

Cancer research that matters

Elisabete Weiderpass is an expert in cancer epidemiology and cancer prevention. She has been the Director of the International Agency for Research on Cancer, the specialized cancer agency of the World Health Organization, since January 2019. She spoke with *Nature Cancer* about 2021 and the years ahead.

■ **2021 has been another difficult year for the world, with the COVID-19 pandemic still not under control. What was the continuing impact of the pandemic on cancer research and patients with cancer?**

EW: In response to the pandemic, the International Agency for Research on Cancer (IARC) assessed the impact of COVID-19 on health systems at the national level and looked at the outcomes of current and future patients with cancer. IARC also participated in the COVID-19 and Cancer Global Taskforce and became a founding partner of the COVID-19 and Cancer Global Modelling Consortium, with a remit to co-develop tools and provide evidence to aid decision-making during and after the pandemic.

In this manner, IARC was able to clearly assess the negative impact that the pandemic has had on cancer health systems and cancer outcomes. COVID-19 has interrupted registry operations, disrupted screening programs, and delayed patient diagnosis and initiation of treatment. The long-term, large-scale cancer aftershock will be strongly felt in the coming years.

More precisely, IARC scientists found that two thirds of all population-based cancer registries surveyed [reported disruptions](#) to their operation during the early phases of the COVID-19 pandemic. In addition, inequalities in the cancer burden were exacerbated, with negative impacts reported more commonly in countries with a low human development index (HDI) than in countries with a high HDI.

Furthermore, IARC assessed the [impact of the COVID-19 outbreak on cancer screening programs](#) in 17 low- and middle-income countries (LMICs) within different HDI categories. Lockdowns were imposed in all but one of these countries. Screening was suspended for at least 30 days in 13 of the countries, and diagnostic services for screen-positive individuals were suspended in 9 of the countries. All but 5 of the countries continued cancer treatment. These results suggest an increase in the burden of cancer in the following years as a consequence of the COVID-19 pandemic, particularly in LMICs. In light of this estimated increase in the burden of cancer, IARC is developing and coordinating



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a new strategy based on the Global Cancer taskforce, to find ways not only to mitigate these repercussions but also to improve cancer care and to develop evidence-based tools to guide health-system responses during pandemics. [In a recent article](#), a team of public-health specialists led by scientists from IARC provided comprehensive guidance on best practices to maintain quality-assured cancer screening during the COVID-19 pandemic.

Scientists from IARC estimated the impact of the COVID-19 pandemic on global cancer mortality related to delays to treatment caused by the COVID-19 pandemic and proposed [a model to minimize this excess mortality](#). They used published data on head-and-neck cancer, a known time-dependent disease, to develop an online tool that estimates the risk of cancer mortality and applied it to estimate the impact of the COVID-19 pandemic on data from 15 oncological services from around the world. This demonstrated that maintaining higher levels of cancer treatment during the COVID-19 outbreak

and achieving more-rapid increases in treatment levels during the post-outbreak period can reduce the number of accumulated patients needing treatment and decrease the additional risk of dying due to longer time to treatment initiation.

Finally, IARC and partner institutions comprehensively assessed the [impact of the COVID-19 pandemic on pediatric oncology diagnoses and provision of healthcare](#), for the first time covering an entire country. The researchers compared the incidence of childhood cancer in Germany, which has 13.5 million people younger than 18 years, using nationwide high-quality cancer registry data, and found that the estimated age-standardized incidence rates were markedly higher, overall and across diagnostic groups, in 2020 than in 2015–2019. The results from a qualitative survey indicate that diagnostic processes, timeliness of diagnosis, and delivery of treatment were hardly affected during the COVID-19 pandemic, so the underlying reasons for the increase in incidence rates seen in this study remain speculative. However, continued close monitoring of incidence patterns should shed light on the underlying reasons for the observed increase and contribute to understanding similar situations in other countries.

■ **2021 has been the year of COVID-19 vaccination campaigns, with high-income countries taking the lead in vaccinating their populations, in contrast to many low-income countries, especially in Africa. How are the COVID-19 vaccination inequalities impacting cancer-related health services and existing cancer disparities?**

EW: We have evidence indicating that the COVID-19 vaccination inequalities will exacerbate cancer-related health services and inequalities in cancer burden. We have already discussed the negative impact of the COVID-19 pandemic on cancer-related health services, cancer registries, screening and treatment, more commonly reported in LMICs with a low HDI than in countries with a high HDI.

It is a fact that the cancer burden is far from equitable. We know that LMICs — with 70% of all cancer deaths — bear

a larger burden of cancer mortality than do high-income countries. IARC global data on cancer burden indicate that there will be **30.2 million new cases of cancer and 16.3 million cancer-related deaths worldwide in 2040**. The cancer burden will disproportionately affect LMICs that lack access to essential healthcare services, including essential information about cancer prevention, screening, treatment, and therapy. These inequalities will be even more emphasized in the future, and will be exacerbated by the pandemic and COVID-19 vaccination inequalities. We have already witnessed how the pandemic has intensified existing challenges in health systems and hospitals and has affected services across the cancer continuum, from prevention to diagnosis, cancer screening, treatment, and palliative care. Inequalities in COVID-19 vaccination will further delay redressing these challenges.

■ How has the pandemic been affecting IARC's mission of "cancer research for cancer prevention"?

EW: The past two unprecedented years have brought IARC many challenges. There was an adaptation to remote working from March to May 2020. Our operations continued thanks to the outstanding commitment of IARC's personnel and significant investment in the digitalization of activities. Subsequently, there was a gradual return to on-site operations, with ~70% of personnel working remotely for the following months. Despite the challenges, IARC successfully conducted most of its research remotely and deployed innovative tools and technologies such as digital signatures and online conferencing solutions. All meetings and various other scientific events were successfully transformed into virtual meetings for the first time in IARC's history. Unfortunately, the COVID-19 pandemic had a negative impact on IARC's fundraising activities, and certain activities and projects that could not be conducted remotely, such as field work, were suspended.

■ What progress has been made in cancer prevention, early detection and mitigating risk factors over the last year? What should be the priorities for regulatory authorities in high-income versus under-resourced countries for 2022?

EW: IARC's latest estimates show that the global cancer burden rose to **19.3 million new cases and 10.0 million cancer deaths** in 2020. IARC scientists found that cancer and cardiovascular disease were the **leading causes of premature death** in 127 countries worldwide. One of IARC's most striking

discoveries is that, for the first time, **female breast cancer has overtaken lung cancer** as the most commonly diagnosed cancer worldwide.

In 2020, 2.3 million cases of breast cancer were diagnosed, and 685,000 women died from the disease. **Our long-term projections** show that if the latest incidence trends continue for the major cancer types, we will see a doubling in the number of cancer cases by 2070, relative to 2020. The greatest increases are predicted to occur in lower-resource settings. This is due not only to demographic changes but also to a transition in risk factors leading to a change in the pattern of cancers from those linked predominantly to infection to those linked to environmental factors and obesity. The anticipated surge in the annual number of new patients with cancer over the coming decades, particularly in countries with low or medium HDI, is a clear signal for immediate and substantial investment in cancer control.

The figures are alarming, so it is time to act! Given this prediction of enormous personal and societal losses, and the fact that 40% of all cancers are preventable, prevention will soon become the key response to tackling the cancer epidemic. IARC scientists predict that tobacco smoking, alcohol consumption, overweight and obesity, and infection with certain types of high-risk human papillomavirus (HPV) will be the biggest contributors to the future cancer burden; tobacco smoking will remain the foremost preventable cause of cancer. Several IARC studies highlighted the long-term beneficial impacts of preventive interventions, emphasizing the tremendous potential for prevention to invert the projected trends in cancer incidence and mortality.

IARC research has supported, and will continue to support, the World Health Organization (WHO) in many global initiatives, to accelerate the effective translation of research findings into public-health actions. IARC is currently supporting the global strategy to accelerate the elimination of cervical cancer by providing key scientific evidence, technical materials, and updates. IARC has been at the forefront of game-changing research to establish the causal role of infection with oncogenic HPV types in cervical cancer, to evaluate the safety and efficacy of HPV vaccines, and to identify simplified alternatives for screening and treatment of precancerous cervical lesions in LMICs. The WHO, in collaboration with IARC and the International Atomic Energy Agency, launched the Global Breast Cancer Initiative on 8 March 2021. IARC has a wide range of

programs, research studies, and publications that fit perfectly into this initiative and can support the WHO in the implementation of efficient and cost-effective solutions. Additional programs that IARC research work can support are the WHO Global Initiative for Childhood Cancer and the WHO Global Hepatitis Programme. We are already working closely with the WHO on health economics, and a collaboration has been initiated on cancer inequalities, one of IARC's crucial emerging priorities: the economic and societal impacts of cancer.

■ What were IARC's biggest achievements in 2021 and what were the biggest obstacles the organization faced?

EW: 2021 has seen some important achievements for IARC. In May 2021, China joined IARC, bringing the total number of Participating States to 27. IARC has also developed an exciting new Medium-Term Strategy for 2021–2025. This roadmap will guide IARC for the next five years. We live in a fast-changing world, so we have forged our scientific strategy to optimize IARC's public-health impact and position IARC as the leading global cancer authority.

The biggest challenges come from continued resource constraints. In response, IARC will further prioritize activities and ensure that the agency remains fit for purpose and sufficiently agile to respond effectively to the evolving operational environment for cancer research.

■ What is the outlook for the coming year and what are some of IARC's longer-term goals?

EW: As I mentioned, IARC's latest predictions indicate a 50–60% increase in the cancer burden will occur within two decades, by 2040. These figures are alarming and a call for action!

When considering IARC's priorities, we defined four fundamental activities that IARC has already established and must continue: Data for Action (i.e., describing the occurrence of cancer); Understanding the Causes; From Understanding to Prevention (i.e., the implementation of cancer research); and Knowledge Mobilization. In addition, IARC identified three emerging priorities that are important and evolving global issues for cancer prevention research and in which IARC must increase its involvement: Evolving cancer risk factors and populations in transition; Implementation research; and Economic and societal impacts of cancer. In the longer term, IARC will gradually strengthen its engagement in these three emerging priorities, increasing its activity in implementation research.

Indeed, the potential for IARC's work to have an even greater public-health impact has not been fully exploited yet, which is why IARC is increasingly emphasizing the importance of implementation research. In particular, I would like to enhance our assessments of cancer-prevention interventions in order to generate a robust scientific base for best practices at a country level.

■ **The end of 2021 will mark your third year at the helm of IARC. What has been the highlight and the biggest challenge of your tenure so far, and what are you most looking forward to in 2022?**

EW: For almost three years, I have assumed the role of director of one of the most prestigious international cancer research institutions. IARC's mission is more important than ever. Cancer will affect every other man, and one in three women, in many countries. Over the next 20 years, the number of cancer cases is estimated to rise by at least 60%. Cancer is a deeply personal disease — many of us have members of our families or friends who have had to live and

sometimes die with this horrible disease, or have been affected ourselves.

Leading IARC is a privilege and a great honor, as well as an important responsibility. This includes responsibility toward IARC's Participating States, which provide the resources needed for our scientific activities and guide us in delivering on IARC's mandate effectively and efficiently; responsibility toward our ultimate beneficiaries — people who do not develop cancer or survive it because of interventions for which IARC provided the scientific evidence and prevention-intervention strategies; responsibility toward our donors who entrust us to deliver the impacts we promise; and, last but not least, responsibility toward IARC personnel, who are the engines behind all of IARC's achievements.

The adoption of the Medium-Term Strategy was a major milestone, and one of IARC's greatest achievements was to welcome China as a new Participating State in May 2021. Despite the challenges brought by the COVID-19 pandemic over the past two years, IARC successfully

conducted most of its research remotely and deployed innovative tools, including digital technologies and online solutions.

The biggest challenges came from continued resource constraints. This situation is unlikely to improve, especially in light of the economic downturn caused by the repercussions of the pandemic. Many international and local organizations will face similar limitations for the foreseeable future. Yet IARC's economic constraints are a dominant feature of our operational environment. IARC is desperately mobilizing funds to finance the move to our new headquarters: the 'Nouveau Centre'. After 55 years, IARC needs a new work environment to better achieve its mission of reducing the burden of, and suffering from, cancer, now and for future generations, by conducting cancer research that matters.

Interviewed by Alexia-Ileana Zaromytidou

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