

COVID-19 and cancer care in India

The COVID-19 pandemic has impacted cancer care globally, the consequences of which are still not well understood. Through the lens of the impact in India, we emphasize the importance of continuing cancer care even during extenuating public health circumstances, and of strengthening health systems as a global priority.

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The COVID-19 pandemic has had a devastating effect globally, and India has been no exception. At the time of writing, India has reported more than 34 million infections, resulting in over 450,000 deaths with almost half of these occurring within just 2 months during the second wave (April–May 2021)¹. The real numbers may be higher given the low testing rates and incomplete death certification in some parts of the country. Although the case-fatality rates are relatively lower in India than in many developed countries (cumulative deaths in India are 324 per million, compared to 2,167 per million in the United States and 2032 per million in the United Kingdom), the high absolute numbers have posed a major challenge to existing health systems that have been reeling under the pressure of a double disease burden of infections and non-communicable diseases. While the short-term implications of COVID-19 on several spheres of medicine and patient care, including cancer, have been reported, its long-term impact remains largely unknown.

More than 1.3 million new patients are diagnosed with cancer and over 850,000 patients die of the disease annually in India². The mortality to incidence ratio for cancer in this country is much higher than in high-income countries (HIC), with cancer contributing to 8% of adult deaths³. Although overdiagnosis of non-lethal cancers in HICs may partly account for this discrepancy, a combination of factors contributes to delayed diagnosis, advanced stage at presentation and treatment abandonment in India compared to HICs. Among these factors are a lack of cancer awareness in the general population, inadequate healthcare infrastructure, poor workforce resourcing, poor access to cancer care close to patients' homes, and limited affordability of cancer treatments.

The COVID-19 pandemic, which hit India the hardest during Spring 2021, further exposed these vulnerabilities and adversely affected cancer care in several ways. First, lockdowns and restrictions on movement during the pandemic, combined

with patients' fear of contracting COVID-19, prevented patients from travelling to cancer centers for diagnosis, treatment and follow-up⁴. Second, some cancer centers were converted to COVID-19 care facilities with redeployment of hospital beds and staff, reducing the resources available for cancer care. This was further exacerbated by scarcity of personnel in hospitals due to infection, quarantine or as a conscious staff-sparing strategy^{5,6}. Finally, treatment regimens for cancer were modified or de-escalated to ameliorate the risk of an anticipated increase in mortality from COVID-19 in immunocompromised patients. Cumulatively, these factors are likely to have widespread short- and long-term repercussions.

Data from 41 cancer centers across India, which between them treat one-third of the country's cancer burden, show a substantial decline in the number of new registrations, follow-up visits, cancer surgeries, radiotherapy and chemotherapy sessions during the peak of the lockdown in 2020 (ref. ⁴). Diagnostic delays and treatment interruptions are likely to contribute to stage migration and higher cancer-related mortality in the next few years, with the added burden this will impose on healthcare systems. Delays in cancer treatment are known to have a detrimental effect on cancer outcomes: every month's delay in accessing or starting treatment was found to result in 6–8% increased mortality for patients requiring surgery and substantially increased mortality in those requiring radiotherapy and chemotherapy for specific indications⁷. Poor access to palliative care and opioids, which existed even before the pandemic, has been exacerbated in the past year and a half. Although similar complications have been seen in all parts of the world, they are likely to have more adverse consequences in low- and middle-income countries such as India.

Patients with cancer have a worse prognosis and mortality when infected with SARS-CoV-2 compared to otherwise healthy people, and thus belong to the high-risk populations that need to be

protected from infection⁸. This has created a dilemma when it comes to the continuation of cancer treatment in patients infected with SARS-CoV-2, as oncologists have to balance the risk of cancer progression with that of poorer post-COVID-19 outcomes. A systematic review has now shown that active cancer treatment is not associated with worse outcomes following COVID-19⁹, although we are still waiting for detailed data on the short- and long-term effects of COVID-19 within this patient population. From our own experience, it became evident during the initial phase of the pandemic that most patients with cancer who contracted COVID-19 needed only a temporary deferral of their cancer therapy during the active symptomatic phase of SARS-CoV-2 infection, and in the vast majority of patients, treatment delays lasted only 2–4 weeks. Thus, treatment modifications may be necessary only in high-risk groups such as the elderly, and those with multiple comorbidities or poor performance status. Therefore, broad decisions on deferring cancer treatment due to the extenuating circumstances of the pandemic need to be weighed carefully against the consequences of such delays for the disease course and prognosis of each individual patient. There should be a concerted effort to develop guidelines based on the current evidence to reduce non-essential interventions, response assessment scans, follow-up and treatments with marginal magnitude of benefit. While we are fully conscious of the responsibility of all healthcare providers to respond to crises such as the COVID-19 pandemic and the need to protect potentially vulnerable patient populations, it is equally important to realize the devastating effects of stopping or deprioritizing the management of diseases such as cancer.

Encouragingly, many cancer centers in India and globally adopted strategies early in the pandemic to facilitate the continuation of cancer care. Chief among these strategies is segregating hospitals into COVID-19 and COVID-19-free areas, enhanced infection prevention and control practices, and increasing reliance

on tele- and video-consultations. Thus, the response to the COVID-19 pandemic has already brought some important changes in delivery of cancer care in India, which should continue as part of standard care in the post-COVID-19 era, but also as measures of preparedness for future pandemics. For instance, implementation of enhanced infection prevention and control practices can potentially reduce the risk of other hospital-acquired infections. Adoption of tele- and video-consulting facilities to reduce hospital visits and travel can help in decentralizing cancer care with a tiered care delivery model. Treatment protocols finalized at tertiary cancer centers may be implemented in primary or secondary health centers closer to the homes of patients. Screening programs could be modified by using techniques that require minimal interaction with the healthcare system, such as physical examination for breast and oral cancers, and visual inspection with acetic acid for cervical cancer. Access to medicines, especially essential chemotherapy and pain relief, should be improved by arranging for delivery of these drugs to the patient to ensure continued care.

Vaccines that protect against the SARS-CoV-2 virus have been developed at record speed, and scientists in different parts of the world need to be congratulated for this achievement. However, the demand–supply mismatch has meant that there are vast swathes of the world's population that do not yet have access to the vaccine, and thus could not prioritize patients with cancer for vaccination¹⁰. Limited capacity to manufacture vaccines in most countries has meant that other countries have to wait for the local and national needs of vaccine-manufacturing countries to be fulfilled before other parts of the world get access. India hosts the world's largest vaccine-producing facilities, and hence was able to mitigate these issues to a large extent. After a relatively slow start, India has accelerated its vaccinations to a 7-day rolling average of more than 4.2 million daily doses, which is currently the highest in the world. Yet, the massive 1.35 billion population means that the only 20% of the population has received both doses, and just under 50% have received at least 1 dose¹¹. Currently, vaccination is the only proven intervention to reduce the risk of COVID-19 and its complications. Patients with cancer should be prioritized for vaccination to decrease the risks of immunosuppressive therapies. With the understanding that they may not produce a robust immune response to the vaccine, specific strategies, such as reduced intervals between doses, and booster shots, may be required.


One of the least recognized fallouts of the COVID-19 pandemic has probably been the impact on medical training, which has the likelihood of compromising outcomes of cancer care in the future. With many trainees redeployed to COVID-19 care, their regular training in other core medical areas has possibly been impacted. A national survey of cancer centers showed that most Indian hospitals cut down on training schedules both due to time constraints and to ensure physical distancing⁴. With some cancer centers being converted to COVID-19 facilities, trainees have had considerably reduced exposure to management of cancer. Educationists need to consider how to optimize training to compensate for this loss during the present, but also for future pandemics. Education and training of medical and paramedical professionals require a different approach with novel learning methods to ensure adequate workforce is available for COVID-19 as well as cancer management, without hampering training of healthcare workers in their own specialties. Among the potentially valuable tools to incorporate into standard oncology training are novel digital learning and simulation platforms that offer the ability to limit in-person interactions and provide flexibility of access.

As all other forms of biomedical research, clinical cancer research and relevant funding have been reduced drastically during the pandemic due to research facility lockdowns, halting of clinical trials and the urgent essential diversion of funds to COVID-19-related research. Moreover, as cancer care needed to be prioritized over research, and many research staff were redeployed to patient care, patient access to clinical trials was reduced considerably, and patients already on clinical trials were faced with modifications of treatment regimens and follow-up protocols. In addition, research protocols were modified to adjust to travel restrictions and to avoid frequent hospital visits to minimize risk to patients. These necessary adaptations have demonstrated that at least some of the stringent protocols followed in clinical trials (for example, 8-weekly computerized tomography scans for response evaluation in cancer and in-person visits versus remote consultations) may not be always necessary. Although returning to normalcy with respect to clinical research is crucial, we hope that the experience gained during the pandemic will prompt researchers, reviewers, funders and regulators to think of novel methods to design, conduct and fund clinical research. Ideally, this will involve more patient- and researcher-friendly clinical trial protocols, designed in a way that can be easily

implemented across different levels of care and not just at the tertiary level, and with meaningful clinical benefit to optimize resource utilization. In addition to being less affected by events such as pandemics, such 'pragmatic' clinical trials will also lead to research outputs with more generalizability.

Most countries, including India, found themselves unprepared to handle the COVID-19 pandemic while continuing routine healthcare, having instead to compromise non-COVID-19 care to varying degrees. However, the impact has been most severely felt in low- and middle-income countries where health systems have been inherently weak. We look at the current pandemic as an opportunity to improve healthcare delivery. Although there is uncertainty about the likelihood and severity of future COVID-19 waves (or other future pandemics), it is clear that health systems globally need to be in a state of preparedness for prioritizing healthcare areas beyond simply the management of the pandemic. Based on the discussion above, we propose the following measures to mitigate the effects of pandemics on cancer outcomes by focusing efforts on five aspects: (1) ensuring uninterrupted cancer treatment; (2) establishing guidelines for the management of patients with cancer during pandemics; (3) focusing on assessment and management of patients with cancer who have been infected; (4) developing strategies to implement appropriate modifications to screening programs; and (5) ensuring the uninterrupted continuation of cancer education and research.

Although no preparedness system can fully protect against black-swan events such as the COVID-19 pandemic, it is important to ensure that events of this nature do not lead to the neglect of critical healthcare areas. The problematic and protracted response to COVID-19 is a warning sign for governments across the world that health needs to be prioritized universally, and that access to healthcare should be a basic human right that cannot be compromised. □

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Competing interests

The authors declare no competing interests.