SROHP
Societatea Română de Onco-Hematologie Pediatrică
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Dăruiește Aripi
we innovate for children with cancer

ROMANIAN NATIONAL REGISTRY FOR PEDIATRIC ONCOLOGY AND HEMATOLOGY

EXECUTIVE REPORT
2010 - 2021

DECEMBER 2023

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1. INTRODUCTION

1.1. History

The history of cancer registration in Romania dates back to 1980 when the notification of cancer cases became mandatory under Order No. 219 of 1980 issued by the Ministry of Health. According to this order, all new cases of cancer had to be reported individually to the Center for Medical Calculations, Statistics, and Medical Documents, directly subordinate to the Ministry of Health. In 2002, Order No. 871 was issued with the aim of improving compliance with the reporting process. This was the first Ministerial Order to involve the private medical sector in mandatory reporting activities, thus providing cancer registries with the status of a comprehensive data resource for cancer cases.

With Romania's accession to the European Union, the regulatory framework for cancer registration was updated through Order No. 2027 of November 26, 2007, issued by the Ministry of Health, which established the new organizational framework for cancer reporting activities. Regional registries were established for each of the 8 development regions in the country, ensuring alignment of reporting procedures with the standards and recommendations of the European Network of Cancer Registries (ENCR) and the International Agency for Research on Cancer (IARC).

As a result of this order, the registration activity was reorganized starting from January 1, 2008, by implementing ENCR standards for data collection, classification, and cancer coding: punctuating reportable cases and episodes, defining the minimum set of required data, and utilizing multiple data sources.

The International Classification of Diseases for Oncology, Third Edition (ICD-O-3) by the World Health Organization (WHO) was introduced to code and record multiple primary cancers, as well as the TNM classification, 6th edition, to estimate the extent of cancer at diagnosis.

Considering the small number of pediatric cancer cases (report ratio of 1:200 compared to adult cancers) and the pressing need to know and centralize these cases nationally using a rigorous methodology to ensure international comparability, the Romanian Society of Pediatric Oncology-Hematology (**SROHP**) established a dedicated cancer registry for the pediatric population on September 1, 2009: the **National Registry of Pediatric Oncology-Hematology (RNOHP)**.

RNOHP includes all cancer cases recorded in the national pediatric oncology-hematology network starting from January 1, 2010, from birth to 19 years old. Until 2018, reporting was done on paper and electronically (Word forms); from 2018 to 2023, reporting was done online through the **dedicated secure platform ONCPED**, hosted by the "Ion Chiricuță" Oncology Institute in Cluj-Napoca.

Technical support for the initiation and operationalization of the Registry was provided by the team of the North-West Regional Cancer Registry, led by Dr. Daniela Coza from the “Ion Chiricuță” Oncology Institute in Cluj-Napoca.

1.2. Scope and Objectives

The purpose of a population-based cancer registry is primarily the accurate enumeration of cancers in a well-defined population, both territorially and temporally. In this case, it involves counting cases of cancer in children in Romania.

The population-based cancer registry is the unique resource that allows for the understanding of cancer epidemiology over time and space: incidences, distributions according to demographic, biological (locations), and geographical criteria, evolving trends, cancer mortality, and survival rates.

RNOHP provides essential data for policies concerning the care of children with cancer, the planning of specialized services' development at the national level, and the foundation of national health programs. Additionally, the low incidence of cancer in children necessitates national and international collaborations to establish databases that can be analyzed.

Another advantage of dedicated pediatric case registration is that the relatively low number of new annual cases, compared to other cancers/conditions, facilitates the collection and quality management of data, especially in cases where the "general" cancer registry faces difficulties in organization and national coverage.

The results obtained from analyzing the database reveal the epidemiological developments of cancer pathology in children and, at the same time, provide insights into the addressability and access to services, as well as aspects concerning the performance of the healthcare system, reflected in survival rates.

1.3. Organization

The National Registry of Pediatric Oncology-Hematology (RNOHP) is founded and led by the **Romanian Society of Pediatric Oncology-Hematology**. New cases are reported by trained personnel from each pediatric oncology-hematology center by completing the ONC form, which contains the minimum mandatory data set according to the criteria and definitions recommended by the European Network of Cancer Registries (ENCR) and implemented in Romania through WHO 2027/2007. Cases are reported at the time of registration and are then supplemented with notifications of important events in the case history, including: completion of treatment, relapse or progression, monitoring episodes, as well as (if applicable) death.

All pediatric oncology-hematology centers nationwide contribute data to the registry:

- "Prof. Dr. Alexandru Trestioreanu" Oncology Institute, Bucharest
- Fundeni Clinical Institute, Bucharest
- Ion Chiricuță Oncology Institute, Cluj-Napoca
- "Sf. Maria" Emergency Clinical Hospital for Children, Iași
- Emergency Clinical Hospital for Children, Cluj-Napoca
- "Louis Țurcanu" Emergency Clinical Hospital for Children, Timișoara
- Maria Sklodowska Curie Emergency Clinical Hospital for Children, Bucharest
- County Emergency Clinical Hospital - Pediatrics, Târgu Mureș
- County Emergency Clinical Hospital, Craiova
- County Emergency Clinical Hospital, Constanța
- Emergency Clinical Hospital for Children, Brașov
- Municipal Gavril Curteanu Clinical Hospital*, Oradea

*Activity interrupted since 2020

Since 2018, RNOHP has received financial and operational support from the "Dăruiește Aripi" Association, the strategic partner of SROHP in the development of the Registry.

Until 2023, **RNOHP** operated with technical support from ENCR-trained personnel of the North-West Regional Cancer Registry, based at the "Ion Chiricuță" Oncology Institute in Cluj-Napoca, providing methodological and technical expertise.

1.4. Standard Work Methodology

Population-based cancer registries collect a mandatory minimum set of data established by IARC and ENCR. Establishing a common set of variables, a common format, and standard data quality assurance procedures enables the harmonization of European/international cancer data, and adherence to quality assurance procedures provides cancer registries with the opportunity to participate in international research initiatives.

1.4.1 Episodes and Reportable Tumors

RNOHP collects data on children diagnosed with cancer aged 0-19 years, with diagnoses included in the list of reportable tumors:

- Borderline tumors (behavior "1"), in situ cancers (behavior "2"), or malignant/invasive tumors (behavior "3"), according to the International Classification of Diseases for Oncology, 3rd edition (ICD-O-3.2)
- All intracranial and intraspinal tumors, regardless of benign/uncertain/malignant behavior (0/1/3), with topographic codes ICD-O-3.2 C70-C72 and C75.1-C75.3. Benign vascular lesions of the meninges (hemangiomas) or cystic lesions are not reported.

Pediatric oncology centers nationwide report cases for:

- Establishing the cancer diagnosis for a new case and/or at registration for monitoring or treatment (first presentation in any pediatric oncology-hematology department). A primary cancer is one that originates from a primary site or tissue and is not an extension, recurrence, or metastasis.
- Review of a reportable diagnosis that proves to belong to another reportable diagnostic category
- Primary tumor progression in the absence of complete remission
- Confirmation of a reportable diagnosis in the case of a tumor already reported
- Completion of treatment
- Occurrence of another primary tumor
- Death with/by cancer
- Relapse/recurrence
- Passively captured case*: a case that has been noted without being the actual case of the department (e.g., presentations of cases treated abroad, for administrative reasons, or for a second opinion)

1.4.2. Data Collection and Validation

Data collection is carried out by trained registrars nominated from each participating pediatric oncology-hematology center. The data are collected from medical records (discharge summaries, histopathological and immunohistochemical reports, imaging, tumor markers, cytology, etc.).

Data quality verification occurs both at the source - during registration (e.g., mandatory variables, consistency between topography and morphology, inclusion in ICCC-3 groups, and others) - and manually by specialized platform personnel. For each case, information recorded from different sources is aggregated based on the personal identification number (CNP). Each case is verified, coded, and finalized individually at the platform level by specialized personnel, who transform notifications (separate case reports) into consolidated cases (which centralize information from notifications). These notifications can be successive updates of the case from the same center or reports transmitted by

multiple centers, reflecting the case's trajectory in the national pediatric oncology-hematology network.

Before data analysis, they are checked and automatically validated using a data quality checking program provided by JRC-ENCR, and all errors and warnings are resolved accordingly.

Data analysis is performed periodically for usual epidemiological indicators, based on which the annual reports of RNOHP are generated. Every five years, survival surveys are conducted by actively requesting data on the vital status of cases from the Population Registry Office. Considering the established methodology, survival surveys are conducted for multi-year cohorts (minimum of 4 consecutive years of incidence), as they reach five years from diagnosis.

Since 2022, RNOHP has been participating in data flow to the European Cancer Information System (ECIS) call through ENCR-JRC.

1.5. Specific Methodologies for Pediatric Oncology

Recording cases in pediatric oncology has several particularities compared to adult oncology:

• Specific Coding

Tumor coding and data analysis are carried out in accordance with the International Classification of Diseases for Oncology, 3rd edition (ICD-O-3), and the International Classification of Childhood Cancer, 3rd edition (ICCC-3), recommended by the International Agency for Research on Cancer (IARC) for all population-based cancer registries reporting pediatric cancers. The classification of cancers in children is based on tumor morphology and primary site, with an emphasis on morphology rather than primary site, as is the case in adults. ICCC-3 is an aggregation of morphological and topographic codes based on ICD-O-3.

• Specific Staging

Collecting consistent international data in population-based cancer registries regarding the stage of pediatric cancer is essential for epidemiological analyses and conclusive comparisons of pediatric cancer incidence and treatment outcomes. Due to the inadequacy of the TNM staging system (specific to adult cancers) for pediatric tumors, most cancer registries do not include records of stage at diagnosis for pediatric tumors. Consequently, there is a lack of information regarding the extent of pediatric cancer at diagnosis, with significant implications and limitations in international survival analyses. In response to this problem, international bodies (IARC, ENCR), together with internationally recognized experts in childhood cancer research, initiated the development and proposal of a unified and adapted staging system to meet the needs of recording the stage at diagnosis in childhood tumors in cancer registries.

For each of the most common pediatric cancers, all specific staging systems in use were reviewed, and the most suitable ones were recommended for use by population-based cancer registries. These staging systems were adopted by consensus in 2014 within a Working Group convened in Toronto and are now known as the "**Toronto Guidelines for Staging Pediatric Cancers**." The guideline recommends specific staging systems for the most common 16 diagnoses in pediatric oncology-hematology (acute lymphoblastic and myeloblastic leukemia, Hodgkin and non-Hodgkin lymphomas, Neuroblastomaa, nephroblastoma, rhabdomyosarcoma, soft tissue sarcomas, osteosarcoma, Ewing sarcoma, Retinoblastomaa, hepatoblastoma, testicular and ovarian neoplasms, medulloblastoma, ependymoma, and astrocytoma). The Toronto staging guide has been successfully tested for feasibility and validity and was published in the 8th edition of the TNM Staging Manual as part of an international

project involving numerous population-based registries from Europe, the USA, Canada, Australia, and Japan.

In 2019, in the **RNOHP** reporting platform, the minimal dataset provided by WHO 2027/2007 was supplemented with clinical data, and the newest **staging system for pediatric cancers** recommended by the Toronto Consensus was implemented. As a result, **RNOHP** has become one of the most modern and dynamic cancer registries in Central and Eastern Europe.

1.6. Data Security and Confidentiality

Data from the cancer registry can only be accessed by users through the dedicated platform (**http://oncped.iocn.ro/**), which requires authentication through username and password. Each session is authentication-based, and access to confidential data is segregated based on the role of each user, meaning registrars do not have access to data reported by other pediatric oncology centers. Another important aspect is that only administrators can create new accounts, and all data is stored in a database, accessible only to authorized users. Regular backup procedures for the database and data recovery procedures in the event of a disaster are in place. File protection within the application is ensured at the operating system level by permissions and user access control. Antivirus programs and firewalls are used to protect the server where the application and database are stored. There are 4 levels of access: IT administration, cancer case registration, review, and management.

From 2010 to 2023, RNOHP was hosted and operated electronically within the framework of the "Prof. Dr. Ion Chiricuță" Institute of Oncology in Cluj-Napoca, which is a personal data operator registered with number 637 at the National Authority for the Supervision of Personal Data Processing (ANSPDCP). Thus, personal data, non-personal data, cookies, use of collected information, third parties, changes in privacy policy, and contacts were protected.

Additionally, at the level of the hospital units reporting data to **RNOHP**, this activity is subject to informed consent of the patients, in accordance with the current GDPR legislation.

1.7. Affiliations and Collaborations

Since 2018, RNOHP has been a full member of the European Network of Cancer Registries (**ENCR**), an organization supported by the European Commission, and was evaluated and validated by an audit committee in 2021. In 2019, the first survival study using national data was conducted with technical support from ENCR-JRC (*European Commission Joint Research Centre - Health in Society Unit - Cancer Information Group*) for the 2010-2013 incidence cohort. The study was updated in 2023 with survival data for the 2014-2017 incidence cohort.

In September 2022, RNOHP participated with the first national data flow to ECIS (European Cancer Information System).

In September 2023, RNOHP participated in the data call of the CONCORD-4 Program (Romania's first participation with national data in this prestigious program).

Between 2021-2023, RNOHP participated in the BENCHISTA study (International Benchmarking of Childhood Cancer Survival by Stage at Diagnosis), led by the Istituto dei Tumori in Milan and University College London. The aim of this project is to investigate survival differences between countries and correlate them with stage at diagnosis, while validating the Toronto staging system as a basis for international comparisons.

1.9. Funding

From its establishment until present, RNOHP has been funded exclusively by non-governmental sources.

Between 2009-2013, RNOHP received financial support from Danone Romania, with most of the human resources activities being carried out on a voluntary basis.

During the period 2014-2016, some of RNOHP's activities were supported by a Norwegian grant within the NGO Fund program administered by the Foundation for Civil Society Development.

Since 2018 and up to the present, the "Dăruiește Aripi" Association, a public utility association and strategic partner of SROHP in developing services for children with cancer, has taken on the mobilization of resources and the implementation of all operational and tactical aspects related to RNOHP's functioning, including all operating and development costs.

1.10. 1.10. Milestones in the Development of RNOHP

- Partnership with the "Dăruiește Aripi" Association in 2018
- Achievement of national coverage with retrospective completion of casuistry from 2010-2019
- International recognition, with RNOHP's acceptance for affiliation by the European Network of Cancer Registries (ENCR) in October 2018, meeting all quality criteria required by the network's experts
- Completion of the first survival study with JRC assistance for cases diagnosed between 2010 and 2013
- Creation of a dedicated platform and customization of the form to meet children's needs, in accordance with ENCR recommendations
- Introduction of the Toronto staging system in 2019
- Participation in the Benchista study in 2022
- Receipt of favorable approval after the ENCR audit in 2022
- Sending the first data flow to the European Cancer Information System (ECIS) in 2022
- Completion of the second survival study and sending the first data flow to CONCORD in 2023
- Initiation of platform modernization through the automated analytics module (collaboration with Squilline initiated in 2023, currently ongoing)
- Initiation of platform restructuring and optimization through Cloud reconfiguration in 2023.

2. CASE RECORDS

On December 31, 2022, RNOHP comprised 6984 notifications for 5340 cases.

This report contains the 4991 new cases of cancer diagnosed in the age group 0-19 years who presented to the national network of Pediatric Oncology-Hematology during the period 01.01.2010 - 31.12.2021.

2.1 Incidence Dynamics 2010 - 2021

The average annual number of new cases recorded in the national network of pediatric oncology-hematology is:

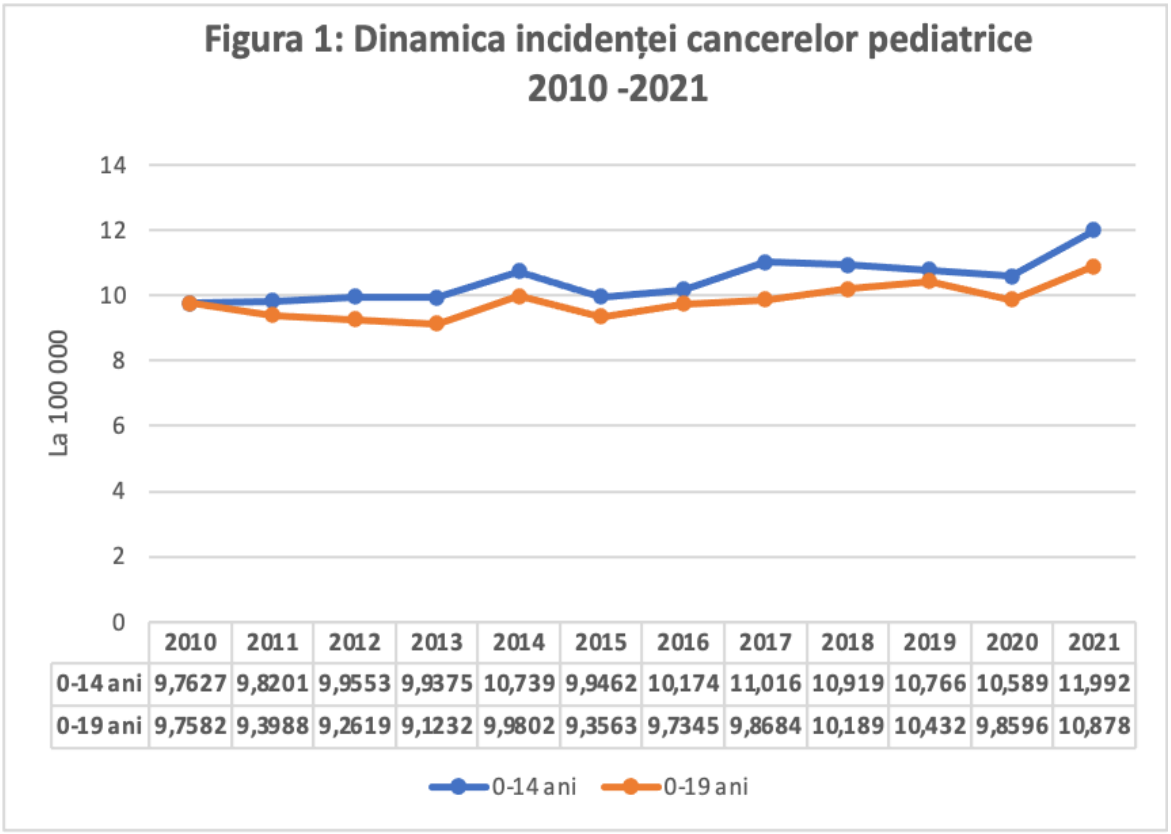
- **422 new cases/year** with SD ± 16.6 for the age group **0-19 years** and
- **326 new cases/year** with SD ± 15.8 for the age group **0-14 years.**

The average crude incidence rate (for the period 2010-2021) is:

- In the age group 0-19 years - **9.82‰**, DS ± 0.51 CI95%[9.49,10.14]
- In the age group 0-14 years - **10.46‰**, DS ± 0.66 CI95%[10.04,10.88]

The stability of the incidence rates over time is notable, a criterion considered as a quality indicator for cancer registries.

Figure 1: Dynamics of pediatric cancer incidence 2010-2021



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
0-14 ani	9,7627	9,8201	9,9553	9,9375	10,739	9,9462	10,174	11,016	10,919	10,766	10,589	11,992
0-19 ani	9,7582	9,3988	9,2619	9,1232	9,9802	9,3563	9,7345	9,8684	10,189	10,432	9,8596	10,878

The number of new cases per year is approximately constant, with very close values of crude and standardized incidences (reported to the standard European population) for the age groups 0-14 and 0-19 years. For the age group 0-14 years, the highest incidence was recorded in 2021, and the lowest in 2010. The level of incidence in 2020 and 2021 was not significantly modified compared to previous years, with the number of new cases recorded in these years practically unaffected by the COVID-19 pandemic.

Table 1: Incidence (crude and ASR) for age groups 0-14 years and 0-19 years, period 2010-2021

		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Annual average
0-14 years old	**New cases**	313	314	317	312	333	307	312	337	334	329	321	363	**324,33**
	Incidence (crude)	9,76	9,82	9,96	9,94	10,74	9,95	10,17	11,02	10,92	10,77	10,59	11,99	**10,47**
	ASR**	9,88	9,96	7,39	10,06	10,79	9,65	10,23	11,11	11,08	10,97	11,29	11,02	**10,29**
years old	**New cases**	423	405	397	386	418	390	404	408	419	427	400	441	**410**
	Incidence (crude)	9,76	9,40	9,26	9,12	9,98	9,36	9,73	9,87	10,19	10,43	9,86	10,88	**9,82**
	ASR**	9,89	9,53	7,36	9,26	10,08	9,07	9,84	10,01	10,33	10,57	10,49	10,19	**9,72**

**Incidence for 100.000*
***Average European Population (2016)*

Most new cases are recorded in the 0-4 age group (similar to international age group distributions), followed by the 10-14 age group and 5-9 age group. Unlike the European distribution, the fewest cases are recorded in the 15-19 age group (a phenomenon that may be, at least partially, due to the referral patterns of cases in this age group to both pediatric and adult services).

Table 2: Annual Distribution of New Cases by Five-Year Age Groups - Crude and ASR Incidence

		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
0- 4 years old	New cases	156	154	131	147	138	133	138	155	158	157	149	159
	Incidence (crude)	14,83	14,67	12,64	14,69	14,23	13,87	4,49	15,96	15,84	5,39	14,86	15,66
	ASR	15,47	15,37	13,14	14,94	14,17	13,10	4,30	16,12	16,52	6,49	17,38	15,70
5- 9 years old	New cases	73	80	117	84	98	77	84	96	76	84	72	95
	Incidence (crude)	6,91	7,58	1,08	7,93	9,20	7,18	7,89	9,26	7,54	8,58	7,45	9,93
	ASR	6,58	7,26	0,67	7,76	9,15	6,94	7,91	9,08	7,22	8,02	6,84	7,52
10-14 years old	New cases	84	80	69	81	97	97	90	86	100	88	100	109
	Incidence (crude))	7,65	7,32	6,32	7,51	9,10	9,19	8,57	8,18	9,49	8,32	9,41	10,33
	ASR	7,58	7,26	6,29	7,48	9,05	8,91	8,48	8,13	9,51	8,40	9,64	9,84
15-19 years old	New cases	110	91	80	74	85	82	92	71	85	98	81	78
	Incidence (crude)	9,75	8,19	7,26	6,78	7,82	7,58	8,49	6,60	8,07	9,45	7,90	7,60
	ASR	9,92	8,26	7,30	6,84	7,93	7,31	8,67	6,71	8,08	9,36	8,09	7,71

*Incidence for 100.000
**Average European Population (2016)

Each year, an average of **230 boys** and **180 girls** are diagnosed in the PHO network, with an **M/F ratio of 1.27/1**, incidence among boys being slightly higher in all years analyzed. The highest incidence among boys was in 2021, while the lowest was in 2020. Among girls, the highest incidence was found in 2019, and the lowest in 2013. The smallest difference in the ratio was recorded in 2020, at 1.03/1. The largest difference was in 2017, with a ratio of 1.5/1.

Table 3: Distribution of new cases by gender and incidence year

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Male	246	229	221	232	236	229	221	245	220	227	201	248
Female	177	176	176	154	182	161	183	163	199	200	194	194

The predominance of cancer in boys is observed both in the number of cases by age groups and in the crude and standardized incidences. The age group 0-4 years has the highest incidence, both in boys and girls.

Table 4: Distribution of cases by age groups and sexes (crude and ASR incidences)

Age groups	0-4 years old			5-9 years old			10-14 years old			15-19 years old		
	No of cases	Incidence (100000, crude)	ASR	No of cases	Incidence (100000, crude)	ASR	No of cases	Incidence (100000, crude)	ASR	No of cases	Incidence (100000, crude)	ASR
M	929	15	15,51	616	9,69	9,69	596	9,05	9,05	562	8,48	8,48
F	739	12,61	13,03	428	7,12	6,86	501	8,04	8,03	475	7,56	7,61
Total	834	14,76	15,23	522	8,38	7,25	548,5	8,55	8,54	518,5	8,02	8,05

The majority of localizations are consistently dominated by male cases, with the exception of central nervous system tumors, Neuroblastomaa, renal tumors, and germ cell tumors where there is an alternation of the ratio from one year of incidence to another. The only localization with a constant female dominance is recorded for epithelial tumors (Table 5).

Table 5: Sex ratio by site (ICCC3 class) of new cancer cases (2010 - 2021)

RAPORT M/F	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
All locations	1,39	1,30	1,26	1,51	1,30	1,42	1,21	1,50	1,11	1,14	1,06	1,28
I.Leukemias	1,29	1,61	1,09	1,24	1,18	1,20	1,49	1,66	1,29	1,35	1,65	1,40
II.Lymphomas	1,52	1,33	1,58	2,29	2,22	2,52	1,80	1,63	1,30	1,33	1,59	1,90
III.CNS	1,24	0,92	1,23	2,05	0,93	1,23	0,93	1,23	0,83	0,94	0,91	1,17
IV.Neuroblastoma	1,50	1,25	0,73	2,80	1,30	1,44	0,82	2,29	1,27	1,36	0,58	1,80

V.Retinoblastoma	1,50	0,50	0,75	0,33	2,00	3,00	5,00	0,67	4,00	1,50	1,00	3,00
VI.Renal tumors	1,70	0,62	1,00	0,89	1,00	1,20	0,77	1,30	0,73	0,21	0,42	0,77
VII.Hepatic tumors	2,00	-	0,67	2,00	1,50	3,00	1,33	1,00	1,33	-	1,00	0,16
VIII.Bone tumors	2,10	1,27	2,09	2,00	1,15	1,45	1,00	1,00	1,00	2,25	0,78	2,33
IX.Soft tissue tumors	1,58	2,10	2,33	2,50	1,42	2,60	1,62	1,50	1,32	1,00	0,94	0,82
X.Germ cell tumors	0,50	1,57	1,57	0,73	2,33	0,87	1,42	7,00	0,92	1,21	0,31	0,77
XI. Epithelial cell tumors	1,13	0,77	0,90	0,77	0,69	0,84	0,65	0,93	0,38	0,64	0,73	0,27
XII.Others	1,75	0,50	-	-	0,00	0,00	-	-	-	0,00	1,00	2,00

Table 6: Annual standardized incidence rates by sex (0-19 years)

2010		**2011**		**2012**		**2013**		**2014**		**2015**		**2016**		**2017**		**2018**		**2019**	
M	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
10,9	8,3	10,3	8,3	10,1	8,5	10,7	7,5	11,0	8,8	10,4	7,6	10,4	9,1	11,5	8,1	10,4	9,9	10,8	10,0
9,69		9,34		9,31		9,16		9,95		9,01		9,75		9,87		10,17		10,4	

• 2.2 Locations

The analysis of pediatric oncology-hematology cases is conducted according to International Classification of Childhood Cancer, 3rd edition, 2017 revision, (ICCC3).

The development of the International Classification of Childhood Cancer (ICCC) was founded on the unanimously accepted fact that pediatric tumors, unlike those in adults, are primarily classified based on morphology rather than the topographic origin of the primary tumor. The first version of the ICCC was proposed in 1996 and underwent a major revision with the advent of the third edition of the International Classification of Diseases for Oncology (ICD-O-3), published in 2000, which introduced significant changes in the coding and classification of neoplasms, particularly for leukemias and lymphomas, which are major malignancies in children. The third revision of the International Classification of Childhood Cancer (ICCC-3) in 2005 was designed to adhere to several principles: compliance with current international standards, integration of newly defined entities, advancement of diagnostic techniques, continuity with previous childhood classifications, and comprehensiveness.

As a result, ICCC-3 classifies tumors coded according to ICD-O-3 into 12 main groups, which are further divided into 47 subgroups. These two levels of ICCC-3 allow standardized comparisons of broad categories of pediatric neoplasms, in continuity with previous classifications. The most heterogeneous 16 subgroups are divided into 2-11 divisions to allow the study of important entities or homogeneous clusters of tumors characterized specifically at the cytogenetic or molecular level. Some divisions can be combined into higher-level categories, such as neoplasms of B-cell lineage in leukemias and lymphomas.

Essentially, the ICCC-3 classification adheres to current international standards and was designed to be used in international epidemiological studies based on populations and cancer registries. The use of an international classification system is particularly important in the field of pediatric oncology, where the low frequency of cases requires rigorous procedures to ensure data comparability. The main table of correspondence of the International Classification of Childhood Cancer Ed 3 (ICCC3) with ICD-O3 (topographic and morphologic codes) can be consulted in *Annex 2*.

In this analysis, 4986 cases assigned to one of the 12 main ICCC3 groups were included.

The largest proportion in pediatric oncology casuistry is represented by malignant hematopathies (almost half of the total cases in the registry), grouped according to ICCC3 into the first two classes of the system: I. **Leukemias, myeloproliferative diseases, and myelodysplastic syndromes** and II. **Lymphomas and reticuloendothelial neoplasms**.

This category of tumors is followed in frequency by group III: **Central nervous system neoplasms** (CNS). The least common diagnostic categories are represented by hepatic tumors (group VII), Retinoblastomaa (group V), and nonspecific childhood tumors (group XII), which together do not exceed 3% of the total RNOHP cases (Table 7).

Table 7: Number of cases and incidences (crude and ASR) for main ICCC3 groups

Locations	0-14 years old			0-19 years old		
	No of cases (2010 -2021)	Incidence (100.000, crude)	ASR 0-14 years old	No of cases (2010 -2021)	Incidence (100.000, crude)	ASR 0-19 years old
I. Leukemias, myeloproliferative diseases and myelodysplastic syndromes	**1340**	**3,54**	**3,6**	**1502**	**2,40**	**3,01**
II. Lymphomas and reticuloendothelial neoplasms	**529**	**1,40**	**1,39**	**758**	**1,59**	**1,49**
III. Central Nervous System Neoplasms (SNC) and other Intracranial and intraspinal neoplasms	**615**	**1,63**	**1,64**	**696**	**1,13**	**1,39**
IV. Neuroblastomas and other peripheral nerve tumors	**295**	**0,71**	**0,75**	**297**	**0,36**	**0,56**
V. Retinoblastoma	**82**	**0,18**	**0,2**	**83**	**0,09**	**0,15**
VI. Renal tumors	**239**	**0,61**	**0,64**	**244**	**0,31**	**0,49**
VII. Hepatic tumors	**53**	**0,13**	**0,14**	**59**	**0,07**	**0,11**
VIII. Malignant bone tumors	**226**	**0,45**	**0,59**	**350**	**0,71**	**0,68**

Locations	0-14 years old			0-19 years old		
	No of cases (2010 -2021)	Incidence (100.000, crude)	ASR 0-14 years old	No of cases (2010 -2021)	Incidence (100.000, crude)	ASR 0-19 years old
IX. Soft tissue sarcomas and other extraosseous sarcomas	264	0,60	0,68	375	0,74	0,73
X. Germ cell tumors, trophoblastic tumors, and gonadal neoplasms	138	0,35	0,35	275	0,71	0,53
XI. Other epithelial neoplasms and malignant melanomas	116	0,31	0,3	298	0,86	0,58
XII. Other malignancies, unspecified malignancies	42	0,04	0,04	49	0,05	0,04

Figure 2: Percentage distribution of case history 2010 - 2021 by major ICCC3

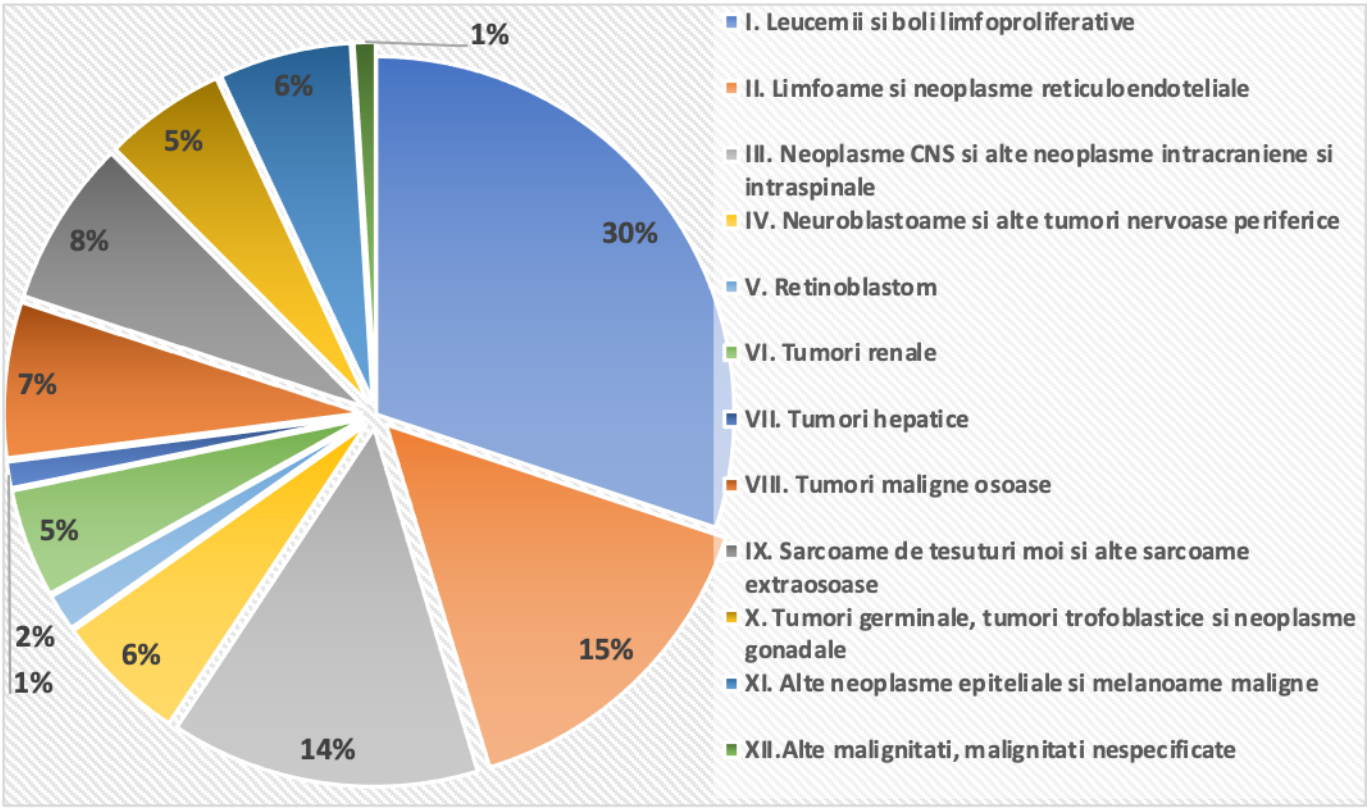


Table 8: Number of cases and incidences (crude) by major groups, subgroups, and subdivisions of ICCC3 subgroups (age groups 0-14 and 15-19 years)

Localizare ICCC3	Age group 0-14 years old	Incidența 0-14 (crude, per 100000)	Age group 15-19 years old	Incidence 15-19 (crude, per 100000)
I. I. Leukemias, myeloproliferative diseases and myelodysplastic syndromes	1340	2,67	162	0,32
(a) Acute lymphoblastic leukemias	1049	2,09	95	0,19
I(a)1. precursor cells leukemias	1031	2,06	91	0,18
I(a)2. Leukemias with mature B-cells	13	0,03	4	0,01
I(a)3. Mature T-cell leukemias and NK cell leukemias	7	0,01	0	0,00
I(a)4. lymphoblastic Leukemias, NOS	0	0,00	0	0,00
(b) Acute myeloblastic leukemias	175	0,35	37	0,07
(c) Chronic myeloproliferative disorders	23	0,05	14	0,03
(d) Myelodysplastic syndromes and other chronic myeloproliferative disorders	17	0,03	3	0,01
(e) Other specified and non specified Leukemias	81	0,16	13	0,03
II. Lymphomas and reticuloendothelial neoplasms	529	1,05	229	0,46
(a) Hodgkin Lymphomas	212	0,42	165	0,33
(b) non-Hodgkin Lymphomas (except for Burkitt lymphomas)	135	0,27	47	0,09
II(b)1 Precursor cells lymphomas	46	0,09	8	0,02
II(b)2 Lymphomas with mature B-cells (*except for Burkitt lymphomas*)	37	0,07	18	0,04
II(b)3 . Mature T-cell leukemias and NK cell Lymphomas	27	0,05	9	0,02
II(b)4 non-Hodgkin Lymphomas, NOS	25	0,05	12	0,02
(c) Burkitt lymphoma	*111*	0,22	*9*	0,02
(d) Other reticuloendothelial neoplasms	*68*	0,14	*6*	0,01
c(e) non specified Lymphomas	*3*	0,01	*2*	0,004
III. Central Nervous System Neoplasms (SNC) and other Intracryears oldal and intraspinal neoplasms	**615**	1,23	**80**	0,16
(a) Ependymomas and choroid plexus tumors	*73*	0,15	*5*	0,01
III (a)1. Ependymomas	*65*	0,13	*4*	0,01
III(a)2. Choroid plexus tumors	*8*	0,02	*1*	0,002
(b) Astrocytomas	197	0,39	33	0,07
(c) Intracryears oldal and intraspinal embryonal tumors	182	0,36	21	0,04

Localizare ICCC3	Age group 0-14 years old	Incidența 0-14 (crude, per 100000)	Age group 15-19 years old	Incidence 15-19 (crude, per 100000)
III (c)1. Medulloblastomas	142	0,28	14	0,03
III (c)2. PNET	24	0,05	6	0,01
III (c)3. Medulloepitheliomas	4	0,01	0	0,00
III (c)4. Atypical teratoid/rhabdoid tumor	12	0,02	1	0,002
III (d) Other gliomas	73	0,15	12	0,02
III (d)1. Oligodendrogliomas	5	0,01	2	0,004
III (d)2. Mixed gliomas and unspecified gliomas	66	0,13	8	0,02
III (d)3. Neuroepithelial glial tumors with uncertain origin	2	0,004	3	0,01
(e) Other specified intracryears oldal and intraspinal neoplasms	30	0,06	5	0,01
III (e)1. Pituitary adenomas and carcinomas	1	0,002	1	0,002
III (e)2. Tumors of the sellar region (cryears oldopharyngiomas)	4	0,01	1	0,002
III (e)3. Parenchymal pineal tumors	5	0,01	0	0,00
III (e)4. Neuronal and mixed glioneuronal tumors	16	0,03	2	0,004
III (e)5. Meningiomas	4	0,01	1	0,002
(f) Unspecified intracryears oldal and intraspinal neoplasms	61	0,12	4	0,01
IV. Neuroblastomas and other peripheral nerve tumors	295	0,59	2	0,004
(a) Neuroblastoma și ganglioNeuroblastoma	292	0,58	1	0,002
(b) Other tumors of peripheral nerve cells	3	0,01	1	0,002
V. Retinoblastoma	82	0,16	1	0,002
VI. Renal tumors	239	0,48	5	0,01
(a) Nephroblastoma and other Non-epithelial Renal tumors	234	0,47	1	0,002
VI (a)1. Nephroblastoma	233	0,46	1	0,002
VI (a)2. Renal rhabdoid tumor	1	0,002	0	0,00
VI (a)3. Renal sarcoma	0	0,00	0	0,00
VI (a)4. renal PNET	0	0,00	0	0,00
(b) Renal carcinomas	3	0,01	4	0,01
(c) Unspecified malignant renal tumors	2	0,004	0	0,00
VII. Hepatic tumors	53	0,11	6	0,01
(a) Hepatoblastoma	46	0,09	1	0,002
(b) Hepatic carcinoma	6	0,01	5	0,01

Localizare ICCC3	Age group 0-14 years old	Incidența 0-14 (crude, per 100000)	Age group 15-19 years old	Incidence 15-19 (crude, per 100000)
(c) Unspecified malignant hepatic tumors	1	0,002	0	0,00
VIII. Malignant bone tumors	226	0,45	124	0,25
(a) Osteosarcoamas	110	0,22	73	0,15
(b) Chondrosarcomas	4	0,01	2	0,004
(c) Ewing's tumors and other bone sarcomas	101	0,20	44	0,09
VIII (c)1. Ewing's tumor and Askin tumor of the bone	101	0,20	44	0,09
VIII (c)2. Bone PNET	0	0,00	0	0,00
(d) Other specified malignant bone tumors	5	0,01	3	0,01
VIII (d)1. Malignant Fibrous Bone Neoplasms	1	0,002	0	0,00
VIII (d)2. Malignant Chondromas	1	0,002	0	0,00
VIII (d)3. Malignant Odontogenic Tumors	0	0,00	0	0,00
VIII (d)4. Other Specified Malignant Bone Tumors	3	0,01	3	0,01
(e) Unspecified Malignant Bone Tumors	6	0,01	2	0,004
IX. Soft Tissue Sarcomas and Other Extraosseous Sarcomas	264	0,53	111	0,22
(a) Rhabdomyosarcomas	146	0,29	33	0,07
(b) Fibrosarcomas, Peripheral Nerve Sheath Tumors, and Other Fibrous Tumors	26	0,05	16	0,03
IX (b)1. Fibroblastic and Myofibroblastic Tumors	16	0,03	10	0,02
IX (b)2. Nerve Sheath Tumors	10	0,02	6	0,01
IX (b)3. Other Fibromatous Neoplasms	0	0,00	0	0,00
(c) Kaposi's Sarcoma	0	0,00	0	0,00
(d) Other Specified Soft Tissue Sarcomas	83	0,17	52	0,10
IX (d)1. Ewing's Tumor and Askin Tumor of Soft Tissues	37	0,07	20	0,04
IX (d)2. Peripheral Primitive Neuroectodermal Tumor (PNET) of Soft Tissues	4	0,01	3	0,01
IX (d)3. Extrarenal Rhabdoid Tumor	5	0,01	0	0,00
IX (d)4. Liposarcomas	3	0,01	1	0,002

Localizare ICCC3	Age group 0-14 years old	Incidența 0-14 (crude, per 100000)	Age group 15-19 years old	Incidence 15-19 (crude, per 100000)
IX (d)5. Fibrohistiocytic Tumors	7	0,01	5	0,01
IX (d)6. Leiomyosarcomas	4	0,01	1	0,002
IX (d)7. Synovial Sarcomas	9	0,02	14	0,03
IX (d)8. Vascular Tumors	7	0,01	5	0,01
IX (d)9. Bone and Chondromatous Tumors of Soft Tissue	1	0,002	1	0,002
IX (d)10. Alveolar Soft Part Sarcoma	1	0,002	0	0,00
IX (d) 11. Other Soft Tissue Sarcomas	5	0,01	2	0,004
(e) Unspecified Soft Tissue Sarcomas	9	0,02	10	0,02
X. Germ Cell Tumors, Trophoblastic Tumors, and Gonadal Neoplasms	138	0,28	137	0,27
(a) Intracranial and Intraspinal Germ Cell Tumors	30	0,06	13	0,03
X (a)1. Intracranial and Intraspinal Germinomas	16	0,03	10	0,02
X (a)2. Intracranial and Intraspinal Teratomas	6	0,01	1	0,002
X (a)3. Intracranial and Intraspinal Embryonal Carcinomas	3	0,01	0	0,00
X (a)4. Intracranial and Intraspinal Yolk Sac Tumors	1	0,002	0	0,00
X (a)5. Intracranial and Intraspinal Choriocarcinomas	0	0,00	0	0,00
X (a)6. Intracranial and Intraspinal Mixed Tumors	4	0,01	2	0,004
(b) Extracranial and Extragonadal Malignant Germ Cell Tumors	30	0,06	18	0,04
X (b)1. Malignant Extracranial and Extragonadal Germinomas	2	0,004	2	0,004
X (b)2. Malignant Extracranial and Extragonadal Teratomas	9	0,02	0	0,00
X (b)3. Malignant Extracranial and Extragonadal Embryonal Carcinomas	3	0,01	0	0,00
X (b)4. Malignant Extracranial and Extragonadal Yolk Sac Tumors	11	0,02	0	0,00
X (b)5. Malignant Extracranial and Extragonadal Choriocarcinomas	2	0,004	15	0,03
X (b)6. Malignant Mixed Germ Cell Tumors and Unspecified Extracranial and Extragonadal Tumors	3	0,01	1	0,002
(c) Malignant Gonadal Germ Cell Tumors	60	0,12	89	0,18

Localizare ICCC3	Age group 0-14 years old	Incidența 0-14 (crude, per 100000)	Age group 15-19 years old	Incidence 15-19 (crude, per 100000)
X (c)1. Malignant Gonadal Germinomas	13	0,03	23	0,05
X (c)2. Malignant Gonadal Teratomas	23	0,05	17	0,03
X (c)3. Gonadal Embryonal Carcinomas	2	0,004	13	0,03
X (c)4. Gonadal Yolk Sac Tumors	10	0,02	3	0,01
X (c)5. Gonadal Choriocarcinomas	0	0,00	2	0,004
X (c)6. Malignant Mixed Gonadal Tumors	12	0,02	31	0,06
X (c)7. Gonadal Gonadoblastoma	0	0,00	0	0,00
(d) Gonadal Carcinomas	8	0,02	10	0,02
(e) Other and Unspecified Malignant Gonadal Tumors	10	0,02	7	0,01
XI. Alte neoplasme epiteliale și melanoame maligne	116	0,23	182	0,36
(a) Carcinoame adrenocorticale	2	0,004	1	0,002
(b) Carcinoame tiroidiene	25	0,05	65	0,13
(c) Carcinoame de nasofaringe	19	0,04	36	0,07
(d) Melanoame maligne	14	0,03	20	0,04
(e) Carcinoame de piele	1	0,002	1	0,002
(f) Alte carcinoame și carcinoame nespecificate	55	0,11	59	0,12
XI (f)1. Carcinoame ale glandelor salivare	2	0,004	2	0,004
XI (f)2. Carcinoame de colon și rect	4	0,01	9	0,02
XI (f)3. Carcinoame apendiculare	26	0,05	21	0,04
XI (f)4. Carcinoame pulmonare	1	0,002	7	0,01
XI (f)5. Carcinoame timice	1	0,002	3	0,01
XI (f)6. Carcinoame mamare	1	0,002	2	0,004
XI (f)7. Carcinoame de cervix uterin	1	0,002	0	0,00
XI (f)8. Carcinoame de vezică urinară	1	0,002	0	0,00
XI (f)9. Carcinoame oculare	0	0,00	0	0,00
XI (f)10. Carcinoame ale altor zone specificate	10	0,02	13	0,03
XI (f)11. Carcinoame ale altor zone nespecificate	8	0,02	15	0,03
XII.Alte malignități, malignități nespecificate	42	0,08	7	0,01
(a) Alte tumori specificate	4	0,01	1	0,002
XII (a)1. Tumoră stromală gastrointestinală	0	0,00	0	0,00
XII (a)2. Pancreatoblastom	1	0,002	0	0,00

Localizare ICCC3	Age group 0-14 years old	Incidența 0-14 (crude, per 100000)	Age group 15-19 years old	Incidence 15-19 (crude, per 100000)
XII (a)3. Blastom pulmonar și blastom pleuropulmonar	1	0,002	0	0,00
XII (a)4. Alte neoplasme complexe mixte și stromale	0	0,00	0	0,00
XII (a)5. Mesoteliom	1	0,002	1	0,002
XII (a)6. Alte tumori maligne specificate	1	0,002	0	0,00
(b) Alte tumori maligne nespecificate	38	0,08	6	0,01

Group ICCC3-I (Leukemias, myeloproliferative disorders, and myelodysplastic syndromes) represent the most frequent localization (over 30% of cases), being dominated by *acute lymphoblastic leukemias with precursor cells* in 77% of cases. They are followed in frequency by *Group II tumors - Lymphomas and reticuloendothelial neoplasms* - dominated by Hodgkin lymphoma in 49.7% of cases, non-Hodgkin lymphomas (excluding Burkitt lymphoma) in 24%, and *Group III tumors - CNS Neoplasms and other intracryears oldal and intraspinal neoplasms* - dominated by medulloblastoma and astrocytomas in 55% of cases.

Regarding the distribution by age groups, 99% of *Neuroblastomaa* cases were diagnosed in children aged 0-14 years, similar to *renal tumors* (98%).

Table 9: Distribution of cases by five-year age groups and groups, subgroups, and subdivisions ICCC3 (cohorts 2010-2021)

GRUPE DE VÂRSTĂ	0-4 years old		5-9 years old		10-14 years old		15-19 years old	
Location	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)
I. Leukemias, boli mieloproliferative și sindroame mielodisplazice	**690**	**1,38**	**368**	**0,73**	**282**	**0,56**	**162**	**0,32**
(a) Leukemias acute limfoblastice	557	1,11	294	0,59	189	0,38	95	0,19
I(a)1. Leukemias cu celule precursoare	552	1,10	287	0,57	183	0,36	91	0,18
I(a)2. Leukemias cu celule B mature	4	0,01	5	0,01	3	0,01	4	0,01
I(a)3. Leukemias cu celule T mature si Leukemias cu NK	1	0,002	2	0,004	3	0,01	0	0,00
I(a)4. Leukemias limfoblastice, NOS	0	0,00	0	0,00	0	0,000	0	0,00
(b) Leukemias acute mieloblastice	59	0,12	37	0,07	67	0,13	37	0,07

GRUPE DE VÂRSTĂ	0-4 years old		5-9 years old		10-14 years old		15-19 years old	
Location	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)
(c) Boli mieloproliferative cronice	6	0,01	6	0,01	10	0,02	14	0,03
(d) Sindroame mielodisplazice și alte boli mieloproliferative cronice	12	0,02	1	0,002	1	0,0020	3	0,01
(e) Alte Leukemias specificate și nespecificate	36	0,07	27	0,05	15	0,03	13	0,03
II. Lymphomas și neoplasme reticuloendoteliale	**121**	**0,24**	**198**	**0,39**	**212**	**0,42**	**229**	**0,46**
(a) Lymphomas Hodgkin	34	0,07	72	0,14	106	0,21	165	0,33
(b) Lymphomas non-Hodgkin (fără limfom Burkitt)	23	0,05	59	0,12	53	0,11	47	0,09
II(b)1 Lymphomas cu celule precursoare	13	0,03	18	0,04	15	0,03	8	0,02
II(b)2 Lymphomas cu celule B nature (fara limfomul Burkitt)	6	0,01	13	0,03	18	0,04	18	0,04
II(b)3 Lymphomas cu celule T mature și cu celule NK	1	0,002	12	0,02	14	0,03	9	0,02
II(b)4 Limfom non-Hodgkin, NOS	3	0,01	16	0,03	6	0,01	12	0,02
(c) Limfom Burkitt	*33*	0,07	*45*	0,09	*33*	0,07	*9*	0,02
(d) Alte neoplasme reticuloendoteliale	*27*	0,05	*18*	0,04	*16*	0,03	*6*	0,01
(e) Lymphomas nespecificate	*1*	0,002	*0*	0,00	*2*	0,0040	*2*	0,004
III. Neoplasme CNS și alte neoplasme intracryears oldene și intraspinale	**238**	**0,47**	**210**	**0,42**	**168**	**0,34**	**80**	**0,16**
(a) Ependymomas and choroid plexus tumors	*30*	0,06	*18*	0,04	*25*	0,05	*5*	0,01
III (a)1. Ependimoame	*27*	0,05	*16*	0,03	*22*	0,04	*4*	0,01
III(a)2. Choroid plexus tumors	*3*	0,01	*2*	0,004	*3*	0,01	*1*	0,002
(b) Astrocytomas	70	0,14	57	0,11	69	0,14	33	0,07
(c) Intracryears oldal and intraspinal embryonal tumors	76	0,15	72	0,14	31	0,06	21	0,04
III (c)1. Medulloblastomas	52	0,10	62	0,12	27	0,05	14	0,03

GRUPE DE VÂRSTĂ	0-4 years old		5-9 years old		10-14 years old		15-19 years old	
Location	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)
III (c)2. PNET	12	0,02	9	0,02	3	0,01	6	0,01
III (c)3. MMedulloepitheliomas	3	0,01	1	0,002	0	0,000	0	0,00
III (c)4. Tumoră teratoidă/rabdoidă atipică	9	0,02	0	0,00	1	0,0020	1	0,002
III (d) Other gliomas	27	0,05	25	0,05	18	0,04	12	0,02
III (d)1. Oligodendrogliomas	1	0,002	2	0,004	2	0,0040	2	0,004
III (d)2. Mixed gliomas and unspecified gliomas	26	0,05	23	0,05	14	0,03	8	0,02
III (d)3. Neuroepithelial glial tumors with uncertain origin	0	0,00	0	0,00	2	0,0040	2	0,004
(e) Other specified intracryears oldal and intraspinal neoplasms	8	0,02	10	0,02	11	0,02	5	0,01
III (e)1. Pituitary adenomas and carcinomas	0	0,00	0	0,00	1	0,0020	1	0,002
III (e)2. Tumors of the sellar region (cryears oldopharyngiomas)	1	0,002	2	0,004	1	0,0020	1	0,002
III (e)3. Parenchymal pineal tumors	1	0,002	3	0,01	1	0,0020	0	0,00
III (e)4. Neuronal and mixed glioneuronal tumors	4	0,01	4	0,01	7	0,01	2	0,004
III (e)5. Meningiomas	2	0,004	1	0,002	1	0,0020	1	0,002
(f) Unspecified intracryears oldal and intraspinal neoplasms	21	0,04	26	0,05	14	0,03	4	0,01
IV. Neuroblastoame și alte tumori nervoase periferice	**238**	**0,47**	**43**	**0,09**	**14**	**0,03**	**2**	**0,004**
(a) Neuroblastoma și ganglioNeuroblastoma	218	0,43	33	0,07	11	0,02	1	0,002
(b) Other tumors of peripheral nerve cells	1	0,002	1	0,002	1	0,0020	1	0,002
V. Retinoblastoma	**71**	**0,14**	**9**	**0,02**	**2**	**0,0040**	**1**	**0,002**
VI. Renal tumors	**172**	**0,34**	**50**	**0,10**	**16**	**0,03**	**5**	**0,01**
(a) Nefroblastom și alte Renal tumors nonepiteliale	166	0,33	47	0,09	10	0,02	1	0,002

GRUPE DE VÂRSTĂ	0-4 years old		5-9 years old		10-14 years old		15-19 years old	
Location	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)
VI (a)1. Nefroblastom	165	0,33	47	0,09	10	0,02	1	0,002
VI (a)2. Tumoră rabdoidă renală	1	0,002	0	0,00	0	0,000	0	0,00
VI (a)3. Sarcom renal	0	0,00	0	0,00	0	0,000	0	0,00
VI (a)4. PNET renal	0	0,00	0	0,00	0	0,000	0	0,00
(b) Carcinoame renale	0	0,00	0	0,00	2	0,0040	4	0,01
(c) Tumori maligne renale nespecificate	1	0,002	0	0,00	1	0,0020	0	0,00
VII. Hepatic tumors	**39**	**0,08**	**7**	**0,01**	**7**	**0,01**	**6**	**0,01**
(a) Hepatoblastom	36	0,07	3	0,01	3	0,01	1	0,002
(b) Carcinom hepatic	0	0,00	2	0,004	4	0,01	5	0,01
(c) Tumori maligne hepatice nespecificate	1	0,002	0	0,00	0	0,000	0	0,00
VIII. Tumori maligne osoase	**16**	**0,03**	**58**	**0,12**	**152**	**0,30**	**124**	**0,25**
(a) Osteosarcoame	2	0,004	23	0,05	84	0,17	73	0,15
(b) Condrosarcoame	0	0,00	0	0,00	4	0,01	2	0,004
(c) Tumori Ewing și alte sarcoame osoase	13	0,03	33	0,07	55	0,11	44	0,09
VIII (c)1. Tumoră Ewing și tumoră Askin osoasă	13	0,03	33	0,07	55	0,11	44	0,09
VIII (c)2. PNET osos	0	0,00	0	0,00	0	0,000	0	0,00
(d) Alte tumori maligne osoase specificate	0	0,00	1	0,002	4	0,01	3	0,01
VIII (d)1. Neoplasme fibroase osoase maligne	0	0,00	1	0,002	0	0,000	0	0,00
VIII (d)2. Condroame maligne	0	0,00	0	0,00	1	0,0020	0	0,00
VIII (d)3. Tumori odontogenice maligne	0	0,00	0	0,00	0	0,000	0	0,00
VIII (d)4. Alte tumori maligne osoase	0	0,00	0	0,00	3	0,01	3	0,01

GRUPE DE VÂRSTĂ	0-4 years old		5-9 years old		10-14 years old		15-19 years old	
Location	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)
(e) Tumori maligne osoase nespecificate	1	0,002	1	0,002	4	0,01	2	0,004
IX. Sarcoame de țesuturi moi și alte sarcoame extraosoase	**99**	**0,20**	**67**	**0,13**	**95**	**0,19**	**111**	**0,22**
(a) Rabdomiosarcoame	60	0,12	42	0,08	39	0,08	33	0,07
(b) Fibrosarcoame, tumori de teacă nervoasă periferică și alte tumori fibroase	8	0,02	7	0,01	9	0,02	16	0,03
IX (b)1. Tumori fibroblastice și miofibroblastice	7	0,01	3	0,01	5	0,01	10	0,02
IX (b)2. Tumori de teacă nervoasă	1	0,002	4	0,01	4	0,01	6	0,01
IX (b)3. Alte neoplasme fibromatoase	0	0,00	0	0,00	0	0,000	0	0,00
(c) Sarcom Kaposi	0	0,00	0	0,00	0	0,000	0	0,00
(d) Alte sarcoame specificate de tesuturi moi	21	0,04	15	0,03	45	0,09	52	0,10
IX (d)1. Tumoră Ewing și tumoră Askin de țesuturi moi	10	0,02	6	0,01	19	0,04	20	0,04
IX (d)2. PNET de țesut moale	2	0,004	0	0,00	2	0,0040	3	0,01
IX (d)3. Tumoră rabdoidă extrarenală	0	0,00	2	0,004	1	0,0020	0	0,00
IX (d)4. Liposarcoame	1	0,002	0	0,00	2	0,0040	1	0,002
IX (d)5. Tumori fibrohistiocitare	0	0,00	2	0,004	5	0,01	5	0,01
IX (d)6. Leiomiosarcoame	0	0,00	2	0,004	3	0,01	1	0,002
IX (d)7. Sarcoame sinoviale	1	0,002	1	0,002	7	0,01	14	0,03
IX (d)8. Tumori de vase de sânge	4	0,01	1	0,002	2	0,0040	5	0,01
IX (d)9. Bone tumors și condromatoase de țesut moale	0	0,00	0	0,00	1	0,0020	1	0,002
IX (d)10. Sarcom alveolar de părți moi	0	0,00	0	0,00	1	0,0020	2	0,004
IX (d) 11. Alte sarcoame de țesuturi moi	1	0,002	2	0,004	2	0,0040	0	0,00

GRUPE DE VÂRSTĂ	0-4 years old		5-9 years old		10-14 years old		15-19 years old	
Location	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)
(e) Sarcoame nespecificate de țesuturi moi	5	0,01	1	0,002	2	0,0040	10	0,02
X. Tumori germinale, tumori trofoblastice și neoplasme gonadale	**45**	**0,09**	**36**	**0,07**	**56**	**0,11**	**138**	**0,28**
(a) Tumori cu celule germinale intracryears oldene și intraspinale	4	0,01	12	0,02	14	0,03	13	0,03
X (a)1. Germinoame intracryears oldene și intraspinale	0	0,00	6	0,01	10	0,02	10	0,02
X (a)2. Teratoame intracryears oldene și intraspinale	3	0,01	2	0,004	1	0,0020	1	0,002
X (a)3. Carcinoame embrioare intracryears oldene și intraspinale	1	0,002	2	0,004	0	0,000	0	0,00
X (a)4. Tumori de sac Yolk intracryears oldene și intraspinale	0	0,00	0	0,00	1	0,0020	0	0,00
X (a)5. Coriocarcinoame intracryears oldene și intraspinale	0	0,00	0	0,00	0	0,000	0	0,00
X (a)6. Tumori mixte intracryears oldene și intraspinale	0	0,00	2	0,004	1	0,0020	2	0,004
(b) Tumori maligne extracryears oldene și extragonadale cu celule germinale	21	0,04	2	0,004	3	0,01	18	0,04
X (b)1. Germinoame maligne extracryears oldene și extragonadale	2	0,004	0	0,00	0	0,000	2	0,004
X (b)2. Teratoame maligne extracryears oldene și extragonadale	7	0,01	1	0,002	0	0,000	0	0,00
X (b)3. Carcinoame embrionare extracryears oldene și extragonadale	2	0,004	0	0,00	1	0,0020	0	0,00
X (b)4. Tumori de sac Yolk extracryears oldene și extragonadale	8	0,02	1	0,002	0	0,000	0	0,00

GRUPE DE VÂRSTĂ	0-4 years old		5-9 years old		10-14 years old		15-19 years old	
Location	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)
X (b)5. Coriocarcinoame extracryears oldene și extragonadale	0	0,00	0	0,00	2	0,0040	15	0,03
X (b)6. Tumori maligne mixte germinale și tumori nespecificate extracryears oldene și extragonadale	2	0,004	0	0,00	0	0,000	1	0,002
(c) Tumori maligne cu celule germinale ale gonadelor	15	0,03	15	0,03	29	0,06	89	0,18
X (c)1. Germinoame maligne gonadale	3	0,01	5	0,01	5	0,01	23	0,05
X (c)2. Teratoame maligne gonadale	6	0,01	9	0,02	8	0,02	17	0,03
X (c)3. Carcinoame embrionare gonadale	1	0,002	0	0,00	1	0,0020	13	0,03
X (c)4. Tumori de sac Yolk gonadale	2	0,004	0	0,00	7	0,01	3	0,01
X (c)5. Coriocarcinoame gonadale	0	0,00	0	0,00	0	0,000	2	0,004
X (c)6. Tumori maligne mixte gonadale	3	0,01	1	0,002	8	0,02	31	0,06
X (c)7. Gonadoblastom gonadal	0	0,00	0	0,00	0	0,000	0	0,00
(d) Carcinoame gonadale	1	0,002	0	0,00	6	0,01	10	0,02
(e) Tumori maligne gonadale altele și nespecificate	2	0,004	5	0,01	3	0,01	7	0,01
XI. Alte neoplasme epiteliale și melanoame maligne	**3**	**0,01**	**21**	**0,04**	**93**	**0,19**	**182**	**0,36**
(a) Carcinoame adrenocorticale		0,00	0	0,00	2	0,0040	1	0,002
(b) Carcinoame tiroidiene		0,00	2	0,004	23	0,05	65	0,13
(c) Carcinoame de nasofaringe		0,00	1	0,002	18	0,04	35	0,07
(d) Melanoame maligne	1	0,002	7	0,01	6	0,01	20	0,04
(e) Carcinoame de piele		0,00	0	0,00	1	0,0020	1	0,002
(f) Alte carcinoame și carcinoame nespecificate	2	0,004	11	0,02	42	0,08	59	0,12

GRUPE DE VÂRSTĂ	0-4 years old		5-9 years old		10-14 years old		15-19 years old	
Location	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)	**Cazuri**	**Incidence** (la 100.000, crude)
XI (f)1. Carcinoame ale glandelor salivare	0	0,00	1	0,002	1	0,0020	2	0,004
XI (f)2. Carcinoame de colon și rect	0	0,00	0	0,00	4	0,01	9	0,02
XI (f)3. Carcinoame apendiculare	0	0,00	5	0,01	21	0,04	21	0,04
XI (f)4. Carcinoame pulmonare	0	0,00	0	0,00	1	0,0020	7	0,01
XI (f)5. Carcinoame timice	0	0,00	0	0,00	1	0,0020	3	0,01
XI (f)6. Carcinoame mamare	0	0,00	0	0,00	1	0,0020	2	0,004
XI (f)7. Carcinoame de cervix uterin	0	0,00	0	0,00	1	0,0020	0	0,00
XI (f)8. Carcinoame de vezică urinară	0	0,00	0	0,00	1	0,0020	0	0,00
XI (f)9. Carcinoame oculare	0	0,00	0	0,00	0	0,000	0	0,00
XI(f)10. Carcinoame ale altor zone specificate	1	0,002	4	0,01	5	0,01	13	0,03
XI(f)11. Carcinoame ale altor zone nespecificate	1	0,002	1	0,002	6	0,01	2	0,004
XII.Alte malignități, malignități nespecificate	**19**	**0,04**	**5**	**0,01**	**15**	**0,03**	**10**	**0,02**
(a) Alte tumori specificate	3	0,01	0	0,00	0	0,000	1	0,002
XII (a)1. Tumoră stromală gastrointestinală	0	0,00	0	0,00	0	0,000	0	0,00
XII (a)2. Pancreatoblastom	1	0,002	0	0,00	0	0,000	0	0,00
XII (a)3. Blastom pulmonar și blastom pleuropulmonar	1	0,002	0	0,00	0	0,000	0	0,00
XII (a)4. Alte neoplasme complexe mixte și stromale	0	0,00	0	0,00	0	0,000	0	0,00
XII (a)5. Mesoteliom	1	0,002	0	0,00	0	0,000	1	0,002
XII (a)6. Alte tumori maligne specificate	0	0,00	0	0,00	0	0,000	0	0,00
(b) Alte tumori maligne nespecificate	7	0,01	1	0,002	5	0,01	5	0,01

It can be observed that in the 0-4 age group, Precursor B-cell acute lymphoblastic leukemia was the pathology with the highest incidence during the study period, with a gradual decrease in its incidence as age increased. Hodgkin lymphoma recorded the highest incidence in the 15-19 age group. Non-Hodgkin lymphomas had the highest incidence in the 5-9 and 10-14 age groups, with the most frequent being those with precursor cells and mature B cells. Burkitt lymphoma had the highest incidence among children aged 5-9.

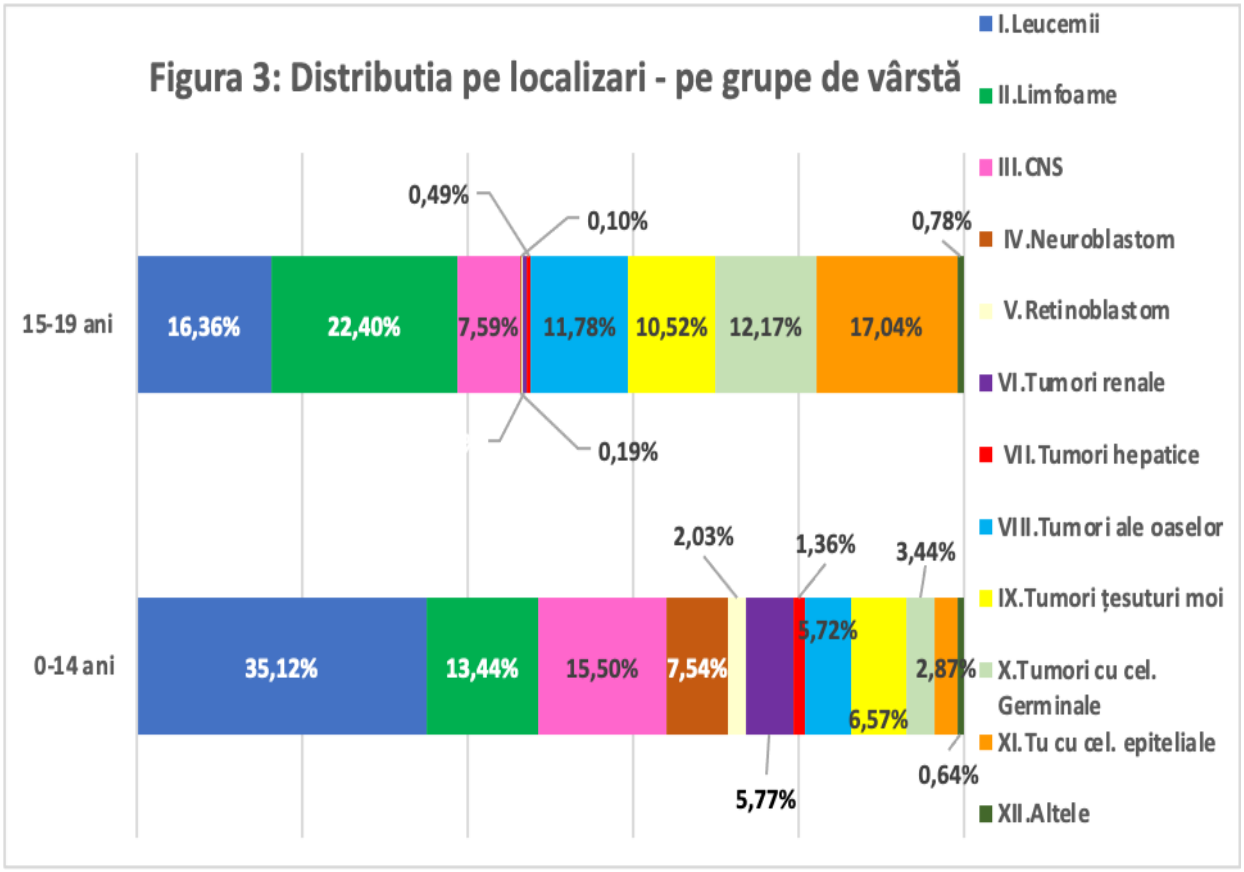
CNS neoplasms had the highest incidence in the 0-4 age group, gradually decreasing with age. Among these, astrocytomas (0-4 years) and medulloblastomas (5-9 years) had the highest incidence. Neuroblastomaa and ganglioNeuroblastomaa had the highest incidence in children aged 0-4, with much lower incidences in other age groups. Retinoblastomaas had the highest incidence in young children aged 0-4.

Nephroblastoma had the highest incidence in the 0-4 age group, with a much smaller number of cases in other age categories. Osteosarcomas and Ewing and Askin bone tumors predominantly occurred in children aged 10-19. Rhabdomyosarcomas predominated in the 0-4 age group, while Ewing and Askin soft tissue tumors predominated in adolescents.

Among germ cell tumors, which had the highest incidence in the 15-19 age group, intracryears oldal and intraspinal germinomas and teratomas were more numerous in children aged 10-19. Extracryears oldal, extragonadal yolk sac tumors were more common in the 0-4 age group, while extracryears oldal, extragonadal choriocarcinomas were more common in adolescents aged 15-19. Among gonadal tumors, the highest incidences were recorded in the 15-19 age group, with mixed gonadal tumors and gonadal germinomas predominating.

Thyroid and nasopharyngeal carcinomas, malignant melanomas, and appendiceal carcinomas were more common in the 10-19 age group.

Figure 3: Distribution by Location-Age Groups



The highest incidences for all sites was recorded in males, with the following exceptions: mixed and unspecified gliomas, nephroblastoma and renal carcinoma, soft tissue PNET, liposarcomas, synovial sarcomas, extracryears oldal and extragonadal yolk sac tumors, extracryears oldal and extragonadal choriocarcinomas, malignant gonadal teratomas, gonadal yolk sac tumors, gonadal carcinomas, thyroid carcinomas, and appendiceal carcinomas (Table 10).

Table 10: Distribution of cases (ICCC3 groups, subgroups, and divisions) by sex, for the cohorts 2010-2021

Location	Masculin	Incidence (la 100000, crude)	Feminin	Incidence (la 100000, crude)
I. Leukemias, boli mieloproliferative și sindroame mielodisplazice	**861**	**3,34**	**641**	**2,63**
(a) Leukemias acute limfoblastice	662	2,57	481	1,97
I(a)1. Leukemias cu celule precursoare	652	2,53	470	1,93
I(a)2. Leukemias cu celule B mature	6	0,02	9	0,04
I(a)3. Leukemias cu celule T mature și Leukemias cu NK	4	0,02	2	0,01

Location	Masculin	Incidence (la 100000, crude)	Feminin	Incidence (la 100000, crude)
I(a)4. Leukemias limfoblastice, NOS	0	0,00	0	0,00
(b) Leukemias acute mieloblastice	109	0,42	102	0,42
(c) Boli mieloproliferative cronice	20	0,08	16	0,07
(d) Sindroame mielodisplazice și alte boli mieloproliferative cronice	13	0,05	6	0,02
(e) Alte Leukemias specificate și nespecificate	57	0,22	36	0,15
II. Lymphomas și neoplasme reticuloendoteliale	**478**	**1,86**	**282**	**1,16**
(a) Lymphomas Hodgkin	219	0,85	163	0,67
(b) Lymphomas non-Hodgkin (fără limfom Burkitt)	121	0,47	64	0,26
II(b)1 Lymphomas cu celule precursoare	38	0,15	20	0,08
II(b)2 Lymphomas cu celule B nature (fără limfomul Burkitt)	33	0,13	21	0,09
II(b)3 Lymphomas cu celule T mature și cu celule NK	25	0,10	10	0,04
II(b)4 Limfom non-Hodgkin, NOS	25	0,10	13	0,05
(c) Limfom Burkitt	*96*	0,37	*24*	0,10
(d) Alte neoplasme reticuloendoteliale	*44*	0,17	*29*	0,12
(e) Lymphomas nespecificate	*3*	0,01	*2*	0,01
III. Neoplasme CNS și alte neoplasme intracryears oldene și intraspinale	**362**	**1,41**	**334**	**1,37**
(a) Ependymomas and choroid plexus tumors	*39*	0,15	*39*	0,16
III (a)1. Ependimoame	*37*	0,14	*32*	0,13
III(a)2. Choroid plexus tumors	*2*	0,01	*7*	0,03
(b) Astrocytomas	119	0,46	113	0,46
(c) Intracryears oldal and intraspinal embryonal tumors	114	0,44	89	0,36
III (c)1. Medulloblastomas	94	0,36	62	0,25
III (c)2. PNET	14	0,05	15	0,06
III (c)3. Medulloepitheliomas	1	0,004	3	0,01
III (c)4. Tumoră teratoidă/rabdoidă atipică	4	0,02	9	0,04
III (d) Other gliomas	40	0,16	45	0,18
III (d)1. Oligodendrogliomas	5	0,02	2	0,01
III (d)2. Mixed gliomas and unspecified gliomas	34	0,13	40	0,16

Location	Masculin	Incidence (la 100000, crude)	Feminin	Incidence (la 100000, crude)
III (d)3. Neuroepithelial glial tumors with uncertain origin	1	0,004	3	0,01
(e) Other specified intracryears oldal and intraspinal neoplasms	16	0,06	18	0,07
III (e)1. Pituitary adenomas and carcinomas	1	0,004	1	0,004
III (e)2. Tumors of the sellar region (cryears oldopharyngiomas)	1	0,004	4	0,02
III (e)3. Parenchymal pineal tumors	3	0,01	1	0,004
III (e)4. Neuronal and mixed glioneuronal tumors	9	0,03	9	0,04
III (e)5. Meningiomas	2	0,01	3	0,01
(f) Unspecified intracryears oldal and intraspinal neoplasms	34	0,13	30	0,12
IV. Neuroblastoame și alte tumori nervoase periferice	**169**	**0,66**	**128**	**0,52**
(a) Neuroblastoma și ganglioNeuroblastoma	166	0,64	127	0,52
(b) Other tumors of peripheral nerve cells	3	0,01	1	0,004
V. Retinoblastoma	**47**	**0,18**	**36**	**0,15**
VI. Renal tumors	**110**	**0,43**	**133**	**0,55**
(a) Nefroblastom și alte Renal tumors nonepiteliale	109	0,42	125	0,51
VI (a)1. Nefroblastom	108	0,42	125	0,51
VI (a)2. Tumoră rabdoidă renală	1	0,004	0	0,00
VI (a)3. Sarcom renal	0	0,00	0	0,00
VI (a)4. PNET renal	0	0,00	0	0,00
(b) Carcinoame renale	0	0,00	7	0,03
(c) Tumori maligne renale nespecificate	1	0,004	1	0,004
VII. Hepatic tumors	**38**	**0,15**	**21**	**0,09**
(a) Hepatoblastom	29	0,11	18	0,07
(b) Carcinom hepatic	8	0,03	3	0,01
(c) Tumori maligne hepatice nespecificate	1	0,004	0	0,00
VIII. Tumori maligne osoase	**208**	**0,81**	**142**	**0,58**
(a) Osteosarcoame	98	0,38	85	0,35
(b) Condrosarcoame	5	0,02	1	0,004
(c) Tumori Ewing și alte sarcoame osoase	96	0,37	49	0,20

Location	Masculin	Incidence (la 100000, crude)	Feminin	Incidence (la 100000, crude)
VIII (c)1. Tumoră Ewing și tumoră Askin osoasă	96	0,37	49	0,20
VIII (c)2. PNET osos	0	0,00	0	0,00
(d) Alte tumori maligne osoase specificate	6	0,02	2	0,01
VIII (d)1. Neoplasme fibroase osoase maligne	1	0,004	0	0,00
VIII (d)2. Condroame maligne	1	0,004	0	0,00
VIII (d)3. Tumori odontogenice maligne	0	0,00	0	0,00
VIII (d)4. Alte tumori maligne osoase	4	0,02	2	0,01
(e) Tumori maligne osoase nespecificate	3	0,01	5	0,02
IX. Sarcoame de țesuturi moi și alte sarcoame extraosoase	**223**	**0,87**	**149**	**0,61**
(a) Rabdomiosarcoame	113	0,44	64	0,26
(b) Fibrosarcoame, tumori de teacă nervoasă periferică și alte tumori fibroase	25	0,10	17	0,07
IX (b)1. Tumori fibroblastice și miofibroblastice	13	0,05	13	0,05
IX (b)2. Tumori de teacă nervoasă	12	0,05	4	0,02
IX (b)3. Alte neoplasme fibromatoase	0	0,00	0	0,00
(c) Sarcom Kaposi	0	0,00	0	0,00
(d) Alte sarcoame specificate de țesuturi moi	71	0,28	63	0,26
IX (d)1. Tumoră Ewing și tumoră Askin de țesuturi moi	33	0,13	23	0,09
IX (d)2. PNET de țesut moale	2	0,01	4	0,02
IX (d)3. Tumoră rabdoidă extrarenală	4	0,02	1	0,004
IX (d)4. Liposarcoame	0	0,00	4	0,02
IX (d)5. Tumori fibrohistiocitare	7	0,03	5	0,02
IX (d)6. Leiomiosarcoame	3	0,01	2	0,01
IX (d)7. Sarcoame sinoviale	9	0,03	14	0,06
IX (d)8. Tumori de vase de sânge	5	0,02	7	0,03
IX (d)9. Bone tumors și condromatoase de țesut moale	2	0,01	0	0,00
IX (d)10. Sarcom alveolar de părți moi	1	0,004	0	0,00

Location	Masculin	Incidence (la 100000, crude)	Feminin	Incidence (la 100000, crude)
IX (d) 11. Alte sarcoame de țesuturi moi	4	0,02	3	0,01
(e) Sarcoame nespecificate de țesuturi moi	14	0,05	5	0,02
X. Tumori germinale, tumori trofoblastice și neoplasme gonadale	**133**	**0,52**	**142**	**0,58**
(a) Tumori cu celule germinale intracryears oldene și intraspinale	31	0,12	12	0,05
X (a)1. Germinoame intracryears oldene și intraspinale	18	0,07	8	0,03
X (a)2. Teratoame intracryears oldene și intraspinale	6	0,02	1	0,004
X (a)3. Carcinoame embrioare intracryears oldene și intraspinale	2	0,01	1	0,004
X (a)4. Tumori de sac Yolk intracryears oldene și intraspinale	1	0,004	0	0,00
X (a)5. Coriocarcinoame intracryears oldene și intraspinale	0	0,00	0	0,00
X (a)6. Tumori mixte intracryears oldene și intraspinale	4	0,02	2	0,01
(b) Tumori maligne extracryears oldene și extragonadale cu celule germinale	12	0,05	36	0,15
X (b)1. Germinoame maligne extracryears oldene și extragonadale	3	0,01	1	0,004
X (b)2. Teratoame maligne extracryears oldene și extragonadale	2	0,01	7	0,03
X (b)3. Carcinoame embrionare extracryears oldene și extragonadale	1	0,004	2	0,01
X (b)4. Tumori de sac Yolk extracryears oldene și extragonadale	4	0,02	7	0,03
X (b)5. Coriocarcinoame extracryears oldene și extragonadale	0	0,00	17	0,07
X (b)6. Tumori maligne mixte germinale și tumori nespecificate extracryears oldene și extragonadale	2	0,01	2	0,01

Location	Masculin	Incidence (la 100000, crude)	Feminin	Incidence (la 100000, crude)
(c) Tumori maligne cu celule germinale ale gonadelor	***84***	***0,33***	***65***	***0,27***
X (c)1. Germinoame maligne gonadale	18	0,07	18	0,07
X (c)2. Teratoame maligne gonadale	12	0,05	28	0,11
X (c)3. Carcinoame embrionare gonadale	5	0,02	0	0,00
X (c)4. Tumori de sac Yolk gonadale	3	0,01	10	0,04
X (c)5. Coriocarcinoame gonadale	2	0,01	0	0,00
X (c)6. Tumori maligne mixte gonadale	34	0,13	9	0,04
X (c)7. Gonadoblastom gonadal	0	0,00	0	0,00
(d) Carcinoame gonadale	3	0,01	15	0,06
(e) Tumori maligne gonadale altele și nespecificate	3	0,01	14	0,06
XI. Alte neoplasme epiteliale și melanoame maligne	**127**	**0,49**	**172**	**0,71**
(a) Carcinoame adrenocorticale	1	0,004	2	0,01
(b) Carcinoame tiroidiene	16	0,06	74	0,30
(c) Carcinoame de nasofaringe	39	0,15	15	0,06
(d) Melanoame maligne	19	0,07	15	0,06
(e) Carcinoame de piele	1	0,004	1	0,004
(f) Alte carcinoame și carcinoame nespecificate	50	0,19	64	0,26
XI (f)1. Carcinoame ale glandelor salivare	2	0,01	2	0,01
XI (f)2. Carcinoame de colon și rect	6	0,02	7	0,03
XI (f)3. Carcinoame apendiculare	14	0,05	33	0,14
XI (f)4. Carcinoame pulmonare	7	0,03	1	0,004
XI (f)5. Carcinoame timice	1	0,004	3	0,01
XI (f)6. Carcinoame mamare	0	0,00	3	0,01
XI (f)7. Carcinoame de cervix uterin	0	0,00	1	0,004
XI (f)8. Carcinoame de vezică urinară	0	0,00	1	0,004
XI (f)9. Carcinoame oculare	0	0,00	0	0,00
XI (f)10. Carcinoame ale altor zone specificate	12	0,05	11	0,05
XI (f)11. Carcinoame ale altor zone nespecificate	8	0,03	2	0,01
XII.Alte malignități, malignități nespecificate	**10**	**0,04**	**13**	**0,05**
(a) Alte tumori specificate	1	0,004	4	0,02

Location	Masculin	Incidence (la 100000, crude)	Feminin	Incidence (la 100000, crude)
XII (a)1. Tumoră stromală gastrointestinală	0	0,00	0	0,00
XII (a)2. Pancreatoblastom	0	0,00	1	0,004
XII (a)3. Blastom pulmonar și blastom pleuropulmonar	0	0,00	1	0,004
XII (a)4. Alte neoplasme complexe mixte și stromale	0	0,00	0	0,00
XII (a)5. Mesoteliom	1	0,004	1	0,004
XII (a)6. Alte tumori maligne specificate	0	0,00	1	0,004
(b) Alte tumori maligne nespecificate	9	0,03	9	0,04

In terms of annual frequency of cases per pathology, **the group of leukemias**, with *acute lymphoblastic leukemia with precursors*, presented the highest number of new cases per year (95.2 new cases/year). At the opposite end within this group, the low frequency of acute myeloblastic leukemias can be observed, diagnosed with an average of 17.58 new cases/year.

In terms of annual frequency, the group of lymphomas is followed by non-Hodgkin lymphomas, which had the highest average of new cases/year (63.33 new cases/year), and by the group of CNS tumors (58 new cases/year), among which new cases of astrocytomas present the highest annual average, with 19.17 new cases/year.

Also notable are the localizations with the lowest frequency of occurrence: hepatoblastoma and Retinoblastomaa, with an annual average of new cases lower than 10 new cases/year, and the very rare tumors not classified in groups I-XI, categorized within group XII (other malignancies), which do not appear with a frequency higher than 2 new cases/year (Table 11).

Table 11: Number of new cases per year by localizations (groups, subgroups, and divisions ICCC3)

Location	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Medie anuală a cazurilor noi
I. Leukemias, boli mieloproliferative și sindroame mielodisplazice	**115**	**126**	**118**	**132**	**131**	**130**	**96**	**134**	**131**	**113**	**129**	**147**	**125,17**
(a) Leukemias acute limfoblastice	*92*	*97*	*90*	*98*	*94*	*94*	*68*	*110*	*104*	*75*	*99*	*122*	*95,25*
I(a)1. Leukemias cu celule precursoare	88	96	87	96	92	92	66	109	103	74	98	120	93,42
I(a)2. Leukemias cu celule B mature	4	1	2	2	1	1	1	1	1	0	0	2	1,33
I(a)3. Leukemias cu celule T mature și Leukemias cu NK	0	0	1	0	1	1	1	0	0	1	1	0	0,50

Location	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Medie anuală a cazurilor noi
I(a)4.Leukemias limfoblastice, NOS	0	0	0	0	0	0	0	0	0	0	0	0	0,00
(b) Leukemias acute mieloblastice	*13*	*18*	*17*	*18*	*21*	*23*	*14*	*12*	*18*	*21*	*18*	*18*	*17,58*
(c) Boli mieloproliferative cronice	*4*	*3*	*5*	*0*	*8*	*1*	*4*	*2*	*3*	*4*	*1*	*1*	*3,00*
(d) Sindroame mielodisplazice și alte boli mieloproliferative cronice	*2*	*1*	*1*	*1*	*2*	*1*	*1*	*2*	*3*	*2*	*1*	*2*	*1,58*
(e) Alte Leukemias specificate și nespecificate	*4*	*7*	*5*	*15*	*6*	*11*	*9*	*8*	*3*	*11*	*10*	*4*	*7,75*
II. Lymphomas și neoplasme reticuloendoteliale	**85**	**62**	**63**	**57**	**74**	**60**	**56**	**68**	**62**	**55**	**57**	**61**	**63,33**
(a) Lymphomas Hodgkin	*46*	*28*	*36*	*25*	*38*	*22*	*24*	*38*	*33*	*25*	*30*	*33*	*31,50*
(b) Lymphomas non-Hodgkin (fără limfomul Burkitt)	*16*	*19*	*13*	*18*	*16*	*21*	*19*	*12*	*15*	*15*	*8*	*11*	*15,25*
II(b)1 Lymphomas cu celule precursoare	5	4	2	6	3	9	4	0	11	4	1	5	4,50
II(b)2 Lymphomas cu celule B mature (fără *limfomul Burkitt*)	7	7	4	4	4	4	6	6	0	5	3	5	4,58
II(b)3 Lymphomas cu celule T mature și cu celule NK	3	4	1	4	8	5	4	2	3	2	0	0	3,00
II(b)4 Limfom non-Hodgkin, NOS	1	4	6	4	1	3	5	4	1	4	4	1	3,17
(c) Limfom Burkitt	*11*	*12*	*9*	*12*	*15*	*13*	*8*	*7*	*8*	*8*	*9*	*8*	*10,00*
(d) Alte neoplasme reticuloendoteliale	*12*	*3*	*5*	*1*	*4*	*4*	*5*	*11*	*5*	*6*	*9*	*9*	*0,50*
(e) Lymphomas nespecificate	*0*	*0*	*0*	*1*	*1*	*0*	*0*	*1*	*1*	*1*	*1*	*0*	*58,00*
III. Neoplasme CNS și alte neoplasme intracryears oldene și intraspinale	**59**	**48**	**73**	**69**	**56**	**58**	**52**	**53**	**50**	**71**	**47**	**60**	**58,00**
(a) Ependymomas and choroid plexus tumors	*5*	*8*	*6*	*7*	*9*	*7*	*4*	*5*	*6*	*11*	*5*	*5*	*6,50*
III (a)1. Ependimoame	5	7	5	5	7	7	4	5	5	10	5	5	5,83
III(a)2. Choroid plexus tumors	0	1	1	2	2	0	1	0	1	1	0	0	0,75
(b) Astrocytomas	*22*	*12*	*29*	*20*	*16*	*17*	*19*	*16*	*16*	*23*	*17*	*23*	*19,17*
(c) Tumori embrionare intracryears oldene și intraspinale	*15*	*12*	*20*	*25*	*16*	*20*	*15*	*16*	*19*	*20*	*11*	*20*	*17,42*
III (c)1. Medulloblastomas	9	9	15	21	13	14	11	14	10	17	8	15	13,00
III (c)2. PNET	5	1	4	4	3	4	4	1	1	2	0	1	2,50
III (c)3. Medulloepitheliomas	0	1	1	0	0	1	0	0	0	0	1	0	0,33
III (c)4. Tumoră teratoidă/rabdoidă atipică	1	1	0	0	0	1	0	1	2	1	2	4	1,08
III (d) Other gliomas	*7*	*9*	*4*	*8*	*7*	*7*	*4*	*9*	*5*	*9*	*11*	*5*	*7,08*

Location	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Medie anuală a cazurilor noi
III (d)1. Oligodendrogliomas	1	2	1	0	1	0	0	0	0	0	2	1	0,67
III (d)2. Mixed gliomas and unspecified gliomas	6	6	3	8	6	6	4	9	5	8	8	5	6,17
III (d)3. Neuroepithelial glial tumors with uncertain origin	0	1	0	0	0	1	0	0	0	1	1	0	0,33
(e) Other specified intracryears oldal and intraspinal neoplasms	*3*	*0*	*3*	*2*	*6*	*2*	*7*	*5*	*2*	*1*	*3*	*1*	*2,92*
III (e)1. Pituitary adenomas and carcinomas	1	0	1	0	0	0	0	0	0	0	0	0	0,17
III (e)2. Tumors of the sellar region (cryears oldopharyngiomas)	0	0	0	1	0	0	2	0	0	0	1	1	0,42
III (e)3. Parenchymal pineal tumors	1	0	1	0	1	0	0	0	0	1	1	0	0,42
III (e)4. Neuronal and mixed glioneuronal tumors	0	0	1	0	4	2	4	5	1	0	1	0	1,50
III (e)5. Meningiomas	1	0	0	1	1	0	1	0	1	0	0	0	0,42
(f) Unspecified intracryears oldal and intraspinal neoplasms	*7*	*7*	*11*	*7*	*2*	*5*	*3*	*2*	*8*	*7*	*0*	*6*	*5,42*
IV. Neuroblastoame și alte tumori nervoase periferice	**21**	**28**	**26**	**19**	**21**	**22**	**34**	**25**	**23**	**25**	**25**	**28**	**24,75**
(a) Neuroblastoma și ganglioNeuroblastoma	*21*	*28*	*26*	*19*	*20*	*21*	*32*	*25*	*23*	*25*	*25*	*28*	*24,42*
(b) Other tumors of peripheral nerve cells	*0*	*0*	*0*	*0*	*1*	*1*	*2*	*0*	*0*	*0*	*0*	*0*	*0,33*
V. Retinoblastoma	**12**	**6**	**7**	**3**	**9**	**4**	**7**	**6**	**5**	**10**	**10**	**4**	**6,92**
VI. Renal tumors	**29**	**23**	**17**	**21**	**22**	**11**	**24**	**23**	**20**	**17**	**21**	**16**	**20,33**
(a) Nefroblastom și alte Renal tumors nonepiteliale	*29*	*22*	*17*	*21*	*21*	*10*	*23*	*22*	*19*	*17*	*19*	*15*	*19,58*
VI (a)1. Nefroblastom	29	22	17	21	21	10	23	22	19	17	19	15	19,58
VI (a)2. Tumoră rabdoidă renală	0	0	0	0	0	0	1	0	0	0	0	0	0,08
VI (a)3. Sarcom renal	0	0	0	0	0	0	0	0	0	0	0	0	0,00
VI (a)4. PNET renal	0	0	0	0	0	0	0	0	0	0	0	0	0,00
(b) Carcinoame renale	*0*	*0*	*0*	*0*	*0*	*1*	*1*	*1*	*1*	*0*	*2*	*1*	*0,58*
(c) Tumori maligne renale nespecificate	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0,17*
VII. Hepatic tumors	**5**	**5**	**5**	**7**	**5**	**8**	**6**	**6**	**6**	**3**	**2**	**1**	**4,92**
(a) Hepatoblastom	*4*	*4*	*3*	*4*	*5*	*8*	*4*	*6*	*6*	*0*	*2*	*1*	*3,92*
(b) Carcinom hepatic	*0*	*1*	*2*	*3*	*0*	*0*	*2*	*0*	*0*	*3*	*0*	*0*	*0,92*
(c) Tumori maligne hepatice nespecificate	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0,08*

Location	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Medie anuală a cazurilor noi
VIII. Tumori maligne osoase	**31**	**35**	**36**	**25**	**30**	**27**	**35**	**30**	**29**	**27**	**26**	**20**	**29,25**
(a) Osteosarcoame	*17*	*18*	*19*	*11*	*16*	*20*	*16*	*15*	*14*	*15*	*15*	*8*	*15,33*
(b) Condrosarcoame	*2*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*1*	*2*	*0*	*0*	*0,50*
(c) Tumori Ewing și alte sarcoame osoase	*10*	*15*	*15*	*13*	*13*	*7*	*16*	*12*	*12*	*9*	*11*	*12*	*12,08*
VIII (c)1. Tumoră Ewing și tumoră Askin osoasă	10	15	15	13	13	7	16	12	12	9	11	12	12,08
VIII (c)2. PNET osos	0	0	0	0	0	0	0	0	0	0	0	0	0,00
(d) Alte tumori maligne osoase specificate	*1*	*0*	*2*	*1*	*1*	*0*	*1*	*0*	*1*	*1*	*0*	*0*	*0,67*
VIII (d)1. Neoplasme fibroase osoase maligne	0	0	1	0	0	0	0	0	0	0	0	0	0,08
VIII (d)2. Condroame maligne	0	0	0	0	0	0	0	0	1	0	0	0	0,08
VIII (d)3. Tumori odontogenice maligne	0	0	0	0	0	0	0	0	0	0	0	0	0,00
VIII (d)4. Alte tumori maligne osoase	1	0	1	1	1	0	1	0	0	1	0	0	0,50
(e) Tumori maligne osoase nespecificate	*1*	*2*	*0*	*0*	*0*	*0*	*1*	*3*	*1*	*0*	*0*	*0*	*0,67*
IX. Sarcoame de țesuturi moi și alte sarcoame extraosoase	**33**	**32**	**22**	**21**	**32**	**29**	**34**	**28**	**46**	**29**	**33**	**36**	**31,25**
(a) Rabdomiosarcoame	*21*	*16*	*14*	*8*	*12*	*15*	*18*	*13*	*20*	*12*	*16*	*14*	*14,92*
(b) Fibrosarcoame, tumori de teacă nervoasă periferică și alte tumori fibroase	*4*	*3*	*2*	*0*	*5*	*4*	*2*	*5*	*6*	*2*	*3*	*6*	*3,50*
IX (b)1. Tumori fibroblastice și miofibroblastice	3	3	2	0	2	1	2	5	3	0	1	4	2,17
IX (b)2. Tumori de teacă nervoasă	1	0	0	0	3	3	0	0	3	2	2	2	1,33
IX (b)3. Alte neoplasme fibromatoase	0	0	0	0	0	0	0	0	0	0	0	0	0,00
(c) Sarcom Kaposi	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0,00*
(d) Alte sarcoame specificate de țesuturi moi	*8*	*11*	*5*	*10*	*13*	*9*	*13*	*8*	*17*	*14*	*11*	*16*	*11,25*
IX (d)1. Tumoră Ewing și tumoră Askin de țesuturi moi	10	2	2	3	6	5	4	3	11	5	6	10	5,58
IX (d)2. PNET de țesut moale	1	1	0	0	1	1	0	0	1	1	0	0	0,50
IX (d)3. Tumoră rabdoidă extrarenală	0	0	0	1	1	0	2	0	0	0	0	1	0,42
IX (d)4. Liposarcoame	1	0	0	2	0	0	1	0	0	0	0	0	0,33
IX (d)5. Tumori fibrohistiocitare	0	1	0	1	1	0	1	1	3	1	0	3	1,00
IX (d)6. Leiomiosarcoame	1	1	1	0	1	0	0	0	1	0	0	0	0,42
IX (d)7. Sarcoame sinoviale	3	3	0	2	1	1	2	2	1	5	2	1	1,92

Location	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Medie anuală a cazurilor noi
IX (d)8. Tumori de vase de sânge	1	2	2	1	1	1	1	2	0	0	1	0	1,00
IX (d)9. Bone tumors și condromatoase de țesut moale	0	1	0	0	0	0	0	0	0	0	1	0	0,17
IX (d)10. Sarcom alveolar de părți moi	0	0	0	0	0	0	1	0	0	0	0	0	0,08
IX (d) 11. Alte sarcoame de țesuturi moi	1	0	0	0	1	0	1	0	0	2	1	1	0,58
(e) Sarcoame nespecificate de țesuturi moi	*0*	*2*	*1*	*3*	*2*	*1*	*1*	*2*	*3*	*1*	*3*	*0*	*1,58*
X. Tumori germinale, tumori trofoblastice și neoplasme gonadale	**20**	**21**	**18**	**19**	**22**	**15**	**33**	**21**	**23**	**28**	**23**	**32**	**22,92**
(a) Tumori cu celule germinale intracryears oldene și intraspinale	*1*	*6*	*2*	*4*	*4*	*1*	*3*	*3*	*1*	*4*	*5*	*9*	*3,58*
X (a)1. Germinoame intracryears oldene și intraspinale	1	4	1	3	1	1	2	2	1	1	4	5	2,17
X (a)2. Teratoame intracryears oldene și intraspinale	0	0	1	0	3	0	1	0	0	2	0	0	0,58
X (a)3. Carcinoame embrioare intracryears oldene și intraspinale	0	0	0	0	0	0	0	1	0	1	1	0	0,25
X (a)4. Tumori de sac Yolk intracryears oldene și intraspinale	0	1	0	0	0	0	0	0	0	0	0	0	0,08
X (a)5. Coriocarcinoame intracryears oldene și intraspinale	0	0	0	0	0	0	0	0	0	0	0	0	0,00
X (a)6. Tumori mixte intracryears oldene și intraspinale	0	1	0	1	0	0	0	0	0	0	0	4	0,50
(b) Tumori maligne extracryears oldene și extragonadale cu celule germinale	*3*	*3*	*2*	*6*	*1*	*2*	*10*	*6*	*2*	*5*	*4*	*4*	*4,00*
X (b)1. Germinoame maligne extracryears oldene și extragonadale	0	1	0	0	0	0	2	0	0	1	0	0	0,33
X (b)2. Teratoame maligne extracryears oldene și extragonadale	2	0	0	1	0	0	2	1	1	1	0	1	0,75
X (b)3. Carcinoame embrionare extracryears oldene și extragonadale	0	0	0	2	0	0	0	1	0	0	0	0	0,25
X (b)4. Tumori de sac Yolk extracryears oldene și extragonadale	0	0	1	2	1	1	1	1	1	1	1	1	0,92

Location	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Medie anuală a cazurilor noi
X (b)5. Coriocarcinoame extracryears oldene și extragonadale	1	2	1	1	0	1	5	1	0	1	2	2	1,42
X (b)6. Tumori maligne mixte germinale și tumori nespecificate extracryears oldene și extragonadale	0	0	0	0	0	0	0	2	0	1	1	0	0,33
(c) Tumori maligne cu celule germinale ale gonadelor	*11*	*9*	*13*	*9*	*14*	*11*	*16*	*9*	*18*	*16*	*10*	*13*	*12,42*
X (c)1. Germinoame maligne gonadale	6	3	2	3	3	4	2	2	3	2	3	3	3,00
X (c)2. Teratoame maligne gonadale	5	3	5	2	5	1	6	2	5	2	2	2	3,33
X (c)3. Carcinoame embrionare gonadale	0	0	1	1	1	1	4	1	1	4	0	1	1,25
X (c)4. Tumori de sac Yolk gonadale	0	2	1	1	0	0	1	0	2	4	2	0	1,08
X (c)5. Coriocarcinoame gonadale	0	0	0	1	0	1	0	0	0	0	0	0	0,17
X (c)6. Tumori maligne mixte gonadale	0	1	4	1	5	4	3	4	7	4	3	7	3,58
X (c)7. Gonadoblastom gonadal	0	0	0	0	0	0	0	0	0	0	0	0	0,00
(d) Carcinoame gonadale	*3*	*1*	*0*	*0*	*2*	*0*	*4*	*2*	*1*	*1*	*2*	*2*	*1,50*
(e) Tumori maligne gonadale altele și nespecificate	*2*	*2*	*1*	*0*	*1*	*1*	*1*	*0*	*1*	*2*	*2*	*4*	*1,42*
XI. Alte neoplasme epiteliale și melanoame maligne	**18**	**24**	**20**	**25**	**24**	**21**	**33**	**34**	**18**	**37**	**23**	**22**	**24,92**
(a) Carcinoame adrenocorticale	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*1*	*0*	*1*	*0,25*
(b) Carcinoame tiroidiene	*3*	*5*	*7*	*6*	*10*	*6*	*12*	*6*	*9*	*12*	*10*	*4*	*7,50*
(c) Carcinoame de nasofaringe	*6*	*5*	*4*	*6*	*4*	*7*	*6*	*8*	*1*	*4*	*3*	*1*	*4,58*
(d) Melanoame maligne	*2*	*2*	*2*	*2*	*2*	*4*	*3*	*7*	*0*	*5*	*1*	*4*	*2,83*
(e) Carcinoame de piele	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0,17*
(f) Alte carcinoame și carcinoame nespecificate	*7*	*11*	*7*	*11*	*8*	*4*	*12*	*13*	*6*	*15*	*9*	*12*	*9,58*
XI (f)1. Carcinoame ale glandelor salivare	1	1	0	1	0	0	0	0	0	1	0	0	0,33
XI (f)2. Carcinoame de colon și rect	0	2	3	3	2	0	1	1	0	1	0	0	1,08
XI (f)3. Carcinoame apendiculare	1	3	2	3	4	2	5	7	2	6	4	8	3,92
XI (f)4. Carcinoame pulmonare	2	1	2	0	1	1	1	0	0	0	1	0	0,75
XI (f)5. Carcinoame timice	0	0	0	0	0	0	1	0	1	1	1	0	0,33
XI (f)6. Carcinoame mamare	0	0	0	0	0	0	0	0	1	0	1	1	0,25

Location	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Medie anuală a cazurilor noi
XI (f)7. Carcinoame de cervix uterin	0	0	0	0	0	0	0	0	0	0	0	1	0,08
XI (f)8. Carcinoame de vezica urinara	0	0	0	0	0	0	1	0	0	0	0	0	0,08
XI (f)9. Carcinoame oculare	0	0	0	0	0	0	0	0	0	0	0	0	0,00
XI (f)10. Carcinoame ale altor zone specificate	1	3	1	1	1	1	3	3	1	6	1	2	2,00
XI (f)11. Carcinoame ale altor zone nespecificate	2	1	0	3	0	0	0	2	1	0	1	0	0,83
XII.Alte malignități, malignități nespecificate	**9**	**3**	**1**	**0**	**2**	**2**	**1**	**0**	**0**	**1**	**0**	**2**	**1,75**
(a) Alte Bone tumors specificate	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*1*	*1*	*1*	*0,42*
XII (a)1. Tumoră stromală gastrointestinală	0	0	0	0	0	0	0	0	0	0	0	0	0,00
XII (a)2. Pancreatoblastom	0	0	0	0	0	0	0	0	0	0	1	0	0,08
XII (a)3. Blastom pulmonar si blastom pleuropulmonar	0	0	0	0	1	0	0	0	0	0	0	0	0,08
XII (a)4. Alte neoplasme complexe mixte și stromale	0	0	0	0	0	0	0	0	0	0	0	0	0,00
XII (a)5. Mesoteliom	0	1	0	0	0	0	0	0	0	0	0	1	0,17
XII (a)6. Alte tumori maligne specificate	0	0	0	0	0	0	0	0	0	1	0	0	0,08
(b) Alte tumori maligne nespecificate	*9*	*2*	*1*	*0*	*1*	*2*	*1*	*0*	*0*	*0*	*1*	*1*	*1,50*

Regarding the referral of cases registered in the **RNOHP** database, this is reflected by the notifications of new cases transmitted by each pediatric oncology-hematology center in accordance with the reporting rules to the cancer registry. The referral is reflected by the registration of the new case in each department involved in the patient's care, so that, for a case whose clinical pathway involves multiple departments, each department that notifies **RNOHP** is taken into account.

The analysis of case distribution by centers according to tumor type indicates a trend of specialization of departments regarding malignant hematopathies versus solid tumors, especially in medical centers where there are both institutes and children's hospitals with pediatric oncology-hematology departments (Table 12).

Thus, leukemias were predominantly diagnosed and treated at the Fundeni Clinical Institute (ICF) (40% of leukemias recorded nationwide), while solid tumors are treated in most centers across the country, with the majority (over 60%) resorting to the services of the Oncology Institutes in Bucharest (IOB) and Cluj-Napoca (IOCN). Additionally, the majority of CNS tumors are concentrated at the "Prof. Dr. Alexandru Trestioreanu" Oncological Institute in Bucharest (over 60%).

It should also be emphasized that all hospitals treating malignant hematopathies also have a significant caseload of non-malignant hematologic cases. Additionally, it should be noted that with the onset of the COVID-19 pandemic, some local departments have ceased to accept oncology cases (Gavril

Curteanu Municipal Clinical Hospital Oradea, Pediatric Department II of Târgu-Mureș County Clinical Hospital).

Table 12 - Case Distribution of Pediatric Oncology-Hematology Centers by Location

Location	IOB	IOCN	SCUC Sf.Maria Iași	ICF	SCUC M.S.Curie Bucuresti	SCUC L.Turcanu Timișoara	SCJU Tg Mureș	SCUC Cluj	SCJU Craiova	SCUC Brașov	SCM G.Curteanu Oradea
I. Leukemias, boli mieloproliferative și sindroame mielodisplazice	**24**	**56**	**303**	**468**	**98**	**144**	**91**	**187**	**51**	**31**	**30**
(a) Leukemias acute limfoblastice	18	41	232	380	61	84	78	146	43	26	22
I(a)1. Leukemias cu celule precursoare	13	31	229	377	61	80	78	143	42	26	22
I(a)2. Leukemias cu celule B mature	5	2	2	3	0	2	0	3	0	0	0
I(a)3. Leukemias cu celule T mature și Leukemias cu NK	0	0	1	0	0	2	0	0	1	0	0
I(a)4. Leukemias limfoblastice, NOS	0	0	0	0	0	0	1	29	4	0	0
(b) Leukemias acute mieloblastice	3	10	55	67	6	20	6	7	2	2	0
(c) Boli mieloproliferative cronice	*3*	*2*	*2*	*14*	*0*	*2*	*3*	*2*	*1*	*0*	*6*
(d) Sindroame mielodisplazice și alte boli mieloproliferative cronice	*0*	*1*	*3*	*6*	*0*	*2*	*1*	*3*	*1*	*0*	*1*
(e) Alte Leukemias specificate și nespecificate	*1*	*2*	*11*	*1*	*31*	*36*	*5*	*0*	*15*	*3*	*1*
II. Lymphomas și neoplasme reticuloendoteliale	**94**	**111**	**133**	**98**	**99**	**64**	**36**	**53**	**7**	**18**	**22**
(a) Lymphomas Hodgkin	50	57	64	52	36	35	12	31	5	8	13
(b) Lymphomas non-Hodgkin (fără limfom Burkitt)	15	34	19	26	28	15	11	3	1	5	7
II(b)1 Lymphomas cu celule precursoare	5	10	6	6	6	4	5	9	1	1	6
II(b)2 Lymphomas cu celule B nature (fără limfom Burkitt)	5	8	4	9	4	3	3	1	2	2	0
II(b)3 Lymphomas cu celule T mature și cu celule NK	5	13	6	9	3	0	3	2	1	0	0

Location	IOB	IOCN	SCUC Sf.Maria Iași	ICF	SCUC M.S.Curie Bucuresti	SCUC L.Turcanu Timișoara	SCJU Tg Mureș	SCUC Cluj	SCJU Craiova	SCUC Brașov	SCM G.Curteanu Oradea
II(b)4 Limfom non-Hodgkin, NOS	0	3	3	2	15	8	0	0	1	2	1
(c) Limfom Burkitt	16	10	29	15	20	10	8	15	0	5	1
(d) Alte neoplasme reticuloendoteliale	13	10	20	5	13	3	2	5	3	0	1
(e) Lymphomas nespecificate	0	0	1	0	2	1	0	2	0	0	0
III. Neoplasme CNS și alte neoplasme intracryears oldene și intraspinale	**348**	**177**	**94**	**0**	**4**	**21**	**2**	**4**	**13**	**2**	**17**
(a) Ependymomas and choroid plexus tumors	33	22	12	0	0	2	0	0	2	1	3
III (a)1. Ependimoame	31	21	9	0	0	2	0	0	2	1	1
III(a)2. Choroid plexus tumors	2	1	3	0	0	0	2	0	0	0	2
(b) Astrocytomas	115	52	39	0	1	11	0	0	2	1	2
(c) Intracryears oldal and intraspinal embryonal tumors	111	49	26	0	1	6	0	0	7	0	0
III (c)1. Medulloblastomas	82	37	23	0	0	6	0	0	6	0	0
III (c)2. PNET	16	8	3	0	1	0	0	1	1	0	0
III (c)3. Medulloepitheliomas	4	0	0	0	0	0	0	0	0	0	0
III (c)4. Tumoră teratoidă/rabdoidă atipică	9	4	0	0	0	0	0	0	0	0	0
III (d) Other gliomas	38	25	13	0	1	1	0	0	0	0	6
III (d)1. Oligodendrogliomas	2	4	0	0	0	0	0	0	0	0	1
III (d)2. Mixed gliomas and unspecified gliomas	35	20	11	0	1	1	0	1	0	0	5
III (d)3. Neuroepithelial glial tumors with uncertain origin	1	1	2	0	0	0	0	0	0	0	0
(e) Other specified intracryears oldal and intraspinal neoplasms	17	13	2	0	1	0	0	0	1	0	1
III (e)1. Pituitary adenomas and carcinomas	0	1	0	0	0	0	0	0	0	0	1
III (e)2. Tumors of the sellar region (cryears oldopharyngiomas)	3	2	0	0	0	0	0	0	0	0	0
III (e)3. Parenchymal pineal tumors	1	4	0	0	0	0	0	0	0	0	0

Location	IOB	IOCN	SCUC Sf.Maria Iași	ICF	SCUC M.S.Curie Bucuresti	SCUC L.Turcanu Timișoara	SCJU Tg Mureș	SCUC Cluj	SCJU Craiova	SCUC Brașov	SCM G.Curteanu Oradea
III (e)4. Neuronal and mixed glioneuronal tumors	11	3	2	0	1	0	0	0	1	0	0
III (e)5. Meningiomas	2	3	0	0	0	0	0	0	0	0	0
(f) Unspecified intracryears oldal and intraspinal neoplasms	34	16	2	0	0	1	0	2	2	0	5
IV. Neuroblastoame și alte tumori nervoase periferice	**63**	**30**	**52**	**2**	**58**	**24**	**10**	**35**	**7**	**3**	**7**
(a) Neuroblastoma și ganglioNeuroblastoma	61	30	52	2	58	24	10	34	7	3	7
(b) Other tumors of peripheral nerve cells	2	1	0	0	0	0	0	1	0	0	0
V. Retinoblastoma	**37**	**18**	**10**	**0**	**1**	**2**	**3**	**1**	**5**	**0**	**3**
VI. Renal tumors	**40**	**16**	**36**	**2**	**63**	**23**	**14**	**26**	**9**	**3**	**7**
(a) Nefroblastom și alte Renal tumors nonepiteliale	36	14	36	2	61	23	14	26	9	3	5
VI (a)1. Nefroblastom	36	0	36	2	61	23	14	26	9	3	1
VI (a)2. Tumoră rabdoidă renală	0	0	0	0	0	0	0	0	0	0	0
VI (a)3. Sarcom renal	0	0	0	0	0	0	0	0	0	0	0
VI (a)4. PNET renal	0	0	0	0	0	0	0	0	0	0	0
(b) Carcinoame renale	4	2	0	0	1	0	0	0	0	0	0
(c) Tumori maligne renale nespecificate	0	0	0	0	1	0	0	0	0	0	1
VII. Hepatic tumors	**14**	**0**	**9**	**0**	**13**	**3**	**1**	**12**	**2**	**0**	**1**
(a) Hepatoblastom	13	0	7	0	10	2	1	10	1	0	1
(b) Carcinom hepatic	1	0	1	0	3	1	0	2	1	0	0
(c) Tumori maligne hepatice nespecificate	0	0	1	0	0	0	0	0	0	0	0
VIII. Tumori maligne osoase	**100**	**16**	**51**	**0**	**65**	**29**	**7**	**3**	**7**	**0**	**2**
(a) Osteosarcoame	45	0	34	0	32	15	0	0	3	0	2
(b) Condrosarcoame	0	0	0	0	3	0	1	0	0	0	0
(c) Tumori Ewing și alte sarcoame osoase	53	27	14	0	28	12	5	3	3	0	0
VIII (c)1. Tumoră Ewing și tumoră Askin osoasă	53	27	14	0	28	12	5	3	3	0	0
VIII (c)2. PNET osos	0	0	0	0	0	0	0	0	0	0	0
(d) Alte tumori maligne osoase specificate	2	2	0	0	0	2	0	0	1	0	0
VIII (d)1. Neoplasme fibroase osoase maligne	0	0	0	0	0	1	0	0	0	0	0

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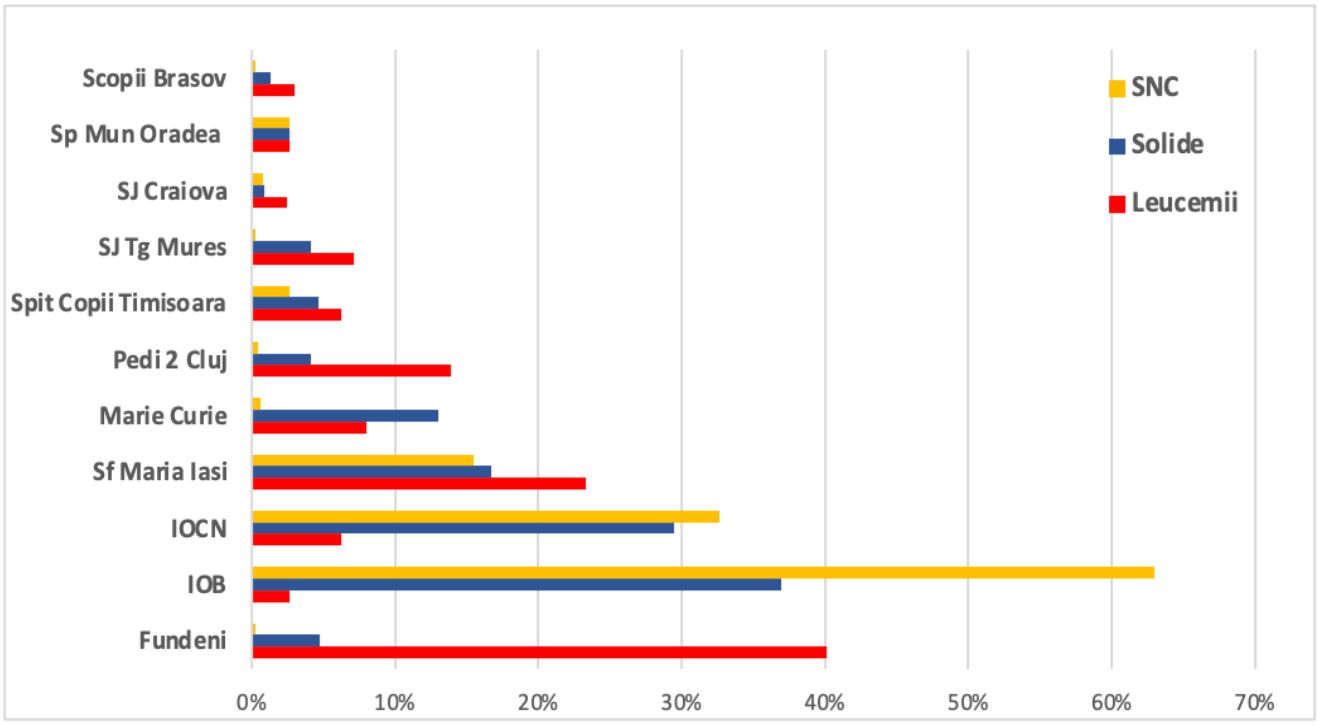
VIII (d)2. Condroame maligne	0	1	0	0	0	0	0	0	0	0	0
VIII (d)3. Tumori odontogenice maligne	2	0	0	0	0	0	0	0	0	0	0
VIII (d)4. Alte tumori maligne osoase	0	1	0	0	0	1	0	0	1	0	0
(e) Tumori maligne osoase nespecificate	0	0	3	0	2	0	1	1	0	0	0
IX. Sarcoame de țesuturi moi și alte sarcoame extraosoase	**130**	**112**	**48**	**2**	**27**	**25**	**9**	**8**	**3**	**3**	**5**
(a) Rabdomiosarcoame	63	46	19	2	16	17	4	5	1	2	2
(b) Fibrosarcoame, tumori de teacă nervoasă periferică și alte tumori fibroase	10	16	7	0	3	2	1	0	1	1	0
IX (b)1. Tumori fibroblastice și miofibroblastice	7	10	2	0	3	2	1	0	0	0	0
IX (b)2. Tumori de teacă nervoasă	3	6	5	0	0	0	0	0	1	1	0
IX (b)3. Alte neoplasme fibromatoase	0	0	0	0	0	0	0	0	0	0	0
(c) Sarcom Kaposi	0	0	0	0	0	0	0	0	0	0	0
(d) Alte sarcoame specificate de țesuturi moi	52	42	18	0	7	6	3	3	1	0	3
IX (d)1. Tumoră Ewing și tumoră Askin de țesuturi moi	25	12	5	0	3	3	2	2	0	0	1
IX (d)2. PNET de țesut moale	2	5	0	0	0	0	0	0	0	0	0
IX (d)3. Tumoră rabdoidă extrarenală	2	1	0	0	1	0	0	1	0	0	0
IX (d)4. Liposarcoame	0	1	2	0	0	0	0	0	0	0	1
IX (d)5. Tumori fibrohistiocitare	4	7	0	0	0	0	1	0	0	0	0
IX (d)6. Leiomiosarcoame	1	0	4	0	0	0	0	0	0	0	0
IX (d)7. Sarcoame sinoviale	8	8	5	0	1	0	0	0	1	0	0
IX (d)8. Tumori de vase de sânge	5	2	1	0	2	2	0	0	0	0	0
IX (d)9. Bone tumors și condromatoase de țesut moale	1	1	0	0	0	0	0	0	0	0	0
IX (d)10. Sarcom alveolar de părți moi	1	0	0	0	0	0	0	0	0	0	0

Location	IOB	IOCN	SCUC Sf.Maria Iași	ICF	SCUC M.S.Curie Bucuresti	SCUC L.Turcanu Timișoara	SCJU Tg Mureș	SCUC Cluj	SCJU Craiova	SCUC Brașov	SCM G.Curteanu Oradea
IX (d) 11. Alte sarcoame de țesuturi moi	3	2	1	0	0	1	0	0	0	0	0
(e) Sarcoame nespecificate de țesuturi moi	5	8	4	0	1	0	1	0	0	0	0
X. Tumori germinale, tumori trofoblastice și neoplasme gonadale	**73**	**80**	**43**	**2**	**26**	**15**	**9**	**7**	**4**	**4**	**3**
(a) Tumori cu celule germinale intracryears oldene și intraspinale	22	11	6	0	1	0	1	0	0	0	1
X (a)1. Germinoame intracryears oldene și intraspinale	11	6	6	0	1	0	0	0	0	0	1
X (a)2. Teratoame intracryears oldene și intraspinale	5	2	0	0	0	0	0	0	0	0	0
X (a)3. Carcinoame embrioare intracryears oldene și intraspinale	2	0	0	0	0	0	1	0	0	0	0
X (a)4. Tumori de sac Yolk intracryears oldene și intraspinale	0	0	0	0	0	0	0	0	0	0	0
X (a)5. Coriocarcinoame intracryears oldene și intraspinale	1	0	0	0	0	0	0	0	0	0	0
X (a)6. Tumori mixte intracryears oldene și intraspinale	3	3	0	0	0	0	0	0	0	0	0
(b) Tumori maligne extracryears oldene și extragonadale cu celule germinale	16	13	7	0	6	3	1	1	0	1	0
X (b)1. Germinoame maligne extracryears oldene și extragonadale	2	1	0	0	0	0	0	1	0	0	0
X (b)2. Teratoame maligne extracryears oldene și extragonadale	2	0	3	0	4	0	0	0	0	0	0
X (b)3. Carcinoame embrionare extracryears oldene și extragonadale	0	1	1	0	1	0	0	0	0	0	0
X (b)4. Tumori de sac Yolk extracryears	1	3	3	0	1	2	1	0	0	0	0

Location	IOB	IOCN	SCUC Sf.Maria Iași	ICF	SCUC M.S.Curie Bucuresti	SCUC L.Turcanu Timișoara	SCJU Tg Mureș	SCUC Cluj	SCJU Craiova	SCUC Brașov	SCM G.Curteanu Oradea
oldene și extragonadale											
X (b)5. Coriocarcinoame extracryears oldene și extragonadale	11	5	0	0	0	0	0	0	0	1	0
X (b)6. Tumori maligne mixte germinale și tumori nespecificate extracryears oldene și extragonadale	0	3	0	0	0	1	0	0	0	0	0
(c) Tumori maligne cu celule germinale ale gonadelor	30	43	24	2	16	8	7	4	3	3	2
X (c)1. Germinoame maligne gonadale	8	12	4	0	3	2	3	1	0	0	1
X (c)2. Teratoame maligne gonadale	9	8	9	1	5	4	2	0	1	1	0
X (c)3. Carcinoame embrionare gonadale	4	4	1	0	1	1	1	1	0	0	0
X (c)4. Tumori de sac Yolk gonadale	0	1	3	0	3	0	1	0	1	2	1
X (c)5. Coriocarcinoame gonadale	1	1	0	0	0	0	0	0	0	0	0
X (c)6. Tumori maligne mixte gonadale	8	17	7	1	4	1	0	2	1	0	0
X (c)7. Gonadoblastom gonadal	0	0	0	0	0	0	0	0	0	0	0
(d) Carcinoame gonadale	2	9	3	0	1	3	0	0	0	0	0
(e) Tumori maligne gonadale altele și nespecificate	3	4	3	0	2	1	0	0	1	0	0
XI. Alte neoplasme epiteliale și melanoame maligne	**64**	**166**	**18**	**2**	**11**	**12**	**2**	**4**	**3**	**0**	**4**
(a) Carcinoame adrenocorticale	1	0	1	0	0	0	0	0	0	0	1
(b) Carcinoame tiroidiene	3	86	0	0	0	1	0	0	0	0	0
(c) Carcinoame de nasofaringe	10	22	8	0	5	1	1	3	0	0	0
(d) Melanoame maligne	12	14	2	0	0	1	0	0	0	0	3
(e) Carcinoame de piele	1	0	0	0	0	0	0	0	1	0	0

Location	IOB	IOCN	SCUC Sf.Maria Iași	ICF	SCUC M.S.Curie Bucuresti	SCUC L.Turcanu Timișoara	SCJU Tg Mureș	SCUC Cluj	SCJU Craiova	SCUC Brașov	SCM G.Curteanu Oradea
(f) Alte carcinoame și carcinoame nespecificate	37	44	7	2	6	0	1	0	2	0	0
XI (f)1. Carcinoame ale glandelor salivare	1	1	0	0	0	1	0	0	0	0	0
XI (f)2. Carcinoame de colon și rect	6	4	2	0	2	0	1	0	0	0	0
XI (f)3. Carcinoame apendiculare	3	27	0	1	0	2	0	0	0	0	0
XI (f)4. Carcinoame pulmonare	17	3	0	0	1	1	0	0	2	0	0
XI (f)5. Carcinoame timice	3	0	0	0	0	1	0	0	0	0	0
XI (f)6. Carcinoame mamare	1	2	0	0	0	0	0	0	0	0	0
XI (f)7. Carcinoame de cervix uterin	0	0	1	0	0	0	0	0	0	0	0
XI (f)8. Carcinoame de vezica urinara	0	1	0	0	0	0	0	0	0	0	0
XI (f)9. Carcinoame oculare	0	0	0	0	0	0	0	0	0	0	0
XI (f)10. Carcinoame ale altor zone specificate	6	6	2	0	1	4	0	1	0	0	0
XI (f)11. Carcinoame ale altor zone nespecificate	3	0	2	1	2	0	0	0	0	0	0
XII.Alte malignități, malignități nespecificate	**7**	**4**	**2**	**0**	**2**	**2**	**0**	**1**	**0**	**0**	**1**
(a) Alte tumori specificate	1	1	1	0	1	1	0	0	0	0	0
XII (a)1. Tumoră stromală gastrointestinală	0	0	1	0	0	0	0	0	0	0	0
XII (a)2. Pancreatoblastom	1	0	0	0	0	0	0	0	0	0	0
XII (a)3. Blastom pulmonar și blastom pleuropulmonar	0	0	0	0	0	1	0	0	0	0	0
XII (a)4. Alte neoplasme complexe mixte și stromale	0	0	0	0	0	0	0	0	0	0	0
XII (a)5. Mesoteliom	0	1	1	0	0	0	0	0	0	0	0
XII (a)6. Alte tumori maligne specificate	0	0	0	0	1	0	0	0	0	0	0
(b) Alte tumori maligne nespecificate	6	3	1	0	1	1	0	1	0	0	1



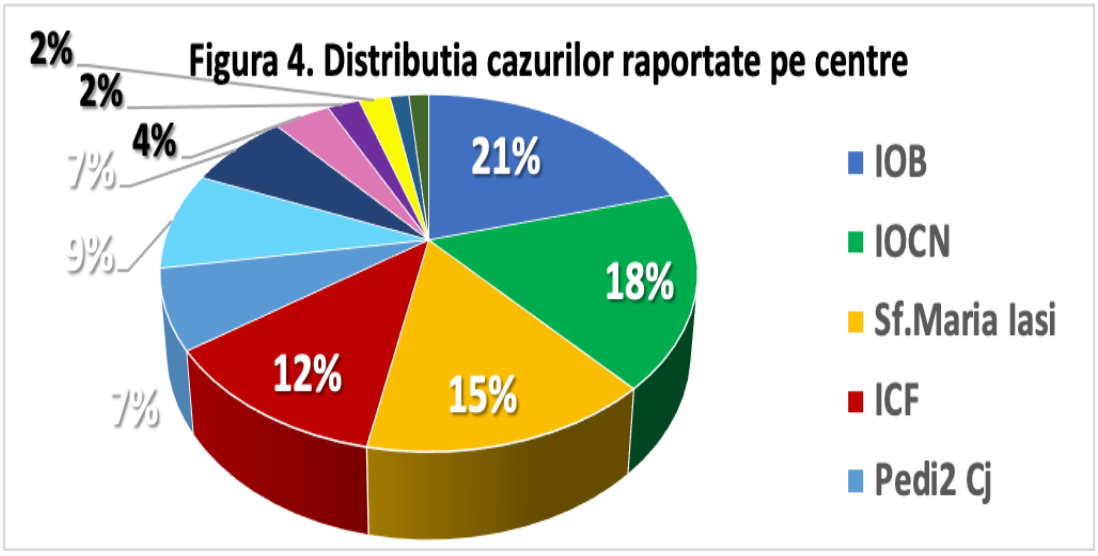


Figure 4: Distribution of Reported Cases by Centers

Figure 5: Cases Addressability (%) by Centers and Tumor Types

• 2.3 Geographic Distribution

Regarding the distribution of cases by counties, significant variations in the number of new cases are observed both between counties (dependent on the number and proportion of the population aged 0-19), and within the casuistry of the same county from one year to another.

Tabel 13: The distribution of the number of new cases annually by counties. (2012 -2021)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	TOTAL 2012 - 2021	Medie cazuri noi/an
Alba	6	7	7	4	6	9	7	9	4	2	61	**11,09**
Arad	10	8	9	5	7	15	9	12	8	5	88	**16,00**
Argeș	14	6	7	8	7	16	9	10	13	10	100	**18,18**
Bacău	21	15	19	11	12	9	13	10	18	10	138	**25,09**
Bihor	21	21	12	11	12	18	15	12	14	18	154	**28,00**
Bistrița-Năsăud	7	5	13	8	4	5	8	3	6	8	67	**12,18**
Botoșyears old	7	11	12	6	6	8	9	11	7	11	88	**16,00**
Brăila	6	4	4	4	11	3	13	6	4	4	59	**10,73**
Brașov	11	8	8	8	13	12	9	11	23	20	123	**22,36**
Buzău	10	7	10	9	8	11	8	1	4	9	77	**14,00**
Călărași	6	5	4	2	8	4	11	6	5	8	59	**10,73**
Caraș-Severin	5	3	3	4	4	5	6	6	4	2	42	**7,64**
Cluj	18	13	18	11	20	15	19	15	20	19	168	**30,55**
Constanța	17	15	16	11	30	16	7	11	11	19	153	**27,82**
Covasna	1	4	1	6	11	4	7	7	3	10	54	**9,82**
Dâmbovița	7	8	6	9	10	17	10	10	7	11	95	**17,27**
Dolj	14	15	13	16	7	11	10	13	12	17	128	**23,27**
Galați	9	4	11	13	15	8	5	9	12	8	94	**17,09**
Giurgiu	7	8	4	2	7	3	4	6	5	7	53	**9,64**
Gorj	4	8	8	2	8	6	7	10	8	7	68	**12,36**
Harghita	5	3	7	4	6	6	11	9	8	4	63	**11,45**
Hunedoara	5	10	3	10	13	5	9	6	9	7	77	**14,00**
Ialomița	3	3	8	10	5	6	2	5	4	5	51	**9,27**
Iași	27	17	13	28	18	21	14	21	21	21	201	**36,55**

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	TOTAL 2012 - 2021	Medie cazuri noi/an
Ilfov	7	9	10	6	5	12	7	9	7	18	90	**16,36**
Maramureș	5	12	15	13	16	7	11	12	3	4	98	**17,82**
Mehedinți	1	4	7	4	6	6	4	6	2	6	46	**8,36**
Municipiul București	23	32	49	35	33	41	41	47	42	35	378	**68,73**
Mureș	13	18	16	17	13	17	11	17	11	8	141	**25,64**
Neamț	11	14	4	20	6	9	11	10	4	8	97	**17,64**
Olt	3	5	6	9	5	6	5	6	8	7	60	**10,91**
Prahova	14	16	16	10	11	15	13	10	15	14	134	**24,36**
Sălaj	5	9	6	5	6	3	4	4	10	8	60	**10,91**
Satu Mare	7	7	13	6	5	9	10	7	5	4	73	**13,27**
Sibiu	5	6	10	7	11	7	11	6	12	10	85	**15,45**
Suceava	24	24	17	17	15	22	15	14	10	24	182	**33,09**
Teleorman	9	1	10	6	4	8	5	6	6	6	61	**11,09**
Timiș	7	4	11	6	8	10	10	17	7	14	94	**17,09**
Tulcea	4	7	3	4	2	4	1	5	1	4	35	**6,36**
Vâlcea	6	5	2	6	7	6	10	4	6	9	61	**11,09**
Vaslui	12	12	8	9	4	10	13	13	15	9	105	**19,09**
Vrancea	9	6	10	6	7	5	10	5	10	9	77	**14,00**

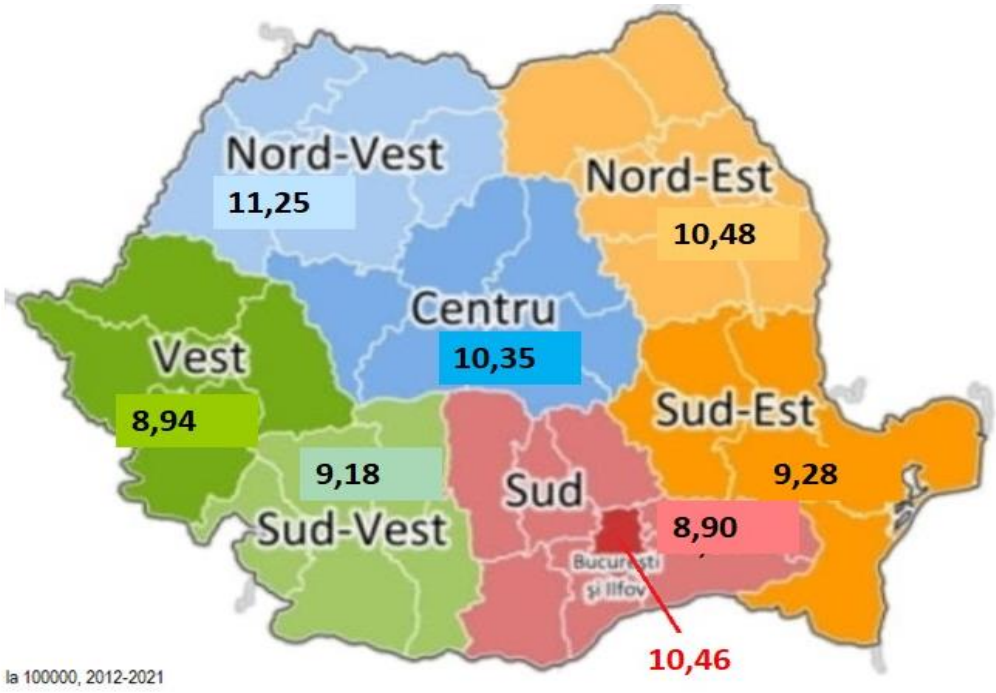
Regarding the distribution by regions, the highest incidences, both in the age groups 0-14 and 0-19 years, were recorded in the North-West region – a result of access to multiple sources of cases, due to the data flow with the North-West Regional Cancer Registry. Incidences above the national average were also recorded in the North-East, Central, and Bucharest-Ilfov regions, indicating an increased addressability of cases from those territories to the centers in the region, respectively in the national network of pediatric onco-hematology. Conversely, the South-East, South-Muntenia, and West regions are situated with an annual caseload below the national average.

Tabel 14: Distribution of new cases by development regions (crude and ASR incidences)

EUROREGIUNE	Incidence* 0-14 years old (crude)	ASR ** 0-14 years old	Incidence 0-19 years old (crude)	ASR 0-19 years old
Nord-Vest	11,76	11,33	11,35	11,25
Nord-Est	11,03	10,87	10,62	10,48
Centru	11,02	11,04	10,45	10,35
Vest	8,52	9,00	8,53	8,94
Sud-Est	10,53	10,09	9,63	9,28
Sud-Vest	11,35	10,25	11,14	9,18
Sud-Muntenia	10,26	9,73	9,29	8,90
București-Ilfov	10,98	11,19	10,09	10,46

** la 100000; **populația standard europeana (2016)*

**The counties included in each of these economic development regions are: for the North-East development region (Bacău, Botoșyears old, Iași, Neamț, Suceava, and Vaslui); for the South-East region*



(Brăila, Buzău, Constanța, Galați, Tulcea, and Vrancea); for the South-Muntenia region (Argeș, Călărași, Dâmbovița, Giurgiu, Ialomița, Prahova, and Teleorman); for the South-West Oltenia development region (Dolj, Gorj, Mehedinți, Olt, and Vâlcea); for the West development region (Arad, Caraș-Severin, Hunedoara, and Timiș); for the North-West region (Bihor, Bistrița-Năsăud, Cluj, Maramureș, Satu Mare, and Sălaj); for the Center region (Alba, Brașov, Covasna, Harghita, Mureș, and Sibiu); and for the Bucharest-Ilfov Region (Bucharest municipality and Ilfov county).

Figure 6: ASR 0-19 years old by Euroregions

The annual number of new cases by locations recorded at the regional level reflects both the size of the pediatric/adolescent population in the region and the accessibility within the national network of Pediatric Hematology-Oncology (PHO) centers. From this perspective, it can be observed that for most locations, the highest number of new cases per year is recorded in the North-East region, which has the largest proportion of the 0-19-year-old population among all regions in the country, along with the increased accessibility of cases to the Sf Maria Hospital in Iași, the sole Pediatric Hematology-Oncology center in the largest region of the country (Table 15).

Table 15: Average annual number of new cases per development regions for the main ICCC3 groups

	BUCUREȘTI - ILFOV	CENTRU	NORD-EST	SUD-EST	SUD	SUD-VEST	VEST	NORD-VEST
Leukemias, boli mieloproliferative și	14,50	14,75	22,75	12,75	16,08	10,83	7,50	16,42

	BUCUREȘTI - ILFOV	CENTRU	NORD-EST	SUD-EST	SUD	SUD-VEST	VEST	NORD-VEST
sindroame mielodisplazice								
Lymphomas și neoplasme reticuloendoteliale	5,08	7,42	12,58	5,17	7,58	5,25	4,50	8,67
Neoplasme CNS și alte neoplasme intracryears oldene și intraspinale	6,42	5,75	10,83	7,50	8,00	4,42	3,42	6,75
Neuroblastoame și alte tumori nervoase periferice	2,75	3,00	4,33	3,00	2,67	1,42	1,83	4,00
Retinoblastoma	0,83	0,42	1,33	0,50	0,75	0,50	0,33	1,25
Renal tumors	2,67	2,17	2,75	2,50	2,67	1,42	1,58	2,17
Hepatic tumors	0,25	0,67	0,50	0,83	0,75	0,33	0,25	0,92
Tumori maligne osoase	2,33	3,42	5,50	3,42	3,92	2,25	2,67	3,17
Sarcoame de țesuturi moi și alte sarcoame extraosoase	3,00	4,00	4,83	4,00	4,00	2,25	1,58	4,83
Tumori cu celule germinale	1,67	3,50	4,67	2,08	2,50	1,83	1,25	3,75
Alte neoplasme epiteliale și melanoame maligne	1,08	2,92	5,17	2,50	1,83	2,17	2,17	5,58
Alte malignități, malignități nespecificate	0,67	0,33	0,50	0,33	0,25	0,17	0,50	0,42

Regarding the residential environment, the incidence in rural areas is slightly lower than in urban areas both globally and especially for the age group of young children, without necessarily interpreting it as a significant difference in access to diagnosis to the detriment of rural cases. This aspect may be due to both the lower proportion of the infant population in rural areas and the tendency of families with young children to live in cities (Table 16).

Table 16: Crude and ASR Incidences by residential environment (by age groups)

	URBAN			RURAL		
	Număr cazuri	Incidence (bruta, la 100000)	ASR	Număr cazuri	Incidence (bruta, la 100000)	ASR
0-4	998	15,38	17,28	778	13,91	13,20
5-9	559	8,92	8,92	482	7,90	7,43
10-14	554	9,17	8,72	539	7,95	8,31
15-19	493	8,17	7,76	539	7,84	8,31
0-14	2111	11,16	**11,64**	1799	9,92	**9,65**
0-19	2604	10,41	**10,67**	2338	9,40	**9,31**

2.4 Stage at Diagnosis

Staging is established according to the Toronto Classification for Staging Pediatric Cancers by the Cancer Registries (2016).
https://encr.eu/news/encr-endorsement-toronto-childhood-cancer-stage-guidelines
http://www.iacr.com.fr/
https://www.uicc.org/news/8th-edition-uicc-tnm-classification-maliant-tumors-published

Pediatric cancer is characterized by a high heterogeneity of staging systems, sometimes even for the same type of cancer, different staging systems are used. The TNM staging system, introduced in the general cancer reporting form, is difficult to use for pediatric cases, leading globally to a lack of stage registration for children's tumors by population cancer registries. For this reason, international forums (IARC; ENCR; IACR), together with relevant academic entities, have agreed on the need to develop a staging system applicable uniformly for recording pediatric cases at the level of population cancer registries.

Thus, consensus guidelines for staging pediatric cancers were developed, adopted in 2014 in Toronto under the name "Pediatric Cancer Staging Guide for Population Cancer Registries," also known as the **Toronto Staging Guide**. It recommends the most suitable staging system for use by population cancer registries for 16 types of malignant tumors in children and adolescents.

Currently, the use of this staging system has become the international standard for recording pediatric cancer, recommended by the European Network of Cancer Registries (ENCR) and the International Agency for Research on Cancer in Lyon (IARC).

Cancer registries have two levels of complexity available for recording the extent of disease at diagnosis:

Level 1: - mandatory, ensures the identification of metastatic cases at diagnosis and is accessible to all registries, including those with limited access to data and available resources, which may provide less detailed criteria.

Level 2: - optional, with increased complexity, for registries with more resources, direct access to data, and the ability to provide more detailed criteria. (*The synthesis of recommendations from the "Pediatric Cancer Staging Guide for Population Cancer Registries," according to the Toronto consensus, can be found in Annex 2 of this document*).

The RNOHP has implemented the recommendations of the Pediatric Cancer Staging Guide, according to the Toronto consensus, starting from 2018. Therefore, this analysis includes only incident cases from the period 2018-2021, after Level 1 staging..

Although the staging guide according to Toronto includes references to leukemias, considering only cases with central nervous system involvement as advanced (3% of all leukemias presented), this diagnostic class was not included in the analysis, given that the prognosis of these neoplasms decisively depends on risk groups (which involve factors not reportable in the RNOHP platform that has operated until now).

Table 17: Cases diagnosed 2018-2021 – Distribution of advanced/metastatic stages at diagnosis by site (according to Toronto Level 1)

Clasa ICCC3	Număr cazuri	Stadializare Toronto Nivel 1	Din care avansate la diagnostic
II.Lymphomas	235	196	60
III.CNS	228	98	25
IV.Neuroblastoma	101	91	45
V.Retinoblastoma**	29	27	2
VI.Renal tumors	74	57	11
VII.Hepatic tumors **	12	11	5
VIII.Tumori ale oaselor	102	93	29
IX.Tumori țesuturi moi	144	125	41
X.Tumori celule germinale	106	76	13
*** a se interpreta cu prudență, număr mic de cazuri*			

According to Toronto Level 1 staging, the proportion of metastatic cases at diagnosis, across all sites (excluding Leukemias), for the period 2018-2021 is **30.5%**.

The highest number of advanced cases at diagnosis were recorded for Neuroblastomaas, followed by soft tissue and bone tumors, lymphomas, renal tumors, and germ cell tumors. Due to the diagnostic peculiarities and the fact that the Toronto staging system applies only to a portion of CNS tumors (medulloblastoma, astrocytoma, and ependymoma), 57% of CNS localizations were not staged, making it difficult to assess a trend regarding the extent of disease at diagnosis for these tumors.

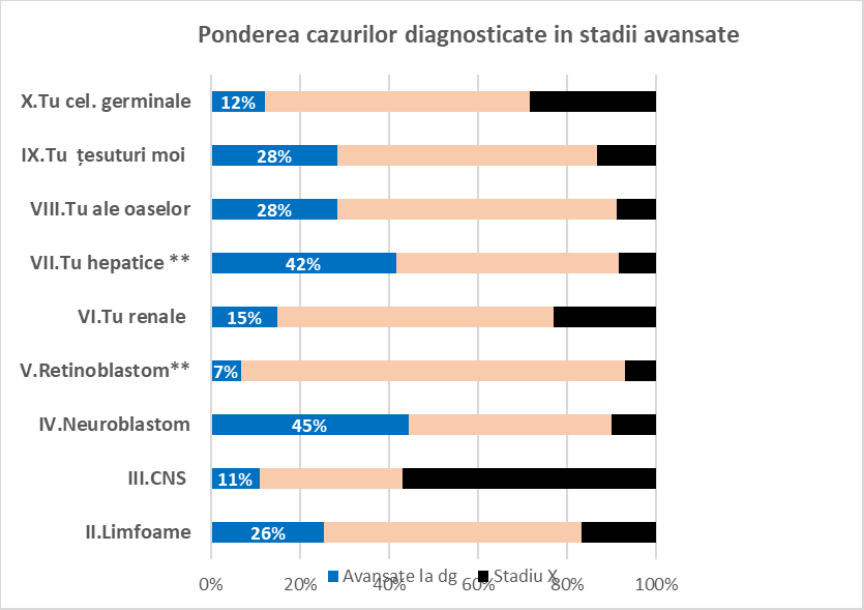
Figure 7: Proportion of cases diagnosed at advanced stages

To explore the hypothesis of a potential impact of delayed diagnosis due to the COVID-19 pandemic, the proportion of cases diagnosed at metastatic stages by tumor types was analyzed according to the year of incidence. However, no consistent pattern significantly indicating delays in diagnosis was observed in 2020 and 2021 compared to 2018 and 2019 (Table 18).

Table 18: Proportion over years (2018-2021) of non-staged cases and cases diagnosed at advanced stages (Toronto Level 1) for the most common locations

.

An	2018		2019		2020		2021	
Location	**% nestadi-alizate**	**% stadii avansate**	**% nestadi-alizate**	**% stadii avansate**	**% nestadi-alizate**	**% stadii avansate**	**% nestadi-alizate**	**% stadii avansate**
II. Lymphomas și neoplasme reticuloendoteliale	**12,90**	**22,58**	**18,18**	**23,64**	**17,54**	**15,79**	**16,39**	**39,34**
(a) Lymphomas Hodgkin	12,12	30,30	0,00	44,00	0,00	23,33	0,00	60,61
(b) Lymphomas Non-Hodgkin (fara limfom Burkitt)	6,67	20,00	80,00	6,67	87,50	12,50	81,82	27,27
III. Neoplasme CNS și alte neoplasme intracryears oldene și intraspinale*	**60,00**	**8,00**	**50,70**	**14,08**	**53,19**	**12,77**	**65,00**	**8,33**
IV. Neuroblastoame și alte tumori nervoase periferice	**17,39**	**56,52**	**4,00**	**56,00**	**12,00**	**60,00**	**7,14**	**42,86**
V. Retinoblastoma	**0,00**	**0,00**	**20,00**	**10,00**	**0,00**	**10,00**	**0,00**	**0,00**
VI. Renal tumors	**25,00**	**5,00**	**41,18**	**11,76**	**14,29**	**19,05**	**12,50**	**25,00**
VII. Hepatic tumors	**0,00**	**50,00**	**33,33**	**66,67**	**0,00**	**0,00**	**0,00**	**0,00**
VIII. Tumori maligne osoase	**6,90**	**24,14**	**18,52**	**33,33**	**0,00**	**19,23**	**10,00**	**40,00**
(a) Osteosarcoame	7,14	21,43	20,00	20,00	0,00	13,33	12,50	12,50
(c) Tumori Ewing și alte sarcoame osoase	0,00	25,00	0,00	66,67	0,00	27,27	8,33	58,33



An	2018		2019		2020		2021	
Location	% nestadi-alizate	% stadii avansate	% nestadi-alizate	% stadii avansate	% nestadi-alizate	% stadii avansate	% nestadi-alizate	% stadii avansate
IX. Sarcoame de țesuturi moi și alte sarcoame extraosoase	**10,87**	**28,26**	**17,24**	**34,48**	**3,03**	**30,30**	**22,22**	**22,22**
(a) Rabdomiosarcoame	5	40	17	25	6	31	0	21
X. Tumori germinale, tumori trofoblastice și neoplasme gonadale	**4,35**	**13,04**	**25,00**	**28,57**	**39,13**	**0,00**	**40,63**	**6,25**

** a se interpreta cu prudență avînd în vedere procentul important al cazurilor fără informații privind stadiul la diagnostic*

The comparative analysis of the proportion of cases diagnosed at metastatic stages based on the child's residential environment revealed a slight trend of delayed diagnosis in rural areas compared to urban areas (22.13% advanced cases in rural areas versus 19.58% in urban areas). However, this difference cannot be statistically interpreted as a significant disparity in access to diagnosis and treatment for new cases. No significant annual variations were observed in relation to the years of the COVID-19 pandemic.

Table 19: Proportion of cases diagnosed at advanced stages (Toronto Level 1) by residential environment and year (2018-2021 period)

		2018	2019	2020	2021	Media
URBAN	Total cazuri stadializate	164	152	153	165	158,5
	Nr cazuri stadii avansate	25	34	28	37	31
	Procent stadii avansate	**15,24**	**22,37**	**18,30**	**22,42**	**19,58**
RURAL	Total cazuri stadializate	163	140	135	145	145,75
	Nr cazuri stadii avansate	35	40	24	30	32,25
	Procent stadii avansate	**21,47**	**28,57**	**17,78**	**20,69**	**22,13**

• 3. SURVIVAL

3.1 METHODOLOGY

In 2023, the second pediatric cancer survival survey was conducted using national data, covering cases from the national network of pediatric oncology and hematology diagnosed between 2010 and 2017. To verify deaths, data was requested from the *Directorate for the Registry of Persons and Database Management*, regarding vital status (including date of death, where applicable) as of December 31, 2022, for cases in the **National Registry of Pediatric Oncology and Hematology (RNOHP)** diagnosed between January 1, 2010, and December 31, 2017.

The *overall survival* was analyzed using the Kaplan-Meier method. Survival rates were calculated for the entire period as well as for incidence cohorts (survival of cases diagnosed between 2010-2013 compared to those diagnosed between 2014-2017), by localization (specifically by ICCC3 classes and the most important diagnostic categories within them), by major age groups (0-19, 0-14), and by five-year age groups (0-4, 5-9, 10-14, 15-19 years), as well as by gender.

Additionally, in the current report, for the first time, an analysis was conducted based on the environment (urban vs. rural) as well as on the euroregions of residence (origin of cases).
Data processing was carried out both internally by the RNOHP team and with the support of the automated analysis platform Danny developed by SQILLINE BUSINESS SOLUTIONS OOD, from Bulgaria.
To enhance the certainty regarding the statistical significance of the results, localizations/analytical units with too few cases (less than 50) were excluded. Furthermore, cautious interpretation of the resulting figures is recommended for cohorts with fewer than 100 cases, especially for dynamic comparisons with variations of small amplitudes (< 3%).
The 5-year survival rates will be updated in 2026 with the diagnostic cohorts from 2018-2021, allowing for the configuration of 4-5-year diagnostic cohorts, which will provide a larger basis of cases for analysis and thus a more robust statistical significance.
Survival studies and the entire activity of RNOHP are supported by non-governmental sources through the partnership of the National Pediatric Onco-Hematology Society with the Daruieste Aripi Association.

3.2 MAIN RESULTS

3.2.1 Survival trends – temporal and demographic dynamics

The analysis was conducted for both the entire case series - the 3328 cases diagnosed from January 1, 2010, to December 31, 2017 (aged between 0 and 19 years), as well as for the 0-14 age group (which represents the pediatric age group of reference in international cancer epidemiology studies).

- The average 5-year survival for all locations/all cases for the entire study period was 70%, respectively 72% for cases aged 0-14 years.
- The trends revealed by the comparative analysis of survival by incidence cohorts (2014-2017 compared to 2010-2013) indicate an average increase in the (overall) survival rate by 5%: from 68% to 73% for cases aged 0-19 years, and from 69% to 74% for the 0-14 age group. (Tables 20 and 21)

Table 20: Overall Survival of cases diagnosed in the period 2010-2017 by major age groups (0-19 vs 0-14)

	Numar cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
0-19	3328	1056	86	85-87	74	72-75	**70**	69-72
0 - 14	2619	797	86	85-88	75	73-76	**72**	70-73

Table 21: Overall survival by incidence cohorts (2010-2013 vs 2014-2017) for major age groups (0-19 vs 0-14)

	Cohorta	Numar cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
0-19 years old	2010-2013	1657	582	84,25	83-86	71,2	69-73	68	66-70
	2014-2017	1671	474	87,61	86-89	76,3	74-78	73	71-75
0-14 years old	2010-2013	1291	436	85,8	83-87	71,5	69-74	69	66-71
	2014-2017	1328	361	88,5	86-90	77,5	75-80	74	72-76

The analysis by five-year age groups across the entire sample indicates a noticeable difference in survival rates in favor of younger age groups (under 10 years) compared to older ages (10 years and above). The lowest survival rate is recorded among adolescents (age group 15-19 years). (Table 22)

Tabel 22: Rata medie de supraviețuire (2010 -2017) pe grupe de vârstă cincinale

Age group *(years old)*	Numar cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
0 – 4	1181	334	86	[84-88]	76	[74-78]	**73**	[71-76]
5 – 9	731	213	89	[86-91]	76	[73-79]	**72**	[68-75]
10 - 14	707	250	85	[82-88]	71	[68-75]	**70**	[64-71]
15 - 19	708	258	85	[82-87]	71	[67-74]	**67**	[63-70]

Regarding survival by gender, slightly higher survival rates are noted for females compared to males, which remain consistent across both incidence cohorts, with a female/male ratio of 71%/67% in the period 2010-2013 and respectively 76%/70% in the period 2014-2017. (Table 23)

Table 23: Survival by gender

Cohorta	Gen	Numar cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
2010-2013	F	707	222	86	83-88	73	70-77	71	67-74
	M	932	345	84	82-87	70	68-73	67	64-70
2014-2017	F	719	183	88	86-91	79	76-82	76	73-79

	M	949	289	87	85-89	74	71-77	**70**	67-73

3.2.2 Survival by location

Survival analysis by location was conducted both globally (at the level of major ICCC3 classes) and for the main diagnostic categories included in each major class. The average survival was calculated for the entire interval from 2010 to 2017, while trends in survival were explored through comparative analysis of the 2010-2013 cohorts versus the 2014-2017 cohorts. Locations/diagnostic categories with fewer than 50 cases per unit of analysis were excluded.

A. Malignant Hemopathies

In this category, *the first two classes of the ICCC3 classification* are grouped as follows:

- **(I) Leukemias, boli limfoproliferative, boli mielodisplazice**
- **(II) Lymphomas și neoplasme reticuloendoteliale**

The overall survival rate for cases diagnosed between 2010 and 2017 was examined for the two major ICCC3 classes (including all diagnostic entities within them), both for the entire case series (0-19 years) and for the age group 0-14 years (which represents the pediatric population of reference in most international studies).

Considering the limited number of cases, specific analysis for adolescents (15-19 years age group) could only be performed for the case series based on the major ICCC3 classes and only for the entire interval from 2010 to 2017.

Survival rates were calculated for all cases recorded between **2010 and 2017**, resulting in 989 cases classified as leukemias and 526 cases classified as lymphomas. The **average 5-year survival rate was 72% for leukemias and 84% for lymphomas**.

For the **0-14 age group**, the 5-year survival rate was **75% for leukemias** and **83% for lymphomas**, while among **adolescents (15-19 years old)**, subject to a lower statistical significance due to the relatively small number of cases, the 5-year survival rate was **60% for leukemias** and **86% for lymphomas** (Table 24).

Table 24: Average survival of cases diagnosed with malignant hematologic diseases (on major ICCC3 classes) and major age groups, period 2010-2017

Location Clase principale ICCC3	Număr cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
0-19 YEARS OLD								

Location Clase principale ICCC3	Număr cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
I Leukemias, boli limfoproliferative, boli mielodisplazice	989	286	84	[81-86]	75	[72-77]	**72**	[69-75]
II Lymphomas și neoplasme reticuloendoteliale	526	93	90	[88-93]	86	[83-89]	**84**	[81-87]
0-14 YEARS OLD								
I Leukemias, boli limfoproliferative, boli mielodisplazice	873	231	86	[83-88]	77	[74-80]	**75**	[72-78]
II Lymphomas și neoplasme reticuloendoteliale	371	66	88	[85-92]	84	[81-88]	**83**	[79-87]
15-19 YEARS OLD								
I Leukemias, boli limfoproliferative, boli mielodisplazice	116	55	72	[62-78]	64	[59-71]	**60**	[56-62]
II Lymphomas și neoplasme reticuloendoteliale	155	27	94	[91-98]	88	[83-94]	**86**	[81-92]

For leukemia, the analysis by diagnostic categories according to ICCC3 was conducted for acute lymphoblastic leukemia (ALL) and acute myeloid leukemia (AML).

- For the overall caseload of the Registry **(0-19 years)**, the 5-year average survival rate for the period **2010-2017** was **77% in ALL** and **48% in AML**.
- In the age category **0-14 years** (the international reference age group for the pediatric population), the 5-year survival recorded in **leukemias** for the period 2010-2017 was **79% for ALL**, **51% for AML**, and 75% in the composite category (ALL, AML, and MDS).

Regarding lymphomas, the ICCC3 diagnostic categories included in the analysis were Hodgkin lymphoma and non-Hodgkin lymphomas (excluding Burkitt lymphoma, which in the ICCC3 classification represents a separate category).

- In the same period (**2010-2017**), the 5-year survival for all ages (**0-19 years**) in lymphomas was **91% in Hodgkin lymphoma**, **77% for non-Hodgkin lymphomas** (excluding Burkitt lymphoma), and **72% in Burkitt lymphoma**.
- For the age category **0-14 years**, in the same period, the 5-year survival in lymphomas was **92% in Hodgkin lymphoma**, **76% in non-Hodgkin lymphomas**, and **72% in Burkitt lymphoma** (considering that 83 out of 87 cases of Burkitt lymphoma were registered in patients aged 14 years or younger) (Table 25).

Table 25 : Survival by major age groups for the most frequent diagnostic categories (ICCC3) of malignant hematopathies in the period 2010-2017

Location ICCC3	Număr cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
0-19 YEARS OLD								
LEUKEMIAS (principalele categorii diagnostice)								
I (a) Leukemias acute limfoblastice	749	182	87	[85-90]	79	[76-82]	**77**	[74-80]
I (b) Leukemias acute mieloblastice	137	74	62	[54-71]	51	[43-60]	**48**	[40-57]
LYMPHOMAS (principalele categorii diagnostice)								
II (a) Lymphomas Hodgkin	257	29	96	[94-99]	93	[89-96]	**91**	[87-94]
II (b) Lymphomas non-Hodgkin *(exceptând Limfom Burkitt)*	134	34	86	[80-92]	78	[72-86]	**77**	[70-84]
II (c) Limfom Burkitt	87	24	78	[70-87]	72	[64-82]	**72**	[64-82]
0-14 YEARS OLD								
LEUKEMIAS (principalele categorii diagnostice)								
I (a) Leukemias acute limfoblastice	682	152	89	[86-91]	81	[78-84]	**79**	[76-87]
I (b) Leukemias acute mieloblastice	109	55	68	[60-77]	56	[47-66]	**51**	[43-62]
LYMPHOMAS (principalele categorii diagnostice)								
II (a) Lymphomas Hodgkin	143	13	95	[92-99]	93	[89-97]	**92**	[87-96]
II (b) Lymphomas non-Hodgkin *(exceptând Limfom Burkitt)*	101	25	85	[78-92]	78	[71-87]	**76**	[68-85]
II (c) Limfom Burkitt	83	23	78	[70-88]	72	[63-83]	**72**	[63-83]

The analysis of survival trends in malignant hematopathies was conducted by comparing the survival outcomes for the 2010-2013 diagnostic cohort with those of the 2014-2017 cohort.

However, it should be noted that these results are influenced by the short time interval of the transition (consecutive 4-year cohorts) and the relatively modest annual number of cases (especially for lymphomas), factors that may amplify minor, statistically insignificant fluctuations. We anticipate that the next survival study (2026), which will increase the studied sample by adding the 2018-2021 diagnostic cohort, will provide a greater statistical certainty for the analysis results.

Currently, we can observe a general trend of slight increase in overall survival for the ICCC3 class of **leukemias** for the case group (**0-19 years**) – increasing from **71%** in the period **2010-2013** to **74%** in the period **2014-2017**, while maintaining a high level of stability in overall survival for **lymphomas at 85% vs 84%**. A similar trend is observed among patients in the **0-14 years** age group, both for leukemias **(73% to 75%)** and lymphomas **(83% to 84%)** (Table 26).

Table 26: Comparative survival in malignant hematopathies (on major ICCC3 classes) between the diagnostic cohorts of 2010-2013 vs 2014-2017.

0-19 YEARS OLD	Număr cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
2010-2013								
I Leukemias, boli limfoproliferative, boli mielodisplazice	490	151	82	[79-86]	73	[69-77]	**71**	[67-75]
II Lymphomas și neoplasme reticuloendoteliale	268	48	89	[86-93]	85	[81-89]	**85**	[80-89]
2014-2017								
I Leukemias, boli limfoproliferative, boli mielodisplazice	499	135	85	[81-88]	77	[73-80]	**74**	[70-78]
II Lymphomas și neoplasme reticuloendoteliale	258	45	91	[88-95]	86	[82-90]	**84**	[79-88]
0-14 years old	**Numar cazuri**	**Decese**	**la 1 an (%)**	**CI 95**	**la 3 years old (%)**	**CI 95**	**la 5 years old (%)**	**CI 95**
2010-2013								
I Leukemias, boli limfoproliferative, boli mielodisplazice	423	117	85	[82-89]	75	[71-80]	**73**	[70-78]
II Lymphomas și neoplasme reticuloendoteliale	183	35	86	[82-91]	83	[77-88]	**83**	[77-88]
2014-2017								
I Leukemias, boli limfoproliferative, boli mielodisplazice	499	135	85	[81-88]	77	[73-80]	**75**	[70-78]
II Lymphomas și neoplasme reticuloendoteliale	258	45	91	[88-95]	86	[82-90]	**84**	[79-88]

Regarding the survival trends in malignant hematopathies for the main ICCC3 diagnostic categories, concerning cases diagnosed in the period 2010-2013 compared to those diagnosed in the period 2014-2017, the **trend of increased survival in leukemias** is confirmed, with the most significant developments being recorded for **acute lymphoblastic leukemias**: the 5-year survival rate increasing **from 74% to 80%** in the general casuistry (0-19), and **from 76% to 81%** for the age group **0-14 years** (Table 27).

Considering the substantial number of cases in both cohorts and the short transition period between them, the 6% increase in the 5-year survival rate can be considered (from an epidemiological perspective) a significant progress in the management of acute lymphoblastic leukemias in our country.

Due to the small number of cases resulting from dividing the cases into diagnostic cohorts (below the threshold of 50 cases per analysis unit), acute myeloid leukemias could no longer be included in the calculation.

In the case of **lymphomas**, there is a **stability in the survival rates** around **90% for Hodgkin lymphoma**, both in the overall case series and for the age group 0-14 years. Meanwhile, **for non-Hodgkin lymphomas** (excluding Burkitt lymphoma), there is an increase in the 5-year survival **from 72% to 80%** for the age group **0-14 years** (an evolution that, however, should not overlook the small number of cases in the two cohorts, 50 and 51 cases respectively) (Table 4).

Tabel 27: Comparative survival in malignant hematologic diseases (for the main ICCC3 diagnostic categories) between the incidence cohorts 2010-2013 vs 2014-2017.

0-19 YEARS OLD	Număr cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
2010-2013								
LEUKEMIAS (principalele categorii diagnostice)								
I (a) Leukemias acute limfoblastice	376	104	85	[82-89]	76	[72-81]	**74**	[70-79]
LYMPHOMAS (principalele categorii diagnostice)								
II (a) Lymphomas Hodgkin	135	15	96	[93-100]	93	[88-97]	**92**	[87-97]
II (b) Lymphomas non-Hodgkin *(exceptând Limfom Burkitt)*	66	17	86	[78-95]	77	[68-88]	**77**	[68-88]
2014-2017								
LEUKEMIAS (principalele categorii diagnostice)								
I (a) Leukemias acute limfoblastice	373	78	90	[86-93]	82	[78-86]	**80**	[76-84]
LYMPHOMAS (principalele categorii diagnostice)								
II (a) Lymphomas Hodgkin	122	14	96	[92-99]	93	[88-97]	**91**	[84-95]
II (b) Lymphomas non-Hodgkin *(exceptând Limfom Burkitt)*	68	17	85	[77-94]	79	[70-90]	**76**	[67-87]

0-14 YEARS OLD	Număr cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
2010-2013								
LEUKEMIAS (principalele categorii diagnostice)								
I (a) Leukemias acute limfoblastice	341	86	87	[83-90]	78	[73-82]	**76**	[72-81]
LYMPHOMAS (principalele categorii diagnostice)								
II (a) Lymphomas Hodgkin	71	6	96	[91-100]	93	[87-99]	**92**	[87-99]
II (b) Lymphomas non-Hodgkin *(exceptând Limfom Burkitt)*	50	15	82	[72-93]	72	[61-86]	**72**	[61-86]

0-14 YEARS OLD	Număr cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
2014-2017								
LEUKEMIAS (principalele categorii diagnostice)								
I (a)Leukemias acute limfoblastice	341	66	91	[88-94]	84	[80-88]	**81**	[77-85]
LYMPHOMAS (principalele categorii diagnostice)								
II (a) Lymphomas Hodgkin	72	7	94	[89-100]	93	[87-99]	**90**	[84-97]
II (b) Lymphomas non-Hodgkin *(exceptând Limfom Burkitt)*	51	10	88	[80-98]	84	[75-95]	**80**	[70-92]

B. Solid tumors

This category encompasses a multitude of neoplastic localizations in children and adolescents, grouped within the last ten of the twelve major classes of the ICCC3 classification*:*

- **(III) Neoplasms of the Central Nervous System (CNS) and Other Intracranial and Intraspinal Neoplasms**
- **(IV) Neuroblastomas and Other Peripheral Nerve Tumors**
- **(V) Retinoblastoma**
- **(VI) Renal tumors**
- **(VII) Hepatic tumors**
- **(VIII) Bone tumors maligne**
- **(IX) Soft Tissue Sarcomas and Other Extraosseous Sarcomas**
- **(X) Germ Cell Tumors, Trophoblastic Tumors, and Gonadal Neoplasms**
- **(XI) Other Epithelial Neoplasms and Malignant Melanomas**
- **(XII) Unspecified Malignancies (Other than Classes I-XI)**

The current report includes both global analysis and disaggregated analysis by localization, for the ICCC3 classes and their diagnostic subcategories (those with a minimum of 50 cases/unit of analysis registered during the period 2010-2017).
Rare localizations, with fewer than 10 new cases/year – namely classes ICCC3: **(V) Retinoblastomaa, (VII) Hepatic tumors, and (XII) Unspecified malignancies (other than classes I-XI)** – were not detailed in the analysis due to their very low statistical significance.
However, their impact on overall mortality from solid tumors is reflected in the overall survival of the 1805 cases of solid tumors diagnosed during the period 2010-2017 – for which a 5-year average survival rate of **65.15%** was recorded.
On the incidence cohorts, the 5-year survival in solid tumors diagnosed between **2014-2017** (895 cases) increased to **69.12%,** compared to **61.12%** in the period **2010-2013** (910 cases), an extremely important variation for such a short interval and extremely robust given the significant number of cases.
The analysis by localization aimed at the overall survival average of cases diagnosed between 2010-2017 for each of the seven major ICCC3 classes that accumulated a minimum of 50 cases/unit of

analysis. Survivals were calculated both for the entire casuistry (0-19 years) and for the 0-14 years age group (the pediatric population reference in most international epidemiological studies).
Due to the limited number of cases, specific analysis for adolescents (15-19 years age group) could only be conducted for the entire 2010-2017 interval (not on incidence cohorts), and with the exclusion of ICCC3 classes *(IV) Neuroblastomaas and other peripheral nervous system tumors*, and *(VI) Renal tumors*, which were registered in an extremely small (insignificant) number after the age of 14.

- Survival analysis based on ICCC3 classes, for all cases (0-19 years old) diagnosed during the period **2010-2017**, revealed the highest average 5-year survival rates in renal tumors (VI) - **88%**, and in *germ cell tumors (X)* - **83%**.
- At the opposite end were tumors in locations with less favorable prognosis: *bone tumors (VIII)* - **53%**; *soft tissue tumors (IX)* - **54%**, *CNS tumors (III)* - **57%**. For the age group **0-14 years**, the average 5-year survival recorded the same trends, namely **89%** in renal tumors (VI), **83%** in epithelial neoplasms (XI), and **81%** in germ cell tumors (X).
- Subject to a reduced statistical significance due to the relatively low number of cases, we can describe a similar survival rate profile among **adolescents** (**age group 15-19 years**), with significantly lower values for epithelial cell tumors (XI) - **71%** and soft tissue tumors (IX) - **46%** (Table 28).

Table 28: Average survival of cases diagnosed with solid tumors (on major ICCC3 classes) and major age groups, period 2010-2017

Location Clase principale ICCC3	Numar cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
0-19 YEARS OLD								
III Neoplasme CNS si alte neoplasme intracryears oldene si intraspinale	**471**	220	82	[78-85]	62	[58-67]	**57**	[53-62]
IV Neuroblastoame si alte tumori nervoase periferice	**195**	71	85	[80-90]	68	[62-75]	**65**	[58-72]
VI Renal tumors	**170**	24	95	[91-98]	89	[84-94]	**88**	[84-93]
VIII Bone tumors maligne	**248**	128	87	[83-91]	62	[56-68]	**53**	[47-59]
IX Sarcoame de tesuturi moi si alte sarcoame extraosoase	**233**	110	82	[78-87]	63	[57-70]	**56**	[50-63]
X Tumori germinale, tumori trofoblastice si neoplasme gonadale	**170**	31	95	[91-98]	85	[79-90]	**83**	[77-89]
XI Alte neoplasme epiteliale si melanom malign	**199**	48	88	[84-93]	78	[72-84]	**76**	[70-82]
0-14 YEARS OLD								

Location Clase principale ICCC3	Numar cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
III Neoplasme CNS si alte neoplasme intracryears oldene si intraspinale	417	191	81	[77-85]	63	[58-68]	57	[53-62]
IV Neuroblastoame si alte tumori nervoase periferice	193	70	85	[80-90]	68	[62-75]	65	[58-72]
VI Renal tumors	167	23	95	[91-98]	89	[85-94]	89	[84-94]
VIII Bone tumors maligne	156	79	85	[80-91]	60	[52-68]	52	[45-60
IX Sarcoame de tesuturi moi si alte sarcoame extraosoase	165	72	85	[80-91]	68	[61-75]	60	[53-68]
X Tumori germinale, tumori trofoblastice si neoplasme gonadale	80	15	94	[89-99]	84	[76-92]	81	[73-90]
XI Alte neoplasme epiteliale si melanoame maligne	81	14	94	[89-99]	84	[76-92]	83	[75-91]
15-19 YEARS OLD								
III Neoplasme CNS si alte neoplasme intracryears oldene si intraspinale	54	29	87	[79-96]	57	[46-72]	56	[44-71]
VIII Bone tumors maligne	92	49	89	[83-96]	65	[56-76]	54	[45-66]
IX Sarcoame de tesuturi moi si alte sarcoame extraosoase	68	38	75	[65-86]	51	[41-65]	46	[35-59]
X Tumori germinale, tumori trofoblastice si neoplasme gonadale	90	16	96	[91-100]	86	[79-93]	84	[77-92]
XI Alte neoplasme epiteliale si melanoame maligne	118	34	85	[79-91]	74	[66-82]	71	[63-80]

Analysis of the survival trends in solid tumors was conducted by a comparative examination of survival results for the **2014-2017 incidence cohort versus the 2010-2013 incidence cohort**.

As with malignant hematologic diseases, it is important to keep in mind the inherent limitations of the short transition period (consecutive 4-year cohorts) and especially the significantly smaller number of cases for all classes of solid tumors (compared to hematologic malignancies), which can amplify minor, statistically insignificant fluctuations. Undoubtedly, the next survival study (2026) will significantly increase the size of the studied samples (by adding cases diagnosed in the period 2018-2021), which will provide greater robustness to the analysis results.

The analysis conducted on the existing cases reveals a general trend of increased survival in solid tumors across most ICCC3 classes during the period 2014-2017 compared to the period 2010-2013.

- Globally (**ages 0-19**): The most pronounced increase in survival was observed for **Central Nervous System (CNS) tumors**, where the number of recorded cases (223 vs. 248) provides additional stability to the observed trend: **a 5-year survival rate increase from 49% to 66%**.

A comprehensive analysis of the factors that contributed to this improvement is necessary to serve as a reference for future initiatives in pediatric onco-hematology.

- Additionally, significant increases in the 5-year average survival rates were recorded for all locations known to be associated with less favorable prognoses: *bone tumors (VIII)* saw an increase from **48% to 57%**, and *soft tissue sarcomas (IX)* experienced an increase from **52% to 59%**.
- It is also noteworthy that the 5-year survival rates for *Neuroblastomaa (IV)* remained stable at **64-65%,** and there was a slight decrease (with reduced statistical significance given the small number of cases) from **85% to 81%** in *germ cell tumors (X)*. (Table 29)

The trends in survival rates for solid tumors in the 0-14 age group across ICCC 3 classes reveal entirely similar patterns. (Table 30)

Table 29: Comparative Survival of 0-19 Year Old Cases by Incidence Cohorts and Locations (by Major ICCC3 Classes)

Location -Clase principale ICCC3 (0-19 years old)	Numar cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
2010 -2013								
III Neoplasme CNS si alte neoplasme intracryears oldene si intraspinale	248	140	79	[74-84]	54	[49-61]	**49**	[43-56]
IV Neuroblastoame si alte tumori nervoase periferice	94	35	86	[79-93]	69	[60-79]	**64**	[55-74]
VI Renal tumors	89	16	94	[90-99]	87	[80-94]	**85**	[78-93]
VIII Bone tumors maligne	126	74	82	[75-89]	57	[49-66]	**48**	[40-58]
IX Sarcoame de tesuturi moi si alte sarcoame extraosoase	109	56	80	[73-88]	61	[53-71]	**52**	[44-63]

Location -Clase principale ICCC3 (0-19 years old)	Numar cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
X Tumori germinale, tumori trofoblastice si neoplasme gonadale	79	14	92	[87-98]	85	[77-93]	85	[77-93]
XI Alte neoplasme epiteliale si melanoame maligne	87	24	86	[79-94]	76	[67-85]	72	[64-82]
2014-2017								
III Neoplasme CNS si alte neoplasme intracryears oldene si intraspinale	223	80	85	[80-90]	71	[65-77]	66	[60-72]
IV Neuroblastoame si alte tumori nervoase periferice	101	36	84	[77-92]	67	[59-77]	65	[57-75]
VI Renal tumors	81	8	95	[90-100]	91	[85-98]	91	[85-98]
VIII Bone tumors maligne	122	54	92	[87-97]	66	[59-75]	57	[49-67]
IX Sarcoame de tesuturi moi si alte sarcoame extraosoase	124	54	85	[79-91]	65	[57-74]	59	[51-68]
X Tumori germinale, tumori trofoblastice si neoplasme gonadale	91	17	97	[93-100]	85	[78-92]	81	[74-90]
XI Alte neoplasme epiteliale si melanoame maligne	112	24	90	[85-96]	79	[72-87]	79	[71-87]

Table 30: Comparative Survival of 0-14 Year Old Cases by Incidence Cohorts and Locations (by Major ICCC3 Classes)

Clase principale ICCC3 (0-14 years old)	Numar cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
2010 -2013								
III Neoplasme CNS si alte neoplasme intracryears oldene si intraspinale	220	118	79	[74-85]	56	[50-63]	50	[44-58]
IV Neuroblastoame si alte tumori nervoase periferice	94	35	86	[79-93]	69	[60-79]	64	[55-74]
VI Renal tumors	89	16	94	[90-99]	87	[80-94]	85	[78-93]
VIII Bone tumors maligne	72	43	78	[69-88]	50	[40-63]	44	[34-58]
IX Sarcoame de tesuturi moi si alte sarcoame extraosoase	82	39	84	[77-92]	66	[56-77]	56	[46-68]
X Tumori germinale, tumori trofoblastice si neoplasme gonadale	37	8	89	[80-100]	78	[66-93]	78	[66-93]

Clase principale ICCC3 (0-14 years old)	Numar cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
2014-2017								
III Neoplasme CNS si alte neoplasme intracryears oldene si intraspinale	197	73	83	[78-89]	71	[64-77]	**65**	[59-72]
IV Neuroblastoame si alte tumori nervoase periferice	99	35	84	[77-91]	68	[59-78]	**66**	[57-76]
VI Renal tumors	78	7	95	[90-100]	92	[87-98]	**92**	[87-98]
VIII Bone tumors maligne	84	36	92	[86-98]	68	[59-79]	**58**	[49-70]
IX Sarcoame de tesuturi moi si alte sarcoame extraosoase	83	33	87	[80-94]	70	[61-80]	**64**	[54-75]
X Tumori germinale, tumori trofoblastice si neoplasme gonadale	43	7	98	[93-100]	88	[79-98]	**84**	[73-96]

A detailed analysis of survival rates for the most common diagnostic categories within **class III - CNS Tumors** in cases diagnosed during the period **2010-2017** reveals significant differences in survival rates based on tumor types.

- The highest 5-year average survival rates were recorded in **Astrocytomas - III(b) at 74%**, while the lowest were in **Embryonal Tumors - III(c) at 45%**. Additionally, average survival rates of **65%** were calculated for **Ependymomas - III(a)** and **49%** in category **III(d) - Other Gliomas**, values that have a lower statistical significance due to the very small number of cases (just over 50, the inclusion threshold for analysis) (Table 31).

Table 31: Average Survival of Cases Diagnosed with CNS Tumors (for the Most Common ICCC3 Categories) for the Period 2010-2017

Categorii diagnostice ICCC3	Cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
2010-2017								
III (a) Ependimoame si tumori de plex coroid	**52**	**22**	**77**	**[66-89]**	**73**	**[62-86]**	**65**	**[54-80]**
III (b) Astrocytomas	**152**	**42**	**76**	**[69-83]**	**74**	**[67-81]**	**74**	**[67-81]**
III (c) Tu. embrionare intracryears oldene si intraspinale	**139**	**86**	**63**	**[56-72]**	**55**	**[48-64]**	**45**	**[38-54]**
III (d) Other gliomas	**55**	**30**	**56**	**[45-71]**	**56**	**[45-71]**	**49**	**[38-64]**

Due to the reduced number of cases, the analysis of survival trends for brain tumor types by comparing the 2014-2017 incidence cohort with the 2010-2013 cohort could be distinctly conducted only for III(b) Astrocytomas and III(c) Intracryears oldal and Intraspinal Embryonal Tumors (Table 32).

For both, a significant increase in survival was observed, with the magnitude of the variations being significant despite the relatively small number of cases. Thus, in *astrocytomas*, the 5-year survival increased from 70% in the 2010-2013 interval to 79% in the 2014-2017 interval, while in e*mbryonal tumors*, survival increased from 37% to 54%.

Table 32: Comparative survival of cases diagnosed with Central Nervous System Tumors (for the most frequent diagnostic categories) in the incidence cohort of 2014-2017 vs 2010-2013.

Categorii diagnostice ICCC3	Cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
2010-2013								
III (b) Astrocytomas	**82**	**27**	**70**	**[60-80]**	**70**	**[60-80]**	**70**	**[60-80]**
III (c) Tu embrionare intracryears oldene si intraspinale	**72**	**51**	**57**	**[47-70]**	**49**	**[38-62]**	**37**	**[28-51]**
2014-2017								
III (b) Astrocytomas	**70**	**15**	**83**	**[74-92]**	**79**	**[70-89]**	**79**	**[70-89]**
III (c) Tu embrionare intracryears oldene si intraspinale	**67**	**35**	**70**	**[60-82]**	**63**	**[52-75]**	**54**	**[43-67]**

Comparative survival on incidence cohorts for specific locations (the most frequent diagnostic categories ICCC3) was calculated for the periods 2014-2017 versus 2010-2013 in other specific locations of solid tumors, for diagnostic categories ICCC3 frequent enough to generate the minimum number of cases required for analysis.

- Results showed a general trend of increased survival in solid tumors, except for *Neuroblastomaa* where the 5-year survival remains at **64%**.
- The highest survival rate is recorded in *nephroblastoma*, which increased from **85%** in 2010-2013 to **92%** in 2014-2017.
- The greatest variation is observed in *osteosarcomas*, where the 5-year survival rate increased from **48%** in the period 2010-2013 to **59%** in the period 2014-2017.
- Positive developments, but of smaller amplitude, were also observed in *Ewing sarcomas* (**49% from 43%**) and in *rhabdomyosarcomas* (**58% from 53%**), although their statistical significance was diminished due to the small number of cases (at the threshold of analysis). (Table 33)

Table 33: Comparative survival on incidence cohorts for specific locations (the most frequent diagnostic categories ICCC3).

Subcategorii ICCC3	Numar cazuri	Decese	la 1 an (%)	CI 95	la 3 years old (%)	CI 95	la 5 years old (%)	CI 95
2010 -2013								
IV (a) Neuroblastoma	94	35	86	[79-93]	69	[60-79]	**64**	[55-74]
VI (a) Nefroblastom	88	16	94	[90-99]	86	[79-94]	**85**	[78-93]
VIII (a) Osteosarcoame	64	38	86	[78-95]	61	[50-74]	**48**	[38-62]
VIII (c) Sarcoame Ewing	53	33	75	[65-88]	49	[37-65]	**43**	[32-59]
IX (a) Rabdomiosarcom	60	30	90	[83-98]	63	[52-77]	**53**	[42-68]
2014-2017								
IV (a) Neuroblastoma	97	36	84	[76-91]	66	[57-76]	**64**	[55-74]
VI (a) Nefroblastom	77	7	95	[90-100]	92	[86-98]	**92**	[86-98]
VIII (a) Osteosarcoame	66	28	89	[82-97]	70	[59-82]	**59**	[48-72]
VIII (c) Sarcoame Ewing	49	25	94	[87-100]	57	[45-73]	**49**	[37-65]
IX (a) Rabdomiosarcom	60	25	92	[85-99]	67	[56-80]	**58**	[47-72]

3.2.3 Survival by residential environment and geographic location

The analysis by residential environment showed significant differences in survival between urban and rural areas, differences that become more pronounced over time.
Thus, at 1 year after diagnosis, the difference in survival between children living in rural areas and those living in urban areas is not significant, at 86% vs 89%. From the second year after diagnosis, the difference gradually begins to increase (**82% urban vs 77% rural**), reaching **75% urban vs 67% rural** at 5 years. (Table 34)

Table 34: Survival 2010-2017 by residential environment

		1 an	2 years old	3 years old	4 years old	5 years old
Urban	**0-19**	89%	82%	78%	77%	**75%**
Rural	**0-19**	86%	77%	72%	69%	**67%**

Analysis by socio-economic development region of residence also reveals disparities in survival trends, with a significant gradient between the region with the highest 5-year survival rate (2010-2017) - **Bucharest-Ilfov (76%)** and the regions with the lowest survival rate - **North-East and South-East (68%)**. (Table 35)

Similarly to the trend observed in the analysis by residential environment, survival differences are non-/marginally significant in the first year after diagnosis (with the exception of the North-East Region where survival is significantly lower even from the first year: 81% North-East compared to 90% Bucharest-Ilfov). Differences become significant starting from the second year after diagnosis.
We consider it important to thoroughly investigate these dynamics, which in the case of both parameters (urban/rural and region of residence) raise questions about patients' equitable access to diagnosis, treatment, and post-therapeutic monitoring, as well as the role played by socio-economic factors in survival chances.

Table 35: Survival 2010-2017 by euroregion of residence

Regiune	Cazuri (2010-2017)	Decese	1 an (%)	CI 95	3 years old (%)	CI 95	5 years old (%)	CI 95
BUCURESTI - ILFOV	319	81	90	[86-93]	79	[74-83]	**76**	[72-81]
CENTRU	407	116	87	[84-91]	76	[72-80]	**74**	[70-78]
VEST	227	67	88	[84-92]	75	[70-81]	**71**	[65-77]
SUD-MUNTENIA	451	146	89	[86-92]	73	[69-77]	**70**	[66-74]
SUD - VEST OLTENIA	281	88	88	[84-92]	74	[69-79]	**69**	[64-75]
NORD - VEST	521	174	86	[83-89]	72	[68-76]	**69**	[65-73]
SUD - EST	420	144	84	[81-88]	72	[68-76]	**68**	[64-73]
NORD - EST	702	240	81	[79-84]	72	[69-76]	**68**	[65-72]

4. Bibliographic resources

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5. Appendices

3.2.3 Appendix 1: International Classification of Childhood Cancer, 3rd Edition (ICCC3)

Location	ICD-O-3 Histologie (Tip)	ICD-O-2/3 Site	Recode
I. Leukemias, boli mieloproliferative și sindroame mielodisplazice			
(a) Leukemias limfoblastice	9820, 9823, 9826, 9827, 9831-9837, 9940, 9948	C000-C809	011
(b) Leukemias acute mieloblastice	9840, 9861, 9866, 9867, 9870-9874, 9891, 9895-9897, 9910, 9920, 9931	C000-C809	012
(c) Boli mieloproliferative cronice	9863, 9875, 9876, 9950, 9960-9964	C000-C809	013
(d) Sindroame mielodisplazice și alte boli mieloproliferative cronice	9945, 9946, 9975, 9980, 9982-9987, 9989	C000-C809	014
(e) Alte Leukemias specificate și nespecificate	9800, 9801, 9805, 9860, 9930	C000-C809	015
II. Lymphomas și neoplasme reticuloendoteliale			
(a) Lymphomas Hodgkin	9650-9655, 9659, 9661-9665, 9667	C000-C809	021
(b) Lymphomas Non-Hodgkin (fără limfom Burkitt)	9591, 9670, 9671, 9673, 9675, 9678-9680, 9684, 9689-9691, 9695, 9698-9702, 9705, 9708, 9709, 9714, 9716-9719, 9727-9729, 9731-9734, 9760-9762, 9764-9769, 9970	C000-C809	022
(c) Limfom Burkitt	9687	C000-C809	023

Location	ICD-O-3 Histologie (Tip)	ICD-O-2/3 Site	Recode
(d) Alte neoplasme reticuloendoteliale	9740-9742, 9750, 9754-9758	C000-C809	024
(e) Lymphomas nespecificate	9590, 9596	C000-C809	025
III. Neoplasme ale sistemului nervos central (SNC) și alte neoplasme intracryears oldene și intraspinale			
(a) Ependymomas and choroid plexus tumors	9383, 9390-9394	C000-C809	031
(b) Astrocytomas	9380	C723	032
	9384, 9400-9411, 9420, 9421-9424, 9440-9442	C000-C809	032
(c) Intracryears oldal and intraspinal embryonal tumors	9470-9474, 9480, 9508	C000-C809	033
	9501-9504	C700-C729	033
(d) Other gliomas	9380	C700-C722, C724-C729, C751, C753	034
	9381, 9382, 9430, 9444, 9450, 9451, 9460	C000-C809	034
(e) Other specified intracryears oldal and intraspinal neoplasms	8270-8281, 8300, 9350-9352, 9360-9362, 9412, 9413, 9492, 9493, 9505-9507, 9530-9539, 9582	C000-C809	035
(f) Unspecified intracryears oldal and intraspinal neoplasms	8000-8005	C700-C729, C751-C753	036
IV. Neuroblastoame și alte tumori nervoase periferice			
(a) Neuroblastoma și ganglioNeuroblastoma	9490, 9500	C000-C809	041

Location	ICD-O-3 Histologie (Tip)	ICD-O-2/3 Site	Recode
(b) Other tumors of peripheral nerve cells	8680-8683, 8690-8693, 8700, 9520-9523	C000-C809	042
	9501-9504	C000-C699, C739-C768, C809	042
V. Retinoblastoma	9510-9514	C000-C809	050
VI. Renal tumors			
(a) Nefroblastom și alte Renal tumors nonepiteliale	8959, 8960, 8964-8967	C000-C809	061
	8963, 9364	C649	061
(b) Carcinoame renale	8010-8041, 8050-8075, 8082, 8120-8122, 8130-8141, 8143, 8155, 8190-8201, 8210, 8211, 8221-8231, 8240, 8241, 8244-8246, 8260-8263, 8290, 8310, 8320, 8323, 8401, 8430, 8440, 8480-8490, 8504, 8510, 8550, 8560-8576	C649	062
	8311, 8312, 8316-8319, 8361	C000-C809	062
(c) Tumori maligne renale nespecificate	8000-8005	C649	063
VII. Hepatic tumors			
(a) Hepatoblastom	8970	C000-C809	071
(b) Carcinom hepatic	8010-8041, 8050-8075, 8082, 8120-8122, 8140, 8141, 8143, 8155, 8190-8201, 8210, 8211, 8230, 8231, 8240, 8241, 8244-8246, 8260-8264, 8310, 8320, 8323, 8401, 8430,	C220, C221	072

Location	ICD-O-3 Histologie (Tip)	ICD-O-2/3 Site	Recode
	8440, 8480-8490, 8504, 8510, 8550, 8560-8576		
	8160-8180	C000-C809	072
(c) Tumori maligne hepatice nespecificate	8000-8005	C220, C221	073
VIII. Tumori maligne osoase			
(a) Osteosarcoame	9180-9187, 9191-9195, 9200	C400-C419, C760-C768, C809	081
(b) Condrosarcoame	9210, 9220, 9240	C400-C419, C760-C768, C809	082
	9221, 9230, 9241-9243	C000-C809	082
(c) Tumori Ewing și alte sarcoame osoase	9260	C400-C419, C760-C768, C809	083
	9363-9365	C400-C419	083
(d) Alte tumori maligne osoase specificate	8810, 8811, 8823, 8830	C400-C419	084
	8812, 9250, 9261, 9262, 9270-9275, 9280-9282, 9290, 9300-9302, 9310-9312, 9320-9322, 9330, 9340-9342, 9370-9372	C000-C809	084
(e) Tumori maligne osoase nespecificate	8000-8005, 8800, 8801, 8803-8805	C400-C419	085
IX. Sarcoame de tesuturi moi și alte sarcoame extraosoase			
(a) Rabdomiosarcoame	8900-8905, 8910, 8912, 8920, 8991	C000-C809	091

Location	ICD-O-3 Histologie (Tip)	ICD-O-2/3 Site	Recode
(b) Fibrosarcoame, tumori de teaca nervoasa periferica și alte tumori fibroase	8810, 8811, 8813-8815, 8821, 8823, 8834-8835	C000-C399, C440-C768, C809	092
	8820, 8822, 8824-8827, 9150, 9160, 9491, 9540-9571, 9580	C000-C809	092
(c) Sarcom Kaposi	9140	C000-C809	093
(d) Alte sarcoame specificate de țesuturi moi	8587, 8710-8713, 8806, 8831-8833, 8836, 8840-8842, 8850-8858, 8860-8862, 8870, 8880, 8881, 8890-8898, 8921, 8982, 8990, 9040-9044, 9120-9125, 9130-9133, 9135, 9136, 9141, 9142, 9161, 9170-9175, 9231, 9251, 9252, 9373, 9581	C000-C809	094
	8830	C000-C399, C440-C768, C809	094
	8963	C000-C639, C659-C699, C739-C768, C809	094
	9180, 9210, 9220, 9240	C490-C499	094
	9260	C000-C399, C470-C759	094
	9364	C000-C399, C470-C639, C659-C699, C739-C768, C809	094
	9365	C000-C399, C470-C639, C659-C768, C809	094
(e) Sarcoame nespecificate de țesuturi moi	8800-8805	C000-C399, C440-C768, C809	095
X. Tumori germinale, tumori trofoblastice și neoplasme gonadale			

Location	ICD-O-3 Histologie (Tip)	ICD-O-2/3 Site	Recode
(a) Tumori cu celule germinale intracryears oldene și intraspinale	9060-9065, 9070-9072, 9080-9085, 9100, 9101	C700-C729, C751-C753	101
(b) Tumori maligne extracryears oldene și extragonadale cu celule germinale	9060-9065, 9070-9072, 9080-9085, 9100-9105	C000-C559, C570-C619, C630-C699, C739-C750, C754-C768, C809	102
(c) Tumori maligne cu celule germinale ale gonadelor	9060-9065, 9070-9073, 9080-9085, 9090, 9091, 9100, 9101	C569, C620-C629	103
(d) Carcinoame gonadale	8010-8041, 8050-8075, 8082, 8120-8122, 8130-8141, 8143, 8190-8201, 8210, 8211, 8221-8241, 8244-8246, 8260-8263, 8290, 8310, 8313, 8320, 8323, 8380-8384, 8430, 8440, 8480-8490, 8504, 8510, 8550, 8560-8573, 9000, 9014, 9015	C569, C620-C629	104
	8441-8444, 8450, 8451, 8460-8473	C000-C809	104
(e) Tumori maligne gonadale altele și nespecificate	8590-8671	C000-C809	105
	8000-8005	C569, C620-C629	105
XI. Alte neoplasme epiteliale și melanoame maligne			
(a) Carcinoame adrenocorticale	8370-8375	C000-C809	111

Location	ICD-O-3 Histologie (Tip)	ICD-O-2/3 Site	Recode
(b) Carcinoame tiroidiene	8010-8041, 8050-8075, 8082, 8120-8122, 8130-8141, 8190, 8200, 8201, 8211, 8230, 8231, 8244-8246, 8260-8263, 8290, 8310, 8320, 8323, 8430, 8440, 8480, 8481, 8510, 8560-8573	C739	112
	8330-8337, 8340-8347, 8350	C000-C809	112
(c) Carcinoame de nasofaringe	8010-8041, 8050-8075, 8082, 8083, 8120-8122, 8130-8141, 8190, 8200, 8201, 8211, 8230, 8231, 8244-8246, 8260-8263, 8290, 8310, 8320, 8323, 8430, 8440, 8480, 8481, 8500-8576	C110-C119	113
(d) Melanoame maligne	8720-8780, 8790	C000-C809	114
(e) Carcinoame de piele	8010-8041, 8050-8075, 8078, 8082, 8090-8110, 8140, 8143, 8147, 8190, 8200, 8240, 8246, 8247, 8260, 8310, 8320, 8323, 8390-8420, 8430, 8480, 8542, 8560, 8570-8573, 8940, 8941	C440-C449	115
(f) Alte carcinoame și carcinoame nespecificate	8010-8084, 8120-8157, 8190-8264, 8290, 8310, 8313-8315, 8320-8325, 8360, 8380-8384, 8430-8440, 8452-8454, 8480-8586, 8588-8589, 8940, 8941, 8983, 9000, 9010-9016, 9020, 9030	C000-C109, C129-C218, C239-C399, C480-C488, C500-C559, C570-C619, C630-C639, C659-C729, C750-C768, C809	116
XII. Alte malignități, neoplasme maligne nespecificate			

Location	ICD-O-3 Histologie (Tip)	ICD-O-2/3 Site	Recode
(a) Alte tumori maligne specificate	8930-8936, 8950, 8951, 8971-8981, 9050-9055, 9110	C000-C809	121
	9363	C000-C399, C470-C759	121
(b) Alte tumori maligne nespecificate	8000-8005	C000-C218, C239-C399, C420-C559, C570-C619, C630-C639, C659-C699, C739-C750, C754-C809	122
Neclasificate de ICCC sau in situ			999

Appendix 2

3.2.3 Pediatric Cancer Staging for Population-Based Cancer Registries
3.2.4 in accordance with the Toronto Childhood Cancer Staging Guide [1]

Grup/Subgrup diagnostic ICCC3	**Nivelul 1 (pentru registrele cu resurse limitate)***	**Nivelul 2 (pentru registrele cu resurse extinse)****
Leucemie limfoblastică acută	SNC negativ	SNC 1
	SNC pozitiv	SNC 2 SNC 3
Leucemie acuta mieloblastica	SNC negativ	SNC 1
	SNC pozitiv	SNC 2 SNC 3
Limfom Hodgkin	Stadiu IA/B Ann Arbor Stadiu IIA/B Ann Arbor Stadiu IIIA/B Ann Arbor Stadiu IVA/B Ann Arbor	Stadiu IA/B Ann Arbor Stadiu IIA/B Ann Arbor Stadiu IIIA/B Ann Arbor Stadiu IVA/B Ann Arbor
Limfom Non-Hodgkin	Limitat	Sadiul I St Jude/Murphy Sadiul II St Jude/Murphy Sadiul III St Jude/Murphy

[1] Source :
Aitken JF, Youlden D, O'Neill L, Gupta S, Frazier AL, eds. Childhood cancer staging for population registries according to the Toronto Childhood Cancer Stage Guidelines – Version 2. Cancer Council Queensland and Cancer Australia: Brisbane, Australia; 2021
Disponibil la https://cancerqld.blob.core.windows.net/content/docs/childhood-cancer-staging-forpopulation-registries.pd

	Avansat	Sadiul IV St Jude/Murphy
Neuroblastoma	Localizat Locoregional Metastatic Boală INRGSS-MS	INRGSS-MS – localizat L1 INRGSS-MS – locoregional L2 INRGSS-MS – metastatic M Boală INRGSS-MS
Nefroblastom	Localizat	Stadiul I/y – stadiul I Stadiul II/y – stadiul II Stadiul III/y – stadiul III
	Metastatic	Stadiul IV
Rabdomiosarcom	Localizat	Stadiul 1 TNM Stadiul 2 TNM Stadiul 3 TNM
	Metastatic	Stadiul 4 TNM
Osteosarcom	Localizat Metastatic	Localizat Metastatic
Sarcoame de parti moi non-rabdomiosarcoame	Localizat Metastatic	TNM stadiul I TNM stadiul II TNM stadiul III TNM stadiul IV
Sarcom Ewing	Localizat Metastatic	Localizat Metastatic
Retinoblastoma	Localizat (intraocular)	Stadiul 0 IRSS Stadiul I IRSS Stadiul II IRSS
	Regional (orbita și/sau ganglioni limfatici regionali)	Stadiul III IRSS
	Metastatic (extraorbital)	Stadiul IV IRSS
Hepatoblastom	Localizat Metastatic	PRETEXT Stadiul I PRETEXT Stadiul II PRETEXT Stadiul III PRETEXT stadiul IV
Cancer testicular	Localizat Regional Metastatic	Stadiul I TNM Stadiul II TNM Stadiul III TNM
Cancer ovarian	Localizat	Stadiul I FIGO/TNM
	Regional	Stadiul II FIGO/TNM Stadiul III FIGO/TNM
	Metastatic	Stadiul IV FIGO/TNM
Meduloblastom și alte tumori embrionare ale SNC	Localizat	M0
	Metastatic	M1 M2 M3 M4
Ependimom	Localizat	M0
	Metastatic	M1 M2 M3 M4

* Level 1: for registries with limited resources and access to data, which can provide less detailed criteria..
** Level 2: for registries with more resources and data access, which can provide more detailed criteria.

Bucuresti , 15.02.2024
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