

Oncological Care for Children, Adolescents, and Young Adults in Public Services in the Campinas-SP Region

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Assistência Oncológica para Crianças, Adolescentes e Adultos Jovens nos Serviços Públicos da Região de Campinas-SP
Atención Oncológica a Niños, Adolescentes y Jóvenes en Servicios Públicos de la Región de Campinas-SP

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ABSTRACT

Introduction: In Brazil, cancer management at different levels of care indicates that facilities certified as High Complexity Oncology Centers (Cacon) or High Complexity Oncology Units (Unacon) are responsible for providing care and treatment. **Objective:** To identify the organization of health services that provided cancer treatment for children, adolescents, and young adults within the Regional Health Department of Campinas-SP (DRS 7) over the past 21 years (2000 to 2020), and to describe the clinical and epidemiological aspects of the population served. **Method:** Retrospective cross-sectional, exploratory and descriptive study. The analysis included the State Health Plan of São Paulo 2020-2023 (PES-SP) and other guiding documents for Regional Health Networks in São Paulo. The data was tabulated using a public domain tool provided by the Hospital Cancer Registry System (SisRHC). **Results:** Six hospitals specializing in cancer care were identified. A total of 6,503 Hospital Records for Cancer cases among children, adolescents, and young adults were reviewed, with 54.67% of patients being male. The highest incidence was observed in lymphoblastic leukemia and acute myeloid leukemia. **Conclusion:** The National Oncology Care Policy, by adopting a strategic regional distribution, positions São Paulo as a reference for cancer treatment. DRS 7 Campinas stands out for providing care to patients from across the country, with cancer registries that align with the patterns observed in other regions of Brazil.

Key words: Unified Health System; Neoplasms/epidemiology; Health Services; Medical Hospitals, Special.

RESUMO

Introdução: No Brasil, o manejo do câncer nos diferentes níveis de atenção aponta para que os estabelecimentos de saúde habilitados como Centros de Alta Complexidade em Oncologia (Cacon) ou Unidades de Alta Complexidade em Oncologia (Unacon) possam fazer o acolhimento e o tratamento. **Objetivo:** Identificar a organização dos serviços de saúde que ofereceram atendimento para o tratamento de câncer em crianças, adolescentes e adultos jovens pertencentes ao Departamento Regional de Saúde de Campinas-SP (DRS 7), nos últimos 21 anos (2000 a 2020), e descrever os aspectos clínicos e epidemiológicos da população atendida. **Método:** Estudo transversal retrospectivo, de natureza exploratória e descritiva. Para a análise documental, foram consultados o Plano Estadual de Saúde do Estado de São Paulo 2020-2023 (PES-SP), e demais documentos norteadores das Redes Regionais de Atenção à Saúde no Estado de São Paulo. O tabulador é de domínio público fornecido pelo Sistema de Registro Hospitalar de Câncer (SisRHC). **Resultados:** Foram identificados seis hospitais habilitados em atendimento especializado para o câncer. Identificaram-se 6.503 Registros Hospitalares de Câncer de crianças, adolescentes e adultos jovens, dos quais 54,67% eram do sexo masculino. A leucemia linfoblástica de células precursoras e a leucemia mieloide aguda apresentaram maior incidência. **Conclusão:** A Política Nacional de Atenção Oncológica, ao adotar uma distribuição regional estratégica, posiciona São Paulo como referência no tratamento do câncer. O DRS 7 Campinas se destaca pela oferta de atendimento a pacientes de todo o país, com registros de câncer que seguem padrões semelhantes aos de outras Regiões do Brasil. **Palavras-chave:** Sistema Único de Saúde; Neoplasias/epidemiologia; Serviços de Saúde; Hospitais Especializados.

RESUMEN

Introducción: En el Brasil, la gestión del cáncer en los diferentes niveles de atención indica que los establecimientos de salud habilitados como Centros de Alta Complejidad en Oncología (Cacon) o Unidades de Alta Complejidad en Oncología (Unacon) pueden realizar la recepción y el tratamiento. **Objetivo:** Identificar la organización de los servicios de salud que ofrecieron atención para el tratamiento de cáncer en niños, adolescentes y adultos jóvenes pertenecientes al Departamento Regional de Salud de Campinas-SP (DRS 7) en los últimos 21 años (2000 a 2020), y describir aspectos clínicos y epidemiológicos de la población atendida. **Método:** Estudio transversal retrospectivo, de naturaleza exploratoria y descriptiva. Para el análisis documental se consultaron el Plan Estatal de Salud del Estado de São Paulo 2020-2023 (PES-SP) y otros documentos orientadores de las Redes Regionales de Atención a la Salud en el Estado de São Paulo. El tabulador es de dominio público proporcionado por el Sistema de Registro Hospitalario de Câncer (SisRHC). **Resultados:** Se identificaron seis hospitales habilitados en atención especializada para el cáncer. Se identificaron 6503 registros hospitalarios de cáncer en niños, adolescentes y adultos jóvenes, de los cuales el 54,67% era de sexo masculino. La leucemia linfoblástica de células precursoras y la leucemia mieloide aguda presentaron mayor incidencia. **Conclusión:** La Política Nacional de Atención Oncológica, al adoptar una distribución regional estratégica, posiciona a São Paulo como referencia en el tratamiento del cáncer. El DRS 7 Campinas se destaca por ofrecer atención a pacientes de todo el país, con registros de cáncer que presentan patrones similares a los de otras regiones del Brasil. **Palabras clave:** Sistema Único de Salud; Neoplasias/epidemiología; Servicios de Salud; Hospitales Especializados.

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INTRODUCTION

Cancer is one of the main public health problems in the world, and one of the main causes of death¹. In Brazil, cardiovascular diseases and cancer are the two main causes of death in the population². In Campinas-SP, neoplasms follow the same trend, occupying the second position among the causes of death, corresponding to 19.6% of the total number of deaths recorded in 2017³.

The high complexity care reference establishments in Brazil follow international parameters by the International Agency of Cancer Registries (Iacr), which formalizes and determines standardized criteria governing Hospital-based Cancer Records (RHC), whose objective is to monitor oncological care, as well as the clinical and epidemiological aspects of patients⁴. The implantation of RHCs is beneficial and necessary, since the information related to cancer patients treated in hospital units is collected, stored, processed and analyzed⁵.

The organization of the national oncological care network comprises the High Complexity Oncology Care Centers (Cacon), the High Complexity Oncology Care Units (Unacon) and the other general hospitals that provide oncological support (hospital complexes). Cacon offers treatment and palliative care for all types of cancer and may or may not offer support for pediatric oncology. Unacon are units that treat higher incidence neoplasms, and may or may not offer support for radiotherapy, oncological hematology and pediatric oncology⁶.

Regarding the organization of diagnosis and cancer treatments in the National Health System (SUS) services, outpatient and hospital diagnostic services, and hospitals qualified in high complexity in oncology should be integrated into the local and macro-regional healthcare network. The adequate geographic distribution of these services promotes greater organizational quality in the provision of examinations, in order to guarantee economy and quality⁷, bringing benefits to the population and organization of service management. In addition, these services should follow the SUS guidelines regarding regionalization and organization of the oncological assistance line of care, which are guided by epidemiological indicators, living conditions and the characteristics of the territory, so that the services offered are consistent with each local reality.

In this perspective, it is important to evaluate the dynamics of the offer of oncological services performed in the regional scope, from the perspective of the capacity of oncological services offered by the city of Campinas-SP. It is also important to analyze the clinical and epidemiological data of children, adolescents and young adults with cancer who are assisted by these services.

Mapping of oncological health services is presented as a key point in the organization of the hospital network of the Regional Health Departments (DRS) of the State of São Paulo, being fundamental in the definition of strategies that promote adequacy to regional and local demands, reduction of morbidity and mortality and possible inequalities present in the different municipalities that compose them.

In this context, the objective of this article is to identify the organization of health services that offered care for cancer treatment in children, adolescents and young adults belonging to the DRS where the city of Campinas-SP is located, in a time frame of 21 years (2000 to 2020), as well as to describe clinical and epidemiological aspects of the targeted population.

METHOD

Retrospective cross-sectional, exploratory and descriptive study. The research started with an analysis⁸ of documents related to healthcare and cancer records in children, adolescents and young adults (0 to 29 years of age).

The city of Campinas-SP is one of the pioneers in Brazil regarding the formulation of cancer screening, because, still in the early 1990s, it had its first Population-Based Cancer Registry (PBCR), an important service for recording new cases in the city. In addition, in 2021, the municipality registered treatment for children, adolescents and young adults with cancer in four high-complexity facilities in oncology: *Centro Infantil de Investigação Hematológica Boldrini, Hospital das Clínicas da Unicamp – Campinas, Hospital e Maternidade Celso Pierro/PUC – Campinas, e Hospital Mario Gatti*, according to data found in the *Fundação Oncocentro de São Paulo* (Fosp).

The municipality of Campinas is located in the Middle West Region of the State of São Paulo, occupies an area of 795.70 km², and is situated 96 km northwest of the capital. According to the 2022 Population Census (IBGE, 2022), the population of Campinas was 1,139,047, with demographic density (inhabitants/km²) of 1,372.31. Campinas is the headquarters of DRS 7 being part of the political-administrative division of the State Secretariat of Health (SSH), along with another 42 municipalities, also composing the Metropolitan Region of Campinas. Thus, it is known that the city of Campinas is producing information about the incidence of cancer in children, adolescents and young adults, as well as information about the care provided to users in the hospital network.

Information on the organization of the Oncological Care Network in the State of São Paulo was collected from online documents that were publicly accessible and



available free of charge. The document analysis followed the Cardno⁹ steps. The following documents were listed in the study: The State Health Plan of the State of São Paulo 2020-2023 (PES-SP), and other guiding documents of the Regional Health Care Networks (RRAS) in the State of São Paulo, including Decree No. 7.508/2011¹⁰ that provides for the organization of SUS.

A preliminary evaluation of the documents was conducted, considering their historical and socio-political contexts, which resulted in the identification of key points for this phase of the research to serve as an initial tool to learn the characteristics of cancer control policies in children, adolescents and young adults, as well as mapping the care network aimed at children and adolescents with cancer.

Then, the selected materials were read, and each document was analyzed and synthesized. Documents containing information on the cancer network from a different period of the study, for example, that were not in force in the time range of the records identified in the National Cancer Institute (INCA) RHC integrator system¹¹, were excluded. Documents that did not provide for oncological care to children, adolescents and young adults were also excluded.

After this survey, data on cancer treatments in patients aged 0 to 29 years were collected using the Fosp Integrator System¹¹.

This is a public domain tabulator provided and developed by the Hospital-based Cancer Registry System (SisRHC). The identification of accredited establishments such as Unacon and Cacon in the 42 municipalities that make up the DRS 7 was carried out from the INCA Integrator database¹¹, based on the variable municipality of the hospital unit. These identified establishments were consulted in the National Register of Health Establishments (CNES)¹², in which the following information was collected: Name of the hospital unit, full address and administrative nature.

Next, the clinical and epidemiological aspects of children, adolescents and young adults with cancer treated between 2000 and 2020 in the Unacon and Cacon hospitals of the Campinas-SP Region that belonged to the DRS 7 was described using the RHC data, compiled and made available by Fosp. To access the database, it was necessary to register on the website. The data used refers to the 2000-2020 period and is indexed and made available for consultation according to the year of diagnosis of the cancer case. For analysis, the following variables were considered:

Related to the patient

- Age at the date of diagnosis (in years); gender (male, female); SUS user (yes, no).

Location of cases

- Municipality of residence; Federative Units of residence; DRS of residence; institution attended.

Related to the disease

- Date of the first consultation; date of diagnosis; primary location of the tumor – topography; morphology; proposed treatment; staging; date of start of treatment; post-treatment state.

For the study, the classification methods included in the International Classification of Diseases for Oncology, 3rd Review (ICD-O-3)¹³ were used, including the topography and morphology of the neoplasms. Although it is usual for the age group studied, this study was not able to use the International Classification of Childhood Cancer, 3rd Review (ICI-3), as well as the Classification for Tumors of Adolescents and Young Adults (CAYA), due to lack of data from RHC. However, we sought to aggregate the analysis by age group, from 0 to 14 years and 15 to 29 years, respectively. Cases with cancer diagnosis confirmed by anatomopathological (histopathological and cytological), hematological exams or hemograms, surgical exploration, imaging and clinical examination of children, adolescents and young adults treated in the Cacon/Unacon of the city of Campinas were selected. The study excluded cases recorded from other States and/or ignored.

Descriptive analyses – absolute and relative percentages – of the variables related to the patient, the place of residence and the tumor were performed. The municipality of care was the geographical unit, using the cartographic meshes provided by the Brazilian Institute of Geography and Statistics (IBGE)¹⁴, enabling the formulation of a thematic map about the care in the studied region. Data processing and results mapping were performed using Google Sheets and Quantum GIS¹⁵.

This research, developed with public domain data, is linked to the Cancer in Children, Adolescents and Young Adults Project: Cancer Records in the city of Campinas-SP and in the Health Region of Chapecó-SC, and was approved by the Research Ethics Committee under opinion number 3.691.328./2019 (CAAE (submission for ethical review): 23241119.3.0000.5404), in compliance with Resolution 466/12¹⁶ of the National Health Council.

RESULTS

São Paulo's SSH is composed of 17 DRS, divided into 63 Health Regions and 17 RRAS. The DRS and RRAS present great population differences, with greater concentration in the Regions of Greater São Paulo and Campinas.

Similarly, the Health Regions do not have uniform population distribution, ranging from 50 thousand to 11



million inhabitants. The DRS 7 (Campinas) is composed of 42 municipalities divided into four Health Regions: Metropolitan Region of Campinas, Water Circuit, Jundiá, and Bragança. In addition, DRS 7 includes portions of RRAS 15 and RRAS 16.

From the records of children, adolescents and young adults with cancer identified in the RHC of specialized hospitals in municipalities belonging to the DRS 7, six hospitals qualified in specialized care for cancer were identified, four of them in the city of Campinas: *Centro Infantil de Investigações Hematológicas Dr. Domingos A. Boldrini* (C.I.I.H. Boldrini) (Unacon), *Hospital Municipal Dr. Mário Gatti* (Unacon), *Hospital e Maternidade Celso Pierro* (Unacon), *Hospital de Clínicas da Unicamp* (Cacon); one in the city of Bragança Paulista, *Hospital Universitário São Francisco* (Unacon), and one in the city of Jundiá: *Hospital São Vicente de Paulo* (Unacon), as shown in Figure 1¹⁷.

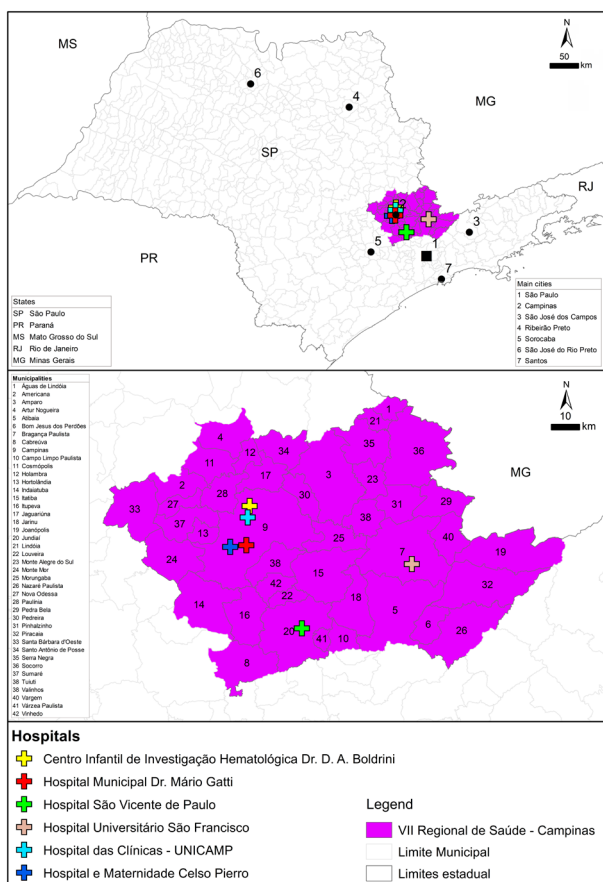


Figure 1. Location of the Unacon belonging to the Health Region of Campinas (DRS 7), 2000 to 2020

Source: Elaborated by the authors based on the State Health Plan of the State of São Paulo 2020-2023¹⁷.

Figure 2 shows that both in 2000 and 2020 *C.I.H. Boldrini* concentrated the largest number of patients attended, followed by the *Hospital de Clínicas Unicamp*. The increase in the representativeness of *C.I.H. Boldrini*

in the 2020 period is noteworthy, rising from 59% in 2000 to 79%.

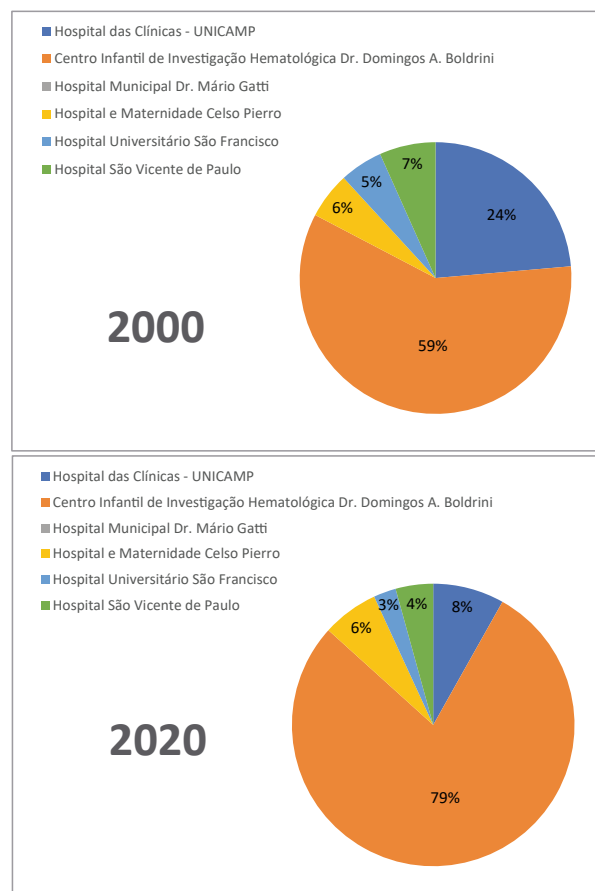


Figure 2. Percentage distribution of the first diagnoses, according to the hospital qualified in specialized cancer care (DRS 7), 2000 and 2020

Source: Based on RHC Integrator data¹¹.

As for the decentralization of administration, the administrative division of the São Paulo SSH was guided through the DRS. In addition to this administrative division, since 2011, with the establishment of guidelines for the organization of the Health Care Network (RAS) by the GM/MS Ordinance no. 4279/2010¹⁸, SSH and the municipalities also established the RRAS as organizational arrangements of health actions and services, of different technological densities that, integrated through technical, logistical and management support systems, seek to ensure the integrity of care in a given territory.

In relation to the patients' municipality of residence, the DRS 7 hospitals qualified in specialized cancer care perform oncological treatment mainly for the population of São Paulo and Minas Gerais, and the Southeast Region concentrates 93.8% of this contingent. However, it was observed that these hospitals also treat patients from several other States such as Bahia, Rio de Janeiro and Tocantins (Table 1). The presence of patients from far-off states, such



as Tocantins, shows a gap in the distribution of oncological services in the Federative Units that must be improved.

Between 2000 and 2020, 6,503 RHC of children, adolescents and young adults were identified in DRS 7 qualified units, of which 54.67% were male. Regarding age, the 0 to 14 years age group had the highest number of records, concentrating 65.25% of the total cases. About 14% of the records had no information on the education variable; 93.78% were from the Southeast Region and 80.22% resided in the State of São Paulo (Table 1).

Considering ICD-O-3¹³, the main primary tumor location occurred in the hematopoietic and reticuloendothelial system, with 1,645 registered cases, corresponding to 25.30% of the total (Table 2).

Table 1. Distribution of sociodemographic characteristics of oncological patients (children, adolescents and young adults) treated in the Campinas-SP Region (DRS 7), 2000 to 2020

Characteristics	n	%
Sex		
Male	3,555	54.67
Female	2,948	45.33
Age group		
0 to 14	4,113	63.25
15 to 29	2,390	36.75
Education		
None	2,241	34.46
No information	923	14.19
Incomplete elementary	1,881	28.93
High school	776	11.93
Complete elementary	561	8.63
Complete higher education	121	1.86
Incomplete higher education	-	-
Region of residence		
Southeast	6,099	93.79
North	164	2.52
Northeast	104	1.60
Middle West	87	1.34
South	48	0.74
No information	1	0.02
State of residence		
São Paulo	5,217	80.22
Minas Gerais	804	12.36
Rio de Janeiro	70	1.08
Bahia	41	0.63
Tocantins	63	0.97
Paraná	32	0.49

Source: Based on RHC Integrator data¹¹.

Table 2. Distribution of cases according to the primary tumor location of oncological patients (children, adolescents and young adults) treated in the Campinas-SP Region (DRS 7), 2000 to 2020

Primary location	n	%
Malignant neoplasm of the hematopoietic and reticuloendothelial system	1,645	25.30
Malignant brain neoplasm	733	11.27
Secondary and unspecified malignant lymph nodes neoplasm	612	9.41
Malignant kidney neoplasm, except renal pelvis	302	4.64
Malignant neoplasm of other locations and ill-defined locations	259	3.98
Malignant neoplasm of the eye and attachments	183	2.81
Others	2,769	42.58

Source: Based on RHC Integrator data¹¹.

Precursor cell lymphoblastic leukemia and acute myeloid leukemia were the most frequent histological types, representing 883 (13.58%) and 408 (6.27%) cases, respectively (Table 3). Next are Hodgkin lymphomas (5.31%) and neuroblastomas (3.74%).

DISCUSSION

The results showed that the provision of care for cancer treatment in children, adolescents and young adults in the Campinas-SP Region in the last 21 years (2000 to 2020) had the *C.I.H. Boldrini, Hospital de Clínicas da Unicamp, Hospital Municipal Dr. Mário Gatti, Hospital e Maternidade Celso Pierro, Hospital Universitário São Francisco* and *Hospital São Vicente de Paulo* as the main centers of care, with the first two having the greater number of patients.

One of the principles of the National Cancer Prevention and Control Policy¹⁹ (PNPCC) within the SUS is that cancer treatment should be as close to the patient's home as possible. Despite this, in practice, the DRS 7 – Campinas qualified units also treat patients from other regions and states such as Minas Gerais, Rio de Janeiro and Tocantins, evidencing possible inequalities regarding the distribution and accessibility of oncological services. The lack of accessibility to specialized oncological services suggests the need for alternative health regionalization policies.

To organize the therapeutic itinerary of oncological patients and the integration of services that provide assistance to those individuals, in 2016, in Brazil, the National Complementary Health Agency²⁰ (ANS) structured and launched a project whose main purpose was the implementation of a new model of oncological patient



Table 3. Distribution of cases according to tumor histological type (ICD-O-3 code and description) of oncological patients (children, adolescents and young adults) treated in the Campinas-SP Region (DRS 7), 2000 to 2020

Histological type	n	%
Others	3,027	46.53
9835/3 – Precursor cell lymphoblastic leukemia, NOS	680	10.46
9861/3 – Acute myeloid leukemia, NOS	408	6.27
9663/3 – Classic Hodgkin lymphoma, nodular sclerosis, NOS	345	5.31
9500/3 – Neuroblastoma, NOS	243	3.74
8960/3 – Nephroblastoma, NOS	232	3.57
9836/3 – Precursor B-cell lymphoblastic leukemia	203	3.12
9180/3 – Osteosarcoma, NOS	200	3.08
9687/3 – Burkitt lymphoma, NOS	174	2.68
9591/3 – Non-Hodgkin lymphoma, NOS	173	2.66
9260/3 – Ewing	172	2.64
9421/1 – Pilocytic astrocytoma	145	2.23
9510/3 – Retinoblastoma, NOS	141	2.17
9380/3 – Glioma, NOS	135	2.08
9470/3 – Melanotic medulloblastoma	121	1.86
8370/3 – Adrenal cortical carcinoma	104	1.60
Total	6,503	100.00

Source: Based on RHC Integrator data¹¹.

Caption: NOS = not otherwise specified.

care, with strategies that promote the reorganization of the integral care network in oncology, where the patient is the center of care. However, the geographic distribution of health services is still a challenge to the healthcare user.

In the dynamics of the Campinas Region service network, the organization of displacements is often mediated by the network of services organized in a hierarchical and regionalized way, in levels of increasing technological complexity, arranged from the delimited geographical area and definition of the population to be attended²¹. Often, to ensure patient care, the out-of-home treatment service is actioned to care for patients from other municipalities who do not have specialized cancer services in their Regions²².

Although there is this Program that regulates patients' – residents of other municipalities or other States – guarantee of access to care services in other municipalities,

there is a need for studies on the theme of childhood cancer, especially regarding access and permanence of these patients throughout the specialized treatment. This accessibility issue was addressed in a survey conducted with patients from the Viçosa Region, Minas Gerais, who abandoned oncological treatment due to the fact that the health service is located outside their city of residence, which hampered access to services that offer treatment²³.

The records included more than six thousand cases in the period, which occurred mainly in males and in the 0 to 14 years age group, which corroborates a global trend, evidenced in a study that described the epidemiological profile for 36 types of cancers in 185 different countries²⁴.

Regarding age, the 0 to 14 years age group had the highest number of records, concentrating 65.25% of the total cases. This higher incidence in lower age groups was verified in the results of another study, which analyzed the medical records of 296 patients aged 0 to 29 years treated at the *Hospital da Criança Santo Antônio* in Porto Alegre and obtained a median age of 6.3 years²⁵.

Regarding education, in this study, 14% of the records did not contain such information. Because it is an age group with a high percentage of children, a lower education level is expected. A study conducted in Belém-PA analyzed the sociodemographic and clinical profile of oncological patients treated in the home visit program of *Hospital Ophir Loyola*, between 2010 and 2017 and showed that the average education level was four to seven years of study²⁶.

The main primary tumor location was the hematopoietic and reticuloendothelial system, while the brain neoplasms concentrate the second largest number of records. These data corroborate the epidemiology of cancer based on another Brazilian study, where the hematopoietic and reticuloendothelial system is the most common²⁷.

In DRS 7 Campinas, the most frequent histological types were: Precursor cell lymphoblastic leukemia, acute myeloid leukemia, non-Hodgkin lymphoma and neuroblastoma. All of these cancer types had already been pointed out as important in the previous study conducted by Lucena²⁸, which identified these same neoplasms as the most frequent for children and adolescents in other hospital records in Brazil.

Studies on cancer in young adults are still limited, with few specific data on this age group. This knowledge gap highlights the importance of further studies focused on this age group to better understand the incidence patterns, risk factors and the most effective treatment options for this population.

In Brazil, tumors most commonly recorded in RHC are similar to those observed in PBCR, with the emphasis on carcinomas, lymphomas and leukemia. Among



carcinomas, thyroid and cervical carcinomas are more prevalent in the age group of adolescents and young people, with cervical carcinoma being the most common type of tumor among young Brazilian women²⁹.

The study presented limitations, showing that the RHCs are secondary databases, in which the researchers have no control over the collection of information. Furthermore, the non-conversion of ICD-O-3 to ICI-3 and CAYA limits the analysis of tumors affecting children, adolescents and young adults, where, to minimize this limitation, data were aggregated by 0 to 14 years and 15 to 29 years age groups, respectively.

CONCLUSION

The findings of this study present the situation of public service care in the Region that comprises the DRS of Campinas-SP. One of them concerns the need for displacement to access cancer treatment, considering that patients from other States were treated at the study location. Future studies can assess whether or not this fact can be an important barrier that aligns with the logistics and economic issues of the patient and their family.

Cancer treatment screening in the State of São Paulo is an important reference for other Brazilian localities due to the number of consultations performed, and the DRS 7 Campinas stands out for the provision of treatment to patients from all over the country, with cancer records that follow similar standards to those of other regions of Brazil. Strengthening public policies to expand the service and training of professionals is an evident demand regarding the urgency of oncology care in Brazil.

CONTRIBUTIONS

Jane Kelly Oliveira Friestino and Breno Binotti de Souza Camargo contributed to the study design, planning, data acquisition, analysis and interpretation, wording, and critical review. Vander Monteiro da Conceição and Patricia Haas contributed to data analysis and interpretation, and critical review. Willian Lorentz contributed to the research data interpretation, and critical review. Rivaldo Mauro de Faria has contributed to the study design and planning; data acquisition, analysis and interpretation; and critical review. Priscila Maria Stolses Bergamo Francisco contributed to the conception and planning of the study, wording and critical review. All the authors approved the final version for publication.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interest to declare.

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None.

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