

# COVID-19: Nemesis and New Normal to Cancer Care Infrastructure and Socio-Clinical Oncology Services in LMICs

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## Abstract:

The COVID-19 pandemic and the great lockdown that followed was significant event owing to the long-term effects it had on society, the economy, and development indices. A large number of COVID cases severely strained the systems' limited resources and had an adverse impact on the health systems of the world's nations. COVID-19 was an evaluation of the effectiveness of the healthcare system in a developing nation like India. Even before the pandemic, India, a country with a population of 1.34 billion, had a sizable gap between the quality of cancer care provided in rural and urban areas. The arrival of the pandemic has widened this gap, which will always affect how cancer care is delivered. Thus, along with a discussion of the effects of the COVID-19 pandemic on cancer care delivery in India, the narrative review describes the cancer care infrastructure in India. The article also makes recommendations to prevent the passivity of the cancer care delivery system in the face of emergencies, such as a potential pandemic in the future. The results of the review showed that the reduction in the number of patients reflects the fear of infection combined with the restriction on movement imposed by the great lockdown. Screenings for potential cancers, among other things, were discontinued because this might have increased the risk of viral infections in the asymptomatic and normal populations. Approaches such as telemedicine and virtual consultation are coming up in the management of patients, and specific studies are booming, which paves the way for new ways to practice oncology and conduct clinical trials.

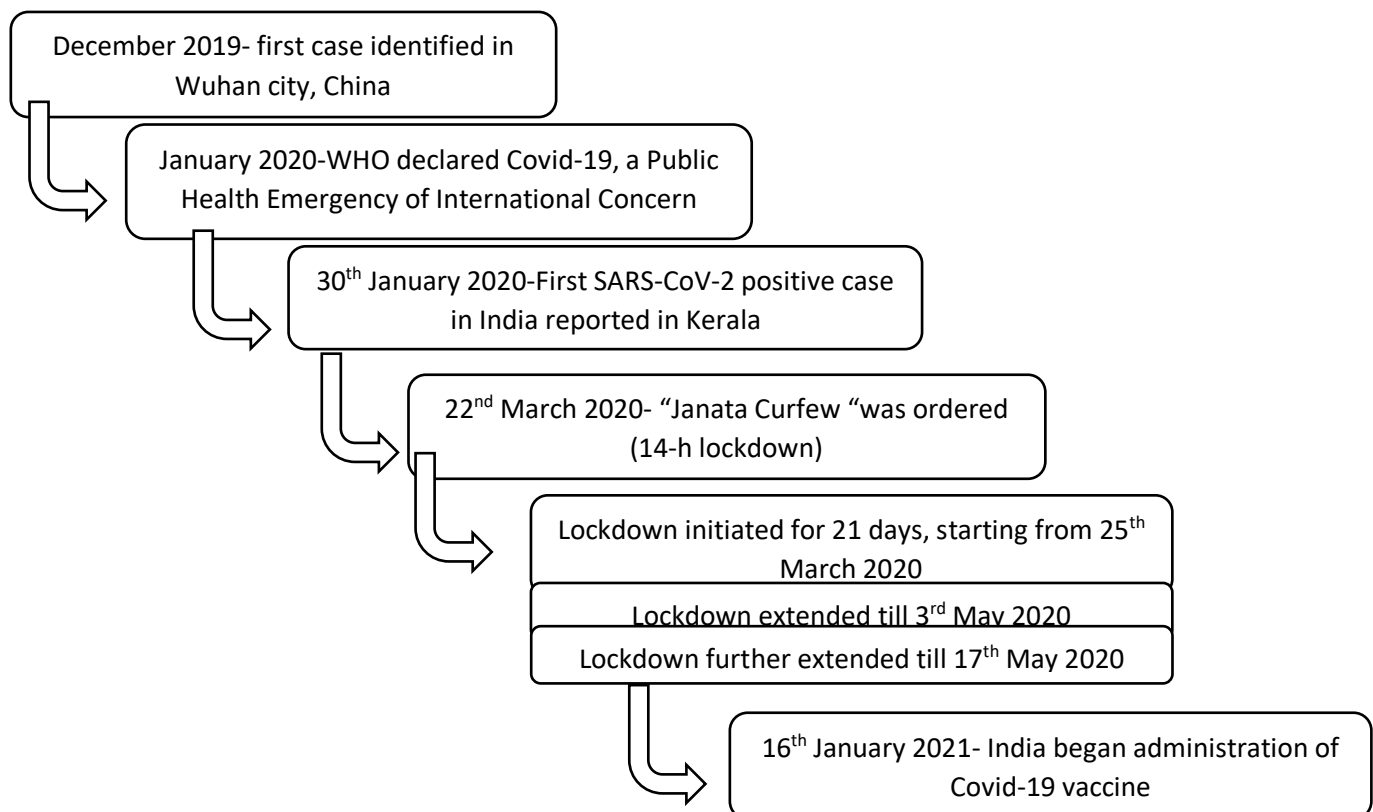
**Keywords:** Oncology services, Cancer Care Infrastructure, COVID-19, Cancer Care Management, Oncology Social Work, Post COVID, Containment measures, LMICs

## Introduction:

The COVID -19 pandemic has shown to be a potential stunner for the health systems around the world over the past two years. The pandemic severely impacted the economic, social, and cultural spheres. This health issue was managed by utilising tactics including social isolation, masks, and constant sanitisation. Even the nations that were formerly hailed as the model for readiness were pushed by the COVID-19 pandemic to their breaking point, exposing the flaws in the enduring health system and escalating long-standing imbalances. It

was a trying moment for the health systems set up in many nations, especially in the lower- and middle-income countries (LMICs). These nations had to make difficult decisions such as prioritising strategy due to the "high-wire act" between insufficient health system resources and internal and international political demands (Lal et al., 2021). COVID-19 has harmed the health system concerning non-communicable diseases like cancer (Khetrapal & Bhatia, 2020). The cause of these adverse effects is multifaceted. It involves the treatment of COVID-19 being prioritised above other illnesses and widespread public and healthcare professional anxiety about the viral spread. Other patients with acute or chronic conditions couldn't get regular care since hospitals and healthcare facilities were overrun by COVID-19 patients (Khetrapal & Bhatia, 2020). The global great lockdown during the pandemic outbreak has worsened these effects even further. India, the second-populous country with about 1.34 billion people, had difficulties treating severe COVID-19 cases as there were only 49,000 ventilators available nationally. India's medical system was woefully unable to handle its enormous population (Kumar et al., 2020). Its quick but harsh responses had unfavourable economic consequences that have been extensively analysed and argued by authorities and civil society.

**Figure 1: Covid-19 chronology in India:**



Source: adapted from Kumar, Kumar, Christopher, & Doss, 2020

In India, the private sector covers more than 71% of all healthcare costs in urban and rural areas, accounting for around 1.25 per cent of the country's GDP. The private sector

provides about 60% of hospital care. For the impoverished, the cost of personal health care is highly onerous. In India, 80.9% of those living in cities and 85.9% in rural areas lack health insurance, resulting in a sharp drop in their standard of living (Outline India-Social Impact through data, 2022). There was a considerable disparity in cancer care in the rural and urban areas before the pandemic. This was exacerbated by the advent of the great lockdown that was implemented nationally. Some cancer treatment centres underwent partial or complete conversion to COVID-19 facilities. The COVID-19 pandemic undoubtedly has a long-lasting impact on the cancer care delivery system. In addition to outlining the cancer care infrastructure in India, the study also affirms the discussion of the effects of the COVID-19 pandemic on cancer care delivery in India. The review article also attempts to bring about some recommendations to avoid the inertia of the cancer care delivery system in the advent of emergencies, including a potential pandemic in future.

This narrative review utilised peer-reviewed and published articles from various sources, namely Science Direct, PubMed, and JSTOR and also from various journals which were published between 2015 to 2022. Keywords which were used for the collection of the pieces for review were “COVID-19 and cancer”, “Psychosocial problems of cancer patients”, “Reduction in staff in oncology during COVID”, and “Restructuring of oncology services due to COVID”, “Cancer care system in India”, “Improvement of Cancer Care in India after COVID-19”. The authors took special care in selecting the articles in English and excluding articles from predatory journals and other unpublished documents.

### **Cancer Care Infrastructure in India:**

Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other body parts (National Cancer Institute, 2007). Cancer is a complicated illness with varying outcomes depending on when it is detected and treated. Since 9% of deaths are caused by cancer, cancer is India's most significant health issue (Bhardwaj, 2021). Cancer can cause psychosocial distress, including anxiety, despair, or other feelings of sadness and distress, as well as financial difficulties associated with treatment or transportation, work disruption, and changes in life values (Veeraiah et al., 2022). Though 70% of the Indian population is in rural areas, there is a major gap to be bridged between rural and urban cancers, where it is observed that rural cancers are not even half of the urban cancers. Still, cancer deaths are double in rural compared to urban (Banavali, 2015). Cancer care delivery and infrastructure are limited in India (Press Information Bureau,2019). Cancer is identified and treated at different levels of the government health care system. Urban India has nearly 95% of the world's cancer treatment facilities. Patients seeking cancer treatment travel to major cities from rural areas and smaller cities.

However, financial and cultural constraints and barriers force patients to present to Tertiary Cancer Centres late (TCCs). Most TCCs are crowded, and the lack of staff and inadequate infrastructure cause further treatment delays (Banavali, 2015). The treatment and diagnosis of cancer occur at different levels in the government health care systems in India, with the majority of cancer treatment occurring in tertiary cancer care centres. Over 599 NCD

clinics were set up at the district level, and 3,274 NCD Clinics were set up at the Community Health Centre level under the umbrella of the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular diseases and Stroke (NPCDCS) to tackle Non-Communicable Diseases (NCDs), including cancer. The Screening programmes under National Health Mission (NHM) in over 215 districts are responsible for the population-level initiative for prevention, control and screening for common NCDs, including common cancers such as oral, breast and cervical cancer.

Ayushman Bharat is the government of India's flagship programme to achieve universal health coverage (UHC). It aims to transition from a sectoral, segmented approach to delivering health services to comprehensive, need-based healthcare. Pradhan Manthri Jan Arogya Yojana was launched in 2018, which also safeguards the beneficiaries from the catastrophic expenditure of cancer treatment. Insurance coverage of \$6122.20 (USD) per family per year is provided in secondary and tertiary care hospitals (Press Information Bureau, GoI, 2022). The screening of these common cancers is also delivered under Ayushman Bharat- Health and Wellness Centres. The facilities for tertiary care of cancer are enhanced by a scheme implemented by the Government of India, namely the Strengthening of Tertiary Care for Cancer Scheme (Press Information Bureau, GoI, 2019).

### **Delivery of Oncology Services during Pandemic**

COVID-19 was a significant event in terms of its long-term consequences, particularly disrupting patients' systemic therapies, distorting patients' psychosocial well-being, and preventing healthcare professionals from providing care due to being overwhelmed with COVID cases. Cancer care services decreased considerably across centres irrespective of geographical location or city classification. The ability to provide cancer care services was affected in many ways due to the pandemic.

#### **A decline in the recipients of services:**

An ambidirectional cohort study conducted by Ranganathan et al. (2021) found a considerable decline in patients visiting hospitals to receive oncology services. Centres provided estimates on reductions in screening, educational, and research activities. A more significant decrease was observed in the number of patients registered. The proportion of patients receiving radiotherapy and palliative care remained relatively unchanged compared to the other services. Patients have difficulty accessing hospitals because of physical containment, travel restrictions, and reductions in public transport facilities including roads, railways, and airways.

The reduction in the number of patients reflects the fear of infection combined with the restriction on movement imposed by the great lockdown (Gupta et al., 2021). Other than radiotherapy, all other sectors of cancer treatment witnessed a visible disruption. This may be because the interruption of radiation is associated with poor oncological outcomes. Delays in diagnosis and treatment may cause cancer to be diagnosed in more advanced stages, have worse health outcomes, and result in higher costs for the healthcare system (Momenimovahed

et al., 2021). A wide range of emotional anguish and psychosocial issues accompany cancer, which makes it difficult to fight. Both patients and their households are affected by it. Families had to leave their homes to receive systemic therapy, so they stayed in the cities to receive it (Edge et al., 2021). The uncertainty concerning the disorder, in addition to the viral infection, treatment modalities being disrupted, and social isolation and distancing makes it worse. The financial burden on the families of cancer patients is one of the reasons contributing to their emotional discomfort. The rapid spread of COVID-19, high mortality rates in certain populations, lack of consistent anti-tumour therapy and widespread quarantine measures have adversely impacted cancer patients, even resulting in mental health issues.

### **Restructuring of Services due to Constrained resources:**

Concerns have been raised about potential delays in cancer diagnosis and management, which for many cancers are known to affect oncological outcomes due to the healthcare system's prioritisation and diversion of resources toward the COVID pandemic and its mitigation. To make more room for COVID-19 cases, oncology centres had to reorganise their services to create COVID-19 units. Screenings for potential cancers, among other things, were discontinued because this might have increased the risk of viral infections in the asymptomatic and normal populations. An analysis of 356 healthcare facilities from 54 nations in Asia, Africa, Australia, Europe, North America, and South America revealed that 88.2% had reduced their usual level of care, with more than half (55.3%) of the reduction being a precaution. When other reasons for system overload, staff shortage, and medication access problems occurred, centres were reduced in capacity (Jazieh et al., 2020). The priority given to the severity of the disease determined the service delivery. The approaches to address COVID-19 and management of COVID-19 generated inequalities, as well as problems in health services, interrupt essential regular operations and require redistribution of existing healthcare workers across health systems (Panneer et al., 2022). The staff were reduced primarily due to redeployment as part of the overrun of COVID-19 cases. Other factors contributing to the reduced staffing include infection, quarantine, or a deliberate staff-sparing strategy (Ranganathan et al., 2021). Riera et al. (2021), in a systematic review, found that up to 60% of respondents reported having reduced staff. This decrease was brought on by quarantine and the workforce's relocation to COVID-19 care. A study of oncology departments in American hospitals found that 57% of the departments experienced staff reductions, primarily due to the effects of the COVID-19 pandemic on staff members' family care obligations, their COVID-19 illnesses, and their transfer to other clinical areas. Due to fewer patients visiting the department, there was also a decreased staffing (Slotman et al., 2020). Difficulty or reduced access to the anticancer medication of the participants was attributed to between 36% and 79% of centres a disruption in the supply chain, which includes everything from medication to technical maintenance of imaging equipment (Riera et al., 2021). The management of COVID-19 has been facilitated by the diversion of healthcare resources. Concerns about potential delays in cancer diagnosis and management, which are known to impact oncological outcomes for many cancers, have arisen due to this resource allocation. The prioritisation of cases for triage during the COVID-19 pandemic is

transparent and supported by evidence. Precautionary principles are also used to guide treatment decisions. In oncology emergencies, such as those involving illnesses that pose a severe risk of early mortality or significant morbidities, treatment may only be feasible under severe resource limitations. Cancer centre staffing was affected by the pandemic, and those with the necessary skill sets continued treating cancer patients. The increased level of distress of cancer patients and their families during the pandemic, in addition to the pain already experienced about their diagnosis and treatment, stresses the need for psychosocial staff to address their issues (Pandemic Planning and Clinical Guideline for Patients with Cancer, 2020).

### **Challenges faced by Health care Personnel (HCP):**

Lack of structured psychosocial support at a facility level and increased workload during COVID times led to severe fatigue among HCP. Because of the workload and increased frustration and loneliness brought on by the fear of infection, the social impact was seen as isolating from friends and family. The physical effects of COVID-19 include physical exhaustion and burnout, as well as symptoms like dehydration, weight loss, suffocation, and rash outbreaks brought on by more extended workdays and using PPE kits. The challenges of HCP in terms of roles include an increase in workload, a change in the role of doctors, a lack of prioritisation for nurses or treatment on par with doctors when providing PPE, a shortage of supplies, disruptions from routine work, a lack of transportation in the initial great lockdown months, increased accountability and burden on hospital leadership, a lack of guidelines to effectively handle the disease, persistent distress calls from patients or family members, and aggressive behaviour (Infrastructure and Routine Practices | Infection Control | CDC, 2021). The significant mental health impact of the COVID-19 pandemic on health professionals includes stress, mental fatigue, fear and anxiety. The distortion of the emotional state in the second wave due to the high mortality rate also affected the mental well-being of the HCPs. The list of causes for mental health distress among HCPs now includes factors like increased workload, infection fear, newness and less COVID knowledge, witnessing patients or colleagues suffer or die, resource limitations, and unkind patients and relatives with unreal expectations. Physical health effects on healthcare professionals include decreased appetite, dehydration, fatigue, weakness, leg cramps, body aches, loss of stamina, mask strain, fatigue, weight loss, exhaustion, and burnout.

The Oncology Social Workers are another set of Health Professionals adversely affected by the COVID-19 pandemic. A study carried out by Zebrack et al. (2021) among Oncology Social Workers (OSWs) suggested that there were considerable reductions in working hours (though temporary), stoppage of work and reduction in pay among the social workers. In addition, two-thirds of respondents were shifted from the workplace to home as their site for work, where they were forced to delimit their patient contact through telephone and video conferencing. Some OSWs described a sense of loss in having face-to-face communication, personal touch with patients and rapport building. Some OSWs suggested that some face-to-face patient contact had been reinitiated but only with the most severely distressed patients and that these contacts were mediated through and often negatively



affected by the use of Personal Protective Equipment (PPE) as they reported that the masks make it harder for the professional to read patient's facial expression and the social workers had to repeat their statements due to hindrance caused by masks.

### **Research and Medical trials:**

The other aspect affected by the COVID-19 pandemic is the functioning of Cancer Registries (cancer surveillance mechanisms) worldwide. A study on the Population Based Cancer Registries (PBCR) showed visible disruption in all aspects, namely staffing, financing and data collection. Most of the PBCRs were government-run, and the funds were reallocated for COVID mitigation, which affected the staffing and data collection. This has adversely affected countries with low Human Development Index (HDI) more than those with higher HDI. The study suggests that the impact of COVID-19 on the health system and the cancer registries can be mitigated by increasing governmental support, improving the cancer registry infrastructure, enhancing the electronic medical recording and encouraging passive data collection. The study also observed that cancer registries are the global eyes and ears of cancer control (Soerjomataram et al., 2022).

The onset of the pandemic has had a significant positive impact on oncology-related preventive, promotional, curative, and research strategies. The pandemic has prompted governments and societies to recognise the importance of a robust public health care system. The importance of value-based care was emphasised by oncologists, who were tempted to prioritise treatment based on values and outcomes, both financially and in terms of patient benefit. Patients with simple and widespread cancers prefer to receive care close to home, whereas tertiary centres provide more tough and intensive therapies. During health crises, patients were encouraged to seek cancer care closer to home, promoting a distributed model of care. In light of the pandemic, patients and consultants readily adopted teleconsultations and video consultations (Ranganathan et al., 2021). Teleconsultation, also known as telehealth, made an excellent contribution to social distancing measures and proved an effective tool for meeting with colleagues, providing consultations, supervising therapies and educational activities, and carrying out various aspects of clinical trials. Privacy and security concerns have been raised, as have technological support, robust note-keeping, and patient education, particularly for those unfamiliar with technology or disadvantaged in access (Segelov et al., 2020). These approaches are being adopted in the management of patients, and specific studies are booming, which paves the way for new ways to practice oncology and conduct clinical trials (Sessa et al., 2021).

### **Cancer Care in Post COVID and Way Forward:**

The post-COVID world brought about new normal in every sphere of human existence. In the post-COVID world, 10–20% of people experience a range of mid and long-term effects after they recover from the initial illness, according to the World Health Organization (2022). Post-COVID-19 conditions, also called "long COVID," are the collective name for these short- and long-term effects. This phenomenon is more intensified for people with comorbidities such as NCDs, one of which is cancer. There is little evidence to depict the

consequence of COVID-19 on Cancer treatment in the post-COVID world, but many studies predicted a surge in the number of cancer cases in the post-COVID world. The presentation of patients in advanced and complex stages will be more due to past neglect and the inability of the health system to provide diagnosis and treatment to cancer patients. A study predicted a severe public health problem due to missed and delayed cancer diagnoses in the next five years. The study also found that the subsequent burden on health services indicates the possible impact on cancer mortality. The study also emphasised the significance of having access to cancer care in light of the fictitious risk of contracting COVID-19. To maximise cancer management while balancing the risks of SARS-CoV-2 infection, doctors treating cancer patients should adhere to evidence-based treatment recommendations.

Many recommendations and guidelines have been brought about by global organisations such as the World Health Organisation (WHO) for the treatment of cancer during the COVID-19 pandemic. Many recommendations are so ideal that it is unable to implement in Lower and Middle-Income Countries (LMICs). The major drawback in every recommendation is that it needs maximum staff, making it challenging to implement in emerging economies like India, where the health resources in terms of human and material resources are minimal. Though each suggestion has many constraints, this study made some general recommendations and suggestions for treating and caring for cancer patients in any future pandemic or similar crisis. Telehealth and digital health in oncology are excellent real-time video consultations for primary care and intervention tools such as counselling, medication prescription and management, management of long-term treatment and post-discharge coordination supported by remote-monitoring capabilities. It can be an excellent tool for wellness interventions in areas such as health education, physical activity, diet monitoring, health risk assessment, medication adherence and cognitive fitness. Cancer care prioritisation and intensity should be adapted to the pandemic scenario, and local health resources and facilities should be subjected to maximum utilisation (Curigliano et al., 2020). Adjuvant and neo-adjuvant therapies should be encouraged in case of low-risk cancer. Palliative and other hospice care services should be strengthened to avoid crowding cancer patients in secondary and tertiary health care settings. Medication for cancer patients should be disseminated through a decentralised mechanism. Screening of common cancers (namely cervical, breast and oral cancers) should be done regularly in remote places and rural pockets of society. Health professionals should be well equipped with PPE (Personal Protection Equipments) kits and properly vaccinated to ensure the decreased impact of COVID-19 on their health. Medical insurance and other financial aid should be provided appropriately to the patients to avoid the financial burden which adds to the financial strains in a future pandemic. It is important to support the new cancer treatment modalities, such as remote care, care provided close to home, and increased use of technology in care delivery, research, and education.

COVID-19 brought a new order of things where noble notions must be formulated to avoid hurdles in health systems in future pandemic outbreaks. All serious ailments, including cancer and many other non-communicable diseases, should be treated with special care. The pandemic has indeed tested the structure and competency of the health system. The lessons



learned from the first and second waves of the pandemic should not be forgotten once the pandemic ceases to exist. These must be translated into actions that are sustained on an all-time basis. With adequate human resources, technological proficiency and better management of patients, it becomes easy to deal with deadly diseases such as cancer in future.

### References:

- Bhardwaj, T. (2021). Quality of Life of Head and Neck Cancer Patients: Psychosocial Perspective using Mixed Method Approach. *Indian Journal of Palliative Care*, 27(2), 291–298.  
[https://doi.org/10.25259/IJPC\\_108\\_21](https://doi.org/10.25259/IJPC_108_21)
- Edge, R., Meyers, J., Tiernan, G., Li, Z., Schiavuzzi, A., Chan, P., Vassallo, A., Morrow, A., Mazariego, C., Wakefield, C. E., Canfell, K., & Taylor, N. (2021). Cancer care disruption and reorganisation during the COVID-19 pandemic in Australia: A patient, carer and healthcare worker perspective. *PLOS ONE*, 16(9), e0257420.  
<https://doi.org/10.1371/journal.pone.0257420>
- Gupta, N., Chauhan, A. S., Prinja, S., & Pandey, A. K. (2021). Impact of COVID-19 on Outcomes for Patients With Cervical Cancer in India. *JCO Global Oncology*, 7, 716–725.  
<https://doi.org/10.1200/GO.20.00654>
- Infrastructure and Routine Practices | Infection Control | CDC*. (2021, November 9).  
<https://www.cdc.gov/infectioncontrol/guidelines/healthcare-personnel/infrastructure.html>
- Jazieh, A. R., Akbulut, H., Curigliano, G., Rogado, A., Alsharm, A. A., Razis, E. D., Mula-Hussain, L., Errihani, H., Khattak, A., De Guzman, R. B., Mathias, C., Alkaiyat, M. O. F., Jradi, H., & Rolfo, C. (2020). Impact of the COVID-19 Pandemic on Cancer Care: A Global Collaborative Study. *JCO Global Oncology*, 6, 1428–1438.  
<https://doi.org/10.1200/GO.20.00351>
- Khetrapal, S., & Bhatia, R. (2020). Impact of COVID-19 pandemic on health system & Sustainable Development Goal 3. *The Indian Journal of Medical Research*, 151(5), 395–399.  
[https://doi.org/10.4103/ijmr.IJMR\\_1920\\_20](https://doi.org/10.4103/ijmr.IJMR_1920_20)
- Kumar, S. U., Kumar, D. T., Christopher, B. P., & Doss, C. G. P. (2020). The Rise and Impact of COVID-19 in India. *Frontiers in Medicine*, 7.  
<https://www.frontiersin.org/articles/10.3389/fmed.2020.00250>
- Lal, A., Erond, N. A., Heymann, D. L., Gitahi, G., & Yates, R. (2021). Fragmented health systems in COVID-19: Rectifying the misalignment between global health security and universal health coverage. *The Lancet*, 397(10268), 61–67. [https://doi.org/10.1016/S0140-6736\(20\)32228-5](https://doi.org/10.1016/S0140-6736(20)32228-5)
- Momenimovahed, Z., Salehiniya, H., Hadavandsiri, F., Allahqoli, L., Günther, V., & Alkatout, I. (2021). Psychological Distress Among Cancer Patients During COVID-19 Pandemic in the World: A Systematic Review. *Frontiers in Psychology*, 12, 682154.  
<https://doi.org/10.3389/fpsyg.2021.682154>
- Outline India*. (n.d.). Retrieved September 29, 2022, from <https://outlineindia.com>
- Pandemic Planning and Clinical Guideline for Patients with Cancer*. (2020, March 10). Ontario Health, Cancer Care Ontario. Retrieved September 29, 2022, from

[https://obgyn.utoronto.ca/sites/default/files/ohcco\\_pandemic\\_planning\\_clinical\\_guideline\\_final\\_2020-03-10\\_002.pdf](https://obgyn.utoronto.ca/sites/default/files/ohcco_pandemic_planning_clinical_guideline_final_2020-03-10_002.pdf)

- Ranganathan, P., Sengar, M., Chinnaswamy, G., Agrawal, G., Arumugham, R., Bhatt, R., Bilimappa, R., Chakrabarti, J., Chandrasekharan, A., Chaturvedi, H. K., Choudhrie, R., Dandekar, M., Das, A., Goel, V., Harris, C., Hegde, S. K., Hulikal, N., Joseph, D., Kantharia, R., ... Pramesh, C. S. (2021). Impact of COVID-19 on cancer care in India: A cohort study. *The Lancet Oncology*, 22(7), 970–976. [https://doi.org/10.1016/S1470-2045\(21\)00240-0](https://doi.org/10.1016/S1470-2045(21)00240-0)
- Riera, R., Bagattini, Â. M., Pacheco, R. L., Pachito, D. V., Roitberg, F., & Ilbawi, A. (2021). Delays and Disruptions in Cancer Health Care Due to COVID-19 Pandemic: Systematic Review. *JCO Global Oncology*, 7, 311–323. <https://doi.org/10.1200/GO.20.00639>
- Segelov, E., Underhill, C., Prenen, H., Karapetis, C., Jackson, C., Nott, L., Clay, T., Pavlakakis, N., Sabesan, S., Heywood, E., Steer, C., Lethborg, C., Gan, H. K., Yip, D., Karanth, N., Karikios, D., & MacIntyre, C. R. (2020). Practical Considerations for Treating Patients With Cancer in the COVID-19 Pandemic. *JCO Oncology Practice*, 16(8), 467–482. <https://doi.org/10.1200/OP.20.00229>
- Sessa, C., Cortes, J., Conte, P., Cardoso, F., Choueiri, T., Dummer, R., Lorusso, P., Ottmann, O., Ryll, B., Mok, T., Tempero, M., Comis, S., Oliva, C., Peters, S., & Taberero, J. (2021). The impact of COVID-19 on cancer care and oncology clinical research: An experts' perspective. *ESMO Open*, 7(1), 100339. <https://doi.org/10.1016/j.esmoop.2021.100339>
- Slotman, B. J., Lievens, Y., Poortmans, P., Cremades, V., Eichler, T., Wakefield, D. V., & Ricardi, U. (2020). Effect of COVID-19 pandemic on practice in European radiation oncology centers. *Radiotherapy and Oncology*, 150, 40–42. <https://doi.org/10.1016/j.radonc.2020.06.007>
- Soerjomataram, I., Bardot, A., Aitken, J., Piñeros, M., Znaor, A., Steliarova-Foucher, E., Kohler, B., Bettio, M., Matsuda, T., de Camargo Cancela, M., Mery, L., & Bray, F. (2022). Impact of the COVID-19 pandemic on population-based cancer registry. *International Journal of Cancer*, 150(2), 273–278. <https://doi.org/10.1002/ijc.33792>
- Veeraiah, S., Kayser, K., & Sudhakar, R. (2022). Psychosocial factors influencing distress among cancer patients in South India. *Journal of Psychosocial Oncology Research and Practice*, 4(1), e067. <https://doi.org/10.1097/OR9.0000000000000067>
- What Is Cancer? - NCI (nciglobal,ncicenterprise). (2007, September 17). [CgvArticle]. <https://www.cancer.gov/about-cancer/understanding/what-is-cancer>
- Press Information Bureau, Government of India, Ministry of Health and Family Welfare (2019, December 13) *Cancer Care Infrastructure* (Press release) <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1596310>
- Banavali, S. D. (2015). Delivery of cancer care in rural India: Experiences of establishing a rural comprehensive cancer care facility. *Indian Journal of Medical and Paediatric Oncology : Official Journal of Indian Society of Medical & Paediatric Oncology*, 36(2), 128–131. <https://doi.org/10.4103/0971-5851.158848>
- Press Information Bureau (Research Unit) ministry of Information and Broadcasting Government of India (2022, May 16), *Strengthening Cancer Care in India (Ministry of Health and Family Welfare)* (Press release)

<https://static.pib.gov.in/WriteReadData/specificdocs/documents/2022/may/doc202251656201.pdf>

Zebrack, B., Grignon, M., Guan, T., Long, D., Miller, N., Nelson, K., Otis-Green, S., Rayton, M., Schapmire, T., & Wiener, L. (2021). Six months in: COVID-19 and its impact on oncology social work practice. *Journal of Psychosocial Oncology*, 39(3), 461.

<https://doi.org/10.1080/07347332.2021.1893421>

Curigliano, G., Banerjee, S., Cervantes, A., Garassino, M. C., Garrido, P., Girard, N., Haanen, J., Jordan, K., Lordick, F., Machiels, J. P., Michielin, O., Peters, S., Tabernero, J., Douillard, J. Y., Pentheroudakis, G., Addeo, A., Albiges, L., Ascierto, P. A., Barlesi, F., ... Yang, J. (2020). Managing cancer patients during the COVID-19 pandemic: an ESMO multidisciplinary expert consensus. *Annals of Oncology*, 31(10), 1320–1335.

<https://doi.org/10.1016/j.annonc.2020.07.010>

Panneer, S., Kantamaneni, K., Akkayasamy, V. S., Susairaj, A. X., Panda, P. K., Acharya, S. S., Rice, L., Liyanage, C., & Pushparaj, R. R. B. (2022). The Great Lockdown in the Wake of COVID-19 and Its Implications: Lessons for Low and Middle-Income Countries.

*International Journal of Environmental Research and Public Health*, 19(1), Article 1.

<https://doi.org/10.3390/ijerph19010610>