Analysis of the Impact of the SARS-CoV-2 Pandemic on the Stage and Access to Oncology Services in Brazil for the Treatment of Rectal Cancer

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Abstract

Introduction Cancer is a major social, public health, and economic challenge worldwide, accounting for 1 in 6 deaths globally, according to Globocan 2022. Since the onset of the coronavirus disease 2019 (COVID-19) pandemic, there has been a noticeable impact on the provision of services to oncology patients. The present study aimed to analyze the effect of the pandemic on access to healthcare services and disease staging at a specialized oncology hospital located in the state of São Paulo.

Materials and Methods Demographic, clinical, and access data were extracted from 3 electronic information systems, comparing 3 periods: prepandemic (2018–2019), pandemic (2020–2021), and postrestriction easing (2022 to June 2023). The results showed progression in the clinical stage of patients referred to for treatment from the pandemic period onwards. In the prepandemic period, approximately 9.4% of patients presented at clinical stage IV. During the pandemic, this percentage increased to 15.4%, and in the postrestriction easing period, it reached 17.8%.

Conclusion Although access to effective oncological treatment was improved during the pandemic, there was a noticeable progression in the clinical stage of the disease, which persisted after the easing of restrictions.

Keywords
- rectal neoplasm
- access to health services
- COVID-19
- staging
- neoplasm
- acess to health services

Introduction

Colorectal cancer (CRC) is the third most common cancer worldwide and the second leading cause of cancer-related deaths. In 2022, over 1.9 million new cases were reported globally. In Brazil, Instituto Nacional de Câncer (INCA) estimates 704,000 new cancer cases for 2023 to 2025, with approximately 46,000 cases of colorectal cancer, 70% of which are concentrated in the South and Southeast regions.[1,2]

In the Southeast, 12,660 new CRC cases are expected in men, representing 11.1% of male cancer diagnoses, and 13,440 cases in women, accounting for 11.2% of female cancer diagnoses in 2023. These numbers underscore the need for federal and state-level programs focusing on prevention, early diagnosis, and treatment.[2]

Colorectal cancer affects the large intestine and rectum. About 50% of cases impact the rectum and sigmoid colon, and 30% occur in the cecum. Early detection makes CRC treatable and, in most cases, curable if metastasis has not occurred.

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Most tumors arise from polyps, benign growth on the intestinal wall.[2,3]

The World Health Organization (WHO) recommends screening and early diagnosis for CRCs. To determine who should be screened, the Brazilian Ministry of Health classifies the population into different risk levels.[4,5]

- **Medium risk**: Individuals over 50. Approximately 59% of CRC cases occur in those aged 50 to 74;
- **High risk**: Individuals with a family history of CRC or conditions like Lynch syndrome or inflammatory bowel disease.

Brazil's Unified Health System(Sistema Único de Saúde, SUS, in Portuguese) is the largest public health system globally; it serves over 212 million people, with 80% relying solely on its services, and provides comprehensive care, including cancer treatments. Established by the 1988 constitution, SUS marked its 34th anniversary in 2024, advancing in both scientific development and the assurance of the right to health.[6]

Law nr. 12,732, commonly referred to as the "60-day law," was enacted in Brazil in November 2012. This legislation was a significant step forward in the fight against cancer, as it mandates that patients diagnosed with cancer must begin treatment within 60 days of receiving their diagnosis. The treatment can include surgery, chemotherapy, or radiotherapy, depending on the prescribed care plan.

The law aims to address delays in treatment, which can worsen health outcomes for cancer patients. By setting this deadline, the Brazilian government sought to improve access to timely care and reduce mortality rates associated with late treatment.

In São Paulo, the State Department of Health regulates patients' access to cancer treatment through the São Paulo State Regulation Information System (Sistema Informatizado de Regulação do Estado de São Paulo, SIRESP, in Portuguese), which coordinates hospital services based on patient needs.[7]

Instituto do Câncer do Estado de São Paulo (ICESP) is a public hospital for cancer treatment, serving 6,000 patients monthly. However, the COVID-19 pandemic, declared in 2020, severely disrupted cancer care. A study in the US revealed decreased cancer screenings during the pandemic, including for CRC, while a Brazilian study showed a reduction in new CRC diagnoses and an increase in advanced-stage cases, emphasizing the pandemic's negative impact on cancer treatment and diagnosis.[8,9]

The impacts of the COVID-19 pandemic on healthcare services were significant in several countries, including Italy and the Netherlands, particularly concerning cancer prevention, screening, and treatment.

In Italy, cancer prevention and screening services were severely disrupted. First-level screening tests, such as the fecal occult blood test (used for colorectal and rectal cancer screening), were widely suspended. Mobility restrictions and the need to reallocate healthcare resources to address the pandemic emergency further compounded the issue. This led to significant delays in early cancer diagnosis, which could negatively affect patient prognoses. [10,11]

Meanwhile, in the Netherlands, another study highlighted the suspension of elective surgeries for certain types of cancer, including CRC.[10,11]

The document screening process for patients referred by SIRESP is carried out by the hospital regulation team at ICESP, in collaboration with the clinical and surgical oncology teams. During this stage, the teams review the submitted documents and classify the patients; once accepted for treatment, the patient's first medical appointment is scheduled.

The **Managed Flow – FGC20** is an institutional protocol designed to outline the steps and recommended timelines for the treatment of rectal cancer for patients classified as analytical cases, designed to optimize treatment. After completing the screening process, the patient is assigned the **FGC20 FLAG**, an alert incorporated into their electronic medical record to identify their inclusion in this treatment pathway.

The project was submitted to the Research Ethics Committee (CAPPesq) of the School of Medicine at Universidade de São Paulo on August 11, 2023, and was approved on January 22, 2024 under the number CAAE: 70203723.0.0000.0068.

Objective

To analyze the impact of the pandemic on disease staging and access to oncological resources in Brazil for the treatment of rectal cancer.

Materials and Methods

This is an observational study with retrospective data collection that describes the healthcare adherence at ICESP, located in São Paulo, Brazil, during the period from January 2018 to June 2023.

From the beginning of the study's development, the need to follow the SUS guidelines, which determine patients' rights in cancer treatment, was taken into account. In addition to the theoretical aspects—such as referencing bills of law, describing access facilitation, and developing the managed institutional protocol—the dynamics of professional practice and possible external impacts, such as those caused by the COVID-19 pandemic on the organization of cancer services, were also considered.

A literature review was conducted, raising questions about the pandemic's impact on access to the institution and possible changes in the clinical stage of the disease. Throughout the project's development, alignment meetings were held to discuss the study's proposals in order to ensure transparency and bring the project development closer to the reality of each area involved in cancer patient care, from referral to final outcomes.

The development of the study required the use of three information systems. Structuring the database was complex, and it was necessary to analyze cases with discrepant data. All discrepancies between the information services were discussed with the teams involved across the entire service delivery context of the institution to ensure a more accurate account in the development of the project.

The list of patients admitted to the institute for the treatment of rectal cancer between January 1, 2017, and June 30, 2023, was obtained from the Hospital-based Cancer Registry, Outpatient Management and Health Information Management departments.

Patients who were active in 2018 but entered the institution between January 1, 2017, and December 31, 2017, were not included in the study.

- All patients admitted to the institution between January 1, 2018, and December 31, 2019, were included in the **prepandemic group**;
- All patients admitted to the institution for treatment between January 1, 2020, and December 31, 2021, were included in the **pandemic group**;
- All patients who were admitted to the institution for treatment between January 1, 2022, and June 30, 2023, were included in the **postrestriction group**.

The final sample size was composed by 481 individuals. The patients with lack of or discordant information on the data systems were reviewed manually and classified according to the established criteria.

Statistical Analyses

The database was initially created and organized using Microsoft Office Excel 2017 (Microsoft Corporation), and the analysis was conducted using IBM SPSS Statistics for Windows (IBM Corporation), version 25.0.

Descriptive analyses of patient profiles for each group included categorical predictors such as gender, age, education, prior diagnosis, grouped clinical stage, and the latest information on life status. The results are presented in tables and graphs, showing both absolute and relative frequencies.

For the quantitative analysis, time intervals are described using means, standard deviations, medians, minimums, maximums, and percentiles. A box plot graph is used to visually represent the median time for each interval.

Results

The absolute data for the parameters studied in the prepandemic, pandemic, and postrestriction periods are illustrated in ►**Tables 1**–**3**.

Among the patients admitted to the institution, a total of 481 were treated for rectal cancer according to the established institutional protocol. Of these, 171 were in the prepandemic group (2018–2019), 175 in the pandemic group (2020–2021), and 135 in the postrestriction group (2022 and the period from January 1st–June 30th, 2023).

Pre-Pandemic Group

As shown in ►**Table 1**, there was a predominance of male patients (53.8%). The average age of patients was 60.4 years old, with a standard deviation (SD) of ± 12.5 (27–91).

Regarding educational background, 31.6% of the patients had either incomplete or complete elementary education. Most cases were analytical (72.5%), involving patients who were diagnosed but had not yet received treatment at the time of admission.

In terms of clinical staging, approximately 65.5% of patients were admitted with advanced stages of the disease (stages III and IV).

Pandemic Group

Most of the individuals in the sample were male, accounting for approximately 57.7%. The average age of the individuals was 62 (ranging from 26–92 years old).

In terms of education, 28.0% of patients had incomplete or complete elementary education. The majority were analytical cases (with diagnosis but without treatment), representing about 75.4% of the sample.

In terms of clinical staging, most individuals were admitted to the institution at stages III and V of the disease, accounting for approximately 73.1%.

Table 1 Characteristics of patients with colorectal cancer, in São Paulo between 2018 and 2023

Characteristics	n = 481	Year of diagnosis		
		2018–2019	2020–2021	2022–2023
		N = 171	N = 175	N = 135
		n (%)	n (%)	n (%)
Sex: n (%)	Male	92 (53.8%)	101 (57.7%)	73 (54.1%)
	Female	79 (46.2%)	74 (42.3%)	62 (45.9%)
Age (years)	Mean(± standard deviation)	60.4(± 12.5)	62.0(± 13.0)	61.8(± 13.5)
	Median (range)	63 (27-91)	63 (26-92)	63 (25-96)
Level of schooling: n (%)	Illiterate	6 (3.5%)	2 (1.1%)	8 (5.9%)
	Elementary not completed	54 (31.6%)	49 (28.0%)	14 (10.4%)
	Elementary completed	29 (17.0%)	45 (25.7%)	58 (43.0%)
	High school	27 (15.8%)	40 (22.9%)	40 (29.6%)
	College	12 (7.0%)	10 (5.7%)	8 (5.9%)
	Ignored	43 (25.1%)	29 (16.6%)	7 (5.2%)

Table 2 Clinical characteristics of patients with colorectal cancer, in São Paulo between 2018 and 2023

Characteristics	n = 481	Year of diagnosis		
		2018–2019	2020–2021	2022–2023
		N = 171	N = 175	N = 135
		n (%)	n (%)	n (%)
Diagnosis: n (%)	No diagnosis, no treatment	43 (25.1%)	40 (22.9%)	35 (25.9%)
	Diagnosed, no treatment	124 (72.5%)	132 (75.4%)	99 (73.3%)
	Diagnosed, with previous treatment	4 (2.3%)	3 (1.7%)	1 (0.7%)
Clinical stage (CS): n (%)	0	0	0	1 (0.7%)
	I	20 (11.7%)	12 (6.9%)	14 (10.4%)
	II	39 (22.8%)	35 (20.0%)	22 (16.3%)
	III	96 (56.1%)	101 (57.7%)	73 (54.1%)
	IV	16 (9.4%)	27 (15.4%)	24 (17.8%)
	X	0	0	1 (0.7%)
Vital status: n (%)	Alive, with cancer	20 (11.7%)	61 (34.9%)	92 (68.1%)
	Alive, NOS	91 (53.2%)	75 (42.9%)	25 (18.5%)
	Death for cancer	57 (33.3%)	34 (19.4%)	15 (11.1%)
	Death from other causes	3 (1.8%)	5 (2.9%)	3 (2.2%)

Abbreviations: X, not informed; NOS, not otherwise specified.

Postrestriction Group

Abouth 54.1% were male. The mean age of the individuals was 61.8 years (25–96).

In terms of education, the majority of patients had either incomplete or complete elementary education, 43.0%. Most of the sample consisted of analytical cases (with diagnosis but without treatment), representing about 73.3%.

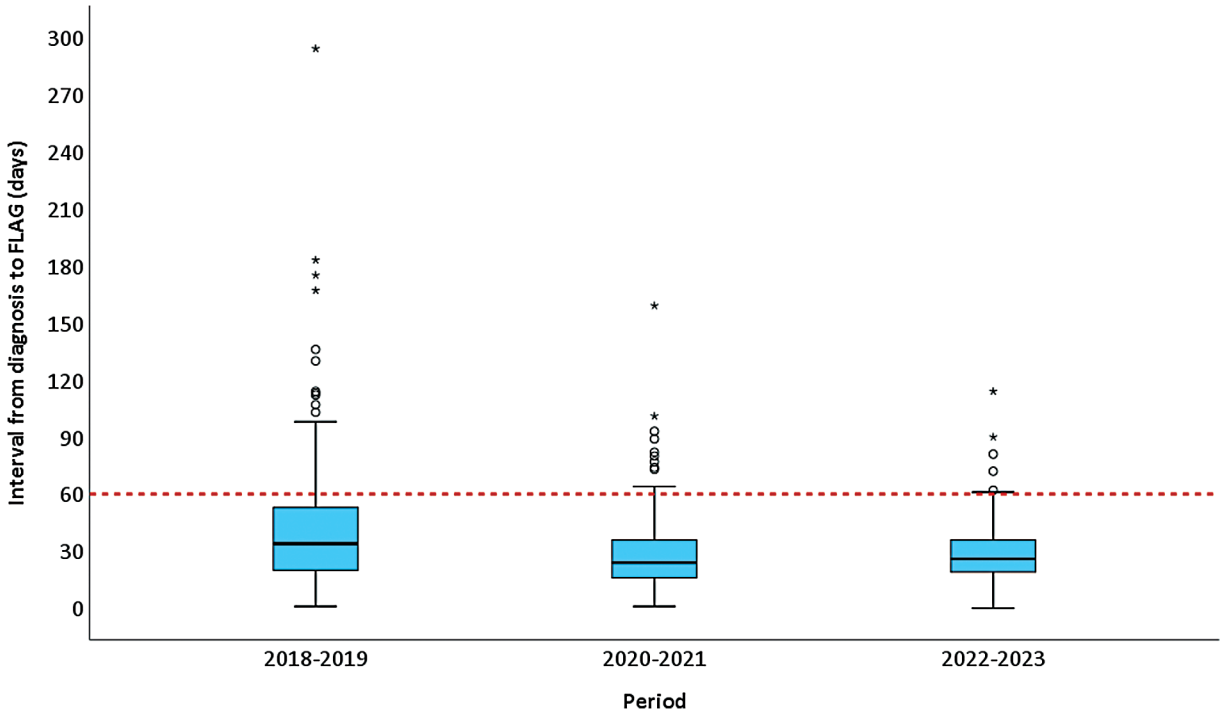
In terms of clinical staging, most individuals were admitted to the institution at stage III and IVof the disease, accounting for approximately 71.9% of the sample.

Characterization of Time Intervals in Access to Care

The predictors used to describe the time intervals were:

Table 3 Characterization of time intervals

Defining times intervals		Groups		
		2018–2019	2020–2021	2022–2023
Time from diagnosis date to FLAG (days)	Average	42.8	29.5	30.1
	Standard deviation	36.9	20.5	17.0
	Median	34.0	24.0	26.0
	Minimum	1.0	1.0	0.0
	Maximum	294.0	159.0	114.0
	Percentile 25	20.0	16.0	19.0
	Percentile 75	53.0	36.0	36.0
Time between diagnosis and first treatment (days)	Average	102.2	84.3	87.3
	Standard deviation	50.2	43.5	36.5
	Median	91.0	76.0	81.0
	Minimum	0.0	0.0	0.0
	Maximum	291.0	461.0	226.0
	Percentile 25	73.0	62.0	67.0
	Percentile 75	116.0	98.0	97.0



Graph 1 Interval between diagnosis and FLAG insertion.

- Interval between diagnosis and the insertion of fludarabine, cytarabine, and granulocyte-colony stimulating factor (G-CSF) (FLAG);
- Interval between diagnosis and the start of the first cancer treatment.

The data presented in ►**Table 3** are illustrated using boxplot graphs to demonstrate the distribution/dispersion of the time intervals and to compare the 3 groups.

Diagnosis and Access

Access to the institution was characterized by the date of FLAG insertion, as described in the protocols.

The documentation screening of patients admitted for treatment at the institution is carried out by the regulation team of ICESP. For patients diagnosed with C20, the FLAG is inserted by the regulation team, and the patient is then referred to clinical oncology for evaluation and scheduling of the first consultation.

The reference used to calculate this time interval was the 60-day law.

Among the 3 groups, the longest time interval between diagnosis and FLAG insertion was observed in the prepandemic group, with a mean of 42.8 ± 36.9 days and a median of 34 days. This group also showed the greatest dispersion in the measured intervals.

The maximum time recorded was 294 days, and the minimum was 1 day (►**Graph 1**).

60-Day Law

The 60-Day Law stipulates that the interval between diagnosis and the start of the first cancer treatment must be considered, whether through surgical therapy and/or the initiation of radiotherapy or chemotherapy (►**Graph 2**)

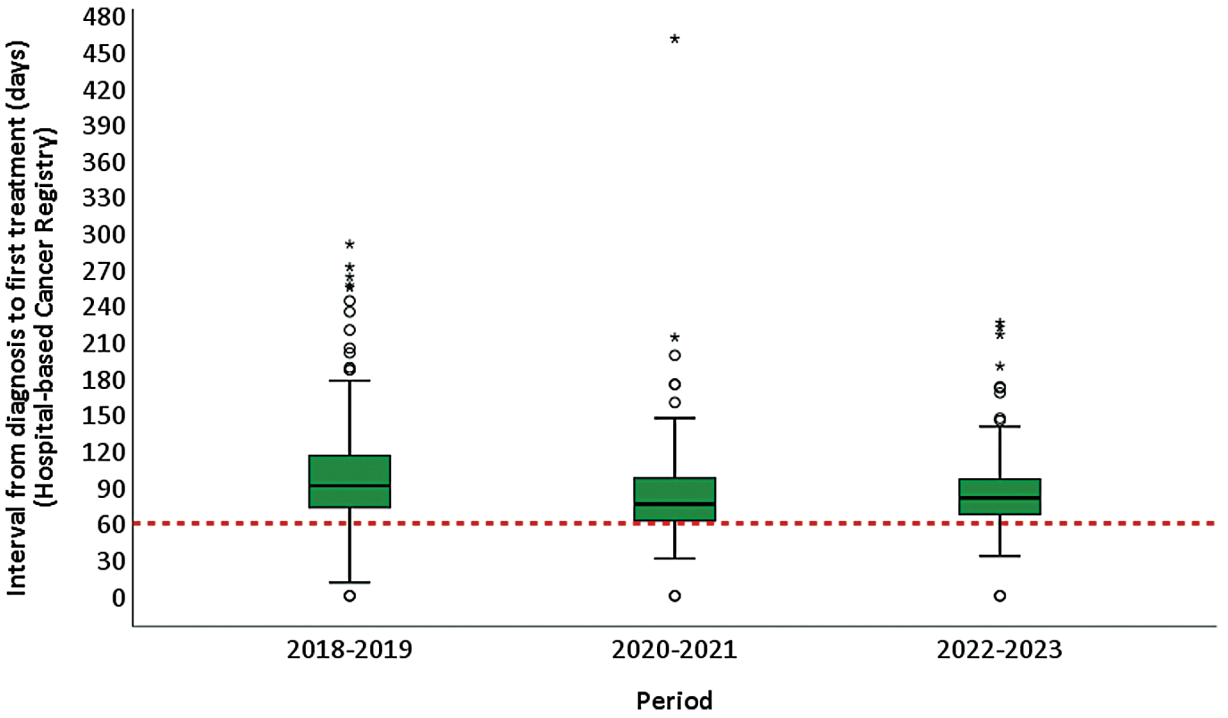
Among the 3 groups, the prepandemic one had the longest interval between diagnosis and treatment initiation, with a mean of 102.2 ± 50.2 days and a median of 91 days. This group also showed the greatest variation in treatment initiation times, ranging from 0 to 291 days.

Discussion

The study's results provided insight into the epidemiological profile of selected patients, the presence of timely treatment management, and the impact of the pandemic on the institution's access and functioning.

From the outset of the project's development, the need to incorporate SUS recommendations, which guarantee patients' rights to healthcare, was considered. In addition to the theoretical aspect, such as references to legislative projects and the description of access facilitation, the study also addressed the dynamics of access to specialized oncology care and the potential external impacts, like those caused by the COVID-19 pandemic on cancer care services.

The main finding of the study was the identification of clinical stage progression in patients admitted for rectal cancer treatment at the institution starting from the pandemic period. Before the pandemic, the percentage of patients at clinical stage IV was 9.4%. In 2020 and 2021, during the pandemic, this percentage increased from 9.4 to 15.4%. In the postrelaxation period, stage IV cases continued to rise substantially, from 15.4 to 17.8% for this specific tumor. It is important to note that the latest percentage represents individu



Graph 2 Time interval between diagnosis and first oncology treatment (days).

als admitted to the institution between January 1st, 2022, and June 30th, 2023. We selected rectal cancer as our case study because it has well established guidelines for access and care in this institution, and we were able to obtain a more homogeneous group of patients. We can consider that this diagnosis represents the best-case scenario in access and care and that the cases in general may have had an even greater impact on clinical stage progression during the pandemic.

Despite the changes in the COVID-19 epidemiological situation in our postpandemic period, there remained a delay in the early diagnosis of the disease in the healthcare system. This indicates the challenges health care systems face after a very disruptive event, impacting both potential patient behavior and the capacity to optimize lines of care from primary care units to specialized services.

On the other hand, specialized oncology services such as this one managed to reframe their treatment guidelines more rapidly, as shown in the significant reduction in the average time between diagnosis and access to the institution and cancer treatment initiation in the postpandemic period. ($42.8 > 30.1$ and $102.2 > 87.3$).

That the pandemic impacted the population and health care is a well-known fact, but the present study contributes to a more detailed understanding of specific impacts and demonstrates its long-lasting effects.

Access to Cancer Treatment – SUS

In the current study, access and referral to the institution were characterized in two ways: referral and access, and referral and treatment initiation.

According to our data, during the pandemic the access time interval significantly decreased, with the average number of days between diagnosis and patient admission to the institution dropping from 42.8 to 29.5 days.

Regarding the start of oncological treatment, all 3 analyzed groups had intervals exceeding the legally stipulated limit (60 days). The prepandemic group had the longest average interval between diagnosis and treatment initiation, with a mean of 102.2 days and a median of 91 days. During the pandemic, this average time significantly decreased from 102.2 to 84.3 days.

The analysis of the time intervals between diagnosis and treatment initiation is crucial, as they can influence the patient's prognosis and provide insights into defining the most appropriate treatment plan.

Fundação Oncocentro de São Paulo (FOSP) is a public institution affiliated with the São Paulo State Health Department, dedicated to fostering research, education, and healthcare in oncology. Its mission includes promoting activities focused on cancer prevention and early detection, strengthening the state's Oncology network.

Fundação Oncocentro de São Paulo is part of the São Paulo State Oncology Reference Committee, contributing to the establishment of technical and scientific criteria that support state oncology guidelines. Additionally, it monitors and provides technical assistance for public cancer policies within the Health Department, driving advancements in oncology care.

According to the FOSP's data report, considering only patients who arrived at hospitals without a prior diagnosis or treatment, the median time between the first tumor-related consultation and the definitive cancer diagnosis

ranged from 8 to 18 days between 2000 and 2020, remaining within the recommended timeframe (fewer than 30 days).[12]

The waiting time between diagnosis and treatment initiation showed significant differences between patients without a prior diagnosis and those already diagnosed before hospital admission.[12]

- **Situation 1:** Patients who arrived without a diagnosis and had their disease confirmed at the same institution where treatment was initiated had a satisfactory median time to start therapy, remaining below the legal limit, not exceeding 27 days.[12]
- **Situation 2:** Patients who arrived at the hospital with a prior cancer diagnosis and started treatment at the institution that reported the case had a median waiting time ranging from 48 to 98 days.[12]

In situation 2, it is assumed that the patient visited more than one healthcare facility to complete the diagnosis and begin treatment.[12]

Characterization of the Patients' Clinical Profile

The staging profile was characterized by the percentage of cases admitted to the institution. According to data from the Hospital Cancer Registry, the most prevalent tumors, in order of frequency, are prostate cancer, breast cancer, and colorectal tumors.

Since the inauguration of the Cancer Institute of the State of São Paulo (ICESP) in 2008, a variation has been observed in the percentage of patients with clinical stage-III or -IV gastrointestinal tumors (C18, C19, C20, and C21), ranging from 30 to 40%. In 2022, the institution recorded the highest percentage of patients with clinical stage III i gastrointestinal tumors n the past 8 years, reaching 48%. Conversely, the percentage of patients diagnosed with clinical stage-II gastrointestinal tumors dropped to 13%, the lowest since the institute's founding.

Regarding patients diagnosed with C20, before the pandemic, 9.4% of those hospitalized for treatment had stage-IV rectal cancer. During the pandemic, this percentage increased to 15.4%, and even after the lifting of pandemic restrictions, it continued to rise, reaching 17.8%.

The study data indicate that despite the reduction in the time between diagnosis and the start of treatment, the proportion of patients diagnosed in more advanced stages of.

Conclusion

Despite the postpandemic period and a significant reduction in the average time between diagnosis, access to healthcare institutions, and beginning of cancer treatment delays in early disease diagnosis within healthcare services persist. Early detection is a fundamental factor for achieving better treatment outcomes in patients.

Authors' Contributions
GCS: collection and assembly of data, data analysis and interpretation, manuscript writing, conception and design, final approval of the manuscript, provision of study materials or patient involvement; RVML: collection and assembly of data, data analysis and interpretation; EFDL: collection and assembly of data, provision of study materials or patient involvement; HMDN: manuscript writing, conception and design, final approval of the manuscript; PHSH: manuscript writing, final approval of the manuscript.

Conflict of Interests
The authors have no conflict of interests.

References

1 Instituto Nacional de Câncer (INCA). Estimativa 2023: incidência de câncer no Brasil. Rio de Janeiro: INCA; 2022. Available from: https://www.inca.gov.br/sites/ufu.sti.inca.local/files//media/document//estimativa-2023.pdf
2 Morgan E, Arnold M, Gini A, Lorenzoni V, Cabasag CJ, Laversanne M, et al. Global burden of colorectal cancer in 2020 and 2040: incidence and mortality estimates from GLOBOCAN. Gut 2023;72(02):338–344. Doi: 10.1136/gutjnl-2022-327736
3 Mota LP, Sousa MVA, Eckhardt A, Nascimento MSd, Almeida LMCd, Freitas JMd, et al. Importance of rectal cancer screening: a review. Research. Soc Dev 2021;10(13):e472101321360. Doi: 10.33448/rsd-v10i13.21360
4 Instituto Nacional de Câncer (INCA). Detecção precoce do câncer. Rio de Janeiro: INCA; 2023.
5 Berto SJP, Carvalhaes MABL, Moura EC. Tabagismo associado a outros fatores comportamentais de risco de doenças e agravos crônicos não transmissíveis. Cad Saude Publica 2010;26(08):1573–1582. Doi: 10.1590/S0102-311X2010000800011
6 Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2018;68(06):394–424. Doi: 10.3322/caac.21492
7 Aguiar S, Riechelmann RP, de Mello CAL, Silva JCFd, Diogenes IDC, Andrade MS, et al. Impact of COVID-19 on colorectal cancer presentation. Br J Surg 2021;108(02):e81–e82. Doi: 10.1093/bjs/znaa124
8 Amram O, Amiri S, Robison J, Pflugeisen CM, Monsivais P. COVID-19 and inequities in colorectal and cervical cancer screening and diagnosis in Washington State. Cancer Med 2022;11(15):2990–2998. Doi: 10.1002/cam4.4655
9 Donlon NE, Hayes C, Davern M, Bolger JC, Irwin SC, Butt WT, et al. Impact of COVID-19 on the diagnosis and surgical treatment of colorectal cancer: a national perspective. Dis Colon Rectum 2021;64(11):1305–1309. Doi: 10.1097/DCR.00000000 00002230
10 Blanco GDV, Calabrese E, Biancone L, Monteleone G, Paoluzi OA. The impact of COVID-19 pandemic in the colorectal cancer prevention. Int J Colorectal Dis 2020;35(10):1951–1954. Doi: 10.1007/s00384-020-03635-6
11 Dinmohamed AG, Visser O, Verhoeven RHA, Louwman MWJ, van Nederveen FH, Willems SM, et al. Fewer cancer diagnoses during the COVID-19 epidemic in the Netherlands. Lancet Oncol 2020;21(06):750–751. Doi: 10.1016/S1470-2045(20)30265-5
12 Fundação Oncocentro de São Paulo (FOSP) Boletim Epidemiológico: Câncer Colorretal. São Paulo: FOSP; 2024

