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UPDATE ON THE IARC INITIATIVE FOR RESILIENCE IN CANCER CONTROL (IARC IRCC)

- 1. The present document describes an update on the research activities of the IARC Initiative for Resilience in Cancer Control (IARC IRCC) (formerly, the IARC-C19 or the COVID-19 and Cancer Initiative).
- 2. The IRCC was launched in 2020 through a request from the Cancer Surveillance Branch (CSU) to the Governing and Scientific Councils to support IARC in investigating the impact of the COVID-19 pandemic on cancer services, including health system disruptions and mitigation strategies. To capture crises in a wider sense, the activities planned within the IARC-C19 have been expanded to include natural and human-made disasters. The updated major aims of the initiative cover three overarching workstreams:
 - i. **Conduct in-depth monitoring** of key indicators of cancer incidence, survival, and mortality during and after health crises, such as the COVID-19 pandemic.
 - ii. **Explore reasons for disruptions** to cancer services and mitigation strategies used during health crises, emphasizing the importance of the local context.
 - iii. **Provide tools to model** the short-, medium-, and long-term impact of disruptions on cancer outcomes, to improve resilience in cancer control.

The IARC IRCC also launched its <u>dedicated website</u> which describes the scope of the initiative, as well as providing a centralized source of information and updates about ongoing work.

- 3. The first workstream, conduct in depth monitoring of key indicators of cancer incidence, survival, and mortality during and after health crises such as the COVID-19 pandemic, has encompassed the following activities:
 - a) Collection of data from population-based cancer registries, as a fundamental element of the IRCC's activities and providing the basis of data for quantitative analyses. Consequently, since 2021, CSU has received:
 - Data from 63 population-based cancer registries in 32 countries under transition (SURVCAN countries), totaling 3.36 million cancer diagnoses.
 - Data from 16 population-based cancer registries in five high-income countries (SURVMARK countries), totaling 10.9 million cancer diagnoses.

b) Global mapping of cancer incidence in populations affected by crises:

- This population-based study aims to provide a first systematic attempt to map the
 overlap between crisis conditions and cancer burden globally. Data on severity of
 humanitarian crises across the world have been harmonized with national cancer
 incidence estimates from the IARC Global Cancer Observatory (GLOBOCAN).
- While this study is still in the data collection and analysis stage, expected results will identify vulnerable populations facing the dual burden of cancer and crises.

c) Impact of the COVID-19 pandemic on cancer diagnosis and stage:

- This population-based study assessed the impact of the COVID-19 pandemic on incidence and stage at diagnosis of seven major cancer types across seven high-income countries in the International Cancer Benchmarking Partnership. Briefly, this study compared the expected number and rates of monthly diagnoses of cancer with those observed during 2020.
- The study found that incidence rates of cancer were lower during the first nine months
 of the COVID-19 pandemic (April–December) across most countries and most cancer
 sites. The pandemic had the largest impact on cancer incidence during the first four
 months when strict societal lockdowns were in place across all countries.
- The largest reductions in incidence were observed for breast cancer, likely linked to temporary halts in screening services, and reductions in melanoma and prostate cancer incidence reflected disruptions in access to general health care. For stage at diagnosis, this study observed decreases in early-stage cancers at the beginning of the pandemic, but no increases in late-stage disease.

d) Survival from cancer before and during the COVID-19 pandemic:

- This population-based study aimed to compare survival among patients with cancer diagnosed during the first year of the COVID-19 pandemic (2020) and up to 2023 with those diagnosed in previous years. The study covers five cancer types across five highincome countries in the International Cancer Benchmarking Partnership.
- This study's findings suggest that short-term survival remained the same before and during the pandemic except for one country where four out of the five types of cancer studied seen a decreased survival during the first year of the COVID-19 pandemic but recovered in subsequent years. These findings indicate that there were limited shortterm impacts of health system disruptions on cancer survival in these high-income settings.

e) Global impact of the COVID-19 pandemic on cancer mortality:

- This population-based study investigated the impact of the COVID-19 pandemic on cancer mortality in 54 countries whose data were available for 2020 or later in the World Health Organization (WHO) Mortality Database. Briefly, this study compared the expected mortality rates for four cancer sites (lung, pancreatic, breast, and leukemia) plus all cancers combined with those observed during the pandemic (2020–2023).
- The study found that observed mortality was lower than expected during the pandemic.
 Differences in expected mortality were limited for poor-prognosis cancers (lung and
 pancreatic), while breast cancer and leukemia were more affected due to long-term
 healthcare disruptions. Regional disparities unmasked the negative impact of
 compounding crises on cancer mortality and underscore the need for resilient systems
 to protect cancer care during emergencies.
- A follow-up study investigating oral and pharyngeal cancer mortality during the COVID-19 pandemic using the data and methods is ongoing. Preliminary findings suggest mortality was lower than expected among younger adults during the pandemic but similar to expected in older adults. Substantial regional heterogeneity reflected complex interactions between competing risks and disruptions in cancer care.
- 4. The second workstream, reasons for disruptions to cancer services and mitigation strategies used during health crises, emphasizing the importance of the local context, has encompassed the following activities:

a) Global impact of the COVID-19 pandemic on delays and disruptions in cancer services:

- This systematic review and meta-analysis which is now published as <u>a peer reviewed</u> research article in *Nature Cancer* synthesized the scale and impact of pandemic-related delays and disruptions on cancer services, including diagnosis, diagnostic procedures, screening, treatment, and supportive and palliative care.
- The study observed declines in the number of cancer screening participants (39.0%), diagnostic procedures (24.0%), diagnoses (23.0%), and treatment (28.0%) ranging from 15.0% decline for radiotherapy to 35.0% decline for systemic treatment during the pandemic compared with the pre-pandemic period.
- Countries of medium human development index (HDI) experienced greater reductions than high and very high HDI countries. There were no data from low HDI countries, emphasizing the need for increased investments in cancer surveillance and research in these settings.

b) Global impact of COVID-19 mitigation strategies on disruptions in cancer services:

• This systematic review, which is now published as <u>a peer reviewed research article</u> in the *Journal of Cancer Policy*, reviewed the implementation of mitigation strategies to reduce disruptions to cancer services across health system functions and their impact on cancer diagnosis and care during the pandemic. The strategies were grouped into four functions (governance, financing, service delivery, and resource generation) and sub-functions of the WHO's framework for health system performance assessment.

- Multiple mitigation approaches were implemented, predominantly affecting subfunctions of service delivery to control COVID-19 infection via the suspension of non-urgent cancer care, modified treatment guidelines, and increased telemedicine use in routine cancer care delivery. Resource generation was mainly ensured through adequate workforce supply. However, less emphasis on monitoring or assessing the effectiveness and financing of these strategies was observed. Seventeen studies suggested improved service uptake after mitigation implementation; the resulting impact on cancer diagnosis and care has not yet been established.
- These findings emphasize the importance of developing effective mitigation strategies
 across all health system functions to minimize disruptions to cancer services during
 crises. Improvements could be made in health service delivery (to ensure equity),
 governance (to monitor and evaluate the implementation of mitigation strategies), and
 financing.

c) Health System Responses and Stakeholder Experiences Amidst the COVID-19 Pandemic

- In this study we performed a mixed methods approach to provide an overview and comparison of the health system responses and cancer service in seven International Cancer Benchmarking Partnership countries during the first three years of the pandemic (2020 to 2022). Desktop review of grey literature was conducted alongside semistructured interviews with key ICBP stakeholders.
- The study found that in 2020, all the ICBP countries experienced disruptions in cancer service provision, especially in cancer screening and surgical services. Disruptions in surgery were found to persist up to 2021 and 2022 in the four United Kingdom constituent countries, Australia and New Zealand. Common mitigation strategies deployed included telehealth, prioritization strategies, treatment adaptation and fundings to improve capacity. Other country-specific mitigation strategies deployed included the COVID-19 free hubs and one-stop diagnostic centres (England, Northern Ireland and Wales), personal protective equipment monitoring and evaluation strategy (Scotland) and a cancer screening framework for priority populations (New Zealand). Based on the stakeholders' interviews, personal protective equipment shortages and inequity were identified as additional and common challenges across the countries. In 2021 and 2022, workforce shortages and burnout were identified as a major challenge in all ICBP countries, except for Norway. Although there were many common mitigation strategies identified (e.g. prioritization of services, telehealth, collaborations with private health services), the perceived effectiveness varied by country. Reflections on key lessons learnt included the importance of support for healthcare workforce, having effective communication and the need to rationalise services.
- The scientific article for this work is being drafted for submission to journals in 2026.

d) Health systems resilience in coordinating cancer control during crises in selected low- and middle-income countries:

- To provide insights on health system responses in low- and middle-income countries, a
 qualitative assessment of cancer control activities during crises such as pandemics,
 natural disasters, and conflict is ongoing. Countries included in this study were selected
 to facilitate comparisons across different income classifications and global regions. The
 selected case countries were Brazil, India, Morocco, South Africa, Turkey, and Uganda.
- Our scoping review and document analysis collected further information on disruptions and mitigation strategies in the six selected countries. The documents included grey literature and policy documents that reported updates to recommended pathways on cancer diagnosis and care in the context of the COVID-19 pandemic. This scoping review has served as an essential foundation for understanding each country's cancer control pathways and guides the ongoing interviews and cross-country analysis.
- All necessary ethical approvals for the interview phase have been obtained, and in-depth interviews are almost completed in Brazil, South Africa, and Morocco (30 completed by the end of October) and are ongoing in Turkey, India, Uganda (20 interviews planned by the end of January). Interviewees have included policymakers, heads of cancer control departments, oncologists, public health or primary care specialists, patient representatives, and representatives from nongovernmental organizations (NGOs).
- Preliminary analysis of the interviews from Brazil, South Africa, and Morocco has
 revealed both shared and context-specific dimensions of resilience. In all three settings,
 stakeholders emphasized adaptive governance, flexible service delivery, and
 multisectoral collaboration as key enablers of resilience in cancer control. Analysis of the
 interviews has also identified that the sources and dynamics of resilience differ markedly
 across countries.
- To promote knowledge translation and stakeholder engagement, the results from Brazil
 were discussed in early December 2025 in the workshop "Planning Resilient Cancer
 Control in Brazil", co-organized with the Instituto Nacional de Câncer (INCA) and Pan
 American Health Organization (PAHO)/WHO. This event brought together national and
 international experts to validate the IRCC's findings and co-develop context-specific
 policy recommendations for Brazil.

e) Climate change mitigation and synergies with primary cancer prevention in Europe:

• This study was published as a <u>commentary in the Journal of the National Cancer Institute</u> and explored the intersection between climate change mitigation and primary cancer prevention in Europe, emphasizing the potential for synergistic public health benefits.

- Overlapping strategies that can simultaneously reduce cancer risk and environmental impact were identified: promoting active transport and outdoor exercise reduces emissions and cancer risk; reducing red and processed meat intake lowers colorectal cancer risk and food-related greenhouse gas emissions; avoiding excessive sun and reducing air pollution aligns with both skin cancer prevention and climate goals; governmental support is essential to implement these dual-benefit strategies effectively.
- 5. The third workstream provides tools to model the short-, medium-, and long-term impact of disruptions on cancer outcomes, to improve resilience in cancer control, continues to develop as findings become available from the first two workstreams. Current developments encompass the following:
 - The <u>Cervical Cancer Elimination Planning Tool</u> was launched in May 2025 to enable countries to create effective, sustainable cervical cancer elimination strategies that are specifically adapted to their unique demographic and healthcare needs. The modelling behind the tool estimated that around 12.5 million lives across 75 low- and middle-income countries are already on course to be saved as a result of current efforts, with full implementation of the WHO global strategy to eliminate cervical cancer potentially protecting up to 62 million this century. The tool is currently used actively by countries joined by the Elimination Partnership in the Indo-Pacific for Cervical Cancer (EPICC) which is the largest ever initiative of its kind, leveraging Australian, international and in-country partner expertise to accelerate the WHO's strategy for the elimination of cervical cancer.
 - A second tool, as an expansion of the Cervical Cancer Elimination Planning Tool, is being designed around the four functions within the WHO's framework for health system performance assessment: governance, financing, resource generation, and service delivery. Data and insights from points 3 and 4 above will be used as inputs for this tool. At the moment, the framework of the tool is being developed with collaborating partners from the International Partnership for Resilience in Cancer Systems.