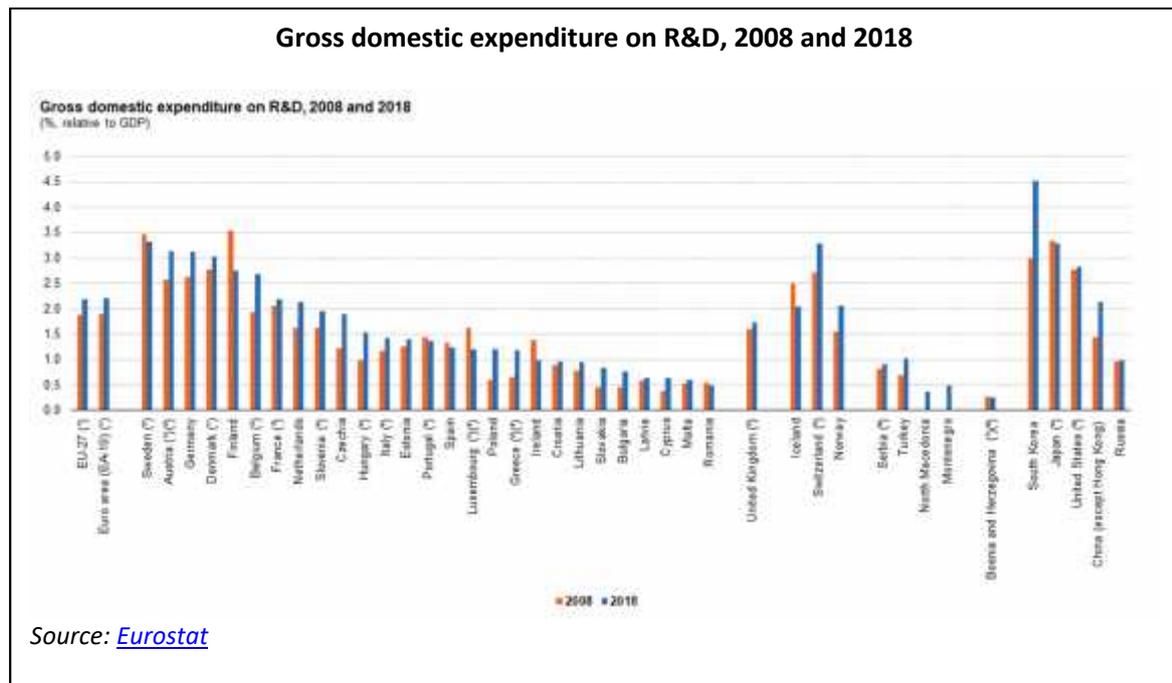
R&D and cancer research spending in perspective¹

To put into perspective the EU funding for R&D and cancer research activities, it is worth looking at how much is spent by the Member States and in the big economies.

The Europe 2020 strategy, adopted in 2010, maintains the long-standing objective for the EU to devote 3% of GDP to R&D activities. Though Member States have gradually increased their spending on R&D, the target at EU-level has not been achieved yet. In 2018, Gross Domestic Expenditure on R&D was 294.5 billion EUR in the EU-27; that is equivalent to 60% of the expenditure of the US, more than double the expenditure of Japan, and more than four times as high as in South Korea.

¹ [Eurostat](#), R&D expenditure in Europe in 2008-2018. Further information on cancer research in the US and Japan are available from the [NIC](#) and [AMAD](#).

The ratio of this expenditure relative to GDP (the R&D intensity) increased modestly in the EU-27 during 2008-2012, and even more slowly in 2012-2018, where it was fluctuating within the range of 2.10% to 2.18%. Despite these increases, the EU-27's R&D expenditure relative to GDP remained well below the corresponding ratios of Japan (3.28%) and the US (2.82%), as has been the case for a lengthy period of time. R&D intensity in China has come close to that of the EU-27 since 2015, and in 2018 Chinese R&D expenditure was equivalent to 2.14% of GDP.



In 2018, in the EU-27, business enterprises funded more than half (58.9%) of the total R&D expenditure, while almost one third (29.8%) was funded by government, and a further 9.2% came from abroad (foreign funds). Funding by the higher education and private non-profit sectors was relatively small, around 1% for each.

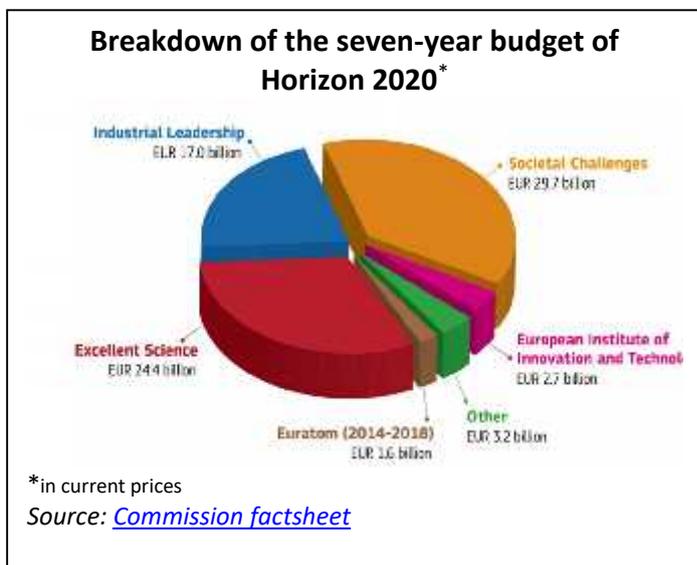
Assessing the share of cancer research within the overall R&D expenditure is not an easy exercise. In some cases, research projects are clearly linked to cancer (focus on one or more different cancer types) but there are also cases where links are not obviously clear as they focus on the interventions, basic research and other aspects linked to cancer. It is estimated that EU funding accounts for less than 10% of the total public spend on cancer research and innovation in Europe.

Cancer research activities and funding under Horizon 2020

Horizon 2020, the EU's current research framework programme, runs from 2014 to 2020 with an overall budget of close to 80 billion EUR². Focussing on the three priorities of 'excellent science', 'industrial leadership' and 'societal challenges', the programme offers support to the whole spectrum of activities of research, technological development, demonstration and innovation.

² [Regulation \(EU\) No 1291/2013](#) establishing Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020); and [Council Decision 2013/743/EU](#) establishing the specific programme implementing Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020)

The biggest share of the budget, 38.5% or nearly 30 billion EUR is allocated to the ‘societal challenges’ priority and its seven so-called specific objectives. One of the specific objectives is health, demographic change and well-being, with a seven-year budget of almost 7.47 billion EUR; this is where cancer-related research and innovation falls.



Multiannual work programmes turn the research policy priorities into concrete research actions. After an extensive consultation process with Member States, the Commission prepares the multiannual work programme, setting out funding opportunities through calls for proposals. The involvement of experts via the [SC1 Advisory Group](#) and the [Scientific Panel for Health](#), and the targeted stakeholder consultation ensures that the research agenda is relevant, linked to the reality on the ground, and results can be taken up in clinical practice or used for further research and innovation.

Funding opportunities are allocated to transnational collaborative projects, blue-sky research, training of researchers, support to SMEs, and projects carried out via public-private partnerships.

Over the past seven years, approximately 1400 cancer research projects received a total funding of 2 billion EUR from Horizon 2020 or about 0.3 billion EUR per year. Around 50 projects supported childhood cancer for a total EU funding of 102 million EUR from Horizon 2020. EU funding aims at supporting research throughout the cancer continuum, from prevention, screening and early diagnosis, treatment and care, as well as quality of life for patients living with and after cancer³.

The research agenda of partnership activities reinforces the efforts of, and creates synergies with, Horizon 2020. These partnership activities are the European Joint Technology Initiative on Innovative Medicines (IMI-2); the two Art.185 initiatives: Ambient Assisted Living (AAL) and the European Developing countries Clinical Trials Partnership (EDCTP); the European Innovation Partnership on Active and Healthy Ageing (EIP AHA); as well as from the three SC1-related Joint Programming Initiatives on Neurodegenerative Diseases (JPND), on Anti-Microbial Resistance (JPIAMR) and on Demographic Change (More Years, Better Lives); and the EIT-KIC Health and Active Ageing.

Furthermore, the Union supports, or has supported, several other initiatives outside the Horizon 2020 framework, through the Health Programme:

³ Source: Commission inquiry; Cordis [paediatric cancer research under Horizon 2020](#), and [cancer research under Horizon 2020](#); [Commission’s Horizon 2020 Dashboard](#)

- ✓ [CanCon](#), Cancer Control Joint Action, whose main deliverable was a European [guide](#) on quality improvement in comprehensive cancer control;
- ✓ [EPAAC](#), European Partnership for Action Against Cancer, which brought together the efforts of different stakeholders into a joint response to prevent and control cancer;
- ✓ [iPAAC](#), Innovative Partnership for Action Against Cancer, which builds upon deliverables of the CANCON Joint Action and implements innovative approaches to cancer control;
- ✓ [JARC](#), Joint Action Rare Cancers, which is a framework for EU stakeholders and policy makers to set the agenda at national level and help provide diagnostics, healthcare and support to citizens who suffer from rare cancer;
- ✓ [ERN PaedCan](#), the European Reference Network on Paediatric Cancer, which was funded by the European Union's Health Programme (2014-2020);
- ✓ [ERN EURACAN](#), the European Reference Network for rare adult solid tumours;
- ✓ [ERN EuroBloodNet](#), the European Reference Network for rare haematological diseases including malignant and non-malignant conditions;
- ✓ [ERN GENTURIS](#), the European Reference Network for rare genetic tumour risk syndromes.

An overview on a selection of the tangible outcome of EU-funded research and innovation activities, highlighting the practical application and the direct impact of research on patients' lives is available [here](#).

The [interim evaluation](#) of Horizon 2020 concluded that Societal Challenge 1 'Health, demographic change and wellbeing' (SC1) was on track to deliver on its objectives. The biggest share of the funding, 43%, had been allocated to 'Treating and managing disease', followed by 'Active ageing and self-management of health' (13.5 %), 'Understanding health, wellbeing and disease' (10.5%), 'Preventing disease' (9.5%), 'Methods and data' (7%) and 'Health care provision and integrated care' (3.5%). The final evaluation of Horizon 2020 will be carried out once the programming period is over, and all projects are closed.

The need for a paediatric and rare cancer research agenda

Pursuant to the incidence-based definition of rare cancers by the [RARECARE project](#), rare cancers are considered as the ones with less than 6 new cases out of 100,000 people per year in the European population. Though they are individually rare, they affect many patients: one quarter of all cancers diagnosed each year are rare cancers, and altogether approximately 5.1 million patients are suffering from rare cancers all over Europe. Given their uncommon nature, they pose specific challenges concerning clinical research, healthcare organisation and clinical decision-making. Research in rare cancers is hindered by the shortage of biological samples from patients, the challenging organisation of clinical trials, and the lack of clinical expertise and suboptimal quality of care.

Cancer research activities and funding under Horizon Europe

Legislation putting in place the next framework research programme, Horizon Europe (2021-2027) is not yet finalised as the Multiannual Financial Framework for that programming period is still under negotiation⁴. When presenting the [legislative proposal](#) in 2018, the Commission proposed a gradual increase of the research budget: the 94.1 billion EUR-budget would have been repatriated amongst three pillars of the programme,

⁴ Legislative procedure [2018/0224\(COD\)](#)

The need for a paediatric and rare cancer research agenda - cont'd.

Cancer is the main cause of death in children of older than one year, and incidence rates have been increasing continuously over the last decades. Paediatric cancers develop early in life and over a much shorter period, opposed to adult cancers which result from long-term processes. Cancers in adolescents and young adults also require special attention, as their biological characteristics are different both from early childhood cancers and from cancers in adults. Among children, several types of rare cancers occur, which have specific epidemiological, biological and clinical characteristics. For these reasons, understanding how cancers in children, adolescents and young adults start and develop is crucial for better prevention and developing more efficient treatment options. As an indicator of the current state of play, it is worth mentioning that more than 150 cancer medicines were developed in the last decade, and only nine of them, i.e. 6% were approved for children.

Source: Study '[Strengthening Europe in the fight against cancer](#)', Chapter 4; [Cancer Mission outline, Recommendation 11](#)

'open science', 'global challenges and industrial competition' and 'open innovation'. The second pillar, 'global challenges' would have more than half of the budget (57.2 billion EUR); this is where health-related research belongs as one of the five clusters of the pillar. In its [first reading position](#), Parliament proposed to substantially increase the budget of the programme to 120 billion EUR, allocating 55.48% to the second pillar, and 8.16%, i.e. 9.79 billion EUR for the health cluster.

Following a political agreement on large parts of the draft legislation in spring 2019, the Commission, together with Member States and all concerned stakeholders, launched a co-design process to prepare for the first work programmes. Part of this preparation concerns the definition of the desired impacts and funding priorities. The result of the process will be set out in a multiannual Strategic Plan to prepare the content in the work programmes for the first four years of Horizon Europe, which will be published in the first quarter of 2021.

The COVID-19 pandemic and the ensuing economic and health crises shifted the priorities of the EU's long-term budget. According to the [deal](#) made by the European Council in July 2020, the financial envelope for the implementation of the Horizon Europe programme for the period 2021-2027 would be 75.9 billion EUR. In the final stage of the negotiations, Parliament still insists that programmes in areas such as health and research should receive extra funding; while the German Presidency says that it is willing to find 10 billion EUR for the programmes, they also caution that any structural changes to a deal reached by leaders in July are unacceptable.

What did not change with the pandemic is the importance of cancer-related research, which will be one of the 'missions' of Horizon Europe. According to the draft legislation, missions are bold and inspirational research activities, sparking activity across disciplines, sectors and actors, and have a wide societal or economic relevance; they aim to deliver solutions to some of the greatest challenges of our times.

The Cancer Mission has a [Mission Board](#), composed of experts in the field of cancer research, public health policy, healthcare provision and practice, and patient advocacy, whose task is to identify the details of the mission. Following an initial report and public consultation, they presented their [report](#) this September, outlining ambitious targets by 2030.

Recommendations for the Cancer Mission, according to the September 2020 Mission outline

Understand cancer, its risk factors and impact

Recommendation 1: Launch UNCAN.eu – a European Initiative to Understand Cancer

Recommendation 2: Develop an EU-wide research programme to identify (poly-) genic risk scores

Prevent what is preventable

Recommendation 3: Support the development and implementation of effective cancer prevention strategies and policies within Member States and the EU

Recommendation 4: Optimise existing screening programmes and develop novel approaches for screening and early detection

Optimise diagnostics and treatment

Recommendation 5: Advance and implement personalised medicine approaches for all cancer patients in Europe

Recommendation 6: Develop an EU-wide research programme on early diagnostic and minimally invasive treatment technologies

Support quality of life

Recommendation 7: Develop an EU-wide research programme and policy support to improve the quality of life of cancer patients and survivors, family members and carers, and all persons with an increased risk of cancer

Recommendation 8: Create a European Cancer Patient Digital Centre where 25 cancer patients and survivors can deposit and share their data for personalised care

Ensure equitable access

Recommendation 9: Achieve Cancer Health Equity in the EU across the continuum of the disease

Recommendation 10: Set up a network of Comprehensive Cancer Infrastructures within and across all EU Member States to increase quality of research and care

Cross-cutting recommendations

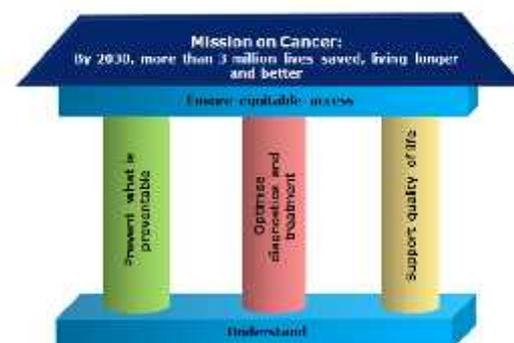
Recommendation 11: Childhood cancers and cancers in adolescents and young adults: cure more and cure better

Recommendation 12: Accelerate innovation and implementation of new technologies and create Oncology-focused Living Labs to conquer cancer

Recommendation 13: Transform cancer culture, communication and capacity building

Source: [Cancer Mission outline](#), September 2020

This Mission outline serves as a basis for defining and developing synergies with national cancer plans and other programmes of Member States, with other Horizon Europe Missions and research and investment programmes, and with other EU policies and actions, in particular the Europe's Beating Cancer Plan. The final Cancer Mission report, due in December 2020, will feed the work programmes of Horizon Europe.



Source: [Cancer Mission outline](#), September 2020

Available expertise

✓ **Cancer research**

Chapter 3, point 3 (pp 108-117) of the study [Strengthening Europe in the fight against cancer](#) - Policy Department for Economic, Scientific and Quality of Life Policies, July 2020

✓ **Rare cancers and childhood cancers**

Chapter 4 of the study [Strengthening Europe in the fight against cancer](#) - Policy Department for Economic, Scientific and Quality of Life Policies, July 2020

✓ **Horizon 2020**

[Scrutiny on Horizon 2020 focusing on the European Parliament's priorities](#) - Study - Policy Department for Economic, Scientific and Quality of Life Policies, July 2020

[Interim evaluation of Horizon 2020](#) - Briefing - EPRS, March 2018

[Assessment of the Horizon 2020 programme](#) - Study - Policy Department on Budgetary Affairs, January 2016

✓ **Horizon Europe**

[Horizon Europe: Framework programme for research and innovation 2021–2027](#) - Briefing - EPRS, May 2019