Knowledge to Policy Center K2P

AUB American University of Beirut

Faculty of Health Sciences
Knowledge to Policy | K2P | Center

PROTECTING PEOPLE WITH CANCER DURING COVID-19 PANDEMIC

K2P COVID-19 SERIES

KEY MESSAGES

The Coronavirus disease 2019 (COVID-19) pandemic is rapidly expanding and has led to almost 3 million infections and more than 207,000 deaths worldwide. A meta-analysis of 11 studies reported a 2% overall pooled prevalence of cancer in patients with COVID-19. People with cancer are especially vulnerable to COVID-19 and can suffer from severe clinical outcomes as a result of COVID-19. Lebanon, is among the countries with the highest incidence of cancer in the Eastern Mediterranean Region, and is at a critical position when it comes to protecting people with cancer if measures are not adequately implemented at national, organizational and individual levels.
In addition, given the government's decision to ease the lockdown, premature measures can result in a surge in COVID-19 cases and thus putting people with cancer at even higher risk.
This document aims to shed light on the severity of COVID-19 on people with cancer and provides evidence-informed measures for the protection of people with cancer in light of the emerging COVID-19 situation.

Cancer and COVID-19 in the Eastern Mediterranean Region (EMR)

- Healthcare systems are already burdened in the EMR, with high cancer incidence, shortages in health resources, limited access to cancer therapies and medications, and lack of specialized physicians (Lyons, Sankaranarayanan, Millar, & Slama, 2018).
- The COVID-19 pandemic has further pressured healthcare systems to provide care to a high number of people infected with COVID-19 while maintaining essential healthcare services to the rest of the population (Ueda et al., 2020).
- Lebanon has one of the highest incidence rates of cancer in the Eastern Mediterranean Region

Authors
Sarah Soueidan, Clara Abou Samra & Fadi El-Jardali*

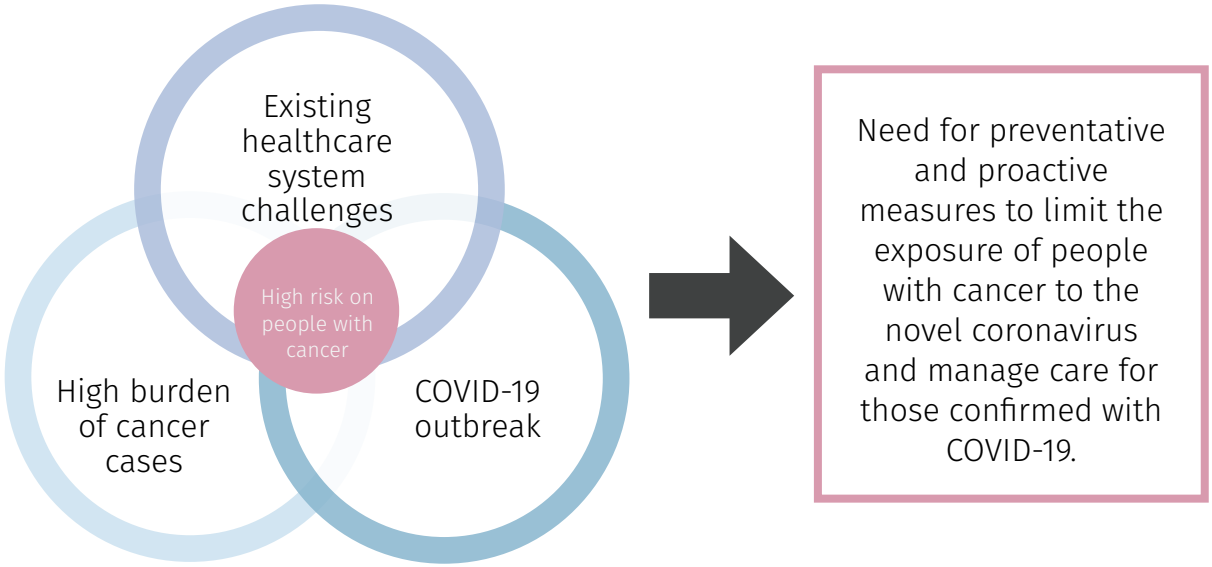
Citation
Soueidan S, Abou Samra C, El-Jardali F. K2P COVID-19 Series: Protecting People with Cancer during COVID-19 Pandemic, Knowledge to Policy (K2P) Center. Beirut, Lebanon, April 28 2020

*senior author

Challenges in the existing health system in Lebanon

While strong healthcare system foundations are critical for the adequate and timely response to a disease, the healthcare system faces several challenges at that may hinder the response to COVID-19, specifically to vulnerable populations, such as people with cancer.

1. Inefficient public health sector that is inclined to curative rather than preventative care
2. Lack of comprehensive systematic, and standardized referral system for cancer assessment and treatment in primary health care centers
3. Weak and fragmented information systems
4. Poor engagement of the private sector in early response to the coronavirus
5. Limited availability of needed supplies and equipment (such as ICU beds, mechanical ventilators, personal protective equipment)
6. Unavailability of a national cancer strategy
7. High cost of cancer care
8. Anxiety, stress and depression of people with cancer due to the risk of contracting COVID-19



Measures to protect people with cancer amidst COVID-19

To protect people with cancer from contracting COVID-19, comprehensive measures at multiple levels including at the:

- Individual level
- Caregiver level
- Healthcare provider level
- Healthcare facility level
- Health system

الرسائل الأساسية

تتوسع جائحة فيروس كورونا المستجدّ –كوفيد-19 بوتيرة عالية، حيث أدّت إلى ما يقارب 3 ملايين إصابة وأكثر من 207000 حالة وفاة حول العالم. أفاد تحليل لـ11 دراسة أن 2% من الأشخاص الذين أصيبوا بفيروس كورونا هم بالفعل أشخاص مصابين بالسرطان (Densai, 2020). الأشخاص المصابون بالسرطان معرضون بشكل خاص بالإصابة بعدوى كوفيد-19 ويمكن أن يعانون من مضاعفات سريرية خطيرة نتيجة العدوى. يسجل لبنان واحدة من أعلى معدلات الإصابة بالسرطان في منطقة شرق المتوسط، يعاني حالياً من وضع حرج بما يتعلق بحماية الأشخاص المصابين بمرض السرطان إذا لم يتم تنفيذ تدابير مناسبة على المستويين الوطني والتنظيمي وعلى المستوى الفردي.

بالإضافة إلى ذلك، نظرًا لقرار الحكومة اللبنانية بتخفيف إجراءات الحظر، يمكن أن يؤدي رفع هذه الإجراءات في مرحلة مبكرة، إلى زيادة غير متوقعة في حالات كوفيد-19، وبالتالي ارتفاع خطر تعرض الأشخاص المصابين بالسرطان للفيروس.

يهدف هذا المستند إلى تسليط الضوء على خطورة كوفيد-19 على الأشخاص المصابين بالسرطان، ويوفر تدابير مستندة الى الأدلة لحماية الأشخاص المصابين بالسرطان على ضوء كوفيد-19.

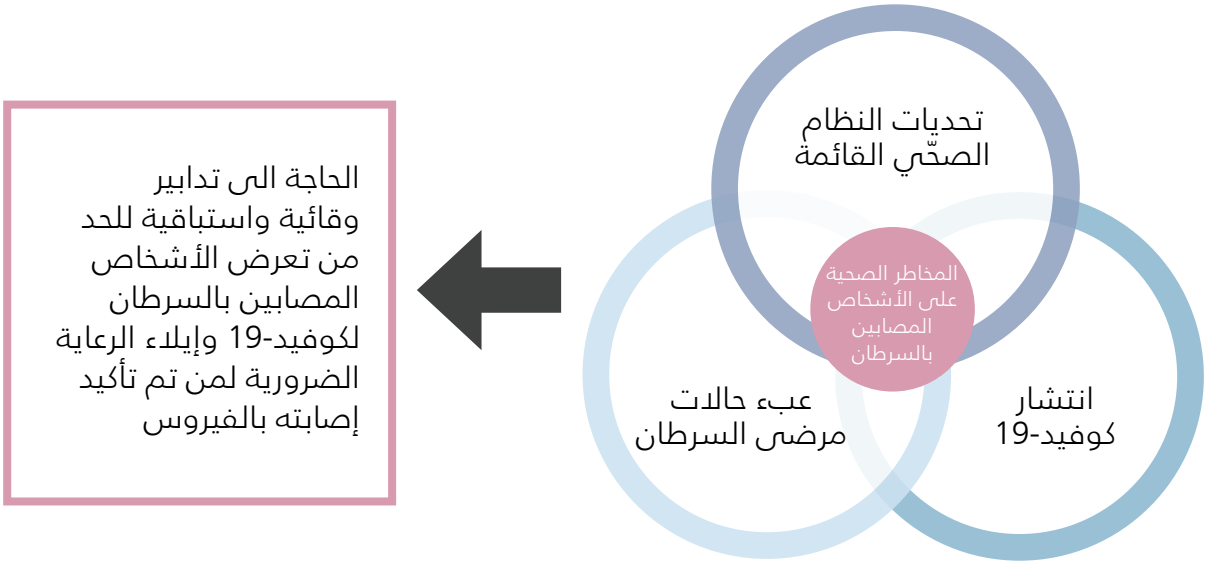
مرض السرطان و كوفيد-19 في منطقة شرق المتوسط

- تحمل أنظمة الرعاية الصحية أعباء إضافية في منطقة شرق المتوسط، مع نقص كبير بالموارد الصحية اللازمة لإدارة حالات السرطان، وعوائق الوصول إلى علاجات وأدوية السرطان، وشحّ بأعداد الأطباء المتخصصين
- ولّدت جائحة كوفيد-19 المزيد من الضغط على أنظمة الرعاية الصحية لتوفير الرعاية لعدد كبير من الأشخاص المصابين بـ كوفيد-19 مع ضرورة المحافظة على خدمات الرعاية الصحية الأساسية لسائر الناس
- لبنان يسجّل واحدة من أعلى معدلات الإصابة بمرض السرطان في إقليم شرق المتوسط على مستوى المريض

تحديات النظام الصحي القائم في لبنان

في حين أن أسس نظام الرعاية الصحية القوية عامل أساسي للاستجابة الفعّالة وفي الوقت المناسب للمرض، فإن نظام الرعاية الصحية يواجه العديد من التحديات التي قد تعوق الاستجابة لكوفيد-19، وبالأخص للأشخاص الأكثر عرضة للإصابة، مثل الأشخاص المصابين بالسرطان:

1. قطاع الصحة العامة غير الفعال الذي يميل إلى الرعاية العلاجية بدلاً من الرعاية الوقائية
2. عدم وجود نظام إحالة ممنهج وموحد لتقييم حالات مرضى السرطان وعلاجاتها في مراكز الرعاية الصحية الأولية
3. نظم معلوماتية ضعيفة ومجزأة
4. ضعف مشاركة القطاع الخاص في الاستجابة المبكرة لفيروس كورونا المستجد
5. محدودية الإمدادات والمعدات اللازمة (مثل أسرّة وحدة العناية المركزة، وأجهزة التنفسّ، ومعدات الحماية الشخصية)
6. عدم وجود استراتيجية وطنية للسرطان
7. ارتفاع تكلفة رعاية مرضى السرطان الصحية
8. القلق والتوتر والاكتئاب لدى مرضى السرطان بسبب الخوف من الإصابة بـ كوفيد-19



تدابير لحماية الأشخاص المصابين بالسرطان، خلال أزمة كوفيد-19

لحماية المصابين بالسرطان من الإصابة بفيروس كورونا المستجدّ ورعاية مرضى السرطان، يجب اتخاذ تدابير شاملة على مستويات متعددة بما في ذلك على:

- المستوى الفردي
- مستوى مقدم الرعاية
- مستوى مقدم الرعاية الصحية
- مستوى المرافق الصحية
- مستوى النظام الصحي

CONTENT

The Coronavirus disease 2019 (COVID-19) pandemic is rapidly expanding and has led to almost 3 million infections and more than 207,000 deaths worldwide (Worldometer, 2020). A meta-analysis of 11 studies reported a 2% overall pooled prevalence of cancer in patients with COVID-19 (Densai, 2020). People with cancer are especially vulnerable to COVID-19 and can suffer from severe clinical outcomes as a result of COVID-19. Lebanon, is among the countries with the highest incidence of cancer in the Eastern Mediterranean Region (Charafeddine et al., 2017), and is at a critical position when it comes to protecting people with cancer if measures are not adequately implemented at national, organizational and individual levels. In addition, given the government's decision to ease the lockdown, premature measures can result in a surge in COVID-19 cases (Fadlallah & El-Jardali, 2020) and thus putting people with cancer at higher risk . This document aims to shed light on the severity of COVID-19 on people with cancer and provides evidence-informed measures for the protection of people with cancer in light of the emerging COVID-19 situation.

EFFECT OF COVID-19 ON CANCER

As of April 27, 2020, the number of confirmed cases due to COVID-19 reached more than 2,992,970 cases and 207,518 deaths worldwide (Worldometer, 2020). COVID-19 is particularly critical for the high risk population including older people, and people with pre-existing conditions such as diabetes, cardiovascular diseases, and cancer (World Health Organization, 2019). People with cancer are especially vulnerable to COVID-19 and are more likely to have severe clinical complications and poor outcomes due to their immunocompromised system caused by cancer and its treatment (Kutikov et al., 2020; Yang, Zhang, & Yang, 2020; Zhang et al., 2020; Yu, Ouyang, Chua, & Xie, 2020; Shankar et al., 2020). According to a WHO report on COVID-19, cancer patients in China had an estimated 2-fold increased risk of COVID-19 compared to the general population (World Health Organization, 2020). In addition, a nationwide analysis from China found that patients with cancer were found to be at higher risk of COVID-19, required more hospital admissions, and were 3.5 times at higher risk of needing mechanical ventilation or ICU admission or dying compared with patients without cancer (Liang et al., 2020). Due to the COVID-19 outbreak, cancer patients are faced with major risks related to their hospital admissions and inability to receive necessary medical services when needed (Shankar et al., 2020).

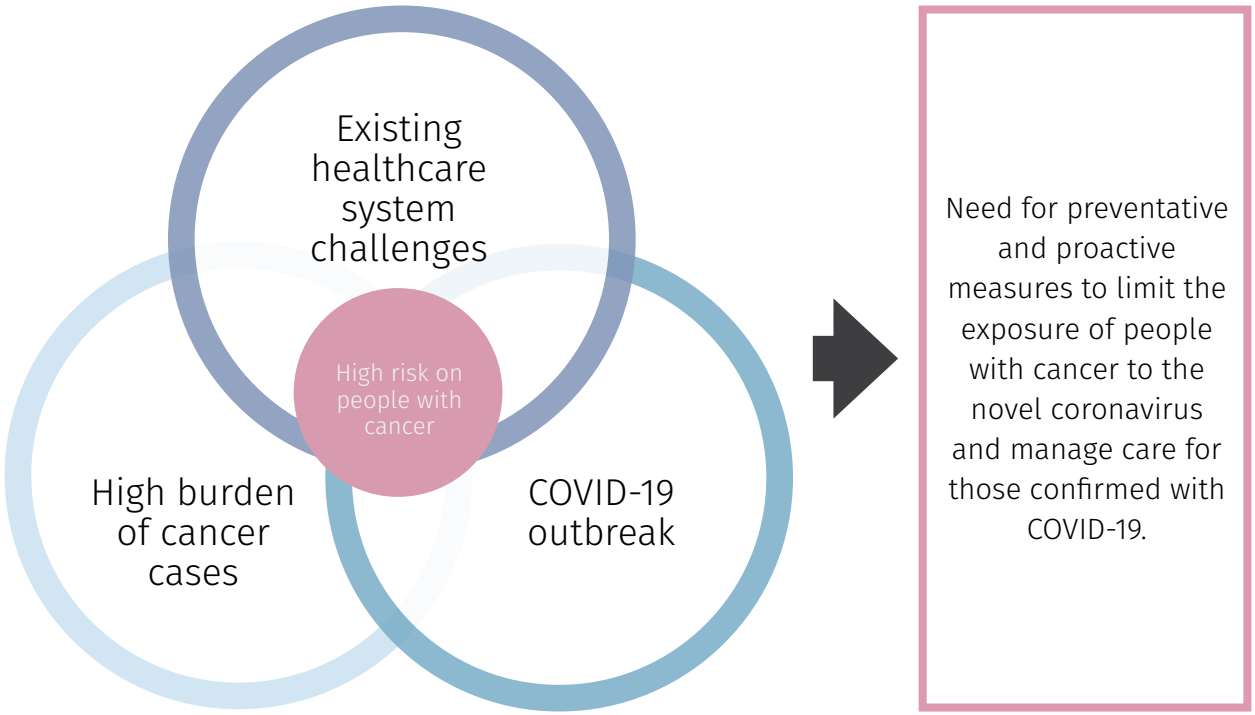
CANCER AND COVID-19 IN THE EMR

Healthcare systems are already burdened in the EMR, with high cancer incidence, shortages in health resources, limited access to cancer therapies and medications, and lack of specialized physicians (Lyons, Sankaranarayanan, Millar, & Slama, 2018). The COVID-19 pandemic has further strained healthcare systems to provide care to a high number of people infected with COVID-19 while maintaining essential healthcare services to the rest of the population (Ueda et al., 2020).

IN LEBANON, AS IN OTHER COUNTRIES OF THE EMR, CANCER RATES HAVE BEEN INCREASING SIGNIFICANTLY AND THE INCIDENCE OF CANCER (ESTIMATED TO BE AROUND 200 PER 100,000) IS AMONG THE HIGHEST COMPARED TO EASTERN MEDITERRANEAN COUNTRIES WHERE IT WAS ESTIMATED TO BE AROUND 70, 80, AND 100 PER 100,000 IN OMAN, KUWAIT AND QATAR RESPECTIVELY (CHARAFEDDINE ET AL., 2017; KULHÁNOVÁ ET AL., 2017).

CHALLENGES IN THE EXISTING HEALTH SYSTEM IN LEBANON

Since the identification of the first COVID-19 case on 21 February 2020 in Lebanon (MOPH, 2020), COVID-19 cases have been increasing where 710 COVID-19 cases have been officially recorded until April 27 2020, in Lebanon. While strong healthcare system foundations are crtitical for the adequate and timely response to a disease, the healthcare system faces several challenges at that may hinder the response to COVID-19, specifically to vulnerable populations, such as people with cancer. These challenges include; (1) inefficient public health sector that is inclined to curative rather than preventative care, whereby only 5% of the MOPH budget is allocated to primary healthcare (Hemadeh et al., 2019), (2) lack of comprehensive systematic, and standardized referral system for cancer assessment and treatment in primary health care centers which affects the prevention, screening, early diagnosis, and early treatment of cancer, (3) weak and fragmented information systems, (4) poor engagement of the private sector in early response to coronavirus, and (5) limited availability of needed supplies and equipment (such as ICU beds, mechanical ventilators, personal protective equipment) (El-Jardali et al., 2020), (6) Unavailability of a national cancer strategy, (7) high cost of cancer care (Elias et al., 2016), (8) anxiety, stress and depression of people with cancer due to the risk of contracting COVID-19, especially as resources become more constrained (Uzzo & Kutikov, 2020).



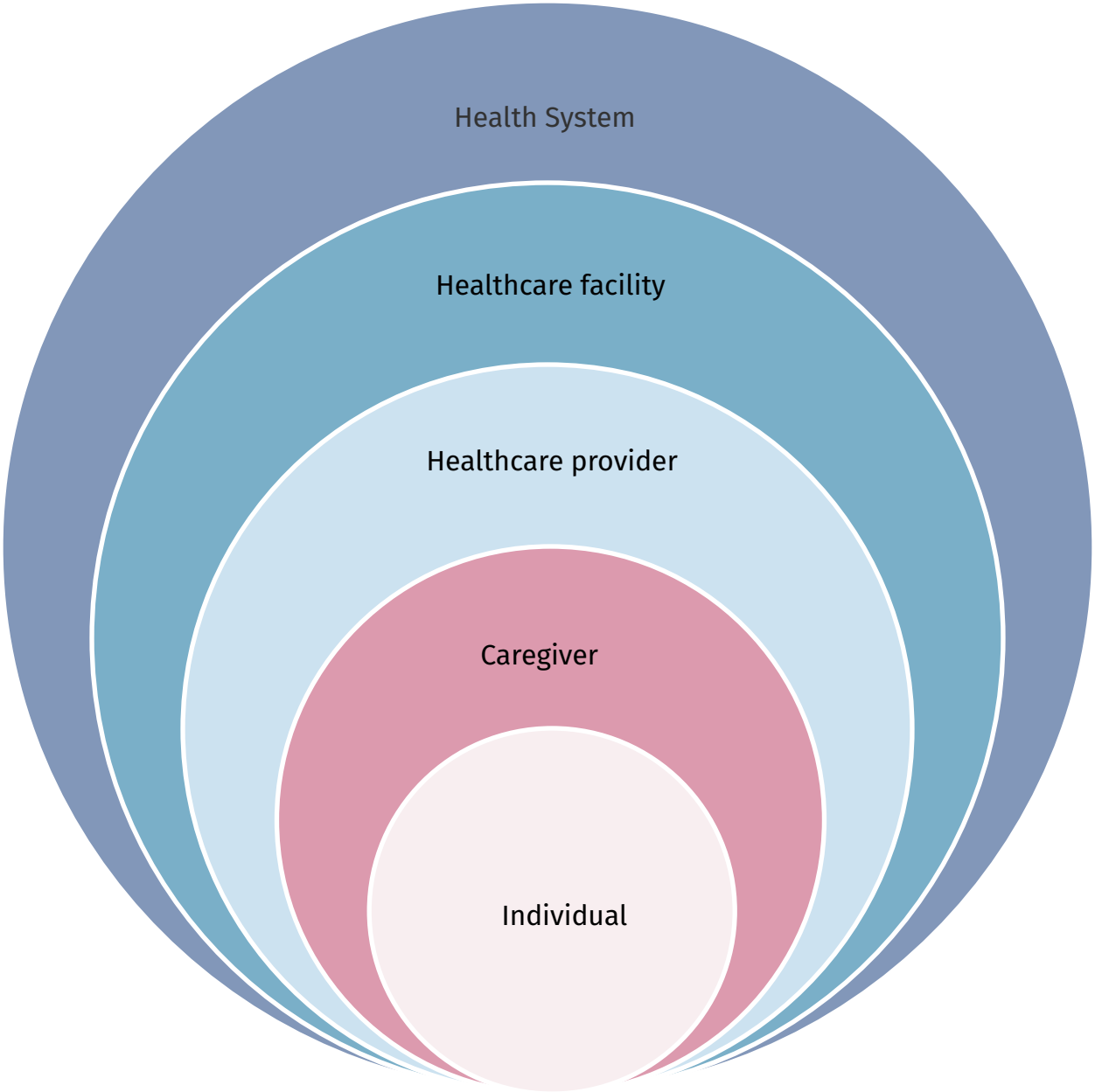
WITH THE EXISTING CHALLENGES FACING THE LEBANESE HEALTHCARE SYSTEM, THE HIGH BURDEN OF CANCER CASES, AND THE COVID-19 OUTBREAK, THERE IS AN URGENT NEED TO IMPLEMENT PREVENTIVE AND PROACTIVE MEASURES AT MULTIPLE LEVELS TO LIMIT THE EXPOSURE OF PEOPLE WITH CANCER TO THE NOVEL CORONAVIRUS AND MANAGE CARE FOR PEOPLE WITH CANCER WHO GET INFECTED BY THE NOVEL CORONAVIRUS.

MEASURES TO PROTECT PEOPLE WITH CANCER AMIDST COVID-19

To protect people with cancer from contracting COVID-19, comprehensive measures at multiple levels should be implemented.

- Measures were identified using a systematic search strategy.
- The search strategy yielded 200 articles of which 52 were relevant to the topic and 20 articles were integrated.
- Reports from WHO and other health authorities were utilized.

Framework of action COVID-19 and cancer



AT THE INDIVIDUAL LEVEL (PEOPLE WITH CANCER)

- Maintain hygiene practices by constantly hand washing, covering mouth with a tissue when coughing and sneezing, avoiding touching face, and cleaning and disinfecting objects frequently (Shankar et al., 2020)
- Wear masks properly when going to hospital or clinic (Bitar, Kattan, Kourie, Mukherji, & Saghir, 2020)
- Strictly avoid contact with someone who is displaying symptoms of COVID-19 (Public Health England, 2020)
- Contact healthcare providers in case of contact history with individuals who have COVID-19 or having any related symptoms (Shankar et al., 2020)
- Maintain social distancing with all people to limit potential exposure to COVID-19 (Kotecha, 2020)
- Request that food or medication deliveries be left at the door to minimize contact (Public Health England, 2020)
- Quit smoking and avoid using alcohol or drugs (World Health Organization, 2019)
- Avoid unnecessary hospital visits (Shankar et al., 2020)
- Rely on technology (e.g. online services, phone call) to contact healthcare provider or for other essential services (Public Health England, 2020)

AT THE CAREGIVER LEVEL

- Family members in contact with people with cancer must adhere to standard precautions for basic and respiratory hygiene and practice social distancing to reduce the risk of COVID-19 transmission to people with cancer (Public Health England, 2020)
- Visits from people who provide essential support to people with cancer such as healthcare, personal support, and social support should continue. However, if care workers show any symptom of COVID-19 they must stop their visits immediately (Public Health England, 2020).

AT THE HEALTHCARE PROVIDER LEVEL

- Use personal protection equipment (PPE) appropriately to reduce risk of COVID-19 transmission and for safety of patients and healthcare providers (Bouffet et al., 2020)
- Ensure good knowledge of the diagnosis and symptoms of COVID-19 (Yang, Zhang, & Yang, 2020)
- Inform people with cancer about the signs and symptoms of COVID-19 (Shankar et al., 2020)
- Monitor closely any signs of COVID-19 in people with cancer as they are highly susceptible to infection (Kotecha, 2020; Shankar et al., 2020)
- Clear myths and false information and communicate clearly with people with cancer on the right information about COVID-19 (Shankar et al., 2020).
- Apply intensive surveillance and treatment for patients with cancer especially older patients or those who suffer from comorbidities infected with COVID-19 (Liang et al., 2020)

- Identify patients suitable for remote monitoring and follow up (Al-Shamsi et al., 2020)
- Avoid overcrowded clinics and units by decreasing the number of patients receiving weekly chemotherapy, space out treatments where possible (Bitar, Kattan, Kourie, Mukherji, & Saghir, 2020), and delaying stem cell transplantation when cancer is controlled with regular treatment (Shankar et al., 2020)
- Limit number of visitors to clinics to one visitor only (Al-Shamsi et al., 2020)
- Organize daily phone calls with cancer patients before admitting them to ensure these patients do not present any symptoms compatible with COVID-19 (You et al., 2020)
- If the hospital has a high risk of COVID-19 transmission, consider balancing the risk of delaying cancer diagnosis or treatment against the risk for a potential COVID-19 exposure (Kutikov et al., 2020; Shankar et al., 2020; You et al., 2020)
- Reschedule elective surgeries for stable cancer cases (Liang et al., 2020). This decision should be made by both oncologists and patients after weighing in the potential harms of delaying the surgery (Shankar et al., 2020; Yang et al., 2020)
- Screen cancer patients vigorously taking into consideration their epidemiological history such as travel history and mobility (Yang et al., 2020).
- Consider the replacement of intravenous drugs with oral drugs and home infusion of chemotherapy (Shankar et al., 2020; You et al., 2020) and adjusting dosing schedules of chemotherapy or radiotherapy to reduce the frequency of hospital admissions (You et al., 2020; Zhang et al., 2020).
- Consider stopping immunosuppressive treatment for patients who are at high risk or diagnosed with COVID-19 until they fully recover (Bitar, Kattan, Kourie, Mukherji, & Saghir, 2020)
- Inform patients about potential risks of cancer therapy or surgery due to COVID-19 (Al-Shamsi et al., 2020) and empower patients to make decisions related to their treatment by educating them and providing them with necessary resources (Ueda et al., 2020).

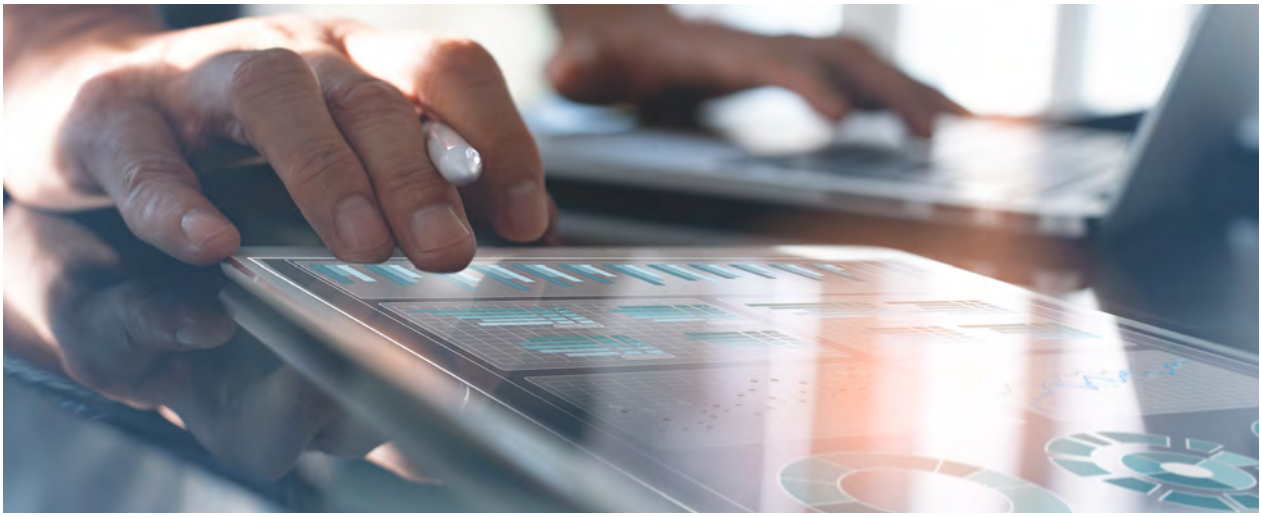
AT THE HEALTHCARE FACILITY (HOSPITAL, CLINICS AND PRIMARY HEALTHCARE CENTERS)

- Implement strict screening for COVID-19 symptoms in ambulatory care clinics including chemotherapy infusion units and primary healthcare centers and refer potential cases safely without risking disease transmission (Al-Shamsi et al., 2020)
- Implement infection prevention and control measures in healthcare facilities and provide healthcare providers with personal protective equipment (PPE) (Adams & Walls, 2020)
- Provide education to healthcare workers about hand hygiene, infection control measures, signs and symptoms of COVID-19, high-risk travel or exposure, and importance of reporting new symptoms to healthcare workers (Al-Shamsi et al., 2020)
- Dedicate healthcare professionals to the care of COVID-19 patients to reduce risk of transmission to uninfected patients (Al-Shamsi et al., 2020)
- Reduce number of visitors at hospital entry/exit points (Al-Shamsi et al., 2020), restrict the number of people visiting oncology departments (Kotecha, 2020) and post-transplant patients (Shankar et al., 2020).
- Leverage on telehealth communication (e.g. telemedicine, phone calls, online medical counselling) to minimize the risk of infection (Kutikov et al., 2020)
- Ensure communication between oncology and hematology teams for timely implementation of contingency plans that balance risks and protects both patients and health workers (Willan, 2020)
- Identify a cancer patient prioritization criteria (based on type of cancer, type of treatment, life expectancy severity of the case, etc.) to limit the number of cancer patients admitted to the hospital when the hospital has a high risk of COVID-19 transmission or low capacity to provide care (Kotecha, 2020; You et al., 2020).

- Implement proper isolation protocols for cancer patients requiring treatment (Kutikov et al., 2020; Yu, Ouyang, Chua, & Xie, 2020) and adopt separation measures (e.g. minimum space between seats, mobile walls, wearing of masks by patients and staff) in chemotherapy outpatient centers (You et al., 2020).
- Provide adequate infrastructure and logistics to facilitate the administration of intravenous and subcutaneous anticancer agents at patients' homes (You et al., 2020)
- Ensure that oncology and radiotherapy departments remain COVID-19-free by avoiding admission of COVID-19 positive patients to these departments (You et al., 2020)
- Implement safe triage procedures to assess any COVID-19 symptoms and need for hospitalization at emergency departments (Al-Shamsi et al., 2020)
- Provide people with cancer who are suspected to have COVID-19, with a mask and place them in a private exam room (Al-Shamsi et al., 2020)
- Admit cancer patients infected with COVID-19 when necessary to departments designated for COVID-19 (You et al., 2020; Kotecha, 2020)
- Ensure availability of psychosocial support for COVID-19 patients (especially cancer patients) and their families (Al-Shamsi et al., 2020; Hanna, Evans, & Booth, 2020)
- Manage appropriate allocation of limited healthcare resources (e.g., wards, ICU beds, ventilators, pharmaceuticals, blood products, staff, and basic medical supplies) (Kutikov et al., 2020)
- Implement clear communication and transparency measures between stakeholders, suppliers, and health organizations to manage drug shortages (Al-Shamsi et al., 2020).
- Create a COVID-19-free site to deliver scheduled cancer care, when possible (Bouffet et al., 2020)

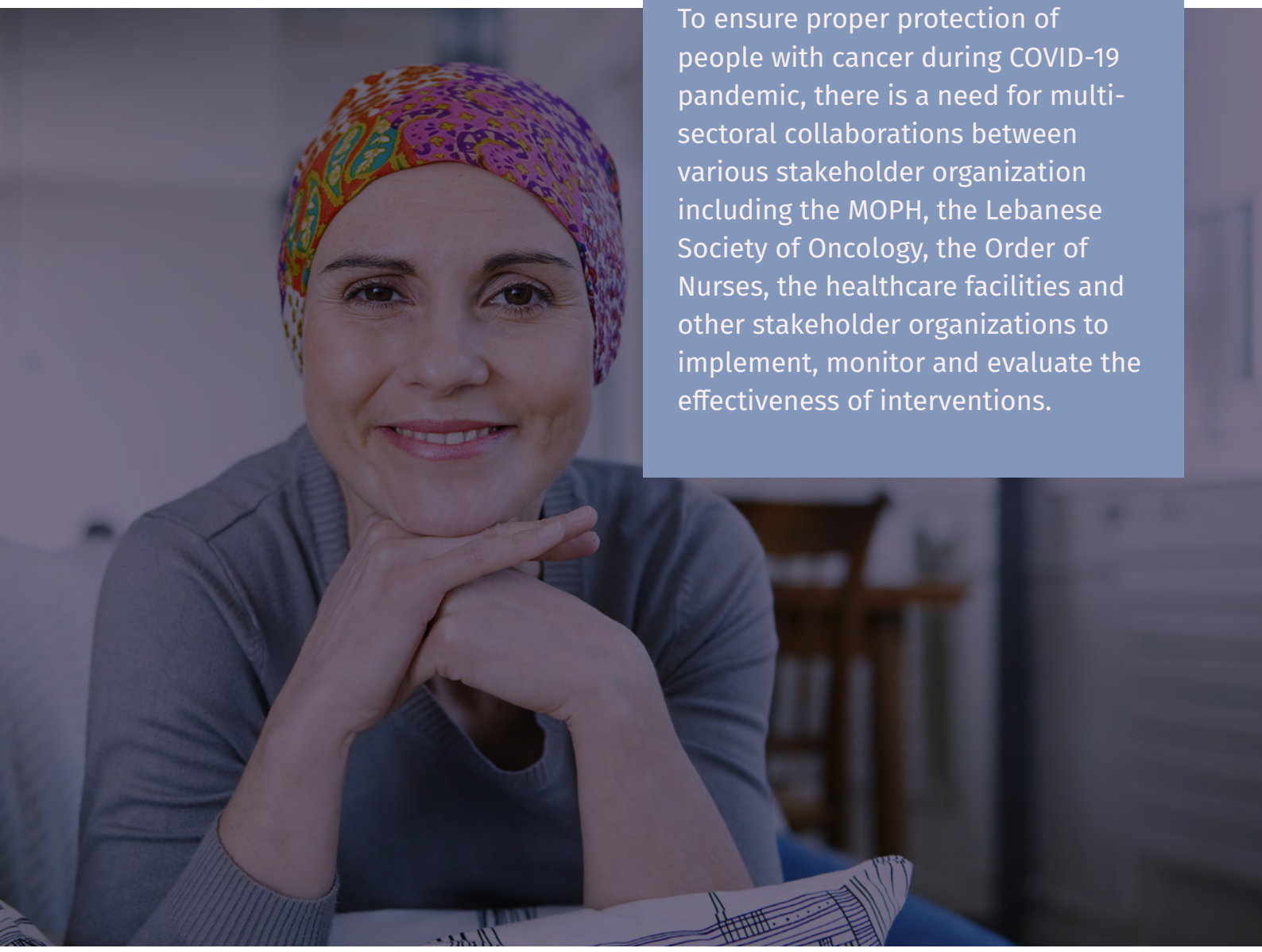
AT THE HEALTH SYSTEM LEVEL

- Ensure continuity of health services (facilities, personnel, medicines, supplies, medical devices) (World Health Organization, 2020)
- Raise awareness on prevention of COVID-19 among people with cancer using different platforms (e.g. social media, briefings) (Shankar et al., 2020)
- Monitor data collected about cancer patients infected with COVID-19 to inform decision-making related to cancer management (Wang, Ng, & Brook, 2020)
- Leverage on telehealth communication to reduce the burden of cancer care delivery on health systems (Kutikov et al., 2020; Wang & Zhang, 2020; You et al., 2020)
- Review supply chain and stocks of essential medicines and health technologies (World Health Organization, 2020).
- Protect the physical health of frontline health workers by ensuring access to PPEs (World Health Organization, 2020)
- Increase the number of hospitals designated to receive COVID-19 cases and scale- up ICU capacity (World Health Organization, 2020)
- Reinforce standard operating procedures for facility-based infection control mechanisms in all healthcare settings (during transport, in hospitals, in primary care) (World Health Organization, 2020)
- Assess and mitigate potential financial, operational, and logistical barriers to accessing care (World Health Organization, 2020)
- Implement strong personal protection provisions for people with cancer or cancer survivors (Liang et al., 2020)
- Update and disseminate best practices and guidelines for cancer care prevention and management on a regular basis



As the pandemic progresses, a multilevel approach is needed to protect people with cancer. This may including balancing tough choices such as balancing the benefits and risks of delaying or rescheduling treatments or surgeries and providing care with limited resources (Kutikov et al., 2020; Ueda et al., 2020). People with cancer also have a responsibility to practice social distancing and hygiene to limit their exposure to COVID-19.

To ensure proper protection of people with cancer during COVID-19 pandemic, there is a need for multi-sectoral collaborations between various stakeholder organization including the MOPH, the Lebanese Society of Oncology, the Order of Nurses, the healthcare facilities and other stakeholder organizations to implement, monitor and evaluate the effectiveness of interventions.



REFERENCES

Al-Shamsi, H. O., Alhazzani, W., Alhuraiji, A., Coomes, E. A., Chemaly, R. F., Almuhanna, M., Xie, C. (2020). A Practical Approach to the Management of Cancer Patients During the Novel Coronavirus Disease 2019 (COVID-19) Pandemic: An International Collaborative Group. Oncologist. doi:10.1634/theoncologist.2020-0213

Bitar, N., Kattan, J., Kourie, H. R., Mukherji, D., & Saghir, N. E. (2020). The Lebanese Society of Medical Oncology (LSMO) statement on the care of patients with cancer during the COVID-19 pandemic. In: Future Medicine.

Bouffet, E., Challinor, J., Sullivan, M., Biondi, A., Rodriguez-Galindo, C., & Pritchard-Jones, K. (2020). Early advice on managing children with cancer during the COVID-19 pandemic and a call for sharing experiences. Pediatr Blood Cancer, e28327. doi:10.1002/pbc.28327

Charafeddine, M. A., Olson, S. H., Mukherji, D., Temraz, S. N., Abou-Alfa, G. K., & Shamseddine, A. I. (2017). Proportion of cancer in a Middle eastern country attributable to established risk factors. BMC cancer, 17(1), 337.

Desai, A. (2020). Pooled Meta-Analysis of Cancer Prevalence in Patients With COVID-19 Infection. Retrieved from https://www.ascopost.com/news/april-2020/pooled-meta-analysis-of-cancer-prevalence-in-patients-with-covid-19-infection/

Elias, F., Khuri, F. R., Adib, S. M., Karam, R., Harb, H., Awar, M., Zalloua, P., & Ammar, W. (2016). Financial Burden of Cancer Drug Treatment in Lebanon. Asian Pacific Journal of Cancer Prevention, 17(7), 3173-3177.

Elias, F., Khuri, F. R., Adib, S. M., Karam, R., Harb, H., Awar, M., & Ammar, W. (2016). Financial burden of cancer drug treatment in Lebanon. Asian Pacific Journal of Cancer Prevention, 17(7), 3173-3177.

El-Jardali F, Fadlallah R, Abou Samra C, Hilal N, Daher N, BouKarroum L, Ataya N. (2020) K2P Rapid Response: Informing Lebanon's Response to the COVID-19 Pandemic, Knowledge to Policy (K2P) Center. Beirut, Lebanon, March 2020

Fadlallah, R., El-Jardali, F. (2020). K2P COVID-19 Series: Exiting the COVID-19 Lockdown: A Road Map for Action, Knowledge to Policy (K2P) Center, Beirut, Lebanon.

Hanna, T. P., Evans, G. A., & Booth, C. M. (2020). Cancer, COVID-19 and the precautionary principle: prioritizing treatment during a global pandemic. Nat Rev Clin Oncol. doi:10.1038/s41571-020-0362-6

Hemadeh, R., Kdouh, O., Hammoud, R., Jaber, T., & Khalek, L. A. (2019). The primary health care network in Lebanon: a national facility assessment. East Mediterr Health J. https://doi.org/10.26719/emhj.20.003

Kotecha, R. S. (2020). Challenges posed by COVID-19 to children with cancer. The Lancet Oncology. Mar 25. pii: S1470-2045(20)30205-9. doi: 10.1016/S1470-2045(20)30205-9.

Kulhánová, I., Bray, F., Fadhil, I., Al-Zahrani, A. S., El-Basmy, A., Anwar, W. A., & Soerjomataram, I. (2017). Profile of cancer in the Eastern Mediterranean region: The need for action. Cancer epidemiology, 47, 125-132.

Kutikov, A., Weinberg, D. S., Edelman, M. J., Horwitz, E. M., Uzzo, R. G., & Fisher, R. I. (2020). A War on Two Fronts: Cancer Care in the Time of COVID-19. Annals of Internal Medicine.

Liang, W., Guan, W., Chen, R., Wang, W., Li, J., Xu, K., Liang, H. (2020). Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. The Lancet Oncology, 21(3), 335-337.

Lyons, G., Sankaranarayanan, R., Millar, A. B., & Slama, S. (2018). Scaling up cancer care in the WHO Eastern Mediterranean Region. East Mediterr Health J, 24(1), 104-110.

Ministry of Public Health. (2020). Coronavirus Disease 2019 (COVID-2019) Health Strategic Preparedness and Response Plan- Lebanon. Retrieved from https://moph.gov.lb/userfiles/files/News/Leb%20nCoV%20Strategic%20Response%20Plan%20MARCH%202020-converted.pdf

Public Health England. (2020). Guidance on shielding and protecting people defined on medical grounds as extremely vulnerable from COVID-19. Retrieved from https://www.gov.uk/government/publications/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19

Shamseddine, A., Saleh, A., Charafeddine, M., Seoud, M., Mukherji, D., Temraz, S., & Sibai, A. M. (2014). Cancer trends in Lebanon: a review of incidence rates for the period of 2003–2008 and projections until 2018. Population health metrics, 12(1), 4. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3996020/pdf/1478-7954-12-4.pdf

Shankar, A., Saini, D., Roy, S., Jarrahi, A. M., Chakraborty, A., Bharati, S. J., & Taghizadeh-Hesary, F. (2020). Cancer Care Delivery Challenges Amidst Coronavirus Disease–19 (COVID-19) Outbreak: Specific Precautions for Cancer Patients and Cancer Care Providers to Prevent Spread. Asian Pacific journal of cancer prevention: APJCP, 21(3), 569.

Ueda, M., Martins, R., Hendrie, P. C., McDonnell, T., Crews, J. R., Wong, T. L., Byrd, D. R. (2020). Managing Cancer Care During the COVID-19 Pandemic: Agility and Collaboration Toward a Common Goal. Journal of the National Comprehensive Cancer Network, 1(aop), 1-4.

Uzzo, R., & Kutikov, A. (2020). Coronavirus disease 2019 (COVID-19): Cancer care during the pandemic. Retrieved from https://www.uptodate.com/contents/coronavirus-disease-2019-covid-19-cancer-care-during-the-pandemic#H2882816674

Wang, C. J., Ng, C. Y., & Brook, R. H. (2020). Response to COVID-19 in Taiwan: Big Data Analytics, New Technology, and Proactive Testing. Jama. doi:10.1001/jama.2020.3151

Wang, H., & Zhang, L. (2020). Risk of COVID-19 for patients with cancer. The Lancet Oncology. Published:March 03, 2020DOI:https://doi.org/10.1016/S1470-2045(20)30149-2

Willan, J. (2020). Care of haematology patients in a COVID-19 epidemic.

World Health Organization. (2020). Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19). Retrieved from https://www.who.int/ publications-detail/report-of-the-who-china-joint-mission-on-coronavirus-disease-2019-(covid-19).

World Health Organization. (2019). COVID-19 and NCDs. Retrieved from https://www.who.int/who-documents-detail/covid-19-and-ncds

World Health Organization. (2020). Strengthening the health system response to COVID-19. Retrieved from http://www.euro.who.int/__data/assets/pdf_file/0003/436350/strengthening-health-system-response-COVID-19.pdf?ua=1

Worldometer. (2020). COVID-19 Coronavirus outbreak. Retrieved from https://www.worldometers.info/coronavirus/

Yang, G., Zhang, H., & Yang, Y. (2020). Challenges and Countermeasures of Integrative Cancer Therapy in the Epidemic of COVID-19. Integrative Cancer Therapies, 19, 1534735420912811.

You, B., Ravaud, A., Canivet, A., Ganem, G., Giraud, P., Guimbaud, R., Grellety, T. (2020). The official French guidelines to protect patients with cancer against SARS-CoV-2 infection. The Lancet Oncology. 2020 Mar 25. pii: S1470-2045(20)30204-7. doi: 10.1016/S1470-2045(20)30204-7

Yu, J., Ouyang, W., Chua, M. L., & Xie, C. (2020). SARS-CoV-2 Transmission in Patients With Cancer at a Tertiary Care Hospital in Wuhan, China. JAMA oncology. Mar 25. doi: 10.1001/jamaoncol.2020.0980

Zhang, L., Zhu, F., Xie, L., Wang, C., Wang, J., Chen, R., Chen, Y. (2020). Clinical characteristics of COVID-19-infected cancer patients: A retrospective case study in three hospitals within Wuhan, China. Annals of Oncology.

Knowledge to Policy (K2P) Center
Faculty of Health Sciences
American University of Beirut
Riad El Solh, Beirut 1107 2020
Beirut, Lebanon
+961 1 350 000 ext. 2942-2943
www.aub.edu.lb/K2P
K2P@aub.edu.lb

Follow us
Facebook Knowledge-to-Policy-K2P-Center
Twitter @K2PCenter

Knowledge to Policy Center K2P