Towards a Cancer Mission in Horizon Europe

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Executive summary

The yearly burden of cancer is expected to increase in the 28 EU member states from 3.0 mio cases (and 1.4 mio deaths, corresponding to the leading cause of death below the age of 70) in 2018 to around 4.0 mio new cases in 2040. Over this period, the number of individuals that live with a cancer diagnosis and treatment and require regular screening and specialised care, including rehabilitation and psychological and socio-economic support, will rise even steeper. With cancer emerging as one of the leading chronic diseases, European healthcare systems are under increasing pressure and will soon be faced with shortage of specialized personnel and resources.

Over the two last decades, the cancer community has explored initiatives that would ensure that all cancer patients will have access to the treatment, care and support they deserve. As a result, the European Commission has recently launched a Cancer Mission, implementing a comprehensive multidisciplinary approach to cancer research to tackle the challenge.

To assists in this endeavour, the European Academy of Cancer Sciences (EACS) has consulted members of a wide range of cancer and patient organisations to formulate a consensus advise to the Cancer Mission Board. Only by reducing cancer incidence by primary prevention, by diagnosing cancer earlier, and by more effective treatments, coupled to measures to assist cancer patients in regaining a healthy life, will we be able to deal with this grim future.

They reached the consensus view that a comprehensive translational cancer research approach that is focused on personalized/precision medicine and that covers the entire cancer research, cancer care and prevention continuum has the potential to achieve in 2030 the goal of a 10-year cancer-specific survival for 75% of the patients diagnosed with cancer in EU Member states with a well-developed healthcare system. Expected effects of primary prevention on incidence and mortality is a more long-term goal to be assessed by age-standardized mortality monitoring.

Concerted actions across this continuum that spans from basic and preclinical research through clinical and prevention research to outcomes research, as well as the establishment of high-quality networked infrastructures will pave the way not only to clinical innovation but also to the mitigation of economic and social consequences across Europe.

To achieve this ambitious goal, we here propose the establishment of both infrastructures as well as defined research areas in which investments need to be made.

We foresee a need for three types of infrastructures:

1. Translational research.
2. Clinical and prevention trials.
3. Outcomes research.

These infrastructures, embodied in Comprehensive Cancer Centres (CCCs) or CCC-like entities and networks thereof, will provide researchers with access to a critical mass of patients, biological materials and technological resources, bridging research and healthcare. The latter will warrant that future scientific and social innovations benefits cancer patients across the healthcare systems in Europe.

We further prioritize thirteen research areas:

This requires a balanced research portfolio: basic and preclinical research; primary prevention; early detection; development of new therapies; rehabilitation; psychosocial oncology; palliative oncology;

outcomes research; survivorship research; health economics; paediatric oncology; geriatric oncology; big data and computational science. We provide recommendations for each of these areas; these recommendations will be, in our view, important for achieving key targets. We also offer suggestions as to how to strengthen patients´ empowerment, improve specialist education, and decrease present inequalities in cancer research within the EU. Meeting the objectives will require further harmonization of EU and national priorities and policies, improved research coordination at the national, region al and EU level, as well as more efficient and flexible funding mechanisms.

It is also crucial to ensure the sustainability of trans-border infrastructures and networks, for example through long-term support directly by the EU, or other schemes to which Member State countries commit. It will require political will and perseverance to bridge the gaps in science, society and policy that impact on cancer treatment and care.

Research areas of priority with selected recommendations (for full description and recommendations see full paper)

Basic and preclinical research
- Encourage multidisciplinary high-risk-high return projects
- Use ERC funding paradigms to select promising bottom-up proposals.

Primary prevention
- Support implementation research to enhance effectiveness of programs that address well-known risk factors and research to uncover new causes of cancer (genetic predisposition, and the influence of environmental/behavioural factors).
- Increase funding for prevention research substantially.

Early detection for prevention and treatment
- Critically evaluate currently applied early detection programs and assess (cost)effectiveness.
- Promote research to better understand premalignant disease and stimulate biomarker research and diagnostic technologies for early detection.

Development of new therapies
- Increase support for innovative data-rich academia-initiated clinical trials and drug repurposing in combination with state-of-the-art diagnostics (omics and AI-based).
- Support development of academic cell therapy entities (e.g. CAR-T cells).
- Structure implementation research to effectively introduce practice changing therapies.

Psychosocial oncology, rehabilitation, and survivorship research
- Support development of tools to assess health-related quality of life (HQoL) and enhance communication with patients and to facilitate informed shared decision making.
- Support development of prediction models for side effects of treatment.
- Develop survivorship-specific patient-reported outcomes to monitor HQoL over time including socioeconomic consequences (e.g. return to workforce; financial constraints).

Palliative oncology
- Support research how to optimally organise supportive care in view of the substantial life-prolongation of emerging cancer treatments.
- Promote educational programs for palliative care professionals to optimize palliation and recognize and mitigate life-threatening side effects of treatments.

Paediatric oncology
- Support research on understanding the underlying biology and applying this knowledge for developing innovative therapies (precision medicine; stimulate creation of centres with sufficient critical mass).
- Promote programmes to address the needs of teenagers and young adults with paediatric cancers.

- Support long-term follow-up programs to monitor side effects and improve quality of survivorship.

Geriatric oncology
- Support research to better understand the links between ageing and cancer.
- Support development of instruments (e.g. frailty scores and HQoL measurements tools) specific for elderly patients with an eye for their often-extensive co-morbidities and research to adapt cancer treatment.

Outcomes research
- Study overall patient survival to assess effects of lead-time bias and possible overdiagnosis.
- Prevention: Assess impact of prevention programmes on the prevalence of behavioural risk taking (smoking, alcohol consumption, obesity) as function of type of intervention.
- Therapeutics: Assess clinical effectiveness of innovations - in combination with health economics analysis as a gate-keeper before implementation in the healthcare system.

Health economics
- Make data collection (and its accessibility) for assessment of cost-effectiveness mandatory for clinical research projects developing new preventive and therapeutic treatments within the Cancer Mission.
- Install a task force that evaluates cost-effectiveness of new interventions.

Big-data and computational science
- Stimulate introduction of AI/machine learning in multiple areas: image analysis, interpretation diagnostic data.
- Define core data records (including those collected through wearables) to be collected from every patient and how these can be shared without violating privacy rules.

Further recommendations*:*

Specialist education
- Provide support to not-for-profit cancer organisations to offer recurrent training and educational courses and extent their reach by participation through the internet.

Patient empowerment
- Support rehabilitation research and research focused on HQoL issues.
- Involve patients and patient organisations in prioritizing research areas in outcomes research and health economics.
- Support educational programs for patients.

Inequalities in research
- Support establishment of Central-Eastern European cancer centres with effective utilisation of OECI's Accreditation and Designation programme, and EACS's Designation of Excellence programme via collaboration with Central/Eastern European Academy of Oncology.
- Open dedicated calls for proposals in less developed regions in Europe to mitigate inequalities in basic, translational and clinical research.