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Lessons learned from COVID-19 lockdown for cancer care: a nationwide survey of oncologists in Luxembourg

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Abstract

Background

COVID-19 is placing unprecedented pressures on healthcare systems. The current pandemic has required healthcare professionals to reorganise profoundly their everyday practice while trying to maintain standards of non-COVID-19 healthcare. Despite measures taken by governments and healthcare providers, cancer patients may face treatment disruption. This study aims to improve the understanding of the impact of COVID-19 on clinical oncology activity from the perspective of healthcare providers in Luxembourg.

Method

A 47-item online survey was created, including four sections covering general information, implemented COVID-19 containment measures, COVID-19 cases in oncology departments and their impact on clinical activities, and the routine use of preventive measures in oncology. In Luxembourg, the lockdown was introduced simultaneously for the entire country on 16 March 2020 until 4 May 2020. Following the lifting of this lockdown, we sent our online survey via email to all oncologists active at national level to assess their clinical experiences during this period. We also analysed data on the nationwide daily number of radiotherapy sessions provided between January 2020 and November 2020, compared to 2017-2019.

Results

The survey had a response rate of 45%, with representation of all national hospitals. Results showed that all respondents moved to teleconsultations during the lockdown, with 92% using phone and 23% video consultations. 77% reported treatment plan changes, with 54% of planned palliative chemotherapy modified and 31% cancelled. Treatment shifts from systemic to oral, lower dose administrations or larger intervals were introduced to reduce hospital visits. Patients received influenza (84%) or pneumococcal (64%) vaccination recommendations regardless of their cancer treatment.

The lockdown reduced the national number of radiotherapy sessions by almost one third. Even following the lockdown, the number of radiotherapy sessions provided remained lower between July and October 2020 compared to the numbers from pre-lockdown and from 2017-2019.

Conclusion

This snapshot of the clinical practice in cancer care during a national lockdown may support decision-making for future outbreaks and improvement in clinical practice for other non-communicable diseases.

KEYWORDS: Cancer; COVID-19; Healthcare; Infection; Pandemic; Telemedicine

Introduction

The *Corona Virus Disease 2019* (COVID-19) outbreak impacts healthcare systems worldwide and poses unprecedented challenges for cancer care (1). The pandemic represents a significant risk of harm for patients undergoing immunosuppressive treatments, such as cancer therapies (2, 3). Cancer patients represent a heterogeneous group encompassing different ages, genders, cancer types and stages and comorbidities, which can pose challenges to ensuring continuity of high quality cancer care during a pandemic. Among others, cancer patients are particularly vulnerable towards COVID-19 infection and face two main sources of infection: (i) they must leave their homes to receive cancer treatments in medical facilities, which may also treat COVID-19 patients and (ii) cancer treatment itself, influences patients' immune response and can predispose patients to more serious COVID-19 health outcomes (4-6). Recent reports show that cancer patients with COVID-19 have an increased number of clinically severe events, a high likelihood of admission to intensive care and a higher risk of mortality (7-10). The COVID-19 crisis and its consequences, such as reduced hospital access, modifications to cancer care and a lack of access to personal protective equipment has the potential to negatively affect patients' cancer treatments. This can cause concerns among oncologists, who must act on available evidence, and lead to anxiety in cancer patients (11, 12).

The WHO COVID-19 operational guidance on maintaining essential health services, emphasises the necessity of maintaining continuity of non-communicable disease treatments while reorganising medical practice in response to the outbreak (13). The establishment of effective patient flow including screening, triage and targeted referral is also recommended, as well as the implementation or expansion of telemedicine, especially in primary healthcare and for non-urgent activities (14, 15).

Across Europe, cancer care has been restructured to preserve high standards and continuity of care in the face of the challenges posed by the pandemic (16). Measures include limiting exposure to infection (by shifting to virtual assessments and follow-ups), rationalising treatments and limiting morbidity (by undertaking triage to identify patients with symptoms, delaying oncologic treatments in COVID-19 positive patients or ensuring vaccinations, for example influenza) (17). Notwithstanding measures taken by governments and healthcare providers, cancer patients are expected to face treatment disruptions that may recur in the future.

Following the reporting of the first COVID-19 case in Luxembourg on 1st March 2020, the government introduced measures to reduce the spread of SARS-CoV-2 (Supplementary Material Table A.1)(18). Lockdown measures introduced simultaneously for the entire country on 16th March 2020, were lifted in three phases

from 4 May 2020. During the lockdown period, all non-urgent medical appointments were cancelled by ministerial decree from the Luxembourgish Ministry of Health, which is responsible for hospital planning. The single health insurance system – the National Health Fund (*Caisse Nationale de Santé*) (19), enabled the rapid implementation of national measures to address the pandemic, including the opening of new advanced care centres (Supplementary Material A, Table A.1). As a result of Luxembourg’s unified health system, preventive measures were promptly implemented across the whole country. National decrees and healthcare reorganisations contributed to changes in the provision of cancer care. The incidence of COVID-19 cases decreased during this lockdown and remained low during June 2020 (Figure 1) (18). In parallel to the lifting of these ‘lockdown’ measures in early July 2020, national large scale testing was implemented. However, from early October 2020, the daily number of cases reported increased rapidly.

The WHO suggested surveys as a method to undertake rapid research to capture the observations of healthcare workers (20). In March 2020, clinicians in Italy published the results of a healthcare provider survey (5). The authors expressed the need for further international cooperation to share experiences of measures undertaken to maintain essential healthcare activity during the pandemic.

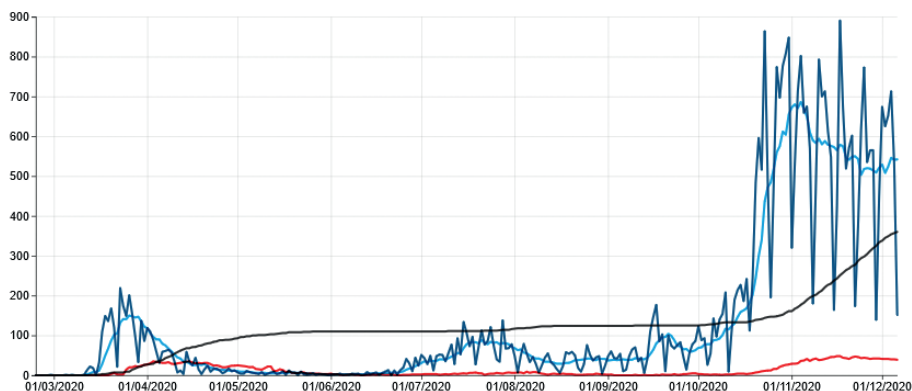


Figure 1: Dynamics of the epidemic in Luxembourg. (dark blue) Number of persons tested COVID+, (red) Number of persons in intensive care, (light blue) Number of persons tested COVID-19+ per day (7-day moving average), (black) Cumulative number of deaths (18)

This unprecedented situation raises important questions, including: ‘How did cancer care providers adapt their practice during this “lockdown” period in Luxembourg?’ and ‘What are the sources of potential pandemic effects on future mortality and incidence rates of cancer?’.

This study aims to improve the understanding of current and future potential impacts of COVID-19 on the clinical activity in oncology from the perspective of healthcare providers. This research enables a systematic assessment of the clinical changes implemented, which may have a long-term impact on cancer care.

Materials and methods

A new 47-item online questionnaire was created and tailored to the Luxembourgish context. The survey was inspired by a previously published study reporting the reorganisation of Italian oncology departments in response to COVID-19 (5). A specific section on detailed types and decision criteria used for adjuvant or palliative cancer treatment changes (chemotherapy, radiotherapy, targeted therapy and immunotherapy) was added.

Our survey included four sections covering: general information on the respondent (Section 1: 3 questions), questions on the implementation of COVID-19 containment measures before and during the lockdown (Section 2: 14 questions), COVID-19 cases in cancer care units and their impact on clinical activities and treatment changes (Section 3: 27 questions), and information on the routine use of preventive measures in cancer patients as vaccination (Section 4: 3 questions).

The online questionnaire was developed using LimeSurvey (Limesurvey GmbH) (21). Responses were structured as multiple choice, Yes/No/ Not applicable or open questions. This study did not require ethical approval and was compliant with the European General Data Protection Regulation (GDPR), EU Regulation 2016/679.

Inclusion criteria were defined as medical oncologist active in clinics, with direct contact with patients in Luxembourg. Thus, we contacted all oncologists active in Luxembourg and gathered contact details via the membership of the Luxembourgish Society of Oncology (*Société Luxembourgeoise d'Oncologie*, SLO) (N=46).

The survey was sent to oncologists via email on 15 May 2020, during the first phase of the lifting of the lockdown measures. Two reminders were sent on 25th May and 7th June 2020. The survey closed on 23th June 2020.

The survey data was exported from LimeSurvey (Limesurvey GmbH) to Stata (StataCorp, Version 15, 2017) for descriptive analysis (21, 22). The data obtained is presented as a percentage of received responses compared to the total number of participants and included in bar charts.

We also analysed the daily number of radiotherapy sessions provided in Luxembourg between February and November 2020, as well as for previous years 2017-2019. The data was provided by the National Radiotherapy Centre (Centre François Baclesse), which delivers all radiotherapy sessions in Luxembourg with three linacs and one CyberknifeTM M6 (Accuray, Sunnyvale, California, USA). The reported number represents all external beam radiotherapy sessions delivered in Luxembourg including stereotactic body radiotherapy. Each session is a work unit financed by Luxembourgish Health Insurance (and possibly foreign insurance systems) and reflects the actual activity of all radiotherapy sessions delivery at national level. Monthly mean values and standard deviations have been compared and Six Sigma test performed.

Results

Of the 46 medical oncologists contacted, 29 were active in clinics, with direct contact with patients in Luxembourg, and met the study inclusion criteria. The 17 excluded specialists were either pathologists or oncologists who practiced outside Luxembourg. 14 of the 29 eligible oncologists responded, with one empty questionnaire, resulting in 13 eligible responses and a response rate of 45%. Respondents represented all four hospitals in Luxembourg, which all provide oncology services; and the National Centre for Radiotherapy. The respondents were representative of the entirety of clinical oncology activities in Luxembourg. To simplify reporting, all results of multiple-choice questions in separate tables (Supplementary Material B, Tables C.2-C.4) and the main comments received are provided in the text below.

Results from Section 2 covering topics on the implementation of COVID-19 containment measures before and during the lockdown (Table B.2a), reveal that 100% of patients underwent a triage procedure before entering a hospital. If COVID-19 symptoms were present, 77% of respondents reported that patients were encouraged to contact the hospital before their appointment and to avoid visiting hemato-/onco-/ radiotherapy departments if possible. 69% of respondents allowed family members to attend consultations in certain circumstances, for example if the patient was dying (77%) or bad news was expected (62%), but not for inpatient stays or day care visits. Before the lockdown, 77% of respondents undertook only face-to-face consultations and 23% used phone consultations (Figure 2, Table B.2a). During the lockdown, all respondents shifted to teleconsultations with 92% using phone consultations for an average of 83% (median 73% [10%-100%]) of consultations, and 23% using video consultations. Some respondents specified that teleconsultation tools were used for 100% of follow-up visits, but not for the initial diagnostic visit. Table B.2a shows that physical examination of asymptomatic patients, mainly for anamnestic consultations or follow-up, were stopped or reduced for an average of 76% (median 90% [30-100%]) of all consultations. Only 31% of respondents performed out-of-hospital medical practice, which also followed stricter contamination control measures (Table B.2b).

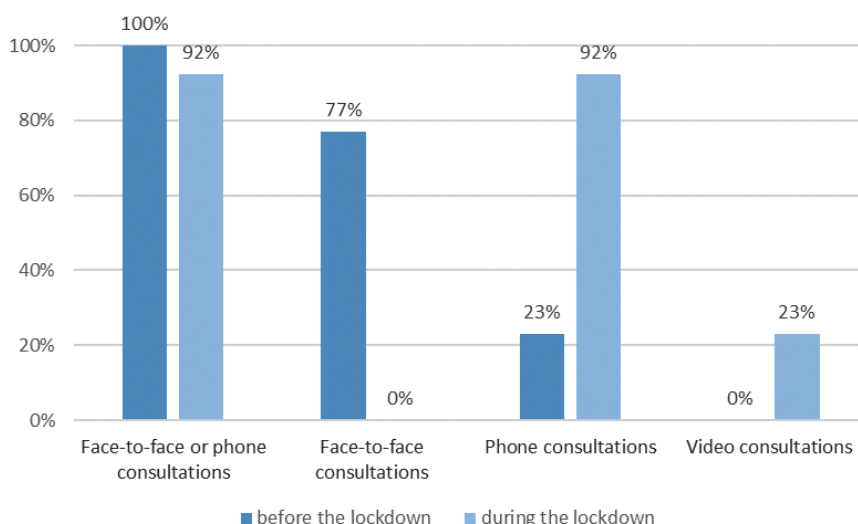


Figure 2: Use of alternative consultation tools before and during the lockdown period (16 March 2020 – 4 May 2020) in Luxembourg.

Table B.3 shows results from Section 3 covering topics on COVID-19 cases in cancer care units and their impact on clinical activities and treatment changes (cancelled or modified). 77% of respondents reported having changed previously defined cancer treatment plans with an average of 15% (median 10% [2%-50%]) of treatment plans changed. Palliative chemotherapy was the most commonly changed treatment plan, where 31% of the respondents reported cancer treatment cancellations, and 54% cancer treatment modifications (Figure 3, Table B.3). The highest average of treatment plans changed was reported for palliative immunotherapy, with an average of 18% of cancellation and 18% of modification.

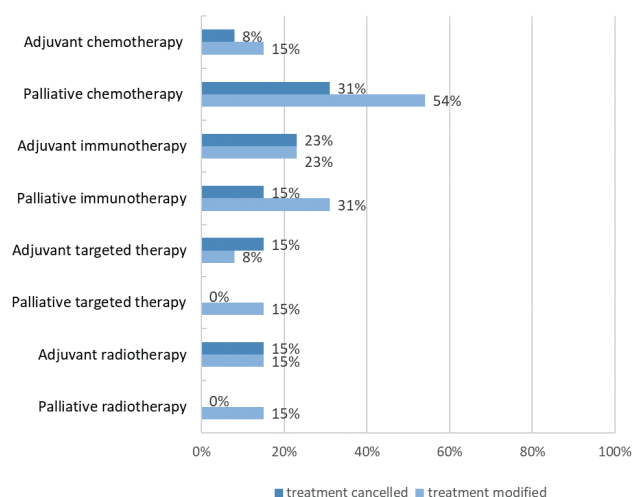


Figure 3: Types of treatment plan changes (%) made during the lockdown (16 March 2020 – 4 May 2020) in Luxembourg.

Respondents provided comments on changes to treatment plans. Palliative chemotherapy cancellations were highly dependent on patients’ general health status and cancer treatment goals. Cancer treatment modifications entailed switches from systemic to oral chemotherapy, lower dose administrations and reductions of the total number of cancer treatment sequences. Immunotherapy was modified by doubling doses to reduce hospital visits or by extending treatment sequence durations from two to four weeks. The number of palliative hypofractionation in radiotherapy treatments was increased up to 50%. For targeted therapies, up to 90% of blood tests were performed at home. The restricted or no access to Magnetic Resonance Imaging (MRI) during the lockdown period resulted in delays to adjuvant radiotherapy.

In general, 38% of respondents expected a large backlog of oncology patients. 77% of respondents reported positive COVID-19 cases in healthcare providers in their department (Figure 4, Table B.3), mainly detected after contact with subjects at risk of infection (60%) or after diagnostic procedures during hospital triage (60%).

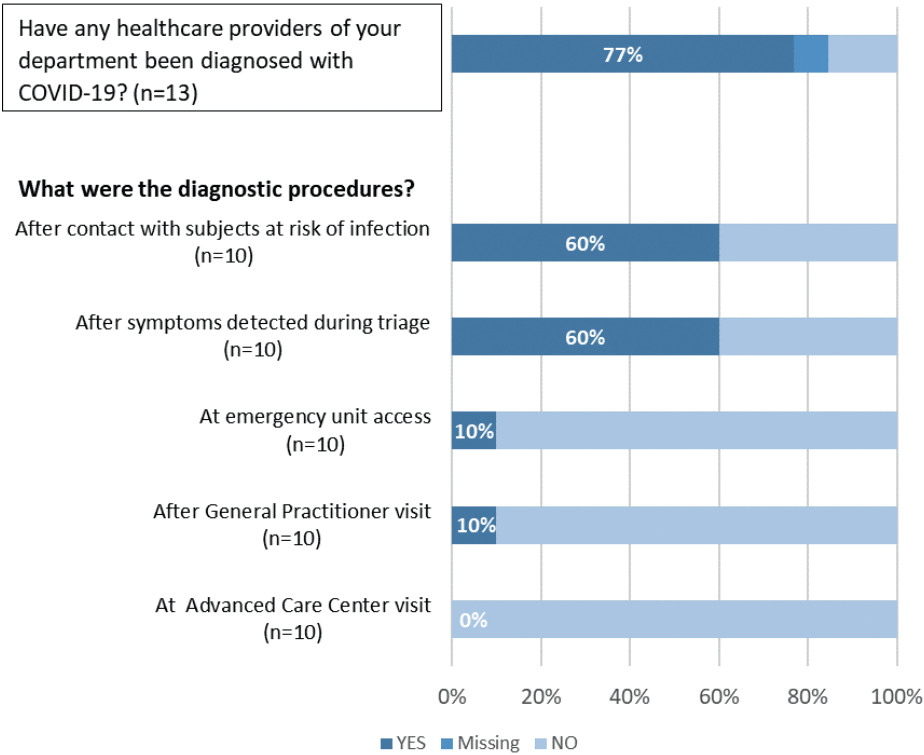


Figure 4: Healthcare workers diagnosed with COVID-19 (n=13) and if yes, the corresponding diagnostic procedures (n=10).

Responses to questions in Section 4 providing information on the routine use of preventive measures in cancer patients (Table C.4) illustrated that patients at risk received vaccination recommendations regardless of their cancer treatment. The most commonly recommended vaccination was against influenza (84%) versus pneumococcal (64%). Respondents underlined the aspiration to maintain triage procedures at medical care units' entrances, to further explore oral anticancer treatments if possible, and to continue teleconsultations following lockdown. Concerns about mental health impacts on cancer patients were also highlighted.

Outcomes of the survey are put into the context of cancer care provided at national level during and after the lockdown. Figure 5 displays the daily number of radiotherapy sessions provided in Luxembourg between 1st of January and 28th of November 2020 (day of article submission). The numbers are compared to the daily radiotherapy sessions delivery between 2017-2019. The figure shows that the number of radiotherapy sessions decreased by almost 23% in May 2020 compared to sessions provided in the previous years, and increased after lifting of the lockdown to reach pre-lockdown levels in June 2020. The number fell again from 23th of July 2020 and remained lower compared to previous years until the 23th of October 2020. In November 2020 the number of sessions delivered was comparable to previous years. Based on a comparison of monthly means and standard deviations, no statistically significant difference between the numbers of radiotherapy sessions delivered in 2020, compared to 2017-2019 was identified.

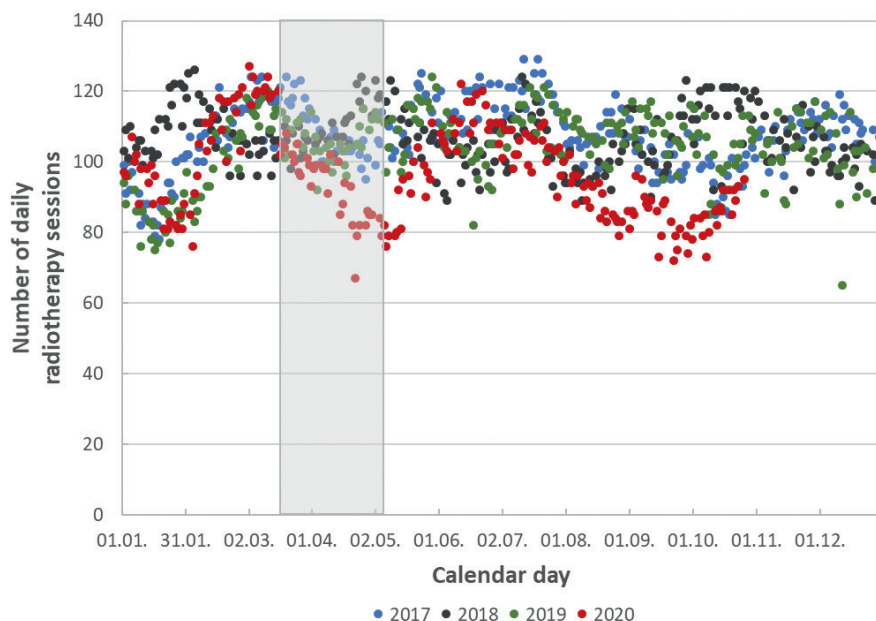


Figure 5: Number of patients treated by radiotherapy per day at the National Radiotherapy Centre from 24 February 2020 until 28 November 2020 and of the 2017-2019.

Discussion

This study concomitantly provides a systematic overview of oncology departments reorganisation during the lockdown and an analysis of the daily number of radiotherapy sessions provided during and after the lockdown at national level in Luxembourg. Our results show that healthcare providers enacted a rapid and proactive response to the pandemic while trying to maintain the continuum of care. This response necessitated the implementation of infection control and prevention measures, of changes to chemotherapy and radiotherapy treatment plans, and the increased use of teleconsultations. These results are aligned to national and international advice on the provision of cancer care during the COVID-19 pandemic (23-25).

High infection rates required the rapid implementation of effective preventative measures such as adapted personal protective equipment, triage and vaccination recommendations (26). These measures that were introduced in oncology departments in Luxembourg and other countries are particularly important for cancer patients undergoing immunosuppressive treatments (27). The strict visit restrictions are in line with previously published studies (28, 29). It is recommended that strict containment measures for cancer patients undergoing treatment and reduced hospital visits should be maintained during the pandemic, including exceptions (30).

The European Society for Medical Oncology (ESMO) multidisciplinary expert panel (statement 2) published in July 2020 underlined the need to adapt cancer care prioritisation and cancer care intensity to the pandemic scenario of the European Centre for Disease Prevention and Control (ECDC) index and of the healthcare facilities and resources (23). Our findings show that hospital visits were reduced by moving to shorter radiotherapy fractionations and switching intravenous to oral treatment administrations, in order to diminish contamination risk for cancer patients undergoing anticancer treatments. Hypofractionated radiation therapy was recommended in several studies, however high difference in effectiveness are reported depending on the cancer type and patients conditions (28, 31). The shift to oral anticancer treatments or shorter radiotherapy fractionation is also presented in a general framework for prioritizing cancer care published by a Canadian research group (4). However, such general frameworks need to take account of various individual factors, including patients' general health status or treatment objectives, as highlighted by our results, where mainly palliative cancer care doses were reduced or cancelled. Treatment modifications also included dose adaptations, as reported in similar surveys (11, 31, 32). As a support for the decision-making process of risk-benefit evaluations, the global radiation therapy community started in early March 2020 an innovative approach of an online Twitter discussion and publication platform on recommendations on crucial steps of cancer radiotherapy during the pandemic (33). These outputs may support departments with reduced capacity to deliver radiotherapy fractions and enable discussions on the reallocation of priorities of adjuvant and palliative treatments.

Besides treatment plan changes, telemedicine is highlighted as a promising alternative tool to reduce or avoid in-hospital visits (34). Respondents reported a rapid shift from face-to-face consultations to teleconsultations during the lockdown, especially for follow-up and anamnesis. This was facilitated by the introduction of a new health insurance billing code for teleconsultation applicable during the lockdown. An increased use of teleconsultations may lead to its embedment into routine healthcare delivery, not only in the short - to medium-term, while the risk of infection remains high; but also in the longer-term. While clinicians may appreciate the benefits of telemedicine, limitations may arise from unforeseen consequences, in particular in palliative care (35). The shift to teleconsultations in cancer care during the pandemic and the need to address the challenges of virtual management is also reported for other countries (36). Survey respondents reported that while the implementation of phone consultations was relatively straightforward, video consultations posed more difficulties for various reasons including the user-friendliness of the teleconferencing tools, lacking guidance on teleconsultation quality and missing billing code after the lockdown. The ESMO statement 1 evaluated telehealth in oncology as an “excellent tool for real-time video consultations for primary care triage and interventions, such as counselling, medication prescribing and management, long-term treatment management and post-discharge coordination”, but recommended that face-to-face consultations should still be considered for patients with complex cancer needs, and an accompanying person should be allowed (23). However these cancer care changes may need to be combined with social and psychological support for cancer patients, while teleconsultations may also be an option for patient support.

This study’s results provide an insight into the delivery of cancer care during the pandemic in Luxembourg and will assist future interpretation of epidemiological data. At the individual level, medical oncologists face difficult decisions emphasizing the need for sharing experiences. A particular challenge faced by healthcare systems is the need to ensure patients’ safety, while maintaining adherence to guidelines and best practices. Information collection on treatment modifications supports healthcare professionals to establish evidence and to support further treatment changes implemented during the pandemic (16). Moreover, epidemiological data such as cancer registry data collected and reported for 2020 may be better understood in terms of changes to treatment and palliative care, and potential sources of annual incidence and mortality rate changes. For example, the Italian National Statistical Institute has published preliminary data showing shifts in the death rates for various chronic diseases, including cancer (37). Furthermore, these findings may help to better understand low medical unit attendances reported during the weeks after lockdown (38). To thoroughly investigate these shifts, actions taken by clinicians need to be first understood in the national context, and then potentially compared between countries.

The reduction of the number of radiotherapy sessions at national level reported in this article, highlights the important impact of public health prevention measures on cancer care. While we could surmise that the summer holidays may explain a certain tendency of decrease in-hospital treatments during the summer months (June-July 2020), a comparison with preceding years does not support this theory (39). Aligned to increasing number of COVID-19 cases, the low number of radiotherapy sessions provided between September 2020 and the end of October 2020 needs to be considered and discussed in oncology follow-ups. The interpretation and comparison of the number of radiotherapy sessions delivered need to take into account a constant increase of radiotherapy sessions delivery over the years and an increased number of hypofractionations, especially for breast cancer therapy, since mid-2019. Recently published articles predict a substantial increase in mortality in cancer patients due to the COVID-19 pandemic and urge policy interventions to address the back log of routine cancer diagnostic services and surgery interventions in patients with cancer (40, 41). The reduction in daily radiotherapy sessions delivery highlights the need to conduct further analysis on the relative efficacy of interventions undertaken using large observational studies (42).

There are certain limitations to our study. Our data represents a snapshot in time and ideally data would be collected on a longitudinal basis at regular intervals in order to gain insights into changes in clinical practice as the epidemic evolves and abates. Due to the complexity of the COVID-19 situation, it was difficult to collect data directly after this lockdown. The slight delay in collecting data may have resulted in recall bias as responses to the questionnaire relied on memory. Data on patients and other healthcare personnel's perspective on the risks and benefits of cancer treatment changes may represent an added value to provide a global picture of the impact of COVID-19 on cancer care.

Conclusions

By using a combination of survey and clinical activity data, we provide a unique insight into the changes to cancer care in Luxembourg in response to a COVID-19 lockdown.

This rapid survey represents a picture of the situation at a particular point in time and may be expanded to other countries and diseases. The European Society for Medical Oncology (ESMO) has highlighted the value of cross-country cooperation and sharing of experiences and case studies on the continuity of cancer care during the pandemic (43). As we report decisions implemented at a national level, in a system where all preventative measures were implemented simultaneously, this study highlights the importance of rapid governmental decision-making to support clinical needs. In the event of an increase in infections, and/or of similar future emergencies, our results respond to several international calls for action in

cancer care and may help to guide clinicians to deliver patient care with minimal disruption. Furthermore, some approaches we outline may be adapted for the management of other non-communicable diseases (44).

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Data availability

Data is available from the author on reasonable request. The blank version of the survey is available upon request.

Supplementary data

Supplementary material A + B to this article can be found at the end of this article.

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Conflict of interest statement

The authors have no conflicts of interest to declare for the present article.

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Table A.1: Timeline of key stages of COVID-19 pandemic in Luxembourg (status until November 2020)

Date	Stage
01 March 2020	The first COVID-19 case was diagnosed and reported in Luxembourg
13 March 2020	The Luxembourgish Government implemented the first 'lockdown' measures. A series of measures was introduced as part of the infection control strategy focussing on isolation, quarantine of patients and persons at risk. Free movement of people was restricted and all non-essential businesses were closed. Measures included the closure of schools and childcare facilities, accompanied by a new type of leave for family reasons. During the 'lockdown', health professionals were only allowed to provide care for severe or urgent cases; care provided by medical practices, especially in non-hospital settings, was reduced to minimal levels. New advanced care centres were opened to provide diagnostic and treatment services in an ambulatory setting with the objective of separating the care of patients with and without COVID-19 symptoms. Simultaneously, doctors, dentists and midwives were encouraged to offer teleconsultations.
15 April 2020	The Luxembourgish Government communicates a step-by-step exit strategy:
4 May 2020	All previous clinical activities were resumed progressively, including face-to-face consultations for non-COVID patients (but only with fixed appointments).
	The 'lockdown' was lifted in three phases, with progressive easing of the social confinement measures. Social distancing instructions requiring the maintenance of a distance of 2 metres and the wearing of masks if it is not possible to maintain social distance continues. Schools were reopened and restrictions limiting outdoor gatherings to 20 people were lifted.
18 May 2020	Large scale testing was introduced and extent to cover regular testing possibilities at national level.
25 June 2020	Declaration of the end of the state of emergency ("Etat de Crise").
Early July 2020	Covid-19+ cases rise with Rs-values above 1.
26 October 2020	New reorganisation of hospital departments
25 November 2020	The Luxembourgish Government decides new restrictions measures, as closing of restaurants, bars and sport facilities, limiting visits to only two persons and urging citizens to limit their social contacts.
Sources: The Luxembourg Government Ministry of Health. Coronavirus: COVID 19, situation update. [cited 2020 01 September].; Available from: https://msan.gouvernement.lu/en/dossiers/2020/corona-virus.html. The Luxembourg Government. CORONAVIRUS COVID-19 REPRISE DE L'ACTIVITÉ MÉDICALE DÈS LE 4 MAI. 2020 [cited 2020 01 September].; Available from: https://msan.gouvernement.lu/dam-assets/covid-19/reprise-activite-medicale/200429-santelu-reprise-activite-medicale-A4-FR-FINAL.pdf	

Table B.2a: SECTION 2: Implementation of COVID-19 containment measures –
Questions related to Luxembourg's "lockdown" period (16 March 2020 - 4 May 2020)

Survey questions	Responses (N=13)			
	Yes, n (%)	No, n (%)	Missing, n(%)	N/A, n(%)
Before admission				
Considering the actual COVID-19 pandemic, are all patients undergoing a triage procedure (e.g. body temperature measurements) before entering the hospital/clinic?	13 (100)	0 (0)	0 (0)	0 (0)
Do you ask patients if they have had fever, respiratory symptoms or a possible contact with subjects at risk of infection 15 days before the visit?	9 (69)	3 (23)	1 (8)	0 (0)
Do you encourage patients:				
To contact hemato-/ onco-/ radiotherapy departments if they develop typical Covid-19 symptoms	10 (77)	2 (15)	1 (8)	0 (0)
To avoid visiting hemato-/ onco-/ radiotherapy departments if they have any typical Covid-19 symptoms on the day of consultation, or in case of scheduled day care unit visit or overnight stay	10 (77)	1 (8)	2 (15)	0 (0)
Do you perform a clinical check-up (symptoms):				
before entering the consultation room	7 (54)	5 (38)	1 (8)	0 (0)
before entering the day care unit	7 (54)	4 (30)	1 (8)	1 (8)
before entering the overnight stay hospitalization at of your department	8 (62)	2 (15)	1 (8)	2 (15)
Do you allow family members to attend:				
Consultations	4 (31)	9 (69)	0 (0)	0 (0)
Day care unit	1 (8)	12 (92)	0 (0)	0 (0)
Overnight stays in hospitalisation section of the hospital	0 (0)	13 (100)	0 (0)	0 (0)
Only for some family members	5 (38)	8 (62)	0 (0)	0 (0)
If the patient is unable to enter alone	8 (62)	5 (38)	0 (0)	0 (0)
In case of a new diagnosis	6 (46)	7 (54)	0 (0)	0 (0)
If (possibly) bad news are expected	8 (62)	5 (38)	0 (0)	0 (0)
If the patient is dying	10 (77)	3 (23)	0 (0)	0 (0)
Other: palliative care	1 (8)	0 (0)	0 (0)	12 (92)
General measures for risk reduction (in addition to social distancing & hand washing) - before and during "lockdown" period(16 March 2020 - 04 May 2020)				
Considering the period before "lockdown" in Luxembourg, have you implemented any containment measures (e.g. reducing patients' access in case of contact with COVID-19 positive cases and/or presenting influenza-like symptoms)?	6 (46)	6 (46)	0 (0)	1 (8)
If yes, all follow-up visits (all patients) have been temporarily suspended (except urgent visits and visits which could not be postponed)	2 (15)	4 (31)	0 (0)	7 (54)
If yes, follow-up visits of patients aged above or equal to 65 years and/or with risk factors (e.g. comorbidities)	1 (8)	5 (38)	0 (0)	7 (54)
If yes, patients receiving adjuvant treatment(s)	0 (0)	6 (46)	0 (0)	7 (54)
Have you used alternative communication tools (e.g. telephone consultations) before the COVID-19 pandemic?				
Only face-to-face consultations	10 (77)	3 (23)	0 (0)	0 (0)
Yes, Phone consultations	3 (23)	10 (77)	0 (0)	0 (0)
Yes, Video consultations	0 (0)	13 (100)	0 (0)	0 (0)
Considering the period during "lockdown" in Luxembourg, are you using alternative communication tools (e.g. telephone consultations)?				
Only face-to-face consultations	0 (0)	13 (100)	0 (0)	0 (0)
Yes, Phone consultations	12 (92)	1 (8)	0 (0)	0 (0)
If yes, to which extent (%):	Mean 73%; Median 83% [10-100%]			
Yes, Video consultations	3 (23)	10 (77)	0 (0)	0 (0)
If yes, to which extent (%):	/			
Have you reduced or stopped physical examination for most asymptomatic patients	10 (77)	2 (15)	1 (8)	0
If yes, to which extent (%):	Mean 76%; Median 90% [30-100%]			

Do you reduce the frequency of blood sampling compared to previous standard patient care?	3 (23)	8 (61)	1 (8)	1 (8)
If yes, to which extent (%):	Mean 20%; Median 20% [10-30%]			
Do you perform CT examinations for tumour response evaluations less frequently	4 (31)	8 (61)	1 (8)	0 (0)
If yes, to which extent (%):	Mean 45%; Median 45% [10-80%]			
In case of routine blood sampling, do you also look for signs of viral infection?	3 (23)	9 (69)	1 (8)	0 (0)
Has your hospital and/ or care unit issued any guideline/ recommendation on cancer patients' management during the current COVID-19 pandemic?	10 (77)	2 (15)	1 (8)	0 (0)
Do you perform an out-of-hospital medical practice in oncology (e.g. cabinet médical)?	4 (31)	8 (61)	1 (8)	0 (0)
Do you use any other personal protective equipment (PPE), or provide any further safety recommendations, besides surgical masks and advice on frequent hand washing? Please specify	Surface disinfection in consultation rooms (table, chairs,...); protection measures reinforced in case of suspected COVID-19			
Before returning to work (after having had COVID-19 like symptoms), have healthcare workers to fulfil any other specific condition?	Negative COVID-19 test result, no fever, 14-days of quarantine			

Table B.2b: Specific questions for out-of-hospital practice before admission

Survey questions	Responses			
	Yes, n (%)	No, n (%)	Missing, n (%)	N/A, n (%)
Before admission				
Do you perform an out-of-hospital medical practice in oncology (e.g. cabinet médical)?	4 (31)	8 (61)	1 (8)	0 (0)
If yes, do you provide surgical masks to patients?	3 (23)	1 (8)	0 (0)	9 (69)
If yes, do you provide surgical masks to healthcare providers?	3 (23)	1 (8)	0 (0)	9 (69)
If yes, do you use non-sterile gloves for any patient care with direct patient contact?	3 (23)	1 (8)	0 (0)	9 (69)
If yes, do you currently perform disinfection more frequently?	4 (31)	0 (0)	0 (0)	9 (69)

Table B.3: SECTION 3: COVID-19 cases in cancer care units and their impact on clinical activities

Survey questions	Responses (N=13)			
	Yes, n (%)	No, n (%)	Missing, n (%)	N/A, n (%)
Cancer treatment plan changes				
Have you changed cancer treatment plans, defined before the "lockdown" period?	10 (77)	2 (15)	1 (8)	0 (0)
If yes, to which extent (%):	Mean 15%; Median 10% [2-50%]			
Cancellation of treatment plans during "lockdown" period				
Chemotherapy treatment plan cancelled				
Adjuvant	1 (8)	9 (69)	1 (8)	2 (15)
If yes, to which extent (%) of therapeutic sequences:	Mean 15%; Median 15% [15%]			
If yes, which decision criteria was chosen:	/			
Palliative	4 (31)	7 (54)	1 (8)	1 (8)
If yes, to which extent (%) of therapeutic sequences:	Mean 11%; Median 10% [5-20%]			
If yes, which decision criteria was chosen:	Performance > 3			
Immunotherapy treatment plan cancelled				
Adjuvant	3 (23)	7 (54)	1 (8)	2 (15)
If yes, to which extent (%):	Mean 18%; Median 18% [15-20%]			
If yes, which decision criteria was chosen:	Age > 65y			
Palliative	2 (15)	7 (54)	2 (15)	2 (15)
If yes, to which extent (%) of therapeutic sequences:	Mean 18%; Median 18% [15-20%]			
If yes, which decision criteria was chosen:	Age > 70y			

Targeted therapy treatment plan cancelled				
Adjuvant	2 (15)	10 (77)	1 (8)	0 (0)
If yes, to which extent (%) of therapeutic sequences:	Mean 18%; Median 18% [15-20%]			
If yes, which decision criteria was chosen:	Age > 65y			
Palliative	0 (0)	10 (77)	1 (8)	2 (15)
If yes, to which extent (%) of therapeutic sequences:	/			
If yes, which decision criteria was chosen:	/			
Radiotherapy treatment plan cancelled				
Adjuvant	2 (15)	7 (54)	1 (8)	3 (23)
If yes, to which extent (%) of therapeutic sequences:	/			
If yes, which decision criteria was chosen:	/			
Palliative	0 (0)	9 (69)	2 (15)	2 (15)
If yes, to which extent (%) of therapeutic sequences:	/			
If yes, which decision criteria was chosen:	/			
Modification of treatment plans during "lockdown" period				
Chemotherapy treatment plan modified				
Adjuvant	2 (15)	8 (62)		
If yes, to which extent (%) of therapeutic sequences:	Mean 15%; Median 15% [15%]			
If yes, which decision criteria was chosen:	/			
Palliative	7 (54)	4 (31)		
If yes, to which extent (%) of therapeutic sequences:	Mean 14%; Median 10% [5-40%]			
If yes, which decision criteria was chosen:	Performance > 3			
Immunotherapy treatment plan modified				
Adjuvant	3 (23)	6 (46)		
If yes, to which extent (%) of therapeutic sequences:	/			
If yes, which decision criteria was chosen:	Decision criteria: Age > 65y			
Palliative	4 (31)	6 (46)		
If yes, to which extent (%) of therapeutic sequences:	Mean 18%; Median 18% [15-20%]			
If yes, which decision criteria was chosen:	Age > 65y or Performance > 3			
Targeted therapy treatment plan modified	Yes, n (%)	No, n (%)	Missing, n(%)	N/A, n(%)
Adjuvant	1 (8)	7 (54)	3 (23)	2 (15)
If yes, to which extent (%) of therapeutic sequences:	/			
If yes, which decision criteria was chosen:	Age > 65y			
Palliative	2 (15)	8 (62)	2 (15)	1 (8)
If yes, to which extent (%) of therapeutic sequences:	Mean 15%; Median 15% [15%]			
If yes, which decision criteria was chosen:	Age > 65y or Performance > 3			
Radiotherapy treatment plan modified				
Adjuvant	2 (15)	6 (46)	1 (8)	4 (31)
If yes, to which extent (%) of therapeutic sequences:	/			
If yes, which decision criteria was chosen:	/			
Palliative	2 (15)	8 (62)	1 (8)	1 (8)
If yes, to which extent (%) of therapeutic sequences:	/			
If yes, which decision criteria was chosen:	/			
Do you estimate a large backlog of patients?	5 (38)	7 (54)	1 (8)	0 (0)
May you kindly share your references used for treatment plan changes (e.g.: cooperation with colleagues in other countries)?	ESMO, DGHO, ASCO guidelines; INCa-SFRO recommendations; recommendations HCSP COVID-19 and solid cancers; cooperation with Belgian colleagues (e.g. videoconference about how to manage prostate cancer during the pandemic); references and strategies used by colleagues from other clinics in Luxembourg; practice modification has mainly been influenced by case by case evaluation			

In case a cancer patient was diagnosed with COVID-19, how has this diagnosis changed the treatment plan?	Treatment was interrupted (for 3-4 weeks, 14 days/ until the end of COVID-19 disease/ no treatment during active infection); adaptation of schedule and pathway; palliative situation: no intense treatments; no change in neo-adjuvant or adjuvant therapy; surprisingly , no outpatient was diagnosed with COVID-19, two inpatients in advanced palliative disease contracted COVID-19 : best supportive care was started			
General organisation				
Considering the “lockdown” situation, do you estimate your working activity in oncology has:	Yes, n (%)	No, n (%)	Missing, n(%)	N/A, n(%)
negligibly decreased	6 (46)	7 (54)	0 (0)	0 (0)
If yes, to which extent (%):	20-30			
significantly decreased	4 (31)	9 (69)	0 (0)	0 (0)
If yes, to which extent (%):	35-50			
Remained unchanged	1 (8)	12 (92)	0 (0)	0 (0)
Considering the “lockdown” situation, has your working activity been reorganized?	10 (77)	1 (8)	1 (8)	1 (8)
If yes, did the reorganisation addressed specific patient groups*:				
All follow up visits have been temporarily suspended (except urgent visits and visits which cannot be postponed)	9 (69)	1 (8)	0 (0)	3 (23)
Follow-up visits of all patients (all age groups) and/or with risk factors (e.g. comorbidities)	5 (38)	5 (38)	0 (0)	3 (23)
Follow-up visits of patients aged >= 65 years) and/or with risk factors (e.g. comorbidities)	2 (15)	8 (62)	0 (0)	3 (23)
Patients receiving adjuvant treatment(s)	1 (8)	9 (69)	0 (0)	3 (23)
Has the number of healthcare workers in your departments been reduced?	4 (31)	8 (62)	0 (0)	1 (8)
If yes, to which extent (%):	Mean 33%; Median 29% [13-40%]			
Have any healthcare providers of your department been diagnosed with COVID-19?	10 (77)	2 (15)	1 (8)	0 (0)
If yes, how*:				
Diagnostic procedures after contact with subjects at risk of infection	6 (46)	4 (31)	0 (0)	3 (23)
Diagnostic procedures after symptoms detected during triage	6 (46)	4 (31)	0 (0)	3 (23)
Diagnostic procedures during hospitalized patients and/or emergency unit access	1 (8)	9 (69)	0 (0)	3 (23)
Diagnostic procedures from General Practitioner	1 (8)	9 (69)	0 (0)	3 (23)
Diagnostic procedures from the four new Advanced Care Centres	0 (0)	10 (77)	0 (0)	3 (23)
Have you observed any potential diagnostic delays due to COVID-19?				
Due to teleconsultations	0 (0)	13 (100)	0 (0)	0 (0)
Due to missed symptoms	4 (31)	9 (69)	0 (0)	0 (0)
No delay observed	6 (46)	7 (54)	0 (0)	0 (0)
Do you estimate that measures implemented reduce COVID-19 risk in oncology units?				
Yes, but negligibly: cancer patients are at high-risk and most treatment/ visits cannot be postponed	5 (38)	0 (0)	2 (15)	6 (46)
Yes, I think that limiting access to hospitals can significantly decrease the spread of infection towards the patients at risk	6 (46)	0 (0)	2 (15)	5 (38)
Do you perform multidisciplinary team meetings (RCP):				
face-to-face	4 (31)	8 (62)	1 (8)	0 (0)
by videoconference?	9 (69)	3 (23)	1 (8)	0 (0)
Legend: *reply all that apply / no data reported				

Table B.4: SECTION 4: Routine application of preventive measures (e.g.: vaccinations) for cancer patients

Survey questions	Responses (N=13)			
	Yes, n (%)	No, n (%)	Missing, n (%)	N/A, n (%)
In your department, are seasonal flu vaccinations recommended on a regular basis to patients undergoing systemic treatment?	11 (84)	0 (0)	1 (8)	1 (8)
In your department, are seasonal pneumococcal vaccinations recommended on a regular basis to patients undergoing systemic treatment?	6 (46)	3 (23)	2 (15)	2 (15)
If these vaccinations are regularly recommended, to which patients are these recommendations addressed?				
patients undergoing cytotoxic chemotherapy	6 (46)	6 (46)	0 (0)	1 (8)
patients undergoing immunotherapy	5 (38)	7 (54)	0 (0)	1 (8)
patients undergoing hormonal therapy or targeted therapy	4 (31)	8 (62)	0 (0)	1 (8)
patients in follow up	5 (38)	7 (54)	0 (0)	1 (8)
all patients at risk, regardless of ongoing cancer treatments or follow up	10 (77)	2 (15)	0 (0)	1 (8)
all patients	4 (31)	8 (62)	0 (0)	1 (8)

