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Abstract

The COVID-19 pandemic has disrupted primary and secondary prevention efforts as well as routine care related to the diagnosis and treatment of cancer. The number of cancer-related procedures declined across countries, as much as 40% in some of the reporting countries. Many of the OECD countries also faced challenges in maintaining and further improving cancer care quality and outcomes during the pandemic.

This paper compiles initial findings as well as emerging evidence from a subset of OECD countries covering the period from March 2020 to August 2021. It illustrates how several of these countries attempted to mitigate the impact of COVID-19 on cancer care systems. There have been examples of adapting treatment guidelines, changing clinical practices and reducing backlogs to minimise negative impacts of the pandemic on cancer patients. Several of the countries also undertook more frequent monitoring and in-depth analysis of cancer care performance to help develop more targeted risk-based approaches in providing cancer screening and care. The analyses also confirm that strong health information infrastructure is crucial for developing resilient health systems that provide effective, timely and people-centred cancer care.

Résumé

La pandémie de COVID-19 a perturbé les efforts de prévention primaire et secondaire ainsi que les soins de routine liés au diagnostic et au traitement du cancer. Le nombre de procédures chirurgicales liées au cancer a diminué dans tous les pays, jusqu'à 40 % dans certains pays ayant déclaré l'information. Plusieurs des pays de l'OCDE ont également été confronté à des difficultés pour maintenir et poursuivre l'amélioration de la qualité des soins et des résultats en matière de cancer pendant la pandémie.

Ce document compile les résultats préliminaires ainsi que les évidences émergentes d'un sous-ensemble de pays de l'OCDE couvrant la période de mars 2020 à août 2021. Il illustre comment plusieurs de ces pays ont tenté d'atténuer l'impact du COVID-19 sur les systèmes de soins du cancer. Il existe des exemples d'adaptation des recommandations de traitement, de modification des pratiques cliniques et de réduction de l'accumulation des déprogrammations de prise en charge afin de minimiser les impacts négatifs de la pandémie sur les patients atteints de cancer. Plusieurs de ces pays ont aussi entrepris un suivi plus fréquent et une analyse approfondie des performances en matière de soins contre le cancer, afin de contribuer à l'élaboration d'approches plus ciblées, fondées sur le risque, pour le dépistage et les soins contre le cancer. Les analyses confirment également qu'une solide infrastructure d'information sur la santé est essentielle au développement de systèmes de santé résilients qui fournissent des soins efficaces, opportuns et axés sur les personnes pour prévenir et traiter le cancer.

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Key Findings

1. Over recent decades, OECD countries have broadened their efforts to control cancer and improve cancer outcomes. Political attention around cancer care has grown. For example, in 2021, the European Union articulated its renewed political commitment to improve each stage of cancer patients' pathways through its *Beating Cancer Plan*.

2. However, the COVID-19 pandemic significantly disrupted health care not only for people with COVID-19 but also for those with other health care needs. During the initial phase of the COVID-19 pandemic, tightening restrictions across the health sector and the economy more broadly led to postponement, or hesitancy to access many essential health services including in-person primary care services and childhood vaccination. To increase health systems' capacity, non-urgent elective surgeries were postponed while the COVID-19 surge impacted emergency visits and admissions including, for example, cardiac and cerebrovascular events. Cancer care was not an exception, with the pandemic negatively affecting both primary and secondary cancer prevention activities — as well as routine care related to the diagnosis and treatment for cancer. As a result, many OECD countries faced challenges in maintaining and improving cancer care quality and outcomes.

3. Measures to mitigate the impact of COVID-19 on cancer care systems included adapting treatment guidelines, changing clinical practices and reducing backlogs to minimise the negative impacts on patients in both the short and longer term. Several countries undertook more frequent monitoring and in-depth analysis of cancer care performance to help develop more targeted risk-based approaches in providing cancer screening and care during the public health emergency.

4. Based on available national data for 2020, which were still limited in terms of country coverage in August 2021, and an accompanying review of the literature covering the period between March 2020 and August 2021, this paper analyses the initial impact of the COVID-19 pandemic on cancer care along the patient pathway in a number of OECD countries, from screening and diagnosis through to treatment and follow-up, and highlights good practices in mitigating the negative impacts on cancer care. A strong health information infrastructure is the backbone for developing resilient health systems to provide safe, effective and efficient cancer care at the time of emergencies, so the paper also addresses how countries strengthened monitoring and analysis of cancer care performance.

5. The key initial findings on the impact of COVID-19 pandemic on cancer care in a subset of OECD countries are summarised below:

Cancer screening dropped substantially at the beginning of the pandemic but uptake improved since

- At the onset of the COVID-19 pandemic, **16 out of 21 OECD countries temporarily stopped cancer screening**. Many **people were hesitant to seek cancer screening** due to fear of infection. **The capacity to provide cancer screening was also limited** because of social-distancing requirements, and a shortage of protective equipment and professionals that were

prioritised to care for patients with COVID-19. In Australia and Canada, laboratory capacity for cancer screening was also reduced due to COVID-19 testing.

- This led to **a drop in cancer screening rates** in 15 out of the 16 OECD countries with available data. In France, for example, the number of screening mammograms dropped by 44% in the second quarter of 2020 compared to the same period in 2019. In Italy, cervical cancer screening rates fell by 55% between January and May 2020, compared to the same period in 2019. In the Czech Republic, screenings for colorectal cancer dropped by 53% between March and May 2020. Iceland was the exception with, in 2020, 62% of women in the target age reporting that they had had a mammography in the preceding two years compared with 61% in 2019.
- To increase the uptake of cancer screening, Japan ran public awareness campaigns, while Canada and Slovenia took a more targeted approach to deliver cancer screening services more effectively in a context of limited resources. Slovenia implemented targeted risk-based screening for cervical cancer by providing additional patient information and a tool to help identify high-risk women to all gynaecologists. In the Netherlands, Slovenia and the United States, self-sampling kits for cervical cancer screening were sent to target populations, resulting in higher screening rates than office-based screening.
- Unlike cancer screening, **HPV vaccination rates were stable or increased** in most of the OECD countries that reported 2020 data. But vaccination coverage declined in several countries including Australia, Chile and Mexico.

Access to cancer diagnosis declined, resulting in lower cancer incidence in 2020, with risk of poorer outcomes in the near future

- As a result of reduced screening, data available from six OECD countries points to **access to cancer diagnoses falling** during the initial phase of the pandemic despite efforts to continue providing urgent care for cancer patients. In Ireland, the number of breast cancers diagnosed fell by one-third and the number of lung cancers diagnosed fell by almost a half in April 2020, compared to a year earlier, and the number of prostate cancer diagnoses was just 16% of the cases diagnosed in April 2019. In Finland, the number of cancer biopsies decreased by 12% between March and June 2020, compared to the period between 2018 and 2019.
- **Newly diagnosed cancer cases declined** in all 14 OECD countries with available data[1]. In Belgium, the number of new cancer diagnoses between March and September 2020 was 14% lower than the number of new cases during the same period in 2019, and invasive cancer diagnosed in 2020 was 6% lower than the level in 2019. Besides the decline in the number of diagnoses, waiting times for diagnostic services increased in the United Kingdom and the United States.
- **Delayed cancer diagnosis is likely to result in poorer cancer outcomes** in the near future. A study in the United Kingdom (England) projected that delayed diagnoses occurring in the year since March 2020 will increase five-year mortality by about 5% for lung and oesophageal cancers, 6% for oesophageal cancer, 7% for breast cancer, and 16% for colorectal cancer.
- To provide safe and high quality cancer care in a context of limited resources, experts both at the national and international level **updated cancer care recommendations**. These recommendations generally include 1) minimising risks of COVID-19 infection among cancer patients as they are considered vulnerable to COVID-19, 2) treating high-risk cancer patients

[1] Australia, Austria, Belgium, Denmark, France, Germany, Ireland, Japan, Korea the Netherlands, Poland, Slovenia, Sweden and the United States.

without delay while seeking possibilities of postponing treatment for low-risk patients, and 3) promoting regimen with less intensive care.

- In order to harmonise the quality of cancer care across providers, **newly developed recommendations were taken up at national level** in some OECD countries including France and the Netherlands. New Zealand also developed national guidance outlining treatment protocols by hospital capacity level and delivery of cancer care under different scenarios of public health emergencies.
- To reduce risks of COVID-19 infection, **telemedicine became prevalent for cancer care**. Norway increased the use of telephone and video consultations, for instance, for follow-up care after cancer treatment instead of regular in-person control visits. In the United Kingdom, a telephone triage system was introduced to facilitate new cancer referrals and avoid unnecessary hospital attendance. Telemedicine has also facilitated the availability of multidisciplinary tumour boards by connecting specialists working in different sites.

Access to cancer treatment declined and the backlog for care increased

- Due to a mix of factors such as fewer diagnoses, people's hesitancy to seek health care, disrupted manufacturing and distribution of cancer drugs, limited health system capacities and various clinical recommendations which aim to improve treatment outcomes in resource-limited medical settings, **the volume of a wide range of cancer care services declined** in 2020 across OECD countries. These services included emergency department visits by cancer patients, cancer referrals, outpatient cancer care, cancer surgeries, radiotherapy and chemotherapy appointments and hospitalisations. For example
    - **Overnight hospitalisaton for cancer care declined** in all three countries that reported 2020 data to the OECD before August 2021. The number of hospital discharges (the release of a patient admitted to hospital for at least one night) per 100 000 population for all cancers declined by 34% in Chile in 2020 compared to the average over the period 2017-2019 and hospital discharges for prostate cancer decreased by 44% in 2020. In Costa Rica, hospital discharges for all cancers dropped by 19%. In Norway, the falls were limited, except for breast and skin cancers.
    - **The number of cancer-related procedures declined** in all six countries that reported 2020 data to the OECD. In Costa Rica, Ireland, Italy, Norway and Turkey, cancer-related surgeries per 100 000 population decreased in 2020, compared to the average over 2017-2019. The fall in 2020 was greatest for mastectomy and prostatectomy in Ireland (31% and 51%) and Costa Rica (23% and 41%), and hysterectomies also decreased substantially in Denmark (46%), Costa Rica (31%) and Italy (31%). On the other hand, in Denmark the rate of open prostatectomy per 100 000 population increased by 6%.
    - **The length of hospital stays for cancer care decreased** in all three countries that reported 2020 data. The decrease was substantial in Chile. Prior to the pandemic, there was a general shift away from overnight hospitalisation, but **the share of day cases did not always increase** in 2020.
- **A shift to less intensive cancer care**, such as chemotherapy and hormonal treatment instead of surgery, fewer cycles of radiotherapy, home-based cancer care using oral rather than intravenous chemotherapy, and local anaesthesia instead of general anaesthesia, can also be observed.
- Six OECD countries which were able to monitor waiting times for cancer care delivery during the pandemic, managed to provide care for cancer patients with shorter delays than the pre-pandemic period, partly due to declines in the volume of cancer care. However, w**aiting times became**

longer for at least some cancer care in Italy, Korea, the United Kingdom (England) and the United States.

- Due to disruptions in cancer screening, diagnosis and treatment, several OECD countries accumulated **a backlog of cancer care**. To reduce the backlog, policy measures started to be implemented in a limited number of OECD countries, including Ireland and the United Kingdom. For example, the United Kingdom formed a national cancer delivery taskforce to accelerate the return of cancer services, and developed the cancer services recovery plan, which aims to recover cancer services by implementing modified pathways to reduce waiting time, and taking actions to protect service recovery and ensure sufficient capacity.

To address challenges in cancer care systems in a timely manner, information systems need to be further developed

- Some of the OECD countries **intensified monitoring of cancer care performance** since the onset of the pandemic. The Netherlands established a new organisation to monitor and evaluate the impact of the pandemic on breast cancer care, and New Zealand and Slovenia assigned existing organisations to assess the impact of COVID-19 on cancer care. Australia, France, Ireland and Italy also analysed and reported cancer-related data in a more timely manner and more frequently to identify emerging challenges immediately and to develop needed actions.
- Slovenia **analysed and reported more granular data** such as cancer stage information and access to cancer screening and care by region and socio-economic group. These in-depth analyses are crucial to identify vulnerable groups and to develop more targeted approaches in providing cancer screening and cancer care for these groups.
- It is still early to know the full impact of COVID-19 on cancer care particularly because of the time required to assess outcome measures such as cancer mortality and survival rates. Using administrative data and supplementary data collected through provider-based and patient surveys, countries need to continue monitoring and analysing cancer care performance in order to develop resilient health systems to provide effective, safe and people-centred cancer care. Key data, however, are still missing in many OECD countries as the current health information infrastructure does not allow close-to-real-time monitoring of cancer screening and care, calling for further efforts to strengthen health information infrastructure to support decision-making during emergency situations.

1. Impact of COVID-19 pandemic on cancer care

6. While OECD countries were tackling new challenges brought by the COVID-19 pandemic, people continued to need essential health services including primary care services, childhood vaccination, and emergency visits and admissions. In relation to cancer, countries needed to provide services such as cancer screening and HPV vaccination, and cancer patients also required a seamless delivery of cancer care. However, primary and secondary prevention activities as well as routine cancer care related to the diagnosis, treatment and follow-up were disrupted across OECD countries.

7. Based on a literature review and OECD data, this section analyses the impact of the COVID-19 pandemic on preventive services for cancer and cancer diagnosis, treatment and follow-up. It highlights good practices in mitigating negative impacts on cancer care across a set of OECD countries and how countries strengthened monitoring and analysis of cancer care performance during the pandemic to develop resilient health systems to provide high quality cancer care efficiently at the time of emergencies.

8. The analysis was conducted in August 2021 and relied on 2020 data and literature which were available for a limited number of OECD countries. Hence, this report includes initial findings on the impact of COVID-19 pandemic on cancer care in a selection of OECD countries.

Preventive services for cancer

9. Many of the reporting OECD countries experienced disruptions in delivering preventive cancer care particularly between March and June 2020. Although efforts were made to improve access, cancer screening rates dropped in 2020 in the reporting OECD countries but HPV vaccination rates were stable or increased in most countries.

Three out of four of the OECD countries temporarily stopped cancer screening at the onset of the COVID-19 pandemic

10. Prior to the pandemic, most OECD countries conducted breast, cervical and colorectal cancer screening programmes as an effective way of detecting and intervening in the disease at an early stage (OECD, 2013[1]), but cancer screening was halted in 16 out of 21 OECD countries shortly after the start of the pandemic (Table 1.1). Slovenia, for example, stopped its organised cancer screening programmes on 12 March, 2020 (Ivanuš et al., 2021[2]) and in the Netherlands, the national breast cancer screening programme was halted from 16 March, 2020 (Eijkelboom et al, 2021[3]). In Japan, local governments and healthcare providers suspended cancer screening programmes in accordance with the recommendation issued by the Ministry of Health, Labour and Welfare based on the first declaration of a state of emergency on April 7, 2020.

11. Fortunately, in most of the affected countries, screening programmes resumed after the first wave of the COVID-19 pandemic in 2020. Slovenia resumed cancer screening programmes in mid-May 2020 and Latvia resumed state-organised breast cancer screening programme on 25 May 2020. A few days

later, on 1 June, Hungary re-started cancer screening programmes. In the Netherlands, colon cancer screening resumed in mid-May, breast cancer screening in mid-June, and cervical cancer screening on 1 July 2020 (European Observatory on Health Systems and Policies, 2021[4]). Even when countries had more confirmed COVID-19 cases and health systems faced greater pressure than the beginning of the pandemic, these countries did not stop cancer screening. For example, Hungary continued providing cancer screening even when it had to suspend certain health care services between 9 November 2020 and 3 February 2021 (European Observatory on Health Systems and Policies, 2021[4]).

12. Several OECD countries including Denmark, Finland, Ireland and Turkey did not suspend their cancer screening programmes in early 2020. In Norway, cancer screening appointments that could be postponed were postponed (European Observatory on Health Systems and Policies, 2021[4]; Puricelli Perin et al., 2021[5]). While many of these countries did not officially stop cancer screening programmes, the implementation of cancer screening was however somewhat disrupted.

Table 1.1. At the onset of the pandemic, cancer screening were halted in many OECD countries

	Cancer screening stopped temporally	Cancer screening continued
Country	Belgium, Canada, Germany, Hungary, Italy, Japan, Latvia, Lithuania, the Netherland, New Zealand, Slovenia, Sweden, Spain, Switzerland, the United Kingdom and the United States	Denmark, Finland, Ireland, Norway and Turkey

Source: Socialstyrelsen, 2020[7]; De Pelsemaeker et al., 2020[8]; European Observatory on Health Systems and Policies, 2021[5]; Ivanuš et al., 2021[3]; Eijkelboom et al, 2021[4]; Puricelli Perin et al., 2021[6]

13. Many OECD countries also faced additional indirect challenges in relation to cancer screening. People may have been hesitant to seek health care including preventive services such as cancer screening to avoid the risk of SARS-CoV2 infection. Resources to provide cancer screening were also limited. In Canada, for example, there was a shortage of equipment and professionals, and limits on laboratory capacity as they were diverted to managing the pandemic. In Australia, the availability of pathological lab tests for cancer screening was limited due to the pressure from COVID-19 testing (IJzerman et al, 2020[6]). Social-distancing and the requirement for additional protective equipment to prevent COVID-19 transmission also added difficulties in providing cancer screening programmes (Castanon et al., 2021[7]).

As a result, cancer screening rates declined substantially between March and June 2020

14. The challenges in providing and accessing cancer screening resulted in lower breast cancer screening uptake during the initial phase of the pandemic. In Italy, screening rates for breast cancer fell by 54% between January and May 2020 compared to the same period in 2019 (OECD/European Observatory on Health Systems and Policies, 2021[8]). In Australia, screening for breast cancer among women aged 50-69 fell by 20% between January and September 2020, compared to the same period in 2018, with the decline particularly pronounced between March and May 2020, when BreastScreen services were paused (Australian Institute of Health and Welfare, 2021[9]). A decline was also observed at the early stage of the pandemic in 2020 in other countries including Japan (Toyoda et al., 2021[10]) and the United States (Epic Health Research Network, 2020[11]).

15. Similar trends are reported for screening of other cancers. In Finland, for instance, the participation rate in cervical cancer screening decreased by 9 percentage points between January and October 2020 compared to the same time period in 2019 (European Observatory on Health Systems and Policies, 2021[4]). In Italy, screening rates for cervical cancer fell significantly by 55% between January and May 2020 compared to the same period in 2019 (OECD/European Observatory on Health Systems and Policies, 2021[8]). A decline in cervical cancer screening was also seen in Australia (Australia Government Department of Health, 2020[12]), Belgium (Peacock et al., 2021[13]), Japan (Japan Times, 2020[14]) and the United States (Epic Health Research Network, 2020[11]). Screenings for colorectal cancer dropped by 53%

in the Czech Republic between March and May 2020, and by 34% in Austria between January and July 2020, compared to the same months in 2019 (Suchanek et al., 2021[15]; OECD/European Observatory on Health Systems and Policies, 2021[16]; European Observatory on Health Systems and Policies, 2021[4]). According to a survey conducted by the Japan Cancer Society, cancer screenings for stomach cancer, lung cancer, colon cancer, breast cancer, and uterine cancer declined more than 90% in May 2020 compared with May 2019, the lowest level since the start of the pandemic (Yoshikawa, 2021[17]).

Several OECD countries made efforts to increase the uptake of cancer screening following the initial drop

16. Following the initial decline in cancer screening uptake, at least a few of the OECD countries took a population-based approach in increasing the uptake of cancer screening through public awareness campaigns. In Japan, for example, the Ministry of Health, Labour and Welfare announced on 26 May 2020 that cancer screening should not be postponed any longer and encouraged their citizens to undergo cancer screening through government TV advertisements which promoted seeking necessary medical advice during the pandemic (Ministry of Health, Labour and Welfare, 2020[18]).

17. In some cases, more targeted risk-based approaches were recommended for cancer screening in order to improve its effectiveness and efficiency when available resources are limited.

- In **Canada (Ontario)**, recommendations for cancer screening were updated and health care providers were encouraged to provide screening targeted to population groups with the highest risk of cancer (Walker et al., 2021[19]).
- In **Slovenia**, to encourage women to undergo cancer screening, three cancer screening programmes released a joint press release during the European week against cancer, reiterating the importance of cancer screening and assuring the safe delivery of cancer care. Furthermore, for cervical cancer, scaling-up of screening was endorsed by key stakeholders at the national level, and to implement targeted risk-based screening, all gynaecologists received a list of registered women and their pathological cervical changes and a tool to help identify high-risk women (Ivanuš et al., 2021[2]).

18. In order to address people's hesitancy to undergo cancer screening during the pandemic and to minimise the risk of infection, at least three OECD countries also started using self-sampling devices that were previously found effective. Prior to the pandemic, several studies found that self-sampling devices for cervical cancer screening such as lavage and brush devices were effective and the experience of women was generally positive and sample devices well received (Burger et al., 2016[20]; Enerly et al, 2016[21]). Self-sampling kits for cervical cancer screening were sent out in the Netherlands (Castanon et al., 2021[7]; Smith et al., 2020[22]), Slovenia (Ivanuš et al., 2021[2]) and the United States (Chen et al., 2021[23]). This resulted in attaining higher screening rates for cervical cancer than office-based screening in these countries.

19. After the initial phase of the pandemic, cancer screening uptake started increasing across the OECD countries, although to a varying degree. In Australia, for example, screening uptake between mid-July and mid-September 2020 exceeded the corresponding period in 2018 (Cancer Australia, 2020[24]). In the United States, cancer screenings began to increase in May 2020, although the number of cancer screening visits remained below the level of those undertaken during the same period in previous years (Gorin et al., 2020[25]; DeGroff et al., 2021[26]).

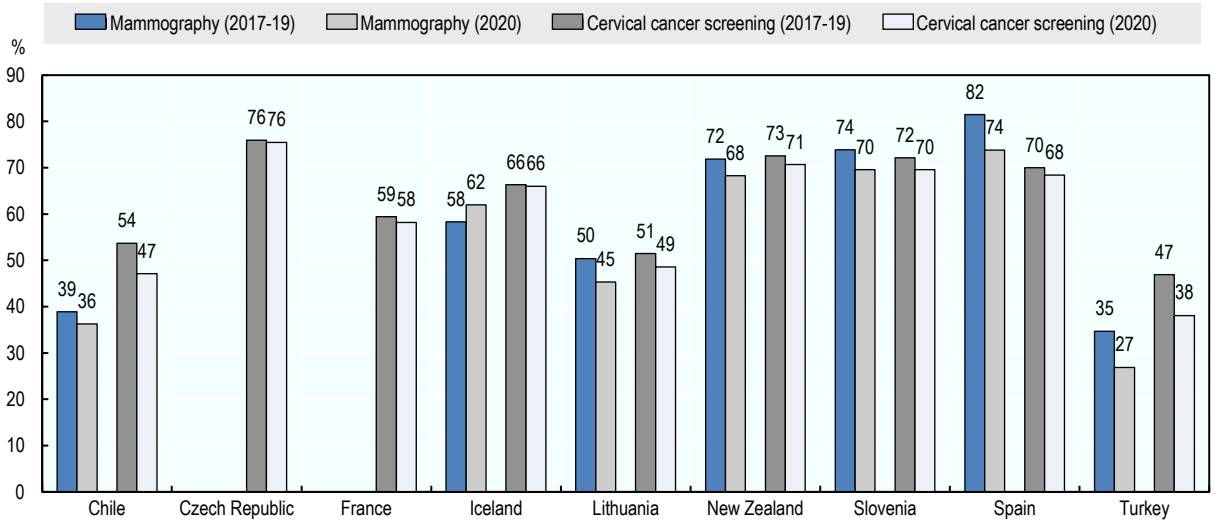
However, the uptake of cancer preventive services was still lower on average in 2020 than in previous years

20. Reflecting challenges such as a temporary closure of screening programmes, public hesitancy to seek care and resource limitations during the pandemic, breast cancer screening rates decreased in all countries which reported 2020 data to the OECD even if some catch-up was seen later in 2020. Figure 1.1 shows the mammography uptake over the previous two or three years as specified in national screening programmes for 9 OECD countries which submitted 2020 data to the OECD before August 2021. For example, 2020 data for Chile showed that 36% of women aged between 50 and 64 had bilateral mammography in the past three years.

21. Rates for 2020 for Chile, Lithuania, New Zealand, Slovenia and Turkey were lower than the average for the period 2017-2019, meaning that the share of women who had a mammography in 2020 alone is likely to be much lower than the data shown in Figure 1.1. Among those countries providing 2020 data, the decline in cancer screening uptake was greatest in Turkey and Spain. Several OECD countries monitor cancer screening uptake for the specific year (i.e. the proportion of targeted women undertaking breast cancer screening in the specific year) or even every month and observed a large decline in 2020. According to OECD/European Observatory on Health Systems and Policies (2021[11]), for example, in Italy 38% fewer women underwent breast cancer screening in 2020 compared to 2019.

22. On the other hand, in Iceland, the breast cancer screening rate in 2020 was higher than the average rate for the period 2017-19 (Figure 1.1). The increase appears large but this reflects lower rates in 2017 and 2018 (57% in 2017 and 2018, and 61% in 2019) and it should be noted that 2020 data includes women who had a mammography in 2019. Data on the number of screening mammograms for breast cancer show that the negative impact was also small in France; while the number of screening mammograms dropped by 44% in the second quarter of 2020 compared to the same period in 2019, from September 2020 onwards, breast cancer screening activity exceeded the levels seen in previous years. It continued to increase between January and May 2021, and the number of breast cancer screenings was 13% above the level of 2019 (OECD/European Observatory on Health Systems and Policies, 2021[27]).

Figure 1.1. The decline in the uptake for mammography and cervical cancer was particularly large in Turkey



Note: 2020 data for Chile and 2020 cervical cancer screening data for Lithuania are provisional. Data refer to screening uptake during the period specified in national screening programmes (mammography: 3 years for Chile, 2 years for Iceland, Lithuania, New Zealand, Slovenia Spain and Turkey. Cervical cancer screening: 3 years for Chile, Lithuania, New Zealand, Slovenia, Spain and Turkey, and 3.5 years for France and Iceland). Data for Spain come from surveys conducted in 2017 and 2019/2020 and for other countries, data come from cancer screening programmes.
Source: OECD Health Statistics 2021.

23. Figure 1.1 also shows the proportion of women aged 20-69 who had been screened for cervical cancer within the past three years or according to the specific national screening frequency recommendations. Screening rates for cervical cancer dropped in the majority of countries which reported 2020 data to the OECD. The decline was again large in Turkey, followed by Chile and Lithuania but the decline was very small in Iceland.

24. More disaggregated data showing the screening uptake in 2020 rather than over the period when the screening frequency is recommended in the country (e.g. three years) are available in some OECD countries. In Slovenia, cervical cancer screening tests decreased substantially by over 90% between mid-March and early May compared to the same period over the past three years, and although the uptake increased steadily afterwards, a much lower proportion of women aged between 20 and 64 had cervical screening in 2020 (Ivanuš et al., 2021[2]). In Italy, the rate decreased substantially and 43% fewer women underwent cervical cancer screening in 2020 than in 2019 (OECD/European Observatory on Health Systems and Policies, 2021[8]).

25. Similarly, screening rates for colorectal cancer declined in most of the countries which reported 2020 data (OECD, 2021[28]). The decrease was again greatest in Turkey. Slovenia was an exception and the uptake was similar in 2020 compared to previous years (OECD, 2021[28]). This may be partly because colorectal cancer screening in Slovenia does not require direct contact with health care providers as self-sampling screening test kits are sent to the target population (Mlakar, 2018[29]). In Korea, beside breast, cervical and colorectal cancer, the uptake for gastric, liver and lung cancers also declined in 2020 compared to 2019 (Kim, 2021[30]).

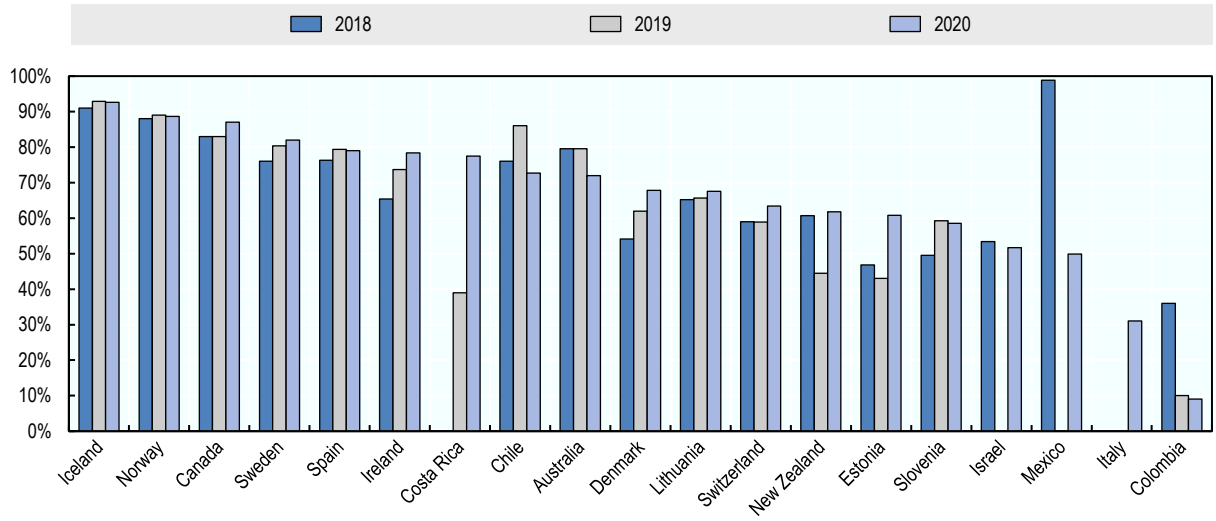
26. Delayed cancer screening is expected to increase the future burden of cancer.

- An Australian study estimated that a one-year pause in screening reduces 5-year breast cancer survival from 91.4% to 89.5% (Feletto et al., 2020[31]).

- A Dutch study also found the disruption in cancer screening programmes would lead to two additional breast cancer deaths per 10 000 women in the next 10 years if missed screening is not caught up (Kregting et al., 2021[32]).
- A Canadian study estimated that a three-month pause of breast cancer screening programme could result in 310 more new breast cancer cases diagnosed at advanced stage and 110 more cancer deaths between 2020 and 2029 and a six-month pause could increase 670 more advanced cases of breast cancer and 250 additional breast cancer deaths, equivalent to an increase of 0.48% (Yong et al., 2020[33]).
- Some studies suggest that delayed cancer screening is also likely to increase existing health disparities in the United Kingdom (Wentzensen et al, 2021[34]; Yong et al., 2020[33]) and the United States (CDC, 2021[35]).

27. With regards to HPV vaccination, about a half of the OECD countries which reported 2020 data (Canada, Costa Rica, Denmark, Estonia, Ireland, Lithuania, Sweden and Switzerland) managed to increase vaccination rates in 2020 compared to previous years (Figure 1.4), although the pandemic generally negatively affected childhood vaccination coverage across countries (Chanchlani, Buchanan and Gill, 2020[36]). Countries which had high vaccination coverage such as Iceland, Norway and Spain also maintained high coverage in 2020. On the other hand, although missed HPV vaccination may lead to an increase in diseases including preventable cervical cancer, vaccination coverage declined in several countries including Australia, Chile and Mexico. HPV vaccine coverage also decreased in March and April, 2020 in the United States; the rate was 23% lower than in 2019 (Daniels et al., 2021[37]; Gilkey et al, 2020[38]).

Figure 1.2. Several OECD countries increased HPV vaccination rate amidst the pandemic



Source: WHO (2020), Human papillomavirus (HPV) vaccination coverage.

Cancer care from diagnosis, treatment to follow-up care

28. At the onset of the COVID-19 pandemic, when health systems faced a surge in demand to treat COVID-19 patients, many health systems including the Czech Republic, Estonia, France, Korea, Japan, Lithuania, New Zealand, Norway and the United Kingdom ensured that the provision of urgent care was prioritised not only for COVID-19 patients but also for others, including cancer patients (European

Observatory on Health Systems and Policies, 2021[4]; Gurney et al., 2021[39]). Lithuania, for instance, issued a guideline on 31 March 2020 to ensure continuity of cancer services (European Observatory on Health Systems and Policies, 2021[4]). Despite these policy directions, it was estimated that during the first wave of the pandemic, cancer care was partially or completely disrupted in one-third of the countries in the WHO Europe region (WHO Europe, 2021[40]). Similarly, in other OECD countries, cancer care delivery was also disrupted to varying degrees from diagnostic services and treatment to follow-up care.

Access to cancer diagnosis declined, resulting in lower cancer incidence in 2020 with the risk of poorer outcomes in the near future

29. As a result of lower uptake of cancer screening and decreased access to health care services, access to cancer diagnostic services and initial referrals for cancer care declined, at least in the beginning of the pandemic in many OECD countries. For instance, in Finland, the number of cancer biopsies decreased by 12% between March and June 2020, compared to the period between 2018 and 2019 (European Observatory on Health Systems and Policies, 2021[4]). In Ireland, the number of breast cancers diagnosed in April 2020 fell by one-third compared with the same month in 2019, while lung cancer diagnoses fell by almost a half, and prostate cancer diagnoses in April 2020 were just 16% of the cases diagnosed during the same month in 2019 (European Observatory on Health Systems and Policies, 2021[4]). During the initial phase of the pandemic, in Canada (Ontario) and Italy, the number of skin biopsies dropped (Asai et al, 2021[41]; Intergruppo Melanoma Italiano, 2021[42]). In Belgium, the number of new cancer diagnoses between March and September 2020 was 14% lower than new cases found during the same period in 2019 (Belgian Cancer Registry, 2020[43]), and invasive cancer diagnoses in 2020 were 6% lower than the level in 2019 (Peacock et al., 2021[13]). In Slovenia, X-rays, mammograms and ultrasounds, and initial control and genetic counselling for cancer care all dropped substantially in the beginning of the pandemic (Zadnik et al., 2020[44]).

30. The number of newly diagnosed cancer cases for 2020 was available for 12 OECD countries and they all showed a decline in 2020[2]. In the United Kingdom, suspected cancer referrals decreased by 350 000 during March-August 2020, compared with the same period in 2019 and about 40 000 fewer people started cancer care in 2020 than in a normal year (Lancet Oncology, 2021[45]), also suggesting a decline in new cancer cases detected.

31. In many OECD countries, nationwide administrative data sources and cancer registries capture changes in cancer incidence. In some cases specific surveys also suggested a decline in cancer cases detected. In Germany, for instance, oncologists reported a 30-50% decline in appointments, including with advanced cancer patients (European Observatory on Health Systems and Policies, 2021[4]). Based on a provider-based survey, the Japan Lung Cancer Society found that the number of newly diagnosed primary lung cancer patient decreased by 6.6% across 118 hospitals surveyed in January-October 2020 compared to the same period in 2019 (Japan Times, 2020[46]). In the United Kingdom, a patient survey was conducted and found that of people with potential cancer symptoms, 45% did not contact their GP for their symptoms between March and August 2020 (Cancer Research UK, 2021[47]).

32. The 2020 data available for a limited number of countries also point to an increase in waiting times for diagnostic services. According to a survey conducted in England and Wales (United Kingdom), about half of the hospitals providing colorectal cancer care reported having experienced delays in tissue diagnosis during the first peak of the pandemic in mid-April, 2020 (Boyle et al., 2021[48]). In the United

[2] Australia (Cancer Australia, 2020[24]), Austria (Tsibulak et al., 2020[131]), Denmark (Sundhedsstyrelsen, 2021[116]), France (Blay et al., 2021[118]), Germany (Jacob et al., 2021[132]), Ireland (Burke et al, 2020[83]), Korea (Kim, 2021[30]) the Netherlands (Eijkelboom et al, 2021[3]), Poland (Maluchnik, Podwójcic and Więckowska, 2020[133]), Slovenia (Ivanuš et al., 2021[2]), Sweden (Swedish Regional Cancer Centres, 2021[129]) and the United States (London et al., 2020[136])

States, a patient survey found that many patients experienced delays in accessing diagnostic imaging and laboratory testing (Papautsky and Hamlish, 2020[49]).

33. Delayed cancer diagnosis is likely to result in poorer cancer outcomes in the near future. A study in the United Kingdom (England) projected delayed diagnoses during a year since March 2020 will increase five-year mortality by about 5% for lung and oesophageal cancers, 6% for oesophageal cancer, 7% for breast cancer, and 16% for colorectal cancer (Maringe et al., 2020[50]).

The availability of more advanced and timely data in some countries reveals a worsening stage distribution for cancer patients

34. Several OECD countries monitor and evaluate changes in stage distribution among cancer patients in a timely manner and found that a higher share of patients were diagnosed at more advanced stages in 2020.

- In the Netherlands, where the breast cancer screening programme was halted, it is estimated that about 1 150 cases of breast cancer missed diagnoses across all age groups and regions. Its cancer registry collects and analyses data comprehensively in a timely manner (Box 1.1) and found that a reduction in cancer incidence mainly occurred among early stage breast cancer patients. Reflecting the temporary pause of screening programmes, the decline was largest among patients aged 50–74 years who are usually eligible for screening. However, the number of breast cancer patients diagnosed at an advanced stage did not change, such that their share became high among all breast cancer patients diagnosed during the first wave of the pandemic in 2020 compared to the same period in the past two years (Eijkelboom et al, 2021[3]).
- According to a study using data at the University of California San Diego in the United States, the number of newly diagnosed cancer patients and stage distribution for all cancer patients was found to be similar between 2019 and 2020. But for breast and colorectal cancer, a higher number of patients were diagnosed at an advanced stage, accounting for 6% compared to 2% for breast cancer and 18% compared to 6% for colorectal cancer while a number and the share of patients diagnosed at an early stage decreased (Zhou et al, 2021[51]).

35. These findings suggest that while people with early stage cancer might not have been detected through screening programmes due to its temporary closure and a hesitancy in seeking health care, many patients at a more advanced stage did seek care.

Box 1.1. Examples of strong information systems for cancer care

Cancer registries are among the most advanced disease registries in many OECD countries, although population coverage, comprehensiveness and timeliness vary across countries. Several countries have a comprehensive cancer registry including timely data that has been utilised to inform decision-making in cancer care.

In the Netherlands, for example, within 3 months after cancer diagnosis, the following data are gathered in the centralised cancer registry covering the entire country:

- patient characteristics such as age at diagnosis, gender and socioeconomic status,
- detection method such as screening,
- tumour characteristics including TNM stage, morphology, grade and hormone receptor status, and
- primary treatment including surgery, neoadjuvant therapy, and systemic therapy.

Nine months after diagnosis, further details on adjuvant and other treatments are collected in the registry (Eijkelboom et al, 2021[3]).

In Slovenia, ZORA registry, a central national database for cervical cancer managed by the coordination office at the Institute of Oncology Ljubljana includes all cervical cytology, histology, and HPV rest results (ZORA Institute of Oncology, 2020[52]). All Slovenian laboratories report results in standardised forms, either every night, week or month to the ZORA registry. Data quality is monitored regularly, and missing or irregular data is subjected to further investigation. Demographic data are available by linking with the Central Population Register, and a unique personal identifier also allows linking data with other national databases including overall cancer registry (Ivanuš et al., 2021[2]; ZORA Institute of Oncology, 2020[52]).

Cancer care standards were adapted in response to the pandemic

36. Based on emerging evidence, various experts, academic and professional associations around the world updated cancer treatment recommendations with the aim of providing safe and high quality cancer care and improving treatment outcomes during public health emergencies which limited health system resources and capacities. They generally include three sets of recommendations.

37. The first set of recommendations aim to minimise risks of COVID-19 infection among cancer patients considered vulnerable to COVID-19 (Robilotti et al., 2020[53]; Wang et al, 2021[54]). NHS England, for example, identified certain cancer patients with a high risk of developing serious symptoms if contracted with the virus. They include cancer patients undergoing chemo- or radiotherapy, immunotherapy or any antibody treatments, or immune system modulation therapy (e.g. protein kinase inhibitors or post-transplantation immunosuppressants) and patients with blood or bone marrow cancers (i.e., leukaemia, lymphoma or myeloma) (Al-Jabir et al., 2020[55]; National Health Statistics Confederation, 2021[56]; NHS, 2020[57]). Hence, beside infection prevention and control at hospitals, clinical practice changes such as virtual consultation and online prescription renewal, were recommended.

38. The second set of recommendations aim to treat high-risk cancer patients without delay while possibilities of postponing treatment is sought for low-risk patients, for example, by neoadjuvant chemotherapy before surgery to make tumours smaller to gain more lead time for surgery. In the United States, for example, the American Society of Breast Surgeons and the Society of Surgical Oncology published clinical guidelines for breast cancer treatment, which recommend clinicians to prioritise higher-risk patients to avoid treatment delays and use alternative treatment for patients with lower risks such as

neoadjuvant endocrine therapy for hormone receptor-positive disease (Satish et al., 2021[58]). Dutch guidelines also recommend using neoadjuvant hormonal treatment for breast cancer patients with hormone-receptor positive breast cancers (Eijkelboom et al, 2021[3]). Researchers also developed algorithms to help identify an adequate treatment option based on patient risks (Mori et al., 2020[59]; Office for National Statistics, 2021[60]).

39. The third set of recommendations try to reduce hospital visits and stays, and regimen with less intensive care are recommended (Mayor, 2020[61]). For example, a study in the United Kingdom encourages surgeons to defer definitive mastectomy and/or reconstruction if radiotherapy options are available and opt for breast-conserving surgery, when possible, and rather than surgeries, alternative, non-surgical therapy is promoted where possible. This study also recommends considering neoadjuvant chemotherapy as a primary treatment option and that the need for surgery be reviewed every two to three months (Al-Jabir et al., 2020[62]).

40. In order to harmonise the quality of cancer care across providers, these newly developed recommendations were taken up at the national level in some OECD countries. For example,

- **France** revised the guidelines for cancer patients to protect against COVID-19 (You et al., 2020[63]).
- **The Netherlands** changed treatment recommendations to adapt to the pandemic (Eijkelboom et al, 2021[3]).
- **New Zealand** developed the national guidance outlining treatment protocols by hospital capacity level, continuity of cancer care during the pandemic, and delivery of cancer care under different scenarios of public health emergencies (Gurney et al., 2021[39]).
- In **Australia**, Cancer Australia has taken a leadership role in cancer care and COVID-19 and provides a hub of research articles to promote international shared learnings on the management of cancer care during the pandemic (Cancer Australia, 2022[64]).

International recommendations were also developed and the European Society for Medical Oncology issued modified treatment protocols (Box 1.2).

41. Even when national level guidelines were not developed, health care professionals refer to guidelines and recommendations developed around the world to benefit from emerging evidence. For example, in Japan and Korea, health care professionals referred to Ontario Health (Cancer Care Ontario) Pandemic Planning Clinical Guideline for Patients with Cancer (Kobayashi et al., 2020[65]).

Box 1.2. Changes in international treatment regimens

The European Society for Medical Oncology adapted treatment protocol by emphasising the importance of virtual consultation and communication and web-based prescription renewal with increased drug supply. It also explores a possibility of reducing hospital visits and sharing information on the risks and benefits of cancer care during the COVID-19 pandemic including risks of SARS-CoV2 infection.

Recommendations are also available for certain types of treatment and patients in view of reducing risks of SARS-CoV2 infection. For example:

- for local treatment (surgery or radiation) for early stage cancer, it was recommended to explore possibilities of postponing it and prioritise treatment based on cost and benefit analysis for an individual case;
- for an ongoing intravenous treatment, a temporary move to an oral treatment is also suggested, if available;
- for patients with resected high risk cancer, adjuvant therapies are recommended if they expect to generate significant benefit;
- for palliative care, its benefits and risks, options of "therapy holidays" and switch to oral drugs if available, also need to be discussed; and
- for patients with lung cancer or past history of lung surgery, older cancer patients and cancer patients with other comorbidities, intensive surveillance is recommended.

Source: ESMO Guideline. Cancer Patient Management During The COVID-19 Pandemic (European Society of Medical Oncology, 2020[66]).

Staff and medication limitations impacted the provision of cancer care in some OECD countries

42. Staff shortages affected some of the OECD countries. In Sweden, fewer radiology specialists were available for cancer care, leading to reduced hospital activities for cancer care (Socialstyrelsen, 2020[67])). A survey conducted in Austria, Germany and Switzerland found that over one-third of health care professionals working at radiotherapy centres reported that processes in their centres were affected due to reduced number of staff (Reuter-Oppermann et al., 2020[68]). In the United States, between March and September 2020, almost all 77 breast imaging facilities which took part in the survey within the Breast Cancer Surveillance Consortium reported reduced capacity and the closure of the facilities (Sprague et al., 2021[69]).

43. In some OECD countries, cancer care delivery needed to be reorganised and this may have had some negative impact in delivering timely high quality cancer care at least in the beginning of the pandemic. In many European countries, hospital beds available for cancer care were reduced due to the prioritisation of treating COVID-19 patients (European Parliament Special Committee on Beating Cancer, 2020[70]). For example, in Portugal, since care for COVID-19 patients is concentrated in public hospitals and they were under capacity limitation, care delivery was reorganised and private hospitals provided more surgeries than before, possibly leading to some disruptions in providing high quality care at the onset of the pandemic.

44. The COVID-19 pandemic also had negative impact on the global supply chain of pharmaceuticals including cancer drugs through disrupted manufacturing and distributions. A few OECD countries in Europe experienced shortages of cancer drugs during the pandemic (WHO Europe, 2021[40]). Mexico also had shortages of oncological medicines, leading to treatment delay, cancellation and modification especially

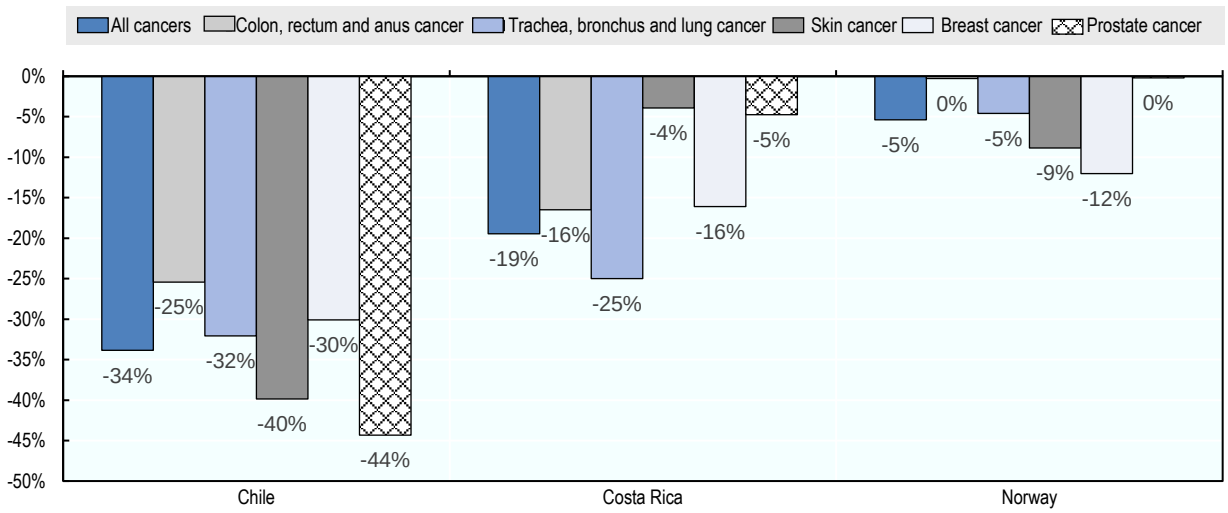
for breast cancer patients (Villarreal-Garza et al., 2021[71]). Korean hospitals also faced challenges in supply chain including chemotherapy drugs and palliative care medications (Riera et al., 2021[72]) In the United States, the FDA Drug Shortages list sometimes contained oncology medications during the pandemic (Al-Shamsi et al., 2020[73]).

The volume of cancer treatment also declined at the beginning of the pandemic but resumed thereafter

45. Due to a mix of factors such as fewer diagnoses, people's hesitancy to seek health care during the pandemic, limited health system capacities and various clinical recommendations which aim to improve treatment outcomes in resource-limited medical settings, the volume of cancer care declined in many OECD countries (European Parliament Special Committee on Beating Cancer, 2020[70]). In Austria, between mid-March to May 2020, the number of cancer patient visits to the emergency department at a cancer care centre in Vienna was 31% lower than those in the same period in 2018 and 2019 (Minichsdorfer et al., 2021[74]). A study in Slovenia found a decline in initial, control and genetic counselling referrals and also outpatient cancer care (Zadnik et al., 2020[44]) and a nationwide hospital survey in Spain also found a decline in new referrals for cancer care and outpatient cancer care in hospitals in the beginning of the pandemic (Amador et al., 2021[75]). Similarly, in Germany, the number of patients admitted to hospitals for cancer care decreased during the early period of the pandemic (Reichardt et al., 2020[76]) and in the United Kingdom, approximately 40 000 less people started cancer treatment in 2020 compared to 2019 (Lancet Oncology, 2021[45]). Globally, it was projected that over one-third of cancer procedures would be cancelled or postponed during a 12-week peak period of disruptions due to the pandemic (COVIDSurg Collaborative, 2020[77]).

46. Figure 1.3 shows hospital discharges (the release of a patient admitted to hospital for at least one night) related to cancer care for three countries able to report 2020 data to the OECD before August 2021. In Chile, the number of hospital discharges for cancer per 100 000 population declined substantially, compared to the three-year average between 2017 and 2019 and among different cancers, the number of hospital discharges for prostate cancer decreased the most by 44%. Costa Rica also experienced a decline in hospital discharges for all cancers. Compared to these countries, in Norway, the falls were limited except for breast and skin cancers.

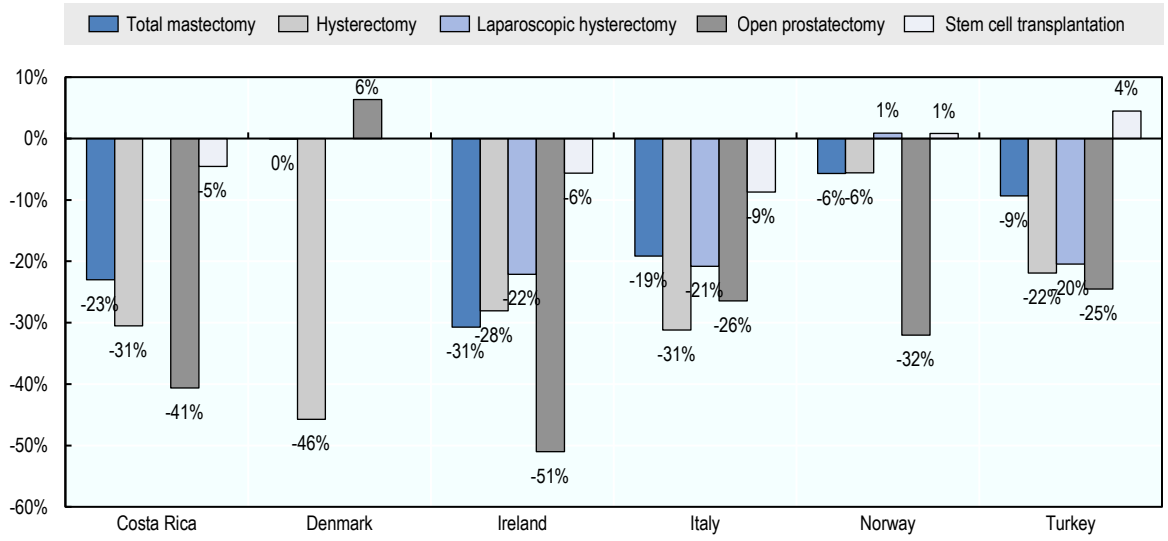
Figure 1.3. Hospital discharges for all cancers decreased in Chile and Costa Rica; Norway shows a mixed picture.



Note: 2020 data for hospital discharges per 100 000 population are compared with the three-year average for the period 2017-2019.
Source: OECD Health Statistics 2021.

47. The number of cancer-related procedures also declined in almost all of the six OECD countries which reported 2020 data before August 2021. In Costa Rica, Ireland, Italy, Norway and Turkey, cancer-related surgeries per 100 000 population decreased in 2020 compared to the average over the period of 2017-2019 (Figure 1.4). The fall was greatest in Ireland and Costa Rica for mastectomy and open prostatectomy, and Denmark, Costa Rica and Italy for hysterectomy. However, 2020 data for Denmark may reflect a steep downward trend of hysterectomies since 2011 and general shift towards minimally invasive procedures such as laparoscopy and robot-assisted laparoscopy (Lycke et al., 2021[78]). Norway also decreased the number of hysterectomies per 100 000 population in 2020 but the rate for laparoscopic hysterectomy slightly increased, suggesting a general trend in shifting towards the less invasive surgical option. In most countries reported 2020 data, the drop was large for open prostatectomy. Denmark was an exception and increased the number of open prostatectomy per population. This seems to follow a general increasing trend at least partly related to population ageing. With regards to stem cell transplantation, compared to other cancer-related surgeries changes were limited in most countries.

Figure 1.4. Most of the countries provided less cancer-related surgeries in 2020 than previous years



Note: The number of procedures per 100 000 population in 2020 is compared to the average number of procedures per capita between 2017 and 2019. For Turkey, 2020 data is compared to the average for 2018 -2019. 2020 data for Italy and Turkey are provisional. Hysterectomy for Denmark refers to vaginal hysterectomy.
Source: OECD Health Statistics 2021.

48. Limited data from the literature review also show that other OECD countries experienced a fall in cancer-related procedure cases in 2020. Canada, for example, experienced a 12% fall in cancer-related surgery between March and December 2020, compared to the same period in 2019. The fall was large for breast tumour excision/biopsy (17%), colectomy for colon and intestines (10%), mastectomy and breast surgery (9%), prostatectomy (7%) and hysterectomy (6%). Within the country, the province of Nunavut had the largest decline of 23% for cancer-related surgeries while the fall was 7% in New Brunswick. The fall was particularly large during the first wave of the pandemic and on average across regions, cancer surgeries fell by 20% between March and June 2020 compared to the same period in 2019 (Skretting, 2021[79]). In Australia, compared with the same period in 2019, surgeries related to breast cancer fell by 6% between January and September 2020, and colorectal surgeries declined by 4%. Surgeries declined the most during the early months of the pandemic, with breast cancer-related surgeries falling by one-third in May 2020 compared to March and April 2020, and colorectal surgeries decreased by 16% between March and May 2020 (Cancer Australia, 2020[80]). In Slovenia, the number of invasive procedures for cervical cancer decreased in the beginning of the COVID-19 pandemic (Ivanuš et al., 2021[2]) and in a similar vein, a study in Portugal also found a decline in locoregional procedures for liver cancer during the lockdown (Veiga et al., 2021[81]).

49. Besides cancer surgeries, the literature review also found a fall in other cancer treatment at the beginning of the pandemic for a limited number of OECD countries. Radiotherapy and chemotherapy appointments decreased in countries such as France (Lamblin et al., 2020[82]), Ireland (Burke et al, 2020[83]), Spain (Amador et al., 2021[75]) and the United States (Patt et al., 2020[84]). In England (United Kingdom), radiotherapy decreased significantly during the first peak of the pandemic in 2020 but increased for some cancers such as breast, oesophageal, bladder and rectal cancers, suggesting radiotherapy compensated for reduced surgeries for these cancers (Spencer et al., 2021[85]).

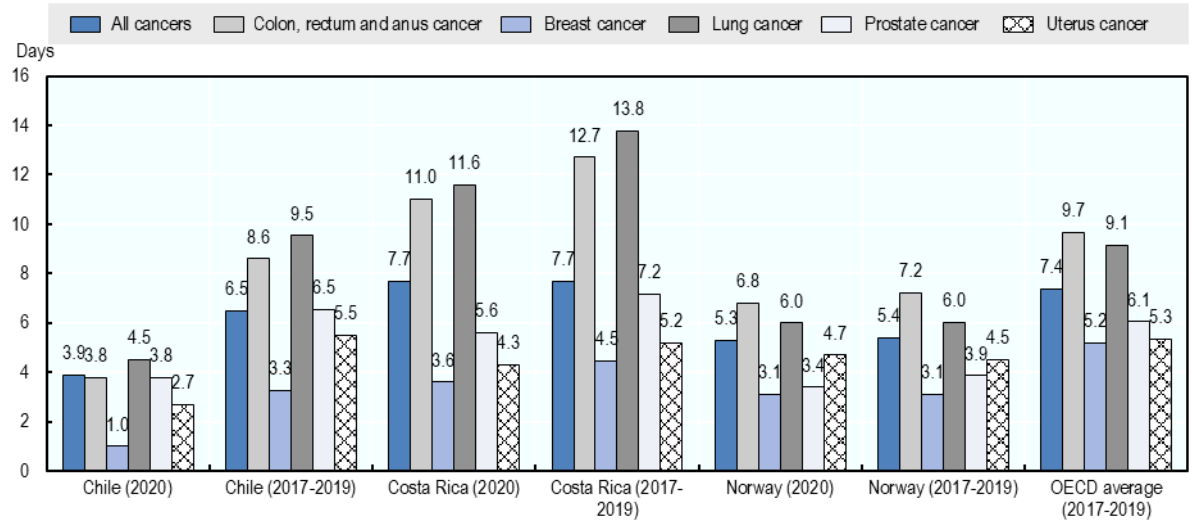
50. According to the literature review, after the initial phase of the pandemic, some OECD countries started to increase the volume of cancer care. In Slovenia, the number of invasive diagnostic procedures for cervical cancer started to increase from May 2020, although in September 2020, levels were still below

the three-year average by around 7% (Ivanuš et al., 2021[2]). In Australia, diagnostic and treatment services partially recovered in the fourth quarter of 2020 (Cancer Australia, 2020[24]). A study in England also found that the initiation of systemic anti-cancer treatments including chemotherapy, hormonal therapies and immunotherapies decreased in April but increased in May 2000, compared to pre-COVID-19 control period (Clark et al., 2021[86]).

Hospital stays became shorter in most OECD countries and day cases of cancer procedures increased in some

51. Beside volumes, the length of hospital stays for cancer care generally decreased in 2020 for the three countries that reported these data to the OECD before August 2021 (Figure 1.5). The fall was substantial in Chile and Costa Rica, suggesting that efforts were made to maintain the capacity of hospitals to care for COVID-19 patients and other patients needing urgent care during the public health emergencies. On the other hand, the decline in the average length of stay for cancer care was minimal in Norway where the length of stay was already lower than the OECD average before the pandemic.

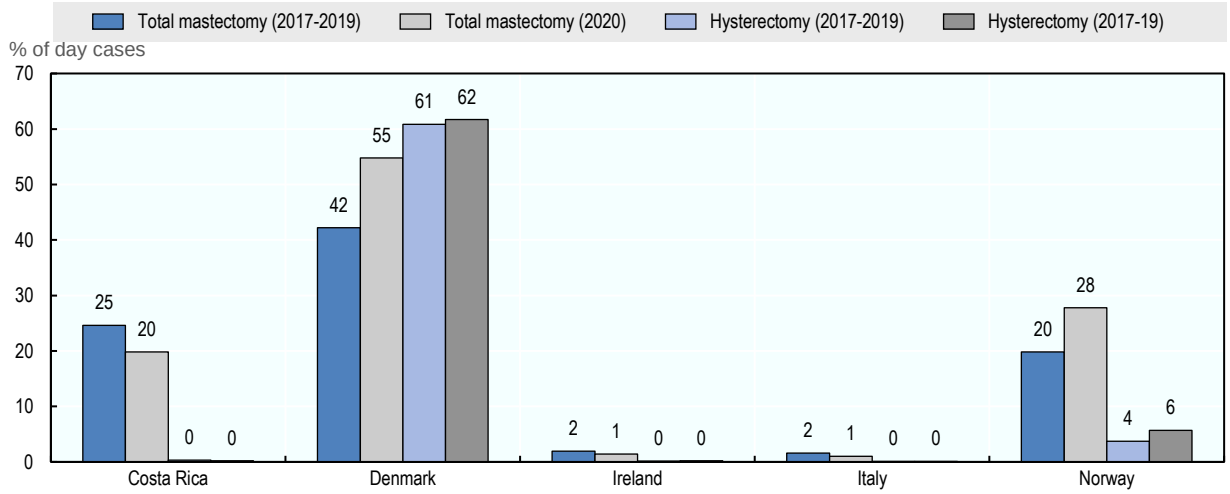
Figure 1.5. In 2020, average length of hospital stay for cancer care decreased substantially in Chile



Note: 2020 data for Chile are provisional.
Source: OECD Health Statistics 2021.

52. Prior to the pandemic, there was a general shift away from overnight hospitalisation, but limited data available to the OECD in August 2021 suggest that this trend did not necessarily continue in 2020. Compared to previous years, in 2020, Denmark and Norway continued increasing day cases for mastectomy while reducing inpatient cases. Statistics Norway (2021[86]) reported that while planned day cases of various forms of tumours decreased by 8% in 2020, compared to the 2019 level, unplanned within-24-hour urgent cancer care increased by 11 % during the same period, suggesting that the health system appears to have prioritised the response to urgent cancer care needs. In Denmark, the share of day cases for total mastectomy was 42% on average between 2017 and 2019 but increased to 55% in 2020, and the share of day cases for hysterectomy increased from 61% to 62% during the same period. But in Costa Rica, Ireland and Italy, the share of day cases decreased for mastectomy and the share of day cases continued to be close to zero for hysterectomy in 2020 (Figure 1.6).

Figure 1.6. Denmark and Norway continued increasing day cases in 2020



Note: Since the number of laparoscopic hysterectomy is low in some countries, the number of cases (instead of the number of cases per 100 000 females) in 2020 is compared to the average number of cases between 2017 and 2019. 2020 data for Chile and Italy are provisional.
Source: OECD Health Statistics 2021.

53. A number of studies also show that the type of cancer treatment provided changed (Carvalho et al., 2022[87]). In Germany, the number of breast removal surgeries increased by 11% while non-urgent breast reconstruction fell by 76% between March 16 and April 5, 2020 compared to the same period in 2019 (European Observatory on Health Systems and Policies, 2021[4]). In the Netherlands, between week 2 and 17 in 2020, invasive breast cancer was less likely to be treated initially by mastectomy with immediate reconstruction or by breast conserving surgery but more likely to be treated initially by chemotherapy and hormonal treatment, compared to the average during the same period in 2018 and 2019. Chemotherapy was provided less often for tumours diagnosed during the initial phase of the COVID-19 pandemic in the country, but became more likely later during the first wave of the pandemic. Primary hormonal treatment was more common between week 2 and 17 in 2020 compared to the corresponding period in the past two years (Eijkelboom et al, 2021[3]). In Australia, hospitals used less intense treatment such as fewer cycles of radiotherapy or home-based cancer care using oral rather than intravenous chemotherapy to avoid the risk of hospital-based infection (IJzerman et al, 2020[6]). In Slovenia, the treatment of high grade lesions for cervical cancer was mostly performed under local anaesthesia and was therefore not compromised by the relocation of anaesthetists and patients' beds to COVID-19 wards (Ivanuš et al., 2021[2]). In the United Kingdom, for colorectal cancer, long-course radiotherapy decreased sharply while the number of short-course radiotherapy almost quadrupled (Morris et al., 2021[88]).

54. Telemedicine became more prevalent for cancer care in an increasing number of OECD countries. In Norway, for instance, there has been a steep increase in the use of telephone and video consultations, for instance, for follow-up care after cancer treatment instead of regular control in-person visits for cancer patients (European Observatory on Health Systems and Policies, 2021[4]). A survey in Denmark found that 68% of cancer patients who used to have in-person consultations started having teleconsultations (Kjeldsted et al., 2021[89]) and a nationwide survey in Spain found nearly all hospitals changed from physical consultation to teleconsultation (Amador et al., 2021[75]). In the United Kingdom, a telephone triage system was introduced to facilitate new cancer referrals and avoid unnecessary hospital attendance (National Health Statistics, 2020[90]; Thornton, 2020[91]). Telemedicine has also facilitated the availability of multidisciplinary tumour boards by connecting specialists working in different sites.

At least some OECD countries managed to limit waiting times for patients at an advanced stage of cancer

55. Although health system resources were stretched in order to care for patients with COVID-19, six OECD countries which were able to monitor waiting times for cancer care delivery during the pandemic, managed to provide care for cancer patients with shorter delays than the pre-pandemic period. It is likely that this improvement can be at least partly explained by declines in the volume of cancer care.

56. In Canada, in 2020, median waiting times improved by 2 or 3 days for breast, bladder, colorectal and lung cancer surgery, as the number of cancer surgeries decreased by about one-fifth compared with 2019 (Canadian Institute for Health Information, 2021[92]). In the United Kingdom (England), the share of people waiting more than 31 days between cancer diagnosis and the first treatment decreased by 1% between April 2020 and March 2021, compared to the same period in 2019/2020 (NHS, 2021[93]). In Slovenia, for invasive cervical cancer, the time to diagnosis and the time to treatment were maintained at pre-pandemic level. The proportion of women who had invasive procedures within 120 days after advanced screening diagnosis was higher in 2020 (77%), compared with the past three years (70% on average) (Ivanuš et al., 2021[2]). In the Netherlands, prior to the first case of COVID-19 from January to end February in 2020, patients diagnosed with an invasive breast tumour may have experienced a delay in receiving treatment while hospitals transitioned to respond to the new health care demands, but after that breast cancer patients had not experienced a treatment delay. Data show that patients with advanced stage breast cancer might have had been treated even earlier than the pre-pandemic period, implying a successful transition to health care delivery in emergency situation (Eijkelboom et al, 2021[3]). The timeliness of starting cancer care also improved in Norway (Helsedirektorate, 2021[94]) and an Italian study covering 13 centres specialised in diagnosis and treatment of skin melanoma also found that treatment for skin cancer patients with advanced stage was promptly managed (Intergruppo Melanoma Italiano, 2021[42]).

57. However, waiting times became longer in some cases. In the United States, surveyed cancer patients reported delays in receiving cancer care, including follow-up clinical appointments and cancer therapies, such as radiation, infusion therapies, and surgical tumour removal (Warner et al., 2020[95]; Papautsky and Hamlish, 2020[49]). In the United Kingdom (England), while the proportion of patients waiting one month for second or subsequent anti-cancer drug treatments and radiotherapy cancer treatments were stable, a lower share of patients had second or subsequent cancer surgical treatment within one month (88.0% in 2020/21 compared to 91.3% in 2019/20) (NHS, 2021[93]). In Korea, a delay was observed for cancer surgeries and radiotherapy (Riera et al., 2021[72]). A study in Italy found that waiting times between diagnosis and initial treatment was longer for breast cancer patients during the first lockdown due to resource reallocation (Vanni et al, 2020[96]). Waiting times sometimes became longer by responding to patients' wishes to postpone due to their fears of hospital-based infection. A study in Japan found that most of the delayed lung cancer procedures were due to patients' request (Fujita et al., 2020[97]).

58. As some cancers can develop into an advanced stage in a short period, delayed treatment could result in more advanced cancers, leading to higher morbidity and health care costs. A study in England (United Kingdom) estimated that three-month delays to surgery would result in over 17% reduction in survival among patients with intermediate-stage cancers such as lung, ovary, liver and stomach cancers (Sud et al., 2020[98]). Delayed treatment could also translate into a substantial financial cost to economies. In Australia, 3-month delays in initial cancer treatment is expected to add AUD 12 million additional health care costs over the next 5 years for all patients diagnosed in 2020. Six-month delay is projected to add an extra AUD 46 million over the next 5 years (Degeling et al., 2021[99]).

OECD countries are likely to face a backlog of cancer care and some are already tackling it

59. Due to disruptions in cancer screening, diagnosis and treatment, OECD health systems are likely to face a backlog of cancer care to a varying extent and more patients, many with more advanced cancers, may require treatment. An increased backlog has been already reported in several OECD countries including Belgium (Peacock et al., 2021[13]), Canada (Mackay, 2021[100]; Wang et al, 2020[101]), France (Bardet et al., 2021[102]), Korea (Kang et al., 2021[103]), Spain (de la Portilla de Juan, Reyes Díaz and Ramallo Solía, 2021[104]) and the United Kingdom (Wilkinson, 2021[105]). In Belgium, for example, up to 4 000 diagnoses were estimated to be outstanding in 2020 (Peacock et al., 2021[13]).

60. A limited number of OECD countries have started taking measures to reduce this backlog. The United Kingdom formed a national cancer delivery taskforce, involving major patient charities and other key stakeholders, to accelerate return of cancer services and developed the cancer services recovery plan which aims to recover cancer services by running a major public awareness campaign to restore demand, implementing best practice and modified pathways to reduce waiting time, and taking actions to protect service recovery and to ensure sufficient capacity (European Observatory on Health Systems and Policies, 2021[4]). It was expected that the National Health Service would receive an additional funding of GBP 3 billion in 2021 and part of this would be used to help cancer care services recover (Rimmer, 2020[106]). In Ireland, a national helpline and psychological service started for cancer patients in April 2020. A communications campaign was launched to encourage people to contact the GP if signs or symptoms of possible cancer exist and to reassure cancer patients to seek treatment, and an information leaflet was produced to announce the resumption of cancer services in May 2020. Ireland also issued a guidance document and webinar on phased reopening for community cancer support centres in June 2020 (National Cancer Control Programme, 2020[107]). Following these efforts, by end-August the number of patients with breast and lung cancers diagnosed reached 98% and 95% of 2019 levels respectively in the country, although the number of prostate cancers diagnosed in 2020 was just 66% of last year's levels (European Observatory on Health Systems and Policies, 2021[4]).

Monitoring of cancer care system performance

61. While many OECD countries have enhanced their health information systems directly related to COVID-19 to develop evidence-based health policies responding to emerging needs from unprecedented public health emergencies, some of them have also strengthened information systems for cancer care in the middle of the pandemic.

62. Several OECD countries established a new organisation or clarified and strengthened a role of an existing organisation to intensify the monitoring of cancer care during the pandemic.

- **The Netherlands** created the multidisciplinary National Breast Cancer Organization of the Netherlands (NABON) COVID-19 Consortium in April 2020 to monitor and evaluate the impact of the pandemic on breast cancer care (Eijkelboom et al, 2021[3]). The Netherlands Cancer Registry also plans to conduct medical record review and complete recording of detailed data, such as various patient information (e.g. COVID-19 positivity), tumour, and treatment methods, and follow-up to assess the impact of the pandemic on cancer care and to guide not only policy-makers but also health care providers and the public (Dinmohamed et al., 2020[108]).
- In **New Zealand**, the National Cancer Control Agency (*Te Aho o Te Kahu*) which is in charge of monitoring diagnostic services and treatment access as part of the national regular reporting of cancer care will also report on trends in cancer stage at diagnosis and by ethnic background to monitor the impact of the COVID-19 pandemic on cancer care (Gurney et al., 2021[39]).

- In **Slovenia**, using data from registry and e-referral system and hospital administrative data, the cancer registry continuously undertakes analysis of the impact of COVID-19 on cancer care to gain knowledge on rapidly changing cancer burden and cancer care delivery and to inform cancer care performance in a timely manner during the pandemic to different stakeholders including decision-makers.

63. As the public health emergency made the timeliness of data ever more crucial, a few OECD countries managed to analyse and report cancer-related data in a more timely manner than before. The Australian government analysed the impact of the COVID-19 pandemic on cancer screening, and the timely availability of cancer screening data was improved. Some countries monitor cancer screening uptake on a weekly basis to monitor the speed in which the backlogs are managed. Beside screening data, as described earlier, several OECD countries also monitored cancer incidence, hospital admissions and discharges and procedures for cancer care in a timely manner and some of them also reported these data to the OECD for international benchmarking.

64. At least several OECD countries also analysed and reported more granular data such as stage information and access to cancer screening and care by region and socio-economic group and monitored disruptions in demand for and supply of cancer care which may not be discernible with more aggregated data. These analyses will help develop more targeted approaches in providing cancer screening and cancer care which are needed under exceptional circumstances such as a pandemic when resources are tight and inequalities are likely to widen by leaving some vulnerable population groups behind. Slovenia, for example, extracted additional data from their cancer registry data and analysed them to further develop targeted risk-based scaling-up strategies for cancer screening programmes (Ivanuš et al., 2021[2]).

65. In order to fill data gaps and to capture emerging patient needs and concerns, some countries conducted additional surveys and monitored changes and disruptions in access to cancer screening and care. Examples of provider surveys are indicated earlier. Population and patient surveys were also undertaken to identify emerging challenges in providing people/patient-centred cancer care. Japan, for example, conducted a web-based population survey to assess the impact of the pandemic on breast cancer screening uptake (Toyoda et al., 2021[10]). Some research projects also conducted patient surveys to assess issues related to access to cancer care and the continuity of cancer care. For instance, according to a patient survey conducted in May 2020 in Denmark, 9% of cancer patients reported that they refrained from seeking care out of fear of contracting COVID-19 (Jeppesen et al., 2020[109]). A study conducted in April 2020 in Belgium found that the 86% of cancer patients reported that it was important to receive the best cancer treatment available despite the risk of infection (Onesti et al., 2020[110]).

66. A few studies also measure patient experiences and outcomes including emotional functioning, mental health and quality of life. A German study conducted in April and May 2020 found that over 40% of cancer patients experienced mental distress related to prolonged treatment breaks between treatments at the onset of the pandemic (Büntzel et al., 2021[111]). A study conducted in April 2020 in the Netherlands found a deterioration in emotional functioning of breast cancer patients and survivors (Bargon et al., 2020[112]). On the other hand, a Danish study found that the quality of life and emotional functioning of cancer patients were similar between May 2020 and the pre-pandemic time in 2019 (Jeppesen et al., 2020[109]). Research on health care professionals is limited but one of the studies undertaken in Italy found that almost three-fourths of professionals providing cancer care show mild to extremely severe levels of stress (Vanni et al., 2020[113]).

67. Assessment of patient safety is still very limited for cancer care provided during the pandemic, although investigating underlining causes of safety issues could help building more resilient cancer care delivery system. A study conducted at a tertiary cancer care centre in the United Kingdom found the 30-day postoperative complications such as infections and wound dehiscence occurred more frequently during gynaecological cancer surgery between January and August 2020, compared to the same period in 2019 and it suggests the importance of teamwork during the new and challenging environment and a

need for additional attention to post-operative care during public health emergencies which often require reconfiguration of service delivery (Leung et al., 2021[114]).

68. Given the limited countrydata to date, it is still early to know the full impact of the COVID-19 pandemic on cancer care. It will also take time to be able to assess cancer care outcomes such as cancer mortality and survival rates. Using administrative data and supplementary data collected through provider-based and patient surveys, countries need to continue monitoring and analysing cancer care performance in order to develop resilient health systems which provide effective, safe and people-centred cancer care even during public health emergencies. Key data, however, are still missing in many OECD countries as the existing health information infrastructure cannot generate data in a timely manner and does not allow close-to-real-time monitoring of cancer screening and care. Hence, countries need to further strengthen health information infrastructure to support decision-making during emergency situations.

2. Conclusion

69. This analysis, based on data and literature available as of August 2021, found that the COVID-19 pandemic disrupted the provision of primary and secondary preventive services, diagnosis and treatment for cancer to a varying extent, and many of the OECD countries had difficulties in maintaining and improving cancer care quality and outcomes. In order to absorb the disruptions caused, and to tackle emerging challenges systematically, some OECD countries introduced measures to attempt to mitigate the negative impact of COVID-19 on their cancer care systems and to strengthen the governance of cancer care. They revised treatment guidelines at the national level to assure a delivery of standardised effective and safe cancer care across providers, and national policies to reduce backlogs in cancer care and to prepare for future public health emergencies.

70. Furthermore, in order to support decision-making in rapidly changing environment, many of the OECD countries also strengthened health information infrastructure. OECD countries continue monitoring cancer care performance through statistics generated by administrative data source and cancer registry such as cancer incidence, cancer stage distribution, cancer screening, hospital admissions/discharges by cancer, cancer procedures, the duration of hospital stay and waiting time for cancer patients. In response to public health emergencies which are fast-changing, some OECD countries analysed and reported these data in a more timely manner and more frequently. Some of these countries also undertook in-depth analyses by region or socio-economic groups to help develop more targeted risk-based approaches in providing cancer screening and treatment so that vulnerable population groups would not be left behind. In some countries, provider-based and patient surveys were also conducted and analysed to quickly understand the state of cancer care delivery including barriers faced by professionals and patients themselves. However, the measurement and collection of patient-reported experiences and outcomes for cancer care was conducted less frequently and only on a smaller scale, even though engagement of population and patients are vital to develop more people/patient-centred cancer care.

71. In many OECD countries, key data are reported with a delay, so countries need to further strengthen health information infrastructure to support decision-making in a timely manner during emergency situations. Strong health information infrastructure enables analyses of granular data, for example, data disaggregated at the regional level and by socio-economic groups and disease severity and to examine variations in cancer prevention, diagnosis, treatment, follow-up, disease severity and progression and other outcomes, for example by socio-economic background. More frequent (e.g. monthly, weekly) and timely data is also needed and to assess differences and changes in the quality and outcomes of cancer care within countries in close-to-real time.

72. International efforts need to be adjusted to monitor access to and quality of cancer care and outcomes more adequately. The European Cancer Organisation, for instance, has already set up a website (Time To Act Data Navigator - European Cancer Organisation) dedicated to monitor the impact of COVID-19 on cancer care by using national data available on cancer screening, diagnosis and treatment. The European Commission's Joint Research Centre and DG SANTE have created a website (European Cancer Inequalities Registry | European Cancer Inequalities Registry (europa.eu)) to monitor inequalities in cancer burden, prevention and screening.

73. The OECD could further improve the monitoring of cancer care performance across countries by developing and reporting a wider set of indicators. The OECD has been using annual national-level cancer

incidence, cancer screening coverage, five-year net survival and mortality data as key indicators to assess cancer care quality internationally. Cancer screening rates that are collected by the OECD refer to the share of the target population who had cancer screening during the period specified in the national screening programme (such as the past two or three years), so 2020 data include those who were invited and had cancer screening, for instance, in 2019. This indicator is good to monitor international differences in the implementation of national cancer screening programmes as the frequency of cancer screening is not the same across countries. However, such an indicator can only partially detect the sharp drop in uptake that many countries experienced particularly in the second quarter of 2020 and does not reflect the speed at which countries increased screening uptake after the initial phase of the pandemic. The share of target population receiving cancer screening for a single year (instead of over the past two or three years as specified in the programme), and monthly uptake data are more sensitive to changes in access to cancer screening and signal backlogs. In addition, the regular collection and monitoring of cancer stage distribution at diagnosis could also signal, for instance, any delays in diagnosis among patients with advanced stage cancer. The development of additional indicators sensitive to changes in access to cancer screening and care could improve international benchmarking of cancer care performance.

74. More data including cancer care outcomes such as cancer mortality and survival rates which will take more time to report, are needed to analyse the full impact of COVID-19 on cancer care. Using a wide range of data which become available through administrative sources and provider-based and patient surveys, countries need to continue monitoring and analysing cancer care performance in order to develop resilient health systems. The OECD will continue to analyse cancer care performance across countries to support countries to develop resilient, effective, safe and people-centred cancer care systems.

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