



Danish Cancer Society



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World
Cancer
Research
Fund International

UK therapeutic

cancer prevention network

collaborating to prevent cancer

International Agency for Research on Cancer



Cancer Mission Statement on Cancer Prevention By Cancer Prevention Europe

Why is cancer prevention inevitable in a European Cancer Mission against cancer?

With the changing demographics of an aging population, Europe is threatened by a massive increase in new cancer patients and cancer deaths. More than 100 million Europeans will be diagnosed with cancer over the next 25 years. This is not a worst case scenario – this is the most likely projection based on scientific evidence. On the contrary, it may well get even much worse, if for instance current trends with increasing overweight and obesity, or exposure to air pollution continue to rise. This means that virtually every family will have members suffering from cancer, together with the psychological and possibly economic consequences for the whole family. In addition, there are negative consequences for the entire population. First, the economic burden will increase to an extent that it will be impossible to provide optimal treatment to all patients. Second, it will increase inequity as those who will suffer first from less optimal treatment are the most vulnerable groups in society. Third, no European country will be able to build up the needed capacity in medical professionals and caretakers.

Only a massive and rigorous investment into cancer prevention may counter this projection. To achieve the minimum goal of plateauing numbers of new cancer patients and deaths until 2040, the risk of developing cancer needs to be reduced by approximately 0.75% per year and the risk of dying from cancer by slightly over 1% per year. Due to the long latency period during which cancer develops between exposure and diagnosis, it takes a long time to reverse a trend. Thus, the figures need to be substantially higher than what was achieved in the past decade. For example, with asbestos being banned in most European countries in the early 1990s, the trend of increasing asbestos-related cancer deaths continued for 30 years and only after about 60 years a situation similar to before the epidemic started will be reached. Timelines are hardly shorter for many other established cancer risk factors. A prominent example of today is air pollution – at present, in Europe, it causes about 1% of cancers, but is reflecting the exposure situation from 20-30 years ago; to avoid an air pollution-related strong increase in cancer action has to be taken today, at least. Such rigorous action in policy change for a long list of known carcinogens or unhealthy behaviours and research to fill our

knowledge gaps can only be achieved with massive investment coordinated across Europe, i.e. through the Cancer Mission Europe.

Why is cancer prevention an All-European challenge and hence perfectly suited for a Cancer Mission?

As mentioned above, only with both rigorous implementation of prevention measures known to be effective, and with enforced research into better prevention, will the goal of the Cancer Mission of “having 3 out of 4 patients surviving cancer” be realistic. No European country is an exception in this regard. Only joining forces in improved cancer prevention and cancer prevention research could change these trends, which also has numerous synergistic benefits for European populations. Broadening in health promotion to include action on the structural determinants of health, including a focus on the implementation of Health in All Policies, tackles cross-cutting themes such as preventive strategies common to other non-communicable diseases or to climate change mitigation (i.e. prevention should be done through inter-sectoral policies encompassing health services, but also the energy, transportation, food, or urban planning sectors), while reducing social disparities in health. The impact of political measures on various levels (European, national, regional, and the community) on the reduction of cancer risk factors will be monitored by cancer incidence and mortality registration and projections. In addition, research is repeatedly finding that there are many ways by which cancer prevention can save costs to the economy. For example, the reduction of meat production in the context of measures against climate change will lower meat consumption with the benefit of reducing the risk of cancer. Similarly, shifting transportation behaviour from car use to biking and walking will have an impact on air pollution, climate change and cancer.

Why is cancer prevention research so essential for successful cancer prevention?

It is estimated that around 40% of cancers could be avoided through implementation of primary prevention measures known to be effective. Most of this is known for many years, if not decades, but has not resulted in effective cancer prevention. It has also been shown that deaths from several types of cancer can be substantially reduced through early detection. The reality is that the extent to which European Screening Guidelines are implemented across Europe differs greatly. Hence, implementation research must be enforced to make prevention more acceptable to health decision-makers and to the people. Research into cancer aetiology must also be continued to identify yet uncovered causes of cancer.

Research is needed to unravel how to most effectively translate scientific evidence into effective prevention measures on the individual, community, national and international level, taking into account socio-economic differences within and across countries.

Why is primary prevention essential?

Primary cancer prevention encompasses reducing harmful environmental exposures or making positive changes towards healthy behaviours, as well as the use of vaccines and therapeutic agents to prevent the development of cancer. It is imperative to improve the impact of primary prevention of cancer on the health of the European populations. This goal

is reached by informing policy and by promoting the adoption and integration of evidence-based practices, interventions, and policies into public health and routine health care settings, as developed by implementation research. The scientific evidence-based most successful individual and some structural measures for Europe are summarized in the European Code against Cancer. Of the estimated 40% preventable cancers in Europe, half are caused by smoking. This illustrates that research on the implementation of evidence-based population-level measures is still of utmost importance. Delivery of the Framework Convention on Tobacco Control (FCTC) measures will effectively address the still leading preventable cause of cancer and the Cancer Mission provides the opportunity for the EU to make good on the treaty obligations on FCTC Article 20 research, surveillance and exchange of information. The European Code against Cancer also calls for action against overweight and obesity and alcohol consumption. Behavioural research is needed to find the most effective ways to reduce both, with a view to the different social circumstances. Better coverage of vaccination programs against HPV and hepatitis B is needed to reduce infection-related cancers. A priority goal is to identify best experiences around the world by means of big data and create an inventory of successful interventions (e.g. taxation for alcohol and ultra-processed food such as soft drinks or chips; “greening” urban planning for active transportation; etc.). This will support politicians in making evidence-based decisions on public health priorities. Also, there is a great deal of variation in the delivery of the already established evidence-based and effective prevention measures across Europe. Research is needed on how to optimize implementation of these measures, while continuing to develop new and better interventions.

Additionally, it is timely to identify and if possible overcome barriers to the implementation and use of preventive therapies (e.g. aspirin). Using available pharmacological databases linked to European cancer registries may identify commonly used off-patent drugs with cancer preventive efficacy and is an area of untapped potential. Results could be followed up experimentally in state-of-the-art preclinical models before translating to clinical trials. A major impediment to the development of cancer preventive interventions is a lack of surrogate biomarkers (i.e. analogous cholesterol levels in cardiovascular disease prevention) to provide a quick read-out of biological activity in early phase trials and predict efficacy during late phase studies. Identification of surrogate biomarkers aligns alongside any wider work to improve risk stratification, since better identification of high-risk populations would also enable, smaller, cheaper and more efficient clinical trials.

Why is secondary prevention essential?

Secondary cancer prevention encompassing early detection and cancer screening can further reduce new cervical and colorectal cancer cases and allow detection at curable stages. Organised screening reduces mortality from cervical, colorectal and female breast cancer, but more research is needed on how to optimise effectiveness and cost-effectiveness, e.g. by novel strategies of risk-adapted screening. Screening for cancers at other sites is under investigation and enforcement of this work is needed. Research is also needed on how to avoid unnecessary resource use and over-diagnosis, as with the example of thyroid cancer.

Secondary prevention also covers the opportunity to offer preventive therapy based on risk-stratification on cancers for which effective screening strategies are established (such as

breast, cervical and colorectal cancer). For its successful implementation, this must also include elements of education of both the population (taking into account cultural and ethnical diversity) and of the health professionals. Two issues are important for this strategy. First, the identification of subjects with a high cancer risk who might benefit from therapeutic prevention. Second, the development of therapies with an optimal risk-benefit profile. Cancer prevention therapy should be discussed routinely with affected individuals (e.g. NICE guideline for breast cancer prevention).

With the aim of understanding the bottlenecks for effective evidence-based secondary prevention, modelling the effectiveness and cost-effectiveness of the expected impact of various screening modalities at the population level is needed. This would support and promote more evidence-based decisions on implementation of screening programs.

Why is tertiary prevention essential?

With the number of cancer cases increasing over the years due to increasing age and improved survival, determining evidence-based successful interventions and guidelines for effective management of symptoms, and prevention of disease- and treatment-related side effects and co-morbidities is crucial to improve cancer patients' quality of life. In addition, research should include lifestyle factors that may influence recurrence and prognosis; broadening the outcomes of research to aspects of quality of life including fatigue and long-term neurotoxicity, for example; and identifying and developing therapies for prevention of chemotherapy/radiotherapy-induced cancers in survivors of both childhood and adult cancers.

What is the outcome of cancer prevention research within a Cancer Mission Europe?

Without doubt, cancer prevention is needed to achieve the goal of long term survival and while there are successes, Europe is far from making the most of the available opportunities. Hence several barriers need to be overcome. Primary cancer prevention will affect absolute numbers of cancer patients mainly in the long run. Secondary prevention may affect absolute numbers of cases in the short run, but reduction of cancer deaths in the longer run. Tertiary prevention reduces the number of cancer deaths.

As outlined above, due to the long latency period a cancer needs to develop from exposure to diagnosis, current elimination or reduction in carcinogenic exposures will decrease cancers that would occur over the next several decades but not in the short term. To evaluate the success of a Cancer Mission in terms of preventive efforts the reduction of exposures or changes towards healthy behaviours need to be measured. The resulting cancer projections will allow evaluation in whether the future cancer burden would be successfully reduced. Overall, internationally coordinated, rapid provision of reliable data is important in key in the evaluation of cancer prevention. The activities of the IARC on coordinating cancer registry data can serve as an example, but an effective Cancer Mission will need much more information for planning and evaluation of progress, e.g. data on risk exposures and standardised, rapid reporting of the preventive measures taken and intermediate outcomes observed. Providing epidemiologically reliable study bases with data and associated biospecimens for prevention research will also be important for progress.