

# Coordinated International Initiatives and Access of Global Research Data: Towards Personalized Cancer Medicine

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## Abstract

Cancer is a complex disease that can be caused by a combination of genetic, environmental, and lifestyle factors. Therefore, knowledge and perspective from multiple disciplines are essential to tackle many of the biggest challenges we currently face in cancer prevention, early detection, and therapy. Coordinated international efforts, such as World Cancer Research Day, highlight the importance of international collaboration, multidisciplinary, and data sharing to address the challenges of the future and accelerate scientific discoveries. Working together to promote global cancer research and open access to research and patient data pave the road towards personalized medicine, allowing more people to live without cancer, and more cancer patients to be diagnosed earlier, suffer less, respond to treatment, and have a better quality of life.

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## Together in the global fight against cancer

With over 18 million new cases annually, cancer is a major public health problem worldwide, with lung, female breast, and colorectal cancer responsible for one-third of the total cancer incidence burden in 2018 [1]. Cancer is also the second leading cause of death globally, with 9.6 million deaths every year, with lung cancer alone accounting for almost one in five cancer deaths globally. Yet at least 7 million lives could be saved from cancer over the next decade by identifying and focusing on a set of priority interventions, investing efficiently, and mobilizing different stakeholders to work together [2]. The growing challenges and opportunities to tackle the global cancer burden emphasize the need to join efforts on international cancer research awareness initiatives to increase global awareness and knowledge about the impact of cancer research. The World Cancer Research Day (WCRD) [3], held annually on September 24 and coordinated jointly by 10 international organizations (Figure 1), seeks to promote cancer surveillance, cancer research, and cancer control worldwide. Since 2016, a total of 620293 people and 102 organizations from Europe, America, and Australia have endorsed the World Declaration for Research on Cancer [4], working towards a truly inclusive and equitable international movement.

## Global access to research and patient data

Data science and machine learning technologies are helping cancer researchers to extract new meaningful data from large molecular and clinical datasets. This calls for the urgent need to support global cancer research and promote data and resource sharing to help transfer



Figure 1: International organizations leading the World Cancer Research Day Initiative.

knowledge about the disease and maximize the reach and impact of scientific discoveries. Open access to research data is key to make science accessible, more transparent, and thereby more effective. As research is more and more data-driven, progress in scientific knowledge becomes intimately tight to data available free of restrictions, free of charge, and without a license or copyright conditions. In Europe, the ambitious program European Open Science Cloud (EOSC) [5] envision that all European scientists will be granted access to a virtual repository wherein data from publicly funded research will be hosted. The EOSC is intended as a safe and reliable virtual environment to store, process, and access research data, ultimately endorsing interdisciplinary research and reproducibility while limiting duplication of studies (e.g., of clinical trial data). Therefore, the EOSC could contribute to the realization of the objectives of the Cancer Mission in Horizon Europe [6], fostering multidisciplinary research cooperation. In the United States, NCI and NIH offer multiple repositories of different data



types and disciplines to ensure the broadest sharing of cancer research data from federally funded research [7]. On the other hand, getting consistently defined, reliable and accurate data on the inputs, decision logic, and outcomes of treatment decisions is a complex challenge. Cancer Commons [8] is a nonprofit network of leading cancer experts, including physicians, clinical researchers, and laboratory scientists that helps cancer patients to identify and access the best-personalized treatment options, therefore turning patient and research data into life-saving treatments. However, it is also important to acknowledge that the benefits of cancer research to date have not been equitably distributed between high-income countries, low-income countries and middle-income countries, or even within high-income countries where marked differences in access to care and other factors contribute to profound cancer health disparities. Such disparities will represent a notable failure of the global cancer research community, both from a humanitarian perspective by ignoring stark inequalities, and from a scientific perspective by not realizing immense opportunities for discovery afforded by global collaboration.

### **Cancer research leads the way for personalized cancer therapy**

Fifty years ago, President Nixon declared the “War on Cancer” and elaborated the National Cancer Act as an effort to find a cure for cancer by increasing research to improve the understanding of cancer biology and the development of more effective cancer treatments, such as targeted drug therapies. However, although major efforts have been made towards the implementation of national cancer plans worldwide, those have been unequally prioritized within the national health policies, and this has led to inequality in the access to cancer diagnosis and treatment. Therefore, WCRD offers the cancer community the opportunity to signal the importance of research and its potential to transform the lives of cancer patients, but it also provides a platform to highlight the advances that have already been made in our knowledge of cancer and interventions that can reduce our risk of acquiring cancer.

Through cancer research we are advancing with continuous steps forward, to control the disease. Indeed, progress in cancer control has contributed to increasing the five-year survival dramatically since the early 1960s, at least in high-income settings [9]. Today, we can identify and characterize specific cancer types, obtain a molecular diagnosis and deliver a more precise therapy linking molecular aspects of cancer to specific treatments.

The development and use of non-invasive or minimally invasive tools, like a liquid biopsy, approaches, for early diagnosis, prediction of recurrent disease and therapy decisions have also the potential to transform the lives of cancer patients. As one illustration, cancer death rates in the United States decreased 15% between 2007 and 2017, in

part as a result of significant and sustained funding to the NCI [10]. Substantial declines in cancer mortality in the last half-century have been seen in many developed countries, thanks to the efforts of many research institutions all over the world and to the support of public and private research funding, raised through taxes and donations to cancer charities.

### **Cancer cannot be left behind during SARS-CoV-2 crisis**

As cancer research is key to drive tomorrow’s advances and identify future prevention and therapeutic strategies to help cancer patients, it cannot stop moving forward, even in difficult times. Cancer research has been interrupted due to the SARS-CoV-2 pandemic and this has resulted in deleterious consequences soon, including disrupted cancer prevention, diagnose and treatment due to widespread infection control measures, high SARS-CoV-2 morbidity and mortality in patients with concurrent cancer, disruptions to ongoing cancer research, intense prioritization of SARS-CoV-2 at biomedical research funding agencies, and diversion of cancer personnel and programmatic funding to pandemic control. Therefore, now more than ever, it is essential to give all support to cancer researchers and oncology professionals and to ensure cancer patients’ wellbeing. The WCRD 2020 campaign claim Team Up for Cancer Research pursued to strength the idea that a collaborative research culture is essential to address the current challenges facing us and the opportunities to accelerate results in cancer research leading to more effective targeted therapies for a future without cancer.

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