AMERICA, LATIN AND THE CARIBBEAN

Argentina

Argentina is located in the southern region of South America and covers an area of 2 766 890 km². It is rich in natural resources and is geographically diverse, with both mountains and plains. The climate is subtropical in the north and polar in the far south. Argentina is a federal country, which is divided into 23 provinces grouped in five regions that are socioeconomically and culturally diverse. The Autonomous City of Buenos Aires is the capital.

In 2010, the population was 41.2 million, and 34% of the population was younger than 20 years (Table A.6). The population is highly urbanized. Most people (85%) are of European descent (mainly Spanish and Italian), and 2% are Indigenous peoples. Spanish is the official language. Argentina is an upper-middle-income country, but income is disproportionately distributed. The literacy rate is high. Agricultural goods are the leading exports, and the industrial sector is diversified.

The current universal health-care system in Argentina guarantees medical care to all citizens free of charge and is available throughout the country. The public system is highly decentralized, and most of the care is provided through a network of hospitals that are overseen by provincial offices and supervised by the Ministry of Health. This organization ensures that minimum standards of care are met and that access to treatment is possible for all through the different health insurance and social assistance programmes available.

However, there are inequalities in the density and quality of health care provided, and not everyone receives the same care. Argentina has a network of 31 public hospitals with paediatric oncology units that offer partial or complete treatment for children with cancer. Of these hospitals, 16 are provincial hospitals, which are capable of providing complete treatment. In addition, six small paediatric oncology units with a limited capacity for treatment are located in the provinces with high population density. However, almost 40% of children with cancer travel to receive some treatment in one of the five paediatric oncology units in Buenos Aires Province or one of the four paediatric oncology units in the capital city of Buenos Aires. Paediatric Hospital "Prof. Dr. Juan P. Garrahan", which is located in the city of Buenos Aires, has the largest paediatric oncology unit, which treats 500 oncology cases per year from all over the country and provides radiotherapy, magnetic resonance imaging (MRI), hepatic or bone marrow transplantation, and intensive care for immunocompromised patients. About 15% of patients are treated at private centres. Residence status is identified correctly by the cancer registries for almost all cases.

POPULATION AT RISK

The population data were provided by the National Institute of Statistics and Censuses (https://www.indec.gob.ar). Estimates are based on the 1991, 2001, and 2010 censuses, as relevant (Table A.7). The provincial registries obtained the population data from local official sources, as described below.

EDITORS' COMMENTS

The Argentinian Paediatric Oncology Registry (ROHA) covers the entire paediatric population (aged 0–14 years); these data are presented in a full table. Data from six registries are presented in a combined dataset. The Chaco, Córdoba, Entre Ríos, Mendoza, and Neuquén registries cover a total of 23 provinces, and one registry covers the municipality of Bahía Blanca in Buenos Aires Province. The registries routinely exchange data, thus avoiding duplication and ensuring completeness of all registries. ROHA also collects stage and treatment information from hospitals. The abbreviated table for the Bahía Blanca registry and the full tables for the constituent registries are available online (Table A.12).

The proportion of cases with unspecified histology was high in the general cancer registries, with the exception of the Neuquén registry. Several registries provided data with incomplete date of birth or incidence in a proportion of cases.

ARGENTINA, 6 registries (1991-2013)

Registry	Period	Cases	%	Person-years	%
Bahía Blanca	1991-2007	273	6.7	1 602 296	5.4
Chaco	2002-2012	618	15.2	4 837 482	16.4
Córdoba	2004-2012	1402	34.4	9 979 605	33.9
Entre Ríos	2001-2011	555	13.6	4 560 970	15.5
Mendoza	2003-2012	893	21.9	6 105 329	20.7
Neuquén	2003-2013	330	8.1	2 370 529	8.0
ARGENTINA	**1991-2013**	**4071**	**100.0**	**29 456 211**	**100.0**

Please consult the quality indicators for this pool and its constituent registries

Argentinian Paediatric Oncology Registry (ROHA), 2000–2013

Florencia Moreno, Ines Kumcher, Judith Goldman, Gloria Montoya, María Agustina Chaplin

The Argentinian Paediatric Oncology Registry (ROHA) is a national population-based cancer registry of children younger than 15 years. Data sources include public and private haematology and oncology units, regional cancer registries, and medical groups. ROHA collects demographic and disease data according to international standards as recommended by IARC; these data are coded according to ICD-O-3 and ICCC. Case status is updated at least once a year. To estimate the completeness of the registry, data are validated against the information on deaths provided by the National Institute of Statistics and Censuses and regional registries. ROHA participates in national and international epidemiological research projects.

PUBLICATIONS

Moreno F, Loria D, Abriata G, Terracini B; ROHA network (2013). Childhood cancer: incidence and early deaths in Argentina, 2000–2008. Eur J Cancer. 49(2):465–73. https://doi.org/10.1016/j.ejca.2012.08.001 PMID:22980725

Moreno F, Dussel V, Orellana L; ROHA network (2015). Childhood cancer in Argentina: survival 2000–2007. Cancer Epidemiol. 39(4):505–10. https://doi.org/10.1016/j.canep.2015.04.010 PMID:25998586

POPULATION AT RISK

Population data were provided by sex and single year of age for the age group 0–14 years for each calendar year for 2000–2010 and by 5-year age group for 2011–2013. The data for the missing year–age–sex categories were estimated at IARC using the methods described in Chapter 2. See also Argentina, above.

EDITORS' COMMENTS

Only cases in the age group 0–14 years were registered during the reporting period. Therefore, no data for the age groups 15–19 years and 0–19 years are included in the tables. Non-malignant CNS tumours were registered, but the proportion was relatively low (14%) (Table A.9). Pilocytic astrocytoma was coded with uncertain behaviour throughout the reporting period, and it was also coded with malignant behaviour in 2010–2013. Sex was unknown in 0.1% of all cases (Table A.8). All skin carcinomas were registered. Laterality was available for almost 70% of the cases of interest.

ARGENTINA, paediatric (2000-2013)

	Age group (years)	Males	Females
Person-years	0	5 016 064	4 804 897
	1-4	19 646 716	18 885 346
	5-9	24 513 871	23 629 966
	10-14	24 559 330	23 756 588
	0-14	73 735 981	71 076 797
Average annual population	0-14	5 266 856	5 076 914

Please consult the quality indicators for this registry

Bahía Blanca Cancer Registry, 1991–2007

Eduardo A. Laura, Cynthia Di Martini, Horacio Caferri, Matías Iván Schulz, Julia Inés Laura, Gastón Giambeluca, Nicolás Antonio Grassi, Ramiro Mendizábal, Iara Agustina Farías, Olga Soulages, Andrés Priotto, Hilda Fretín, Marta Caminos, Marcelo Patkan, Mónica Sayago

The city of Bahía Blanca is located in the south-west of Buenos Aires Province. It has a population of 0.3 million. The area is mainly urban, with large industries (especially petrochemical) and important ports. A proportion of the population lives in small rural villages.

The two public hospitals in the area provide oncology services. Surgery is provided through general surgical services. There are two private radiotherapy institutes, which also treat patients from public hospitals; one of them has a linear accelerator. Computed tomography (CT) is available in almost all of the larger public and private institutions, and one of them has a nuclear MRI facility.

The Bahía Blanca Cancer Registry has covered the city of Bahía Blanca since 1989. The registry was recognized by a provincial law and a municipal resolution in 1993. It is funded by the Argentine Association for Cancer Education and Prevention, a non-profit organization founded in 1986 to improve cancer control.

Data collection is mainly active. Principal data sources are public, private, and military hospitals, pathology and haematology laboratories, a flow cytometry laboratory, and radiotherapy institutes.

Data are stored in and managed using IARC/IACR CanReg software and are used for research and cancer control.

PUBLICATIONS

Laura E, Gonzalez MS, Principe N, Serralunga G, Yañez L, Lioncavallo P, et al. (2015). La mayor prevalencia del hábito tabáquico en Ingeniero White, puede explicar la tasa de incidencia aumentada de cáncer de pulmón. Bahía Blanca Medical Association Magazine. 25(2):55–9.

Laura EA, Serralunga G, Yañez L, Vacchino M, Príncipe N, Belén Prieto M, et al. (2017). Tendencias de la incidencia de cáncer en Bahia Blanca entre 1989 y 2007. Rev Med Rosario. 83:10–7.

POPULATION AT RISK

From censuses conducted in 1991 and 2001 for the municipality of Bahía Blanca, mid-year counts were

ARGENTINA, paediatric (2000-2013)

		Number of cases					Percentage		Incidence rates per million person-years						MV	DCO
		Age group (years)					0-14		Age-specific				ASR	Cumulative	%	%
		0	1-4	5-9	10-14	0-14	All	Group	0	1-4	5-9	10-14	0-14	0-14	0-14	0-14
I	LEUKAEMIA	384	2711	1954	1708	**6757**	37.4	100.0	39.1	70.4	40.6	35.4	**48.1**	700	100.0	0.0
	a. Lymphoid	209	2262	1594	1222	**5287**	29.3	78.2	21.3	58.7	33.1	25.3	**37.8**	548	100.0	0.0
	b. Acute myeloid	155	393	302	423	**1273**	7.0	18.8	15.8	10.2	6.3	8.8	**9.0**	132	100.0	0.0
	c. CMD	1	16	18	29	**64**	0.4	0.9	0.1	0.4	0.4	0.6	**0.4**	7	100.0	0.0
	d. MDS & other	8	14	11	11	**44**	0.2	0.7	0.8	0.4	0.2	0.2	**0.3**	5	100.0	0.0
	e. Unspecified	11	26	29	23	**89**	0.5	1.3	1.1	0.7	0.6	0.5	**0.6**	9	100.0	0.0
II	LYMPHOMA & RELATED	81	513	739	815	**2148**	11.9	100.0	8.2	13.3	15.3	16.9	**14.6**	223	99.9	0.1
	a. Hodgkin	5	132	339	429	**905**	5.0	42.1	0.5	3.4	7.0	8.9	**5.9**	94	100.0	0.0
	b. Non-Hodgkin except BL	11	121	231	253	**616**	3.4	28.7	1.1	3.1	4.8	5.2	**4.1**	64	99.7	0.3
	c. Burkitt (BL)	2	125	136	105	**368**	2.0	17.1	0.2	3.2	2.8	2.2	**2.6**	38	100.0	0.0
	d. Lymphoreticular	62	125	25	13	**225**	1.2	10.5	6.3	3.2	0.5	0.3	**1.7**	23	100.0	0.0
	e. Unspecified	1	10	8	15	**34**	0.2	1.6	0.1	0.3	0.2	0.3	**0.2**	4	100.0	0.0
III	CNS NEOPLASMS †	255	1049	1180	912	**3396**	18.8	100.0	26.0	27.2	24.5	18.9	**23.8**	352	81.2	8.8
	a. Ependymoma	40	181	109	68	**398**	2.2	11.7	4.1	4.7	2.3	1.4	**2.9**	41	100.0	0.0
	b. Astrocytoma	59	287	320	286	**952**	5.3	28.0	6.0	7.4	6.6	5.9	**6.6**	99	100.0	0.0
	c. CNS embryonal	50	271	310	158	**789**	4.4	23.2	5.1	7.0	6.4	3.3	**5.6**	82	100.0	0.0
	d. Other gliomas	8	47	59	67	**181**	1.0	5.3	0.8	1.2	1.2	1.4	**1.2**	19	100.0	0.0
	e. Other specified	20	60	118	136	**334**	1.8	9.8	2.0	1.6	2.5	2.8	**2.2**	35	100.0	0.0
	f. Unspecified CNS	78	203	264	197	**742**	4.1	21.8	7.9	5.3	5.5	4.1	**5.2**	77	14.2	40.2
IV	NEUROBLASTOMA	318	549	138	57	**1062**	5.9	100.0	32.4	14.2	2.9	1.2	**8.2**	110	99.9	0.0
	a. (Ganglio)neuroblastoma	317	541	129	48	**1035**	5.7	97.5	32.3	14.0	2.7	1.0	**8.0**	107	99.9	0.0
	b. Peripheral nervous	1	8	9	9	**27**	0.1	2.5	0.1	0.2	0.2	0.2	**0.2**	3	100.0	0.0
V	RETINOBLASTOMA	204	367	46	7	**624**	3.5	100.0	20.8	9.5	1.0	0.1	**4.9**	65	98.4	0.0
VI	RENAL TUMOURS	144	482	173	46	**845**	4.7	100.0	14.7	12.5	3.6	1.0	**6.4**	87	98.6	0.7
	a. Nephroblastoma	142	475	160	26	**803**	4.4	95.0	14.5	12.3	3.3	0.5	**6.2**	83	100.0	0.0
	b. Renal carcinoma	1	4	7	16	**28**	0.2	3.3	0.1	0.1	0.1	0.3	**0.2**	3	100.0	0.0
	c. Unspecified	1	3	6	4	**14**	0.1	1.7	0.1	0.1	0.1	0.1	**0.1**	1	14.3	42.9
VII	HEPATIC TUMOURS	75	110	29	44	**258**	1.4	100.0	7.6	2.9	0.6	0.9	**1.9**	27	97.7	0.8
	a. Hepatoblastoma	67	102	9	4	**182**	1.0	70.5	6.8	2.6	0.2	0.1	**1.4**	19	100.0	0.0
	b. Hepatic carcinoma	1	8	18	39	**66**	0.4	25.6	0.1	0.2	0.4	0.8	**0.4**	7	100.0	0.0
	c. Unspecified	7	0	2	1	**10**	0.1	3.9	0.7	-	0.0	0.0	**0.1**	1	40.0	20.0
VIII	BONE TUMOURS	7	57	247	566	**877**	4.9	100.0	0.7	1.5	5.1	11.7	**5.6**	91	97.7	1.8
	a. Osteosarcoma	1	14	134	368	**517**	2.9	59.0	0.1	0.4	2.8	7.6	**3.2**	54	100.0	0.0
	b. Chondrosarcoma	0	1	8	6	**15**	0.1	1.7	-	0.0	0.2	0.1	**0.1**	2	100.0	0.0
	c. Ewing & related	3	37	91	160	**291**	1.6	33.2	0.3	1.0	1.9	3.3	**1.9**	30	100.0	0.0
	d. Other specified	0	0	6	9	**15**	0.1	1.7	-	-	0.1	0.2	**0.1**	2	100.0	0.0
	e. Unspecified	3	5	8	23	**39**	0.2	4.4	0.3	0.1	0.2	0.5	**0.3**	4	48.7	41.0
IX	SOFT TISSUE SARCOMA	122	307	304	354	**1087**	6.0	100.0	12.4	8.0	6.3	7.3	**7.6**	113	100.0	0.0
	a. Rhabdomyosarcoma	54	204	166	108	**532**	2.9	48.9	5.5	5.3	3.4	2.2	**3.8**	55	100.0	0.0
	b. Fibrosarcoma	27	22	35	68	**152**	0.8	14.0	2.7	0.6	0.7	1.4	**1.0**	16	100.0	0.0
	c. Kaposi sarcoma	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
	d. Other specified	30	69	81	143	**323**	1.8	29.7	3.1	1.8	1.7	3.0	**2.2**	33	100.0	0.0
	e. Unspecified	11	12	22	35	**80**	0.4	7.4	1.1	0.3	0.5	0.7	**0.5**	8	100.0	0.0
X	GERM CELL TUMOURS	76	165	93	281	**615**	3.4	100.0	7.7	4.3	1.9	5.8	**4.2**	64	98.4	0.7
	a. CNS germ cell	2	3	28	75	**108**	0.6	17.6	0.2	0.1	0.6	1.6	**0.7**	11	100.0	0.0
	b. Other extragonadal	31	48	7	23	**109**	0.6	17.7	3.2	1.2	0.1	0.5	**0.8**	11	100.0	0.0
	c. Gonadal germ cell	40	103	53	153	**349**	1.9	56.7	4.1	2.7	1.1	3.2	**2.4**	36	100.0	0.0
	d. Gonadal carcinoma	0	0	0	20	**20**	0.1	3.3	-	-	-	0.4	**0.1**	2	100.0	0.0
	e. Unspecified gonadal	3	11	5	10	**29**	0.2	4.7	0.3	0.3	0.1	0.2	**0.2**	3	65.5	13.8
XI	CARCINOMA & MELANOMA	12	29	62	163	**266**	1.5	100.0	1.2	0.8	1.3	3.4	**1.7**	28	99.2	0.0
	a. Adrenocortical	5	17	5	6	**33**	0.2	12.4	0.5	0.4	0.1	0.1	**0.2**	3	100.0	0.0
	b. Thyroid	0	2	14	17	**33**	0.2	12.4	-	0.1	0.3	0.4	**0.2**	3	100.0	0.0
	c. Nasopharyngeal	0	0	10	25	**35**	0.2	13.2	-	-	0.2	0.5	**0.2**	4	100.0	0.0
	d. Melanoma	6	8	13	35	**62**	0.3	23.3	0.6	0.2	0.3	0.7	**0.4**	6	100.0	0.0
	e. Skin carcinoma	1	1	12	13	**27**	0.1	10.2	0.1	0.0	0.2	0.3	**0.2**	3	92.6	0.0
	f. Other & unspecified	0	1	8	67	**76**	0.4	28.6	-	0.0	0.2	1.4	**0.5**	8	100.0	0.0
XII	OTHER & UNSPECIFIED	28	30	26	48	**132**	0.7	100.0	2.9	0.8	0.5	1.0	**0.9**	14	31.8	48.5
	a. Other specified	2	2	1	7	**12**	0.1	9.1	0.2	0.1	0.0	0.1	**0.1**	1	100.0	0.0
	b. Other unspecified	26	28	25	41	**120**	0.7	90.9	2.6	0.7	0.5	0.8	**0.8**	12	25.0	53.3
	TOTAL §	1706	6369	4991	5001	**18067**	100.0	100.0	173.7	165.3	103.7	103.5	**128.1**	1871	95.6	2.2

† includes 506 non-malignant
§ includes 16 with sex unknown

Please consult the quality indicators for this registry

estimated by sex and age group for 1991–2005, using the routine Pass Package AGEINT United Nations, which interpolates exponentially. Population data were provided by 5-year age group. See also Argentina, above.

EDITORS' COMMENTS

Data were originally provided for 1991–2014, but the data for 2008–2014 were subsequently omitted because of irregular registration rates in those years. The MV% was low (83%) (Table A.9), but it was 100% during the last 3 years of the reporting period. The proportion of cases with unspecified morphology was high (20%), including among MV cases (13%). The basis of diagnosis was unknown in 5% of cases (Table A.9), and in 17% of cases the code for basis of diagnosis was considered unlikely with respect to histology (Table A.11). Date of birth or incidence was incomplete in 10% of cases; this may have affected the age-specific incidence rates, and the provided age was inconsistent with the provided dates in 4% of cases (Table A.8). The Bahía Blanca Cancer Registry reported the highest incidence rates in Argentina; combined with the other observations, this may indicate some overreporting, such as inclusion of non-residents. The sex ratio was low in children and high in adolescents (Table A.9). CNS tumours with uncertain behaviour were registered, but the proportion was low (11%) (Table A.9). There were no cases of pilocytic astrocytoma in the dataset. Skin carcinomas were reportable, and one case was reported. Laterality was not collected.

Chaco Cancer Registry, 2002–2012

María Angélica Duarte, Guillermina Verónica Tabare

Chaco Province is located in north-eastern Argentina and covers an area of 99 633 km^2. The climate is subtropical, with very hot summers and mild winters; the annual average temperature is 21.6 °C.

In 2010, the population was 1.1 million, and 40% of the population was younger than 20 years (Table A.6). The economy is based on the primary sector; cotton, soybeans, cattle production, and construction predominate. The social indicators are low compared with the rest of the country.

Chaco Province has one of the largest integrated Indigenous populations – the Mataco-Guaicurú peoples include the Wichí (also called Mataco), Qom (also called Toba), and Mocoví – and large numbers of descendants of immigrants from central, eastern, and southern Europe: Czech, Slovak, Bulgarian, Croatian, Montenegrin, Italian, and Spanish.

Chaco Province has a specialized hospital (Paediatric Hospital "Dr. Avelino Lorenzo Castelán") with a highly specialized paediatric oncology unit, which provides most diagnostic and treatment services, but about 46% of children with cancer travel to Buenos Aires for treatment.

Data sources include public and private pathology laboratories, hospitals (admission and discharge records), radiotherapy services, prescription drug records, and death certificates. The data are exchanged with ROHA. Data are coded using ICD-O-3 (Table A.10).

POPULATION AT RISK

Population data were provided by sex and 5-year age group for each calendar year of the reporting period. The data for the missing year–age–sex categories were estimated at IARC using the methods described in Chapter 2. See also Argentina, above.

EDITORS' COMMENTS

The proportion of cases with unspecified morphology was high (13%), including among MV cases (10%) (Table A.9). There are somewhat more children (aged 0–14 years) in the dataset than expected. Date of birth may be incomplete in a proportion of cases (Table A.8). CNS tumours with uncertain behaviour were registered sporadically, and only a few were found in the dataset (Table A.9). There were no cases of pilocytic astrocytoma in the dataset. Skin carcinomas were reportable. Laterality was not collected.

Córdoba Cancer Registry, 2004–2012

Martín Alonso, Rosalba Fita, Graciela Nicolás, Marcela Alvarez, Débora Rivas, Olga Toledo

Córdoba Province is located in north-central Argentina. It is the second most populous province in Argentina; in 2010, the population was 3.3 million, and about one third of the population was younger than 20 years (8% of the national population younger than 20 years) (Table A.6).

Córdoba Province covers an area of 165 321 km^2 and is divided into 26 departments. The population of the provincial capital, Córdoba, is 1.4 million (40% of the provincial population); it is the second largest city in the country, after Buenos Aires.

Children's Hospital "Santísima Trinidad" in Córdoba has a comprehensive paediatric oncology unit. There are also five other private and public paediatric oncology units in the province. About 8% of children with cancer travel to Buenos Aires to receive some treatment.

The Córdoba Cancer Registry covers all 26 departments of the province. The registry is located at the Hospital Oncológico de Córdoba. The registry staff consists of two doctors, one data analyst, and three registrars.

Data are collected both actively and passively from all the sources (e.g. public hospitals, private hospitals, pathological anatomy laboratories, social insurance companies) and compared with data recorded by ROHA. Information on death certificates is obtained from the Office of Vital Statistics of Córdoba Province. Data are recorded using CanReg5. Quality control checks are done periodically using IARC tools to calculate the standard quality indicators. The registry contributed to Cancer Incidence in Five Continents (CI5) and the CONCORD studies.

POPULATION AT RISK

Population data were provided in all required detail. See also Argentina, above.

EDITORS' COMMENTS

The proportion of cases with unspecified morphology was 10% (Table A.9). There was an excess of cases in males in the age group 15–19 years. Non-malignant CNS tumours were registered, but the proportion was low (11%). Pilocytic astrocytoma was coded with uncertain behaviour. Skin carcinomas were reportable. Laterality was not collected.

Entre Ríos Cancer Registry, 2001–2011

Miguel Angel Prince, Patricia Liana Giacciani, Carmen Gonzales, Julio Bechelli, Enrique Fernandez, Hector Arocena, Diego Garcilazo

Entre Ríos Province is the southernmost province in the Mesopotamia region in north-eastern Argentina. It covers an area of 78 781 km^2 and is divided into 17 departments. It is bordered by the provinces of Corrientes to the north, Santa Fe to the west, and Buenos Aires to the south, and by Uruguay to the east.

The population-based Entre Ríos Cancer Registry was established in 1996 and covers the entire population of the province. In 2010, the population was 1.1 million, and 35% of the population was younger than 20 years (Table A.6). The registry project is shared between geographically delimited areas, or nodes, which each manage a part of the vast area covered by the registry. Each node has assigned pathologists, cytologists, oncologists, and other specialists.

Data are collected both actively and passively from all the sources (e.g. public hospitals, private hospitals, pathological anatomy laboratories, social insurance companies) and are exchanged with ROHA. Data are stored in and managed using CanReg4, provided by IARC and adjusted to the specific needs of the registry. Death certificates issued in Entre Ríos are also ascertained for new cases.

The paediatric hospital in Entre Ríos Province (San Roque Hospital) has a haematology unit. Patients with solid tumours are referred to Buenos Aires for treatment. Overall, about 70% of children with cancer travel to Buenos Aires to receive some treatment.

POPULATION AT RISK

Population data were provided by the Statistics and Census Institute of Entre Ríos Province for 2001–2006 and by the Institute of Epidemiology of Santa Fe Province for 2007–2011. Population data were provided by sex and 5-year age group for each calendar year. The data for the missing year–age–sex categories were estimated at IARC using the methods described in Chapter 2. See also Argentina, above.

EDITORS' COMMENTS

The proportion of cases with unspecified morphology was high (15%), including among MV cases (9%) (Table A.9). CNS tumours with uncertain behaviour were registered, but the proportion was low. There were no cases of pilocytic astrocytoma in the dataset. Skin carcinomas were reportable. Laterality was not collected.

Mendoza Cancer Registry, 2003–2012

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The Mendoza Cancer Registry covers Mendoza Province, which is located in west-central Argentina and covers an area of 148 827 km^2. The western part of the province is bordered by the Andes mountain range, which rises to an altitude of almost 7000 m, and the eastern part of the province consists mostly of a desert plain. The continental climate is sunny and dry, with warm summers and cold winters. The province's economy is based on mining, manufacture, agriculture, and tourism.

In 2010, the population of Mendoza Province was 1.7 million, and 36% of the population was younger than 20 years (Table A.6). The population is concentrated in irrigated oases; 80% of people live in urban areas, distributed among 18 municipalities. The population is ethnically heterogeneous, with a mixture of Indigenous peoples and Europeans (mainly Spanish and Italian). In recent decades, immigration to the area from Chile, Bolivia and Peru has increased.

Diagnosis and treatment for children with cancer are provided through the public, private, and social security systems. Mendoza Province has the prestigious Paediatric Hospital "Dr. Humberto Notti", which has a paediatric oncology unit that includes a haematology service. Other specialty services provided include paediatric oncohaematology, anatomical pathology, surgery, orthopaedics, and neurosurgery. The hospital provides care to patients younger than 18 years from all over the province, regardless of their medical insurance status. The 50% of the population that is not covered by the social security system is eligible to receive prescription medication, prostheses and endoprostheses, and positron emission tomography (PET) scans free of charge through a government programme. About 7% of children with cancer travel to Buenos Aires to receive treatment. Both patients with social security and those with private medical insurance are treated. Patients older than 14 years with haematopoietic malignancies and those older than 17 years with solid tumours receive treatment at state hospitals (two of which are within the social security system) or at one of four private hospitals with oncology services. Two medical centres provide radiotherapy.

Data are collected mainly from state and private hospitals, pathology and haematology laboratories, radiotherapy centres, and private practices. The registry

also has access to death certificates. Since 2000, data for the age group 0–14 years have been provided to ROHA. Data are coded in the registry's central unit using ICD-O-3. Data are entered using CanReg, provided by IARC.

POPULATION AT RISK

Population data were provided by the Mendoza Office of Statistics and Economic Research (https://deie.mendoza.gov.ar) and are based on data from the National Census of Population and Housing for 2001 and 2010. Data were provided in all requested detail. See also Argentina, above.

EDITORS' COMMENTS

The proportion of cases with unspecified morphology among MV cases was slightly higher than expected (Table A.9). Non-malignant CNS tumours were registered, and pilocytic astrocytoma was coded with uncertain behaviour. Skin carcinomas were reportable. Laterality was complete for retinoblastoma and relatively complete (80%) for the other sites.

Neuquén Cancer Registry, 2003–2013

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Neuquén Province is located in western Argentina, at the northern end of Patagonia, and is adjacent to Mendoza Province in the north. Neuquén Province covers an area of 94 078 km^2 (3.4% of the area of Argentina) and is divided into 16 departments. There are two main distinctive landscapes: the Andes mountain range with its abundant rains, lakes, and vegetation, is located in the west, and the arid plateau, with fertile land near the Limay River and Neuquén River basins, is located in the east. The extractive sector (gas and petroleum production) is the most important source of the province's income. The Neuquén River basin, which includes part of the provinces of Río Negro, La Pampa, and Mendoza, is the most important oil- and gas-producing region in the country, producing 39% of the total petroleum of Argentina. There is intensive agriculture in the valleys of the Neuquén River and the Limay River, in the east of the province. One of the fastest-growing activities is tourism, in both summer and winter.

The public health-care system has an extensive network of 210 facilities operated within a regional, interrelated, and hierarchical framework. Private health services are located mainly in the provincial capital; there are a few facilities in other cities.

Care for all patients with cancer is provided by specialized teams in a tertiary public hospital (~50% of patients) and in two private centres (~50% of patients). About 24% of children with cancer travel to Buenos Aires to receive some treatment.

The Neuquén Cancer Registry is population-based and covers the entire province. The province has a population of 0.6 million (1.4% of the national population), and 36% of the population is younger than 20 years (Table A.6).

Cases are ascertained from treatment centres (e.g. cancer centres, general hospitals, private centres, nursing homes); pathology services; haematology, biochemistry, and immunology laboratories; and radiology services. Death certificates collected at the provincial level are also used. Records are exchanged with ROHA and the Argentine Cutaneous Melanoma Registry.

The registry used CanReg4, provided by IARC. Tumours were coded according to ICD-O-3 and IARC/IACR standard recommendations (Table A.10).

POPULATION AT RISK

The sources of the population data were the Neuquén Province *Sala de Situación* and the National Institute of Statistics and Censuses for the censuses of 2001 and 2010. Data were provided in all requested detail. See also Argentina, above.

EDITORS' COMMENTS

The dataset included somewhat more cases in the age group 0–14 years than expected. There was an excess of cases in males in the age group 15–19 years. Non-malignant CNS tumours were registered, but the proportion was low (18%) (Table A.9). Pilocytic astrocytoma was coded with uncertain behaviour. Skin carcinomas were reportable, but none were registered during the reporting period. Laterality was not collected.

ARGENTINA, 6 registries (1991-2013)

	Age group (years)	Males	Females
Person-years	0	739 131	701 088
	1-4	2 931 239	2 790 279
	5-9	3 706 380	3 584 679
	10-14	3 845 360	3 713 991
	15-19	3 773 160	3 670 904
	0-14	11 222 110	10 790 037
	0-19	14 995 270	14 460 941

Please consult the quality indicators for this pool and its constituent registries

ARGENTINA, 6 registries (1991-2013)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	LEUKAEMIA	44	377	290	268	205	**979**	**1184**	33.2	100.0	29.1	100.0	30.6	65.9	39.8	35.5	27.5	**45.9**	**41.8**	670	808	95.1	2.0
	a. Lymphoid	23	280	210	166	104	**679**	**783**	23.0	69.4	19.2	66.1	16.0	48.9	28.8	22.0	14.0	**32.0**	**28.0**	465	535	97.6	0.4
	b. Acute myeloid	13	53	46	61	40	**173**	**213**	5.9	17.7	5.2	18.0	9.0	9.3	6.3	8.1	5.4	**7.9**	**7.4**	118	145	98.1	0.9
	c. CMD	0	3	4	5	13	**12**	**25**	0.4	1.2	0.6	2.1	-	0.5	0.5	0.7	1.7	**0.5**	**0.8**	8	17	96.0	0.0
	d. MDS & other	1	6	3	5	7	**15**	**22**	0.5	1.5	0.5	1.9	0.7	1.0	0.4	0.7	0.9	**0.7**	**0.8**	10	15	95.5	0.0
	e. Unspecified	7	35	27	31	41	**100**	**141**	3.4	10.2	3.5	11.9	4.9	6.1	3.7	4.1	5.5	**4.7**	**4.8**	68	96	76.6	13.5
II	LYMPHOMA & RELATED	15	102	150	163	215	**430**	**645**	14.6	100.0	15.8	100.0	10.4	17.8	20.6	21.6	28.9	**19.2**	**21.4**	292	437	98.1	0.9
	a. Hodgkin	0	17	56	77	127	**150**	**277**	5.1	34.9	6.8	42.9	-	3.0	7.7	10.2	17.1	**6.4**	**8.8**	101	187	98.6	0.4
	b. Non-Hodgkin except BL	1	42	54	58	61	**155**	**216**	5.3	36.0	5.3	33.5	0.7	7.3	7.4	7.7	8.2	**6.9**	**7.2**	105	146	98.6	0.0
	c. Burkitt (BL)	0	16	21	14	3	**51**	**54**	1.7	11.9	1.3	8.4	-	2.8	2.9	1.9	0.4	**2.3**	**1.9**	35	37	100.0	0.0
	d. Lymphoreticular	11	19	10	8	2	**48**	**50**	1.6	11.2	1.2	7.8	7.6	3.3	1.4	1.1	0.3	**2.4**	**1.9**	33	34	100.0	0.0
	e. Unspecified	3	8	9	6	22	**26**	**48**	0.9	6.0	1.2	7.4	2.1	1.4	1.2	0.8	3.0	**1.2**	**1.6**	18	33	89.6	10.4
III	CNS NEOPLASMS †	36	152	190	142	110	**520**	**630**	17.6	100.0	15.5	100.0	25.0	26.6	26.1	18.8	14.8	**24.0**	**21.9**	355	429	85.9	4.3
	a. Ependymoma	10	30	18	7	9	**65**	**74**	2.2	12.5	1.8	11.7	6.9	5.2	2.5	0.9	1.2	**3.2**	**2.8**	45	51	97.3	0.0
	b. Astrocytoma	5	43	65	55	38	**168**	**206**	5.7	32.3	5.1	32.7	3.5	7.5	8.9	7.3	5.1	**7.6**	**7.0**	114	140	96.6	0.0
	c. CNS embryonal	7	48	46	27	13	**128**	**141**	4.3	24.6	3.5	22.4	4.9	8.4	6.3	3.6	1.7	**6.0**	**5.1**	88	97	100.0	0.0
	d. Other gliomas	3	5	16	13	10	**37**	**47**	1.3	7.1	1.2	7.5	2.1	0.9	2.2	1.7	1.3	**1.6**	**1.6**	25	32	89.4	0.0
	e. Other specified	2	4	16	13	11	**35**	**46**	1.2	6.7	1.1	7.3	1.4	0.7	2.2	1.7	1.5	**1.5**	**1.5**	24	31	97.8	0.0
	f. Unspecified CNS	9	22	29	27	29	**87**	**116**	2.9	16.7	2.8	18.4	6.2	3.8	4.0	3.6	3.9	**4.0**	**4.0**	59	79	36.2	23.3
IV	NEUROBLASTOMA	55	83	21	7	7	**166**	**173**	5.6	100.0	4.2	100.0	38.2	14.5	2.9	0.9	0.9	**8.7**	**6.9**	115	120	98.3	0.6
	a. (Ganglio)neuroblastoma	55	82	20	7	6	**164**	**170**	5.6	98.8	4.2	98.3	38.2	14.3	2.7	0.9	0.8	**8.6**	**6.8**	114	118	98.8	0.6
	b. Peripheral nervous	0	1	1	0	1	**2**	**3**	0.1	1.2	0.1	1.7	-	0.2	0.1	-	0.1	**0.1**	**0.1**	1	2	66.7	0.0
V	RETINOBLASTOMA	30	50	5	0	0	**85**	**85**	2.9	100.0	2.1	100.0	20.8	8.7	0.7	-	-	**4.5**	**3.5**	59	59	96.5	0.0
VI	RENAL TUMOURS	26	77	28	9	10	**140**	**150**	4.7	100.0	3.7	100.0	18.1	13.5	3.8	1.2	1.3	**7.2**	**5.8**	97	104	95.3	0.7
	a. Nephroblastoma	24	77	27	3	2	**131**	**133**	4.4	93.6	3.3	88.7	16.7	13.5	3.7	0.4	0.3	**6.8**	**5.3**	91	92	97.0	0.0
	b. Renal carcinoma	2	0	1	5	7	**8**	**15**	0.3	5.7	0.4	10.0	1.4	-	0.1	0.7	0.9	**0.3**	**0.5**	5	10	86.7	0.0
	c. Unspecified	0	0	0	1	1	**1**	**2**	0.0	0.7	0.0	1.3	-	-	-	0.1	0.1	**0.0**	**0.1**	1	1	50.0	50.0
VII	HEPATIC TUMOURS	8	13	4	7	2	**32**	**34**	1.1	100.0	0.8	100.0	5.6	2.3	0.5	0.9	0.3	**1.6**	**1.3**	22	23	94.1	2.9
	a. Hepatoblastoma	8	12	1	1	0	**22**	**22**	0.7	68.8	0.5	64.7	5.6	2.1	0.1	0.1	-	**1.2**	**0.9**	15	15	100.0	0.0
	b. Hepatic carcinoma	0	1	2	5	2	**8**	**10**	0.3	25.0	0.2	29.4	-	0.2	0.3	0.7	0.3	**0.3**	**0.3**	5	7	100.0	0.0
	c. Unspecified	0	0	1	1	0	**2**	**2**	0.1	6.3	0.0	5.9	-	-	0.1	0.1	-	**0.1**	**0.1**	1	1	0.0	50.0
VIII	BONE TUMOURS	1	10	38	108	88	**157**	**245**	5.3	100.0	6.0	100.0	0.7	1.7	5.2	14.3	11.8	**6.4**	**7.6**	105	164	94.7	2.4
	a. Osteosarcoma	0	0	14	73	57	**87**	**144**	2.9	55.4	3.5	58.8	-	-	1.9	9.7	7.7	**3.4**	**4.4**	58	96	97.2	0.0
	b. Chondrosarcoma	0	0	1	4	5	**5**	**10**	0.2	3.2	0.2	4.1	-	-	0.1	0.5	0.7	**0.2**	**0.3**	3	7	100.0	0.0
	c. Ewing & related	1	8	20	19	14	**48**	**62**	1.6	30.6	1.5	25.3	0.7	1.4	2.7	2.5	1.9	**2.1**	**2.1**	33	42	100.0	0.0
	d. Other specified	0	0	1	2	3	**3**	**6**	0.1	1.9	0.1	2.4	-	-	0.1	0.3	0.4	**0.1**	**0.2**	2	4	83.3	0.0
	e. Unspecified	0	2	2	10	9	**14**	**23**	0.5	8.9	0.6	9.4	-	0.3	0.3	1.3	1.2	**0.6**	**0.7**	9	15	65.2	26.1
IX	SOFT TISSUE SARCOMA	21	51	51	53	75	**176**	**251**	6.0	100.0	6.2	100.0	14.6	8.9	7.0	7.0	10.1	**8.2**	**8.6**	120	171	95.6	1.2
	a. Rhabdomyosarcoma	10	32	32	13	15	**87**	**102**	2.9	49.4	2.5	40.6	6.9	5.6	4.4	1.7	2.0	**4.2**	**3.7**	60	70	97.1	1.0
	b. Fibrosarcoma	7	7	5	16	13	**35**	**48**	1.2	19.9	1.2	19.1	4.9	1.2	0.7	2.1	1.7	**1.6**	**1.6**	24	33	100.0	0.0
	c. Kaposi sarcoma	0	0	0	0	2	**0**	**2**	-	-	0.0	0.8	-	-	-	-	0.3	**-**	**0.1**	-	1	50.0	0.0
	d. Other specified	3	9	12	13	29	**37**	**66**	1.3	21.0	1.6	26.3	2.1	1.6	1.6	1.7	3.9	**1.7**	**2.2**	25	45	93.9	1.5
	e. Unspecified	1	3	2	11	16	**17**	**33**	0.6	9.7	0.8	13.1	0.7	0.5	0.3	1.5	2.1	**0.7**	**1.0**	11	22	90.9	3.0
X	GERM CELL TUMOURS	20	36	30	72	191	**158**	**349**	5.4	100.0	8.6	100.0	13.9	6.3	4.1	9.5	25.7	**7.1**	**11.3**	107	236	97.7	0.9
	a. CNS germ cell ‡	2	2	8	13	1	**25**	**26**	0.8	15.8	0.6	7.4	1.4	0.3	1.1	1.7	0.1	**1.1**	**0.9**	17	18	96.2	3.8
	b. Other extragonadal	10	6	1	5	14	**22**	**36**	0.7	13.9	0.9	10.3	6.9	1.0	0.1	0.7	1.9	**1.1**	**1.3**	15	25	100.0	0.0
	c. Gonadal germ cell	8	26	18	39	147	**91**	**238**	3.1	57.6	5.8	68.2	5.6	4.5	2.5	5.2	19.7	**4.1**	**7.6**	62	161	100.0	0.0
	d. Gonadal carcinoma	0	0	0	13	22	**13**	**35**	0.4	8.2	0.9	10.0	-	-	-	1.7	3.0	**0.5**	**1.1**	9	23	97.1	0.0
	e. Unspecified gonadal	0	2	3	2	7	**7**	**14**	0.2	4.4	0.3	4.0	-	0.3	0.4	0.3	0.9	**0.3**	**0.5**	5	9	57.1	14.3
XI	CARCINOMA & MELANOMA	4	6	22	43	175	**75**	**250**	2.5	100.0	6.1	100.0	2.8	1.0	3.0	5.7	23.5	**3.2**	**7.7**	51	168	98.8	0.0
	a. Adrenocortical	1	1	1	0	0	**3**	**3**	0.1	4.0	0.1	1.2	0.7	0.2	0.1	-	-	**0.2**	**0.1**	2	2	100.0	0.0
	b. Thyroid	0	1	3	9	52	**13**	**65**	0.4	17.3	1.6	26.0	-	0.2	0.4	1.2	7.0	**0.5**	**2.0**	9	44	100.0	0.0
	c. Nasopharyngeal	0	0	0	1	2	**1**	**3**	0.0	1.3	0.1	1.2	-	-	-	0.1	0.3	**0.0**	**0.1**	1	2	100.0	0.0
	d. Melanoma	1	3	5	8	13	**17**	**30**	0.6	22.7	0.7	12.0	0.7	0.5	0.7	1.1	1.7	**0.7**	**1.0**	12	20	96.7	0.0
	e. Skin carcinoma	0	0	3	8	18	**11**	**29**	0.4	14.7	0.7	11.6	-	-	0.4	1.1	2.4	**0.4**	**0.9**	7	19	100.0	0.0
	f. Other & unspecified	2	1	10	17	90	**30**	**120**	1.0	40.0	2.9	48.0	1.4	0.2	1.4	2.2	12.1	**1.3**	**3.7**	20	81	98.3	0.0
XII	OTHER & UNSPECIFIED	6	6	9	12	42	**33**	**75**	1.1	100.0	1.8	100.0	4.2	1.0	1.2	1.6	5.6	**1.5**	**2.4**	22	51	54.7	20.0
	a. Other specified	2	3	0	3	2	**8**	**10**	0.3	24.2	0.2	13.3	1.4	0.5	-	0.4	0.3	**0.4**	**0.4**	5	7	100.0	0.0
	b. Other unspecified	4	3	9	9	40	**25**	**65**	0.8	75.8	1.6	86.7	2.8	0.5	1.2	1.2	5.4	**1.1**	**2.1**	17	44	47.7	23.1
	TOTAL	266	963	838	884	1120	**2951**	**4071**	100.0	100.0	100.0	100.0	184.7	168.3	114.9	116.9	150.5	**137.5**	**140.4**	2017	2770	94.0	2.1

† includes 76 non-malignant ‡ includes 1 non-malignant

Please consult the quality indicators for this pool and its constituent registries

Brazil

Brazil is the world's fifth largest country by area and the sixth most populous. It covers an area of 8.5 million km^2 and is bounded by the Atlantic Ocean to the east; it has a border with all other South American countries, with the exception of Ecuador and Chile. The Amazon River basin includes a vast tropical forest, which is home to diverse wildlife, a variety of ecological systems, and extensive natural resources that span numerous protected habitats. The climate is tropical in most of the country but comprises a wide range of weather conditions across varied topography, from desert to oceanic. Brazil has a fast-growing economy, supported by abundant natural resources. The main sectors are agriculture, mining, manufacturing, and services.

In 2010, the population was 198.6 million; 25% of the population was in the age group 0–14 years, and 34% was in the age group 0–19 years (Table A.6). About 83% of the population lived in urban areas. According to the National Research by Household Sample of 2008, 48% of the population self-identified as White, 44% as Pardo (Brown), 7% as Black, 0.6% as Asian, and 0.3% (about 0.5 million) as Amerindian (officially, *Indígena* [Indigenous]).

The Unified Health System is managed and provided by all levels of government; it is the largest public health system in the world. Public health services are universal and are offered to all citizens of the country free of charge. Patients are referred to the treatment facilities in the state where they reside. Children with cancer are treated in public oncology facilities, and some within-country migration occurs to private referral centres. Complementary insurance is required for private health care.

The Brazilian National Cancer Institute (INCA; https://www.inca.gov.br/en) is part of the Ministry of Health, with a federal mandate to lead a nationwide policy for cancer prevention and control. As a technical branch of the federal government, under the direct administration of the Ministry of Health, INCA delivers cancer care within the Unified Health System. It also develops research activities and disseminates practices and knowledge for medical oncology.

The incidence data collected by the registries are provided to INCA, which publishes national incidence estimates every 2 years. The reports describe the geographical distribution of cancer cases in the covered regions yearly, temporal trends, survival, and access to screening programmes. The data are also used to ascertain cases by geographical area and to plan referrals accordingly, as well as for epidemiological studies and medical education.

PUBLICATIONS

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POPULATION AT RISK

Population data were provided by the Brazilian Institute of Geography and Statistics (https://www.ibge.gov.br). The data are based on the censuses of 1991, 2000, and 2010 (Table A.7) and intercensal estimates.

EDITORS' COMMENTS

Datasets from five regional registries (Aracaju, Belo Horizonte, Curitiba, Goiânia, and João Pessoa) are presented in a combined dataset. The full tables for the individual registries are available online, as specified in Table A.12. The registries of Goiânia and Belém contributed to IICC-2, and three additional registries in Brazil contributed to IICC-1 (Table A.1). All registries had access to information on deaths from the Mortality Information System of the Ministry of Health.

A high proportion of cases with unspecified morphology in some cancer registries in Brazil resulted in the high percentage of such cases in the national pooled dataset. Two of the registries had a high DCO%, which influenced this indicator in the pooled dataset (Table A.9). Pilocytic

BRAZIL, 5 registries (1995-2012)

Registry	Period	Cases	%	Person-years	%
Aracaju	1996-2012	414	10.7	3 132 138	12.1
Belo Horizonte	2000-2006	771	20.0	5 536 010	21.5
Curitiba	1998-2010	1192	30.9	7 365 070	28.5
Goiânia	1995-2011	1114	28.9	6 905 593	26.8
João Pessoa	1999-2010	367	9.5	2 866 081	11.1
BRAZIL	**1995-2012**	**3858**	**100.0**	**25 804 892**	**100.0**

Please consult the quality indicators for this pool and its constituent registries

astrocytoma was coded with malignant behaviour until about 2005, according to ICD-O-2, and with uncertain behaviour thereafter, according to ICD-O-3. Non-malignant CNS tumours were not systematically registered; thus, this tumour type may have been underreported. All skin carcinoma types were reportable. Laterality was not routinely collected.

Aracaju Cancer Registry, 1996–2012

Carlos Anselmo Lima, José Erinaldo Lobo de Oliveira, Sueli Pina Vieira, Maria das Graças Prata França, Elma Santana de Oliveira

The population-based Aracaju Cancer Registry covers an area of 181 856 km^2. In 2010, the population was 0.6 million, and 31% of the population was younger than 20 years (Table A.6). The population is predominantly urban, and the annual population growth rate was 2% in 2010. The city of Aracaju is located in north-eastern Brazil. The climate is hot and humid, with an average annual temperature of 26 °C and a rainy, windy season from March to August. Most workers are employed in industry, services, and tourism. The municipal GDP was R$ 9.7 billion in 2015.

Cancer diagnostic services are provided by general health-care institutions, two public oncology units, and the several private general care facilities located in the covered area. Chemotherapy is provided by two specialized units and seven private clinics. Radiotherapy is provided by two public cancer units.

The Aracaju Cancer Registry was established in 1998, with retrospective data collection since 1996 (Table A.10). It is sponsored by the Health Agency of the State of Sergipe and receives additional funding from the Ministry of Health. The registry staff consists of a coordinator with a medical degree and four registrars. A scientific commission provides pathological, paediatric, and epidemiological expertise. Data are collected actively from all pathology laboratories, the two oncology units, all the chemotherapy clinics, some general care units, and official databases, such as the mortality database. Routine quality control procedures include verification of topography, age, histology, and death information. Data were coded according to ICD-O-2 until 2005 and according to ICD-O-3 thereafter (Table A.10). IARC/IACR rules were applied to code variables and determine multiple primary tumours. Follow-up of patients is conducted through the two oncology units and the state mortality database.

POPULATION AT RISK

Data were provided in all requested detail. See also Brazil, above.

EDITORS' COMMENTS

The proportion of cases aged 19 years in the age group 15–19 years was high (30%) (Table A.9). Considering the relatively low overall incidence, this may indicate underreporting of cancers in children compared with adolescents. In addition to malignant CNS tumours, only pilocytic astrocytoma was recorded with uncertain behaviour. Laterality was reported for 73% of the cases of interest after a special trace-back of relevant records was conducted for IICC-3. See also Brazil, above.

Belo Horizonte Cancer Registry, 2000–2006

Berenice Navarro Antoniazzi, Gil Patrus Mundim Pena, Margarete Aparecida dos Santos, Claudina Agnese Casale, Aparícia Neves Ferreira, Elen Sabino da Silva Coelho, Fernanda Cordeiro Freire, Juliana Carvalho de Oliveira, Silvania Lourenço Ribeiro, Mônica Nazaré Torres, Rafael Wenceslau Grabe, Ângela Maria do Amparo

The population-based Belo Horizonte Cancer Registry covers the city of Belo Horizonte, the capital of the State of Minas Gerais, which is located in south-eastern Brazil. The registry covers an area of 331 400 km^2, with an urban population of 2.4 million, which grows by 0.6% annually (censuses of 2000 and 2010); about 34% of the population is younger than 20 years (Table A.6). The city of Belo Horizonte is located 852 m above sea level; the climate is tropical, with warm, rainy summers and an average annual temperature of 21 °C.

The city has a network of 68 public and private hospitals, including eight paediatric hospitals, with a total of 9048 beds (3.08 beds per 1000 inhabitants), 5250 of them dedicated to the Unified Health System. Cancer diagnostic and treatment facilities include 12 haematology services, 10 surgical oncology services, 20 clinical oncology services, eight paediatric oncology services, and 12 radiotherapy services (Department of Informatics of the Unified Health System [DATASUS]; https://datasus.saude.gov.br). Cytological, histological, and immunohistochemical diagnosis is provided by 36 local pathology laboratories.

The registry was established in 2001, with retrospective data collection since 2000 (Table A.10). It is located in the Health Surveillance Directory of the Secretariat of Health of the State of Minas Gerais. The registry is responsible for the Evaluation and Monitoring of Cancer and its Risk Factors Programme of the State of Minas Gerais.

The registry has permanent funding. The registry staff consists of an epidemiologist (coordinator), a pathologist, a supervising nurse, a field supervisor of both population- and hospital-based registries, six field registrars, an informatics analyst, and an administrative and field survey professional. The advisory committee includes one epidemiologist, two statisticians, and one oncologist.

Data are actively collected from 43 sources, including one specialized hospital, one university hospital, 16 general hospitals, and 23 pathology laboratories.

POPULATION AT RISK
Data were provided in all requested detail. See also Brazil, above.

EDITORS' COMMENTS
The high proportion of cases aged 19 years in the age group 15–19 years, the high DCO%, and the relatively low overall incidence rates may suggest underreporting (Table A.9). The proportion of cases with unspecified morphology was high (13%). CNS tumours with uncertain behaviour (including pilocytic astrocytoma) were registered, but the proportion was low (15%) (Table A.9). See also Brazil, above.

Curitiba Cancer Registry, 1998–2010

Cyntia Asturian Laporte, Cintia da Costa Marques, Kênia Maria Brero Del Pino, Maria Rita Ostrovski Martins, Vera Regina Pilotto Abelardino da Silva, Vivian de Fátima Blanchet

The population-based Curitiba Cancer Registry covers the city of Curitiba in southern Brazil. The city covers an area of 430 km^2 and is located 934 m above sea level. The climate is subtropical, with warm summers; the average annual temperature is 17.5 °C. In 2010, the population was 1.8 million, and 28% of the population was younger than 20 years (Table A.6). The population is urban and grows by 1.8% per year.

The city of Curitiba has a network of 35 modern public and private hospitals, with a total of 6817 beds (39 beds per 1000 inhabitants). Curitiba has 11 universities and six medical schools. The cancer diagnostic and treatment facilities include 23 oncology services (radiotherapy and chemotherapy) and 81 cytology or pathology laboratories.

The registry was established in 1997 and has complete data from 1998. It is located in the Municipal Department of Health of the Curitiba City Hall. The registry covers all patients who receive care from public or private services; the registry does not have access to health insurance records.

The registry has permanent funding. The registry staff consists of one coordinator, five registrars, and one computer technician. The advisory committee includes one epidemiologist and one pathologist.

Data are actively collected from 50 sources, including two specialized hospitals, four university hospitals, five general hospitals, 12 anatomical pathology laboratories, one haematology clinic, 17 oncology clinics (chemotherapy or radiotherapy), two dermatology clinics, and two specific screening programmes.

POPULATION AT RISK
Data were provided in all requested detail. See also Brazil, above.

EDITORS' COMMENTS
The low proportion of cases with clinical diagnosis (2%) and the high DCO% (7%) suggest that some cases were missed. In addition to malignant CNS tumours, only pilocytic astrocytoma type was recorded with uncertain behaviour; the proportion was low (6%) (Table A.9). See also Brazil, above.

Goiânia Cancer Registry, 1995–2011

José Carlos de Oliveira, Maria Paula Curado, Carleane Maciel Bandeira e Silva, Elcivone Cirineu de Souza, Matinair Siqueira Mineiro, Diego Rodrigues M. e Silva, Antônio Gomes Teles, Élbio Cândido de Paula, Elecy Messias de Oliveira, Geraldo da Silva Queiroz, Nildes Ferreira Borges, Ruffo de Freitas Junior, Sormany Del Carmo

The population-based Goiânia Cancer Registry was established in July 1986 by the Governor-Secretary of the State of Goiás under the coordination of the Ministry of Health. It has been housed at the Association Against Cancer since 1994. Data collection began in 1986, and reliable incidence data are available from 1988 (Table A.10). The registry covers the municipality of Goiânia, which is located in west-central Brazil. The municipality covers an urban area of 739 km^2 and is densely populated, with a population density of 1775 per km^2. In 2010, the population was 1.3 million, and 29% of the population was younger than 20 years (Table A.6).

The city of Goiânia has four paediatric oncology institutions. The Medical Council of Goiânia has 356 paediatricians, including 10 oncologists. The city of Goiânia has two bone marrow transplantation centres, with four paediatric oncologists and one haematologist. There is one cancer hospital in the city: Hospital Araújo Jorge. It has 19 inpatient and 20 outpatient beds for paediatric patients; 20 beds are allocated to chemotherapy of long duration (10 hours), and 10 beds are allocated to chemotherapy of short duration (1–3 hours). On average, 40 children per day receive care at the outpatient clinic.

Information on all cancer cases is stored in appropriate software created for the registry, and confidentiality is maintained. All data providers in the private and public sectors collaborate with the registry. Data are collected actively from 85% of data sources and passively from the other 15%.

PUBLICATIONS

Braga PE, Latorre M do R, Curado MP (2002). Childhood cancer: a comparative analysis of incidence, mortality and survival in Goiânia (Brazil) and other countries. [in Portuguese] Cad Saude Publica. 18(1):33–44. https://doi.org/10.1590/S0102-311X2002000100004 PMID:11910422

de Moura L, Curado MP, Simões EJ, Cezário AC, Urdaneta M (2006). Evaluation of the population based cancer registry of the Municipality of Goiânia, Goiás State, Brazil. [in Portuguese] Epidemiol Serv Saúde. 15(4):7–17.

POPULATION AT RISK

Data were provided by sex and single year of age for 1991 and for all years in the period 1996–2012. In addition, population counts were provided by sex for ages 0, 1, 2, 3, and 4 years for each calendar year of the period 1993–1995. The data for the missing year–age–sex categories were estimated at IARC using the methods described in Chapter 2. See also Brazil, above.

EDITORS' COMMENTS

The provided age was inconsistent with the provided dates in 7% of cases (Table A.8). Non-malignant CNS tumours were not registered, but cases of pilocytic astrocytoma were recorded with malignant behaviour. Laterality was available for 64% of the cases of interest. See also Brazil, above.

João Pessoa Cancer Registry, 1999–2010

Josefa Angela Pontes de Aquino, Gerlane Carvalho de Oliveira, Vanja Raquel Vasconcelos de Souza Lemos, Osmaldo Barbosa de Miranda, Maria de Lourdes, Bernardo da Silva, Helemário José Pacheco de France Son

The population-based João Pessoa Cancer Registry covers the area of the city of João Pessoa, the capital of the State of Paraíba. The city covers an area of 210 km^2 and has a population density of 3421 per km^2. It has 180 primary health units for prevention and early cancer detection programmes and public and private hospitals with 2586 beds. It also has six universities, three of which offer medical courses. In 2010, the urban population was 0.7 million, and 31% of the population was younger than 20 years (Table A.6). The municipality is located 43 m above sea level. The climate is tropical (hot and humid).

The registry was established in 2000 through an agreement between INCA and the Secretary of the State of Paraíba Health Department. The registry is funded by the Ministry of Health. Data collection started in 1999 (Table A.10). The registry staff consists of a coordinator, a supervisor, technical support staff, and three registrars. The advisory committee is composed of an epidemiologist, a statistician, a pathologist, a medical oncologist, a coordinator for noncommunicable diseases, a technical planning sector representative, and the registry coordinator. Information is collected actively from 48 sources, including one specialized hospital, one university hospital, 16 general hospitals, 10 pathology laboratories, three haematology services, four oncology clinics, and one radiation and chemotherapy service. These data sources often lack complete information about the disease, especially for tumours in children. Death certificates are obtained from the mortality information system of the Secretary of the State of Paraíba Health Department.

POPULATION AT RISK

Data were provided in all requested detail. See also Brazil, above.

EDITORS' COMMENTS

The proportion of cases with unspecified morphology was very high (26%), including among MV cases (21%) (Table A.9). Thus, the resulting rates are lower for specific and higher for unspecified cancer types. Non-malignant CNS tumours were not reportable, but pilocytic astrocytoma was included with malignant behaviour. See also Brazil, above.

BRAZIL, 5 registries (1995-2012)

	Age group (years)	Males	Females
Person-years	0	593 318	571 421
	1-4	2 402 162	2 319 407
	5-9	3 066 314	2 987 794
	10-14	3 276 325	3 251 425
	15-19	3 589 196	3 747 530
	0-14	9 338 119	9 130 047
	0-19	12 927 315	12 877 577

Please consult the quality indicators for this pool and its constituent registries

BRAZIL, 5 registries (1995-2012)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	**LEUKAEMIA**	37	325	268	186	185	**816**	**1001**	31.3	100.0	25.9	100.0	31.8	68.8	44.3	28.5	25.2	**46.4**	**41.6**	671	797	91.6	8.2
	a. Lymphoid	19	249	190	123	91	**581**	**672**	22.3	71.2	17.4	67.1	16.3	52.7	31.4	18.8	12.4	**33.2**	**28.5**	479	541	94.5	5.5
	b. Acute myeloid	11	40	49	45	60	**145**	**205**	5.6	17.8	5.3	20.5	9.4	8.5	8.1	6.9	8.2	**8.0**	**8.0**	118	159	88.3	11.2
	c. CMD	0	5	4	5	19	**14**	**33**	0.5	1.7	0.9	3.3	-	1.1	0.7	0.8	2.6	**0.8**	**1.2**	11	24	87.9	12.1
	d. MDS & other	3	1	2	2	3	**8**	**11**	0.3	1.0	0.3	1.1	2.6	0.2	0.3	0.3	0.4	**0.5**	**0.4**	7	9	90.9	9.1
	e. Unspecified	4	30	23	11	12	**68**	**80**	2.6	8.3	2.1	8.0	3.4	6.4	3.8	1.7	1.6	**4.0**	**3.4**	56	64	77.5	21.3
II	**LYMPHOMA & RELATED**	6	76	123	156	281	**361**	**642**	13.9	100.0	16.6	100.0	5.2	16.1	20.3	23.9	38.3	**18.9**	**23.3**	291	482	97.7	2.2
	a. Hodgkin	0	9	51	90	177	**150**	**327**	5.8	41.6	8.5	50.9	-	1.9	8.4	13.8	24.1	**7.3**	**11.1**	119	239	99.1	0.9
	b. Non-Hodgkin except BL	3	35	32	37	79	**107**	**186**	4.1	29.6	4.8	29.0	2.6	7.4	5.3	5.7	10.8	**5.8**	**7.0**	87	141	97.3	2.7
	c. Burkitt (BL)	0	14	28	18	12	**60**	**72**	2.3	16.6	1.9	11.2	-	3.0	4.6	2.8	1.6	**3.2**	**2.9**	49	57	97.2	2.8
	d. Lymphoreticular	3	14	6	3	3	**26**	**29**	1.0	7.2	0.8	4.5	2.6	3.0	1.0	0.5	0.4	**1.6**	**1.3**	22	24	100.0	0.0
	e. Unspecified	0	4	6	8	10	**18**	**28**	0.7	5.0	0.7	4.4	-	0.8	1.0	1.2	1.4	**0.9**	**1.0**	14	21	82.1	14.3
III	**CNS NEOPLASMS** †	30	123	167	131	126	**451**	**577**	17.3	100.0	15.0	100.0	25.8	26.1	27.6	20.1	17.2	**24.8**	**23.1**	368	454	81.6	11.1
	a. Ependymoma	7	21	12	7	12	**47**	**59**	1.8	10.4	1.5	10.2	6.0	4.4	2.0	1.1	1.6	**2.8**	**2.5**	39	47	100.0	0.0
	b. Astrocytoma	10	43	58	57	53	**168**	**221**	6.5	37.3	5.7	38.3	8.6	9.1	9.6	8.7	7.2	**9.1**	**8.7**	137	173	98.2	1.4
	c. CNS embryonal	4	25	52	36	17	**117**	**134**	4.5	25.9	3.5	23.2	3.4	5.3	8.6	5.5	2.3	**6.3**	**5.4**	95	107	97.0	2.2
	d. Other gliomas	1	9	19	13	17	**42**	**59**	1.6	9.3	1.5	10.2	0.9	1.9	3.1	2.0	2.3	**2.2**	**2.3**	34	46	72.9	1.7
	e. Other specified	0	0	1	0	4	**1**	**5**	0.0	0.2	0.1	0.9	-	-	0.2	-	0.5	**0.1**	**0.2**	1	4	100.0	0.0
	f. Unspecified CNS	8	25	25	18	23	**76**	**99**	2.9	16.9	2.6	17.2	6.9	5.3	4.1	2.8	3.1	**4.3**	**4.0**	62	78	17.2	57.6
IV	**NEUROBLASTOMA**	29	82	19	10	5	**140**	**145**	5.4	100.0	3.8	100.0	24.9	17.4	3.1	1.5	0.7	**8.8**	**6.9**	118	121	97.2	1.4
	a. (Ganglio)neuroblastoma	28	80	19	7	1	**134**	**135**	5.1	95.7	3.5	93.1	24.0	16.9	3.1	1.1	0.1	**8.4**	**6.6**	113	113	97.8	1.5
	b. Peripheral nervous	1	2	0	3	4	**6**	**10**	0.2	4.3	0.3	6.9	0.9	0.4	-	0.5	0.5	**0.3**	**0.4**	5	8	90.0	0.0
V	**RETINOBLASTOMA**	16	38	8	1	1	**63**	**64**	2.4	100.0	1.7	100.0	13.7	8.0	1.3	0.2	0.1	**4.0**	**3.1**	53	54	90.6	1.6
VI	**RENAL TUMOURS**	15	98	31	11	6	**155**	**161**	6.0	100.0	4.2	100.0	12.9	20.8	5.1	1.7	0.8	**9.6**	**7.6**	130	134	94.4	2.5
	a. Nephroblastoma	13	94	28	3	1	**138**	**139**	5.3	89.0	3.6	86.3	11.2	19.9	4.6	0.5	0.1	**8.7**	**6.7**	116	117	97.1	0.0
	b. Renal carcinoma	1	1	1	7	4	**10**	**14**	0.4	6.5	0.4	8.7	0.9	0.2	0.2	1.1	0.5	**0.5**	**0.5**	8	11	100.0	0.0
	c. Unspecified	1	3	2	1	1	**7**	**8**	0.3	4.5	0.2	5.0	0.9	0.6	0.3	0.2	0.1	**0.4**	**0.4**	6	6	37.5	50.0
VII	**HEPATIC TUMOURS**	7	13	5	6	11	**31**	**42**	1.2	100.0	1.1	100.0	6.0	2.8	0.8	0.9	1.5	**1.8**	**1.8**	26	33	78.6	19.0
	a. Hepatoblastoma	3	9	3	2	0	**17**	**17**	0.7	54.8	0.4	40.5	2.6	1.9	0.5	0.3	-	**1.0**	**0.8**	14	14	88.2	11.8
	b. Hepatic carcinoma	1	2	2	3	9	**8**	**17**	0.3	25.8	0.4	40.5	0.9	0.4	0.3	0.5	1.2	**0.4**	**0.6**	6	13	94.1	5.9
	c. Unspecified	3	2	0	1	2	**6**	**8**	0.2	19.4	0.2	19.0	2.6	0.4	-	0.2	0.3	**0.4**	**0.4**	5	6	25.0	62.5
VIII	**BONE TUMOURS**	4	9	43	90	143	**146**	**289**	5.6	100.0	7.5	100.0	3.4	1.9	7.1	13.8	19.5	**7.1**	**9.9**	115	213	92.7	5.5
	a. Osteosarcoma	1	1	17	59	81	**78**	**159**	3.0	53.4	4.1	55.0	0.9	0.2	2.8	9.0	11.0	**3.7**	**5.3**	61	116	97.5	1.3
	b. Chondrosarcoma	0	0	0	1	12	**1**	**13**	0.0	0.7	0.3	4.5	-	-	-	0.2	1.6	**0.0**	**0.4**	1	9	100.0	0.0
	c. Ewing & related	1	4	20	26	30	**51**	**81**	2.0	34.9	2.1	28.0	0.9	0.8	3.3	4.0	4.1	**2.6**	**2.9**	41	61	95.1	2.5
	d. Other specified	0	1	2	0	6	**3**	**9**	0.1	2.1	0.2	3.1	-	0.2	0.3	-	0.8	**0.2**	**0.3**	3	7	100.0	0.0
	e. Unspecified	2	3	4	4	14	**13**	**27**	0.5	8.9	0.7	9.3	1.7	0.6	0.7	0.6	1.9	**0.7**	**1.0**	11	20	51.9	44.4
IX	**SOFT TISSUE SARCOMA**	6	50	48	47	93	**151**	**244**	5.8	100.0	6.3	100.0	5.2	10.6	7.9	7.2	12.7	**8.3**	**9.3**	123	187	96.7	1.6
	a. Rhabdomyosarcoma	4	39	26	22	22	**91**	**113**	3.5	60.3	2.9	46.3	3.4	8.3	4.3	3.4	3.0	**5.2**	**4.7**	75	90	98.2	0.9
	b. Fibrosarcoma	1	2	7	6	6	**16**	**22**	0.6	10.6	0.6	9.0	0.9	0.4	1.2	0.9	0.8	**0.8**	**0.8**	13	17	90.9	4.5
	c. Kaposi sarcoma	0	0	0	0	1	**0**	**1**	-	-	0.0	0.4	-	-	-	-	0.1	**-**	**0.0**	-	1	100.0	0.0
	d. Other specified	1	8	12	12	34	**33**	**67**	1.3	21.9	1.7	27.5	0.9	1.7	2.0	1.8	4.6	**1.8**	**2.4**	27	50	98.5	0.0
	e. Unspecified	0	1	3	7	30	**11**	**41**	0.4	7.3	1.1	16.8	-	0.2	0.5	1.1	4.1	**0.5**	**1.3**	9	29	92.7	4.9
X	**GERM CELL TUMOURS**	15	25	17	29	121	**86**	**207**	3.3	100.0	5.4	100.0	12.9	5.3	2.8	4.4	16.5	**4.8**	**7.5**	70	153	96.1	2.4
	a. CNS germ cell	1	1	5	8	7	**15**	**22**	0.6	17.4	0.6	10.6	0.9	0.2	0.8	1.2	1.0	**0.8**	**0.8**	12	17	90.9	4.5
	b. Other extragonadal	7	14	0	1	16	**22**	**38**	0.8	25.6	1.0	18.4	6.0	3.0	-	0.2	2.2	**1.4**	**1.6**	19	30	100.0	0.0
	c. Gonadal germ cell	4	8	9	15	82	**36**	**118**	1.4	41.9	3.1	57.0	3.4	1.7	1.5	2.3	11.2	**1.9**	**4.0**	29	85	100.0	0.0
	d. Gonadal carcinoma	2	1	3	1	8	**7**	**15**	0.3	8.1	0.4	7.2	1.7	0.2	0.5	0.2	1.1	**0.4**	**0.6**	6	11	100.0	0.0
	e. Unspecified gonadal	1	1	0	4	8	**6**	**14**	0.2	7.0	0.4	6.8	0.9	0.2	-	0.6	1.1	**0.3**	**0.5**	5	10	57.1	28.6
XI	**CARCINOMA & MELANOMA**	6	22	31	90	263	**149**	**412**	5.7	100.0	10.7	100.0	5.2	4.7	5.1	13.8	35.8	**7.5**	**13.9**	118	298	98.1	1.2
	a. Adrenocortical	3	10	3	1	4	**17**	**21**	0.7	11.4	0.5	5.1	2.6	2.1	0.5	0.2	0.5	**1.1**	**0.9**	14	17	95.2	0.0
	b. Thyroid	0	0	4	26	98	**30**	**128**	1.2	20.1	3.3	31.1	-	-	0.7	4.0	13.4	**1.4**	**4.1**	23	90	100.0	0.0
	c. Nasopharyngeal	0	0	0	14	17	**14**	**31**	0.5	9.4	0.8	7.5	-	-	-	2.1	2.3	**0.6**	**1.0**	11	22	100.0	0.0
	d. Melanoma	2	3	2	8	18	**15**	**33**	0.6	10.1	0.9	8.0	1.7	0.6	0.3	1.2	2.5	**0.8**	**1.2**	12	24	100.0	0.0
	e. Skin carcinoma	0	2	10	21	50	**33**	**83**	1.3	22.1	2.2	20.1	-	0.4	1.7	3.2	6.8	**1.6**	**2.8**	26	60	100.0	0.0
	f. Other & unspecified	1	7	12	20	76	**40**	**116**	1.5	26.8	3.0	28.2	0.9	1.5	2.0	3.1	10.4	**2.1**	**3.9**	32	84	94.0	4.3
XII	**OTHER & UNSPECIFIED**	18	13	10	13	20	**54**	**74**	2.1	100.0	1.9	100.0	15.5	2.8	1.7	2.0	2.7	**3.1**	**3.1**	45	58	41.9	47.3
	a. Other specified	0	1	0	1	2	**2**	**4**	0.1	3.7	0.1	5.4	-	0.2	-	0.2	0.3	**0.1**	**0.1**	2	3	75.0	25.0
	b. Other unspecified	18	12	10	12	18	**52**	**70**	2.0	96.3	1.8	94.6	15.5	2.5	1.7	1.8	2.5	**3.0**	**2.9**	43	55	40.0	48.6
	TOTAL	189	874	770	770	1255	**2603**	**3858**	100.0	100.0	100.0	100.0	162.3	185.1	127.2	118.0	171.1	**145.2**	**151.0**	2129	2984	91.7	6.2

† includes 35 non-malignant

Please consult the quality indicators for this pool and its constituent registries

Chile

Chile is located on a long, narrow strip of land in South America between the Andes mountain range to the east and the Pacific Ocean to the west. The country covers an area of 756 096 km^2. The diverse climate includes the world's driest desert (the Atacama Desert) in the north, a Mediterranean climate in the central region, a humid subtropical climate on Easter Island, and an oceanic climate, including alpine tundra and glaciers, in the east and south. Chile is a stable and prosperous country, with a high-income economy and a high standard of living. In 2010, the population was 17.0 million (Table A.7); about 85% of the population lived in urban areas, and 30% of the population was younger than 20 years (Table A.6).

The national cancer plan has defined high-priority cancer types, which include all invasive cancers in children younger than 15 years, to be covered by the curative health programme Explicit Health Guarantees (GES) insurance, and the treatment of such cancers is developed mainly within the public health network.

In 2002, the Ministry of Health established the population-based cancer registries by law (Supreme Decree No. 5 of 2002) and defined their standard operations. The cancer registries meet strict confidentiality rules, under the Chilean laws 19.628 ("Protection of privacy") and 18.575 ("Protection of personal data") of the State Administration. In Chile, only Health Authorities can implement population-based cancer registries, which are supported by the Department of Epidemiology of the Ministry of Health. Chile is divided into 15 regions and has six population-based cancer registries: four in the regions of Arica, Antofagasta, Maule, and Los Ríos and two in the provinces of Bío Bío and Concepción. The registries collect data from pathology and haematology laboratories, hospital discharge records, and the health ministry official database of deaths, and systematically review medical records. Tumours are coded according to ICD-O-3 (Table A.10), and data are stored and validated using CanReg5, provided by IARC.

The registries participate in the development of cancer control strategies in their respective regions and produce reports on incidence, mortality, and survival.

POPULATION AT RISK

The population data are based on the censuses of 1992 and 2002 and were projected to 2012 by the National Institute of Statistics (https://www.ine.cl/).

EDITORS' COMMENTS

Data on cancer in children younger than 15 years are recorded by the National Registry of Childhood Cancer (RENCI), described below. In addition, datasets from four regional registries that record cancers in patients of all ages (Antofagasta, Bío Bío, Concepción, and Valdivia) are presented in a combined dataset in the IICC-3 book. All four registries are relatively small; therefore, the data are presented in abbreviated tables online (Table A.12).

The incidence rate reported by RENCI was somewhat lower than that derived from the combined data of the four general cancer registries. This may be because of the differences in the covered populations. Although RENCI also covers remote areas, which may have lower incidence rates, the general registries cover well-served areas that may attract non-residents or that may have higher incidence rates. The relatively small datasets provided by the individual general cancer registries may have resulted in a large random variation of some indicators in excess of the expected ranges. The sex ratio in the age group 15–19 years was higher than expected; this was to a large extent due to the high incidence of germ cell tumours in boys. Non-malignant CNS tumours were reportable, and pilocytic astrocytoma was coded with uncertain behaviour, but few or no cases were recorded in the individual registries. Skin carcinomas were reportable in all registries, but some cases in the private health system may not have been reported.

CHILE, 4 registries (1998-2012)

Registry	Period	Cases	%	Person-years	%
Antofagasta	2003-2010	186	20.5	1 512 008	24.1
Bío Bío	2003-2012	174	19.1	1 276 016	20.4
Concepción	2006-2010	255	28.1	1 557 855	24.9
Valdivia	1998-2012	294	32.3	1 920 455	30.6
CHILE	**1998-2012**	**909**	**100.0**	**6 266 334**	**100.0**

Please consult the quality indicators for this pool and its constituent registries

National Registry of Childhood Cancer (RENCI), 2007–2011

Clelia Vallebuona, Carla Cartes, Natalia Vergara, Fernando Soto, Nora Diaz, Marion Contreras, Lautaro Vargas, Rodolfo Pino

The National Registry of Childhood Cancer (RENCI) is part of the cancer monitoring system of the Ministry of Health in charge of surveillance of the population younger than 15 years in all regions of the country (a total of 3.7 million children).

The public health sector treats 85% of all new cancer cases. This sector includes 11 public health centres for comprehensive care of children with cancer; these are located in different regions of the country. The private sector treats the remaining patients. Both sectors provide diagnostic and treatment services, and pain relief is provided by the public sector.

RENCI is coordinated by the Department of Epidemiology of the Ministry of Health. Its implementation and operations follow the legal norms of the Ministry of Health.

Data are input directly into the RENCI database by oncologists from the public and private health systems. Registry personnel extract data from clinical records and national databases of deaths, of hospital discharges, and others. Data are verified using IARCcrgTools and standards.

RENCI collaborates and exchanges data with the regional population-based cancer registries. It coordinates studies on childhood cancer in Chile and reports childhood cancer incidence and survival for the country as a whole and by region. Its aim is to provide information to policy-makers in the health sector and to improve public health services. More information is available at http://epi.minsal.cl/registro-nacional-del-cancer-infantil-que-es-el-registro.

POPULATION AT RISK

Data were provided in all requested detail. See also Chile, above.

EDITORS' COMMENTS

In this paediatric cancer registry, registration focused on the age group 0–14 years during the reporting period. Therefore, data for the age groups 15–19 years and 0–19 years are not included in the tables. Non-malignant CNS tumours were registered, and pilocytic astrocytoma was coded with uncertain behaviour. Laterality was available for 90% of the cases of interest. See also Chile, above.

CHILE, paediatric (2007-2011)

	Age group (years)	Males	Females
Person-years	0	624 836	600 175
	1-4	2 424 039	2 323 421
	5-9	3 110 826	2 984 964
	10-14	3 418 546	3 269 156
	0-14	9 578 247	9 177 716
Average annual population	0-14	1 915 649	1 835 543

Please consult the quality indicators for this registry

CHILE, paediatric (2007-2011)

		Number of cases					Percentage		Incidence rates per million person-years						MV	DCO
		Age group (years)					0-14		Age-specific				ASR	Cumulative	%	%
		0	1-4	5-9	10-14	0-14	All	Group	0	1-4	5-9	10-14	0-14	0-14	0-14	0-14
I	LEUKAEMIA	63	379	281	238	**961**	40.4	100.0	51.4	79.8	46.1	35.6	**53.8**	778	97.8	2.2
	a. Lymphoid	24	327	226	162	**739**	31.1	76.9	19.6	68.9	37.1	24.2	**41.7**	600	99.3	0.7
	b. Acute myeloid	19	44	44	56	**163**	6.8	17.0	15.5	9.3	7.2	8.4	**8.8**	131	100.0	0.0
	c. CMD	2	0	3	7	**12**	0.5	1.2	1.6	-	0.5	1.0	**0.6**	9	91.7	8.3
	d. MDS & other	6	3	3	3	**15**	0.6	1.6	4.9	0.6	0.5	0.4	**0.9**	12	93.3	6.7
	e. Unspecified	12	5	5	10	**32**	1.3	3.3	9.8	1.1	0.8	1.5	**1.8**	26	56.3	43.8
II	LYMPHOMA & RELATED	4	44	87	100	**235**	9.9	100.0	3.3	9.3	14.3	15.0	**12.1**	186	98.7	1.3
	a. Hodgkin	0	14	43	56	**113**	4.7	48.1	-	2.9	7.1	8.4	**5.6**	89	100.0	0.0
	b. Non-Hodgkin except BL	2	11	31	30	**74**	3.1	31.5	1.6	2.3	5.1	4.5	**3.8**	59	95.9	4.1
	c. Burkitt (BL)	0	13	12	13	**38**	1.6	16.2	-	2.7	2.0	1.9	**2.0**	30	100.0	0.0
	d. Lymphoreticular	2	6	1	1	**10**	0.4	4.3	1.6	1.3	0.2	0.1	**0.6**	8	100.0	0.0
	e. Unspecified	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
III	CNS NEOPLASMS †	26	116	120	111	**373**	15.7	100.0	21.2	24.4	19.7	16.6	**20.4**	300	74.3	6.4
	a. Ependymoma	6	25	5	15	**51**	2.1	13.7	4.9	5.3	0.8	2.2	**2.9**	41	98.0	0.0
	b. Astrocytoma	3	26	37	33	**99**	4.2	26.5	2.4	5.5	6.1	4.9	**5.3**	79	86.9	0.0
	c. CNS embryonal	3	35	33	28	**99**	4.2	26.5	2.4	7.4	5.4	4.2	**5.4**	80	99.0	0.0
	d. Other gliomas	1	10	15	12	**38**	1.6	10.2	0.8	2.1	2.5	1.8	**2.0**	30	55.3	0.0
	e. Other specified	1	5	11	10	**27**	1.1	7.2	0.8	1.1	1.8	1.5	**1.4**	22	81.5	0.0
	f. Unspecified CNS	12	15	19	13	**59**	2.5	15.8	9.8	3.2	3.1	1.9	**3.3**	48	0.0	40.7
IV	NEUROBLASTOMA	34	46	14	3	**97**	4.1	100.0	27.8	9.7	2.3	0.4	**6.1**	81	99.0	0.0
	a. (Ganglio)neuroblastoma	34	46	14	2	**96**	4.0	99.0	27.8	9.7	2.3	0.3	**6.0**	80	99.0	0.0
	b. Peripheral nervous	0	0	0	1	**1**	0.0	1.0	-	-	-	0.1	**0.0**	1	100.0	0.0
V	RETINOBLASTOMA	23	48	8	0	**79**	3.3	100.0	18.8	10.1	1.3	-	**5.0**	66	86.1	0.0
VI	RENAL TUMOURS	18	55	16	6	**95**	4.0	100.0	14.7	11.6	2.6	0.9	**5.8**	79	98.9	1.1
	a. Nephroblastoma	17	54	16	6	**93**	3.9	97.9	13.9	11.4	2.6	0.9	**5.7**	77	100.0	0.0
	b. Renal carcinoma	0	1	0	0	**1**	0.0	1.1	-	0.2	-	-	**0.1**	1	100.0	0.0
	c. Unspecified	1	0	0	0	**1**	0.0	1.1	0.8	-	-	-	**0.1**	1	0.0	100.0
VII	HEPATIC TUMOURS	17	20	8	4	**49**	2.1	100.0	13.9	4.2	1.3	0.6	**3.0**	41	100.0	0.0
	a. Hepatoblastoma	17	20	3	1	**41**	1.7	83.7	13.9	4.2	0.5	0.1	**2.6**	34	100.0	0.0
	b. Hepatic carcinoma	0	0	5	3	**8**	0.3	16.3	-	-	0.8	0.4	**0.4**	6	100.0	0.0
	c. Unspecified	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
VIII	BONE TUMOURS	2	8	34	85	**129**	5.4	100.0	1.6	1.7	5.6	12.7	**6.1**	100	96.9	3.1
	a. Osteosarcoma	0	3	20	51	**74**	3.1	57.4	-	0.6	3.3	7.6	**3.5**	57	100.0	0.0
	b. Chondrosarcoma	0	0	1	1	**2**	0.1	1.6	-	-	0.2	0.1	**0.1**	2	100.0	0.0
	c. Ewing & related	1	5	10	29	**45**	1.9	34.9	0.8	1.1	1.6	4.3	**2.2**	35	100.0	0.0
	d. Other specified	0	0	2	1	**3**	0.1	2.3	-	-	0.3	0.1	**0.1**	2	100.0	0.0
	e. Unspecified	1	0	1	3	**5**	0.2	3.9	0.8	-	0.2	0.4	**0.2**	4	20.0	80.0
IX	SOFT TISSUE SARCOMA	15	56	44	51	**166**	7.0	100.0	12.2	11.8	7.2	7.6	**9.1**	134	99.4	0.0
	a. Rhabdomyosarcoma	5	34	26	12	**77**	3.2	46.4	4.1	7.2	4.3	1.8	**4.4**	63	98.7	0.0
	b. Fibrosarcoma	4	4	4	6	**18**	0.8	10.8	3.3	0.8	0.7	0.9	**1.0**	14	100.0	0.0
	c. Kaposi sarcoma	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
	d. Other specified	3	15	11	27	**56**	2.4	33.7	2.4	3.2	1.8	4.0	**2.9**	44	100.0	0.0
	e. Unspecified	3	3	3	6	**15**	0.6	9.0	2.4	0.6	0.5	0.9	**0.8**	12	100.0	0.0
X	GERM CELL TUMOURS	19	23	19	58	**119**	5.0	100.0	15.5	4.8	3.1	8.7	**6.2**	94	94.1	0.0
	a. CNS germ cell	2	2	8	12	**24**	1.0	20.2	1.6	0.4	1.3	1.8	**1.2**	19	79.2	0.0
	b. Other extragonadal	7	6	0	8	**21**	0.9	17.6	5.7	1.3	-	1.2	**1.2**	17	95.2	0.0
	c. Gonadal germ cell	10	14	11	35	**70**	2.9	58.8	8.2	2.9	1.8	5.2	**3.7**	55	98.6	0.0
	d. Gonadal carcinoma	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
	e. Unspecified gonadal	0	1	0	3	**4**	0.2	3.4	-	0.2	-	0.4	**0.2**	3	100.0	0.0
XI	CARCINOMA & MELANOMA	2	5	12	44	**63**	2.6	100.0	1.6	1.1	2.0	6.6	**3.0**	49	98.4	0.0
	a. Adrenocortical	2	0	1	3	**6**	0.3	9.5	1.6	-	0.2	0.4	**0.3**	5	100.0	0.0
	b. Thyroid	0	3	5	21	**29**	1.2	46.0	-	0.6	0.8	3.1	**1.4**	22	100.0	0.0
	c. Nasopharyngeal	0	0	0	2	**2**	0.1	3.2	-	-	-	0.3	**0.1**	1	100.0	0.0
	d. Melanoma	0	2	2	5	**9**	0.4	14.3	-	0.4	0.3	0.7	**0.5**	7	100.0	0.0
	e. Skin carcinoma	0	0	1	2	**3**	0.1	4.8	-	-	0.2	0.3	**0.1**	2	100.0	0.0
	f. Other & unspecified	0	0	3	11	**14**	0.6	22.2	-	-	0.5	1.6	**0.6**	11	92.9	0.0
XII	OTHER & UNSPECIFIED	4	6	0	4	**14**	0.6	100.0	3.3	1.3	-	0.6	**0.8**	11	14.3	57.1
	a. Other specified	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
	b. Other unspecified	4	6	0	4	**14**	0.6	100.0	3.3	1.3	-	0.6	**0.8**	11	14.3	57.1
	TOTAL	227	806	643	704	**2380**	100.0	100.0	185.3	169.8	105.5	105.3	**131.5**	1919	93.4	2.6

† includes 65 non-malignant

Please consult the quality indicators for this registry

Antofagasta Cancer Registry, 2003–2010

Juan Carlos Galaz, Jessica Moya, Clelia Vallebuona, Carla Cartes

Antofagasta Region is located in northern Chile and covers an area of 126 049 km^2. The population is 0.6 million (3.3% of the national population), and 32% of the population is younger than 20 years (Table A.6). Members of the Indigenous Atacameño and Aymara ethnic groups predominate.

The region has an arid climate and high levels of ultraviolet radiation. The area's dominant industry is mining, primarily of copper, which presents environmental safety concerns. The soil contains significant deposits of arsenic, to which the population has been exposed through the drinking-water (particularly from the 1950s to the late 1970s).

The public health-care network consists of five public hospitals and five private hospitals. Two public hospitals provide radiotherapy, surgery, and other services and function as oncology reference centres; these centres meet the needs of the region and the northern part of the country.

The Ministry of Health established the population-based Antofagasta Cancer Registry, which is located in the Local Health Authority (SEREMI). The registry has two professional staff members. More information is available from https://seremi2.redsalud.gob.cl/ and http://epi.minsal.cl/registros-poblacionales-de-cancer-informes.

POPULATION AT RISK

Data were provided in all requested detail. See also Chile, above.

EDITORS' COMMENTS

Because of the small size of the registry, some indicators have out-of-range values, including age distribution, a high sex ratio (Table A.9), and an unlikely distribution of the dates of birth and incidence (Table A.8). The proportion of cases with unspecified morphology was high (14%) (Table A.9). Thus, the resulting rates may be lower for specific and higher for unspecified cancer types. Non-malignant CNS tumours were reportable, but none were included in the submitted dataset. There were no cases of pilocytic astrocytoma in the dataset. Laterality was available for 70% of the cases of interest. See also Chile, above.

Bío Bío Cancer Registry, 2003–2012

Maria Elena Umaña, Maria Paz Sandoval, Clelia Vallebuona, Nora Díaz, Carla Cartes

The population-based Bío Bío Cancer Registry covers Bío Bío Province within Bío Bío Region. Bío Bío Province is located in the south-central Bío Bío Region and covers an area of 16 226 km^2. The population is 0.4 million (2.3% of the national population), and 32% of the population is younger than 20 years (Table A.6). Members of the Indigenous Mapuche ethnic group living in the province are included.

The province has undergone remarkable development in the industrial and agricultural sectors, particularly in industries related to forestry, in addition to traditional agriculture.

The health-care network in the province comprises six community hospitals and one specialized hospital in Los Angeles. The specialized hospital provides diagnostic services, hormone therapy, and chemotherapy for some haematological cancers. Other cancer cases are referred to Hospital Dr. Guillermo Grant Benavente (in the neighbouring province of Concepción) and to other public hospitals. Hospital Dr. Guillermo Grant Benavente provides childhood cancer diagnostic and treatment services.

The Bío Bío Cancer Registry has one professional staff member. Data on incidence, mortality, and survival are available from https://seremi2.redsalud.gob.cl/ and http://epi.minsal.cl/registros-poblacionales-de-cancer-informes.

POPULATION AT RISK

Population data were provided by sex and single year of age for each calendar year of the period 2007–2011 and by 5-year age group for 2003–2006 and 2012. The data for the missing year–age–sex categories were estimated at IARC using the methods described in Chapter 2. See also Chile, above.

EDITORS' COMMENTS

DCO cases are ascertained, but none were identified (Table A.9). The month of birth may be unknown in 13% of cases (Table A.8), which may affect the age distribution. The sex ratio in the age group 15–19 years was high (1.8) (Table A.9). The proportion of cases aged 19 years in the age group 15–19 years (29%) was higher than expected. Non-malignant CNS tumours were registered. There were no cases of pilocytic astrocytoma in the dataset. Laterality was complete for retinoblastoma and nephroblastoma. See also Chile, above.

Concepción Cancer Registry, 2006–2010

Carla Espinoza, Jocelyn Sanhueza, Clelia Vallebuona, Nora Díaz, Carla Cartes

The Concepción Cancer Registry covers Concepción Province in the west-central coastal Bío Bío Region. Most of the coastal population is concentrated in the region, which is divided into 12 communes; the Commune of Concepción is the regional capital and an important urban and industrial centre.

Concepción Province has a population density of 290 per km^2, the highest in the region. In 2010, the population was 1.0 million; 30% of the population was younger than 20 years (Table A.6), and about 5.2% of the population is Indigenous.

The public health network of the province comprises two health services with nine public hospitals (two of them specialized), 41 family health centres, 23 rural clinics, and 11 primary care services. The private health-care network has multiple haematology and pathology laboratories and dental clinics, 19 general clinics, and four hospitals. One health unit provides specialized services, such as a regional breast imaging diagnostic centre and haemato-oncology services for infants and adults. Referrals are made to the regional cancer and radiotherapy centre at Hospital Dr. Guillermo Grant Benavente.

The Ministry of Health established the Concepción Cancer Registry, which is located in the SEREMI. The registry has one professional staff member. More information is available at https://seremi2.redsalud.gob.cl/ and http://epi.minsal.cl/registros-poblacionales-de-cancer-informes.

POPULATION AT RISK

Population data were provided by sex and single year of age for 2007–2010 and by sex and 5-year age group for 2006. The data for the missing year–age–sex categories were estimated at IARC using the methods described in Chapter 2. See also Chile, above.

EDITORS' COMMENTS

Incidence rates in the age group 0–14 years were high overall (163.4 per million) and for leukaemia (61.7 per million) compared with the other registries in Chile. This may reflect the location of the referral hospital in the province, which facilitates complete ascertainment. Non-malignant CNS tumours were registered, and pilocytic astrocytoma was coded with uncertain behaviour. Laterality was complete. See also Chile, above.

Valdivia, Cancer Registry of Los Ríos Region, 1998–2012

Solange Vargas, Ana María Jofré, Clelia Vallebuona, Carla Cartes

The population-based Valdivia Cancer Registry covers Los Ríos Region, which has an area of 18 429 km^2. Los Ríos Region is located in southern Chile, and the economy is mainly based on forestry, trade, and services. The regional population is 0.4 million; 31% of the population is younger than 20 years (Table A.8), and 11.4% of the population is Indigenous. The population younger than 20 years covered by the registry is 2.3% of the national population younger than 20 years.

The public health-care network consists of a specialized oncology centre within the Regional Hospital of Valdivia; this centre provides diagnostic imaging support, surgical treatment, radiotherapy and chemotherapy, and haematology and pathology services. It is also equipped with an oncology unit that is staffed by paediatric oncologists. The private sector provides medical care, surgical treatment, and chemotherapy for adults as well as pathology services. The Regional Hospital of Valdivia is the only provider of radiotherapy and other treatment for childhood cancers.

The Ministry of Health established the Cancer Registry of Valdivia, which is located in the SEREMI. The registry has one professional staff member. More information is available at https://seremi14.redsalud.gob.cl/ and http://epi.minsal.cl/registros-poblacionales-de-cancer-informes.

POPULATION AT RISK

Data were provided in all requested detail. See also Chile, above.

EDITORS' COMMENTS

The high sex ratio in the age group 15–19 years (Table A.9) is driven mainly by markedly higher rates of lymphomas and germ cell tumour in boys than in girls, as noted in the abbreviated registry table available online. Date of incidence was incomplete for more than 15% of cases (Table A.8). Non-malignant CNS tumours were registered, and pilocytic astrocytoma was coded with uncertain behaviour. Laterality was complete for nephroblastoma. See also Chile, above.

CHILE, 4 registries (1998-2012)

	Age group (years)	Males	Females
Person-years	0	143 979	137 513
	1-4	574 695	554 849
	5-9	766 849	739 393
	10-14	841 174	808 531
	15-19	870 078	829 273
	0-14	2 326 697	2 240 286
	0-19	3 196 775	3 069 559

Please consult the quality indicators for this pool and its constituent registries

CHILE, 4 registries (1998-2012)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	LEUKAEMIA	18	119	70	54	46	261	307	41.4	100.0	33.8	100.0	63.9	105.4	46.5	32.7	27.1	62.1	54.2	881	1017	100.0	0.0
	a. Lymphoid	8	95	59	34	22	196	218	31.1	75.1	24.0	71.0	28.4	84.1	39.2	20.6	12.9	46.9	39.2	664	729	100.0	0.0
	b. Acute myeloid	6	18	6	12	16	42	58	6.7	16.1	6.4	18.9	21.3	15.9	4.0	7.3	9.4	10.0	9.9	141	188	100.0	0.0
	c. CMD	0	1	0	4	4	5	9	0.8	1.9	1.0	2.9	-	0.9	-	2.4	2.4	1.0	1.3	16	27	100.0	0.0
	d. MDS & other	1	0	0	1	0	2	2	0.3	0.8	0.2	0.7	3.6	-	-	0.6	-	0.5	0.3	7	7	100.0	0.0
	e. Unspecified	3	5	5	3	4	16	20	2.5	6.1	2.2	6.5	10.7	4.4	3.3	1.8	2.4	3.8	3.5	54	66	100.0	0.0
II	LYMPHOMA & RELATED	6	13	26	26	46	71	117	11.3	100.0	12.9	100.0	21.3	11.5	17.3	15.8	27.1	15.4	18.0	232	368	98.3	0.0
	a. Hodgkin	0	4	12	15	26	31	57	4.9	43.7	6.3	48.7	-	3.5	8.0	9.1	15.3	6.3	8.3	99	176	100.0	0.0
	b. Non-Hodgkin except BL	1	3	8	10	18	22	40	3.5	31.0	4.4	34.2	3.6	2.7	5.3	6.1	10.6	4.6	5.9	71	124	100.0	0.0
	c. Burkitt (BL)	0	2	5	0	0	7	7	1.1	9.9	0.8	6.0	-	1.8	3.3	-	-	1.6	1.3	24	24	100.0	0.0
	d. Lymphoreticular	5	4	1	0	0	10	10	1.6	14.1	1.1	8.5	17.8	3.5	0.7	-	-	2.7	2.1	35	35	100.0	0.0
	e. Unspecified	0	0	0	1	2	1	3	0.2	1.4	0.3	2.6	-	-	-	0.6	1.2	0.2	0.4	3	9	33.3	0.0
III	CNS NEOPLASMS †	10	40	24	31	22	105	127	16.7	100.0	14.0	100.0	35.5	35.4	15.9	18.8	12.9	24.3	21.8	351	416	76.4	3.1
	a. Ependymoma	3	9	2	2	2	16	18	2.5	15.2	2.0	14.2	10.7	8.0	1.3	1.2	1.2	4.1	3.4	55	61	100.0	0.0
	b. Astrocytoma	0	14	7	12	8	33	41	5.2	31.4	4.5	32.3	-	12.4	4.6	7.3	4.7	7.5	6.8	109	133	92.7	0.0
	c. CNS embryonal	3	9	5	7	2	24	26	3.8	22.9	2.9	20.5	10.7	8.0	3.3	4.2	1.2	5.6	4.6	80	86	100.0	0.0
	d. Other gliomas	1	1	2	3	0	7	7	1.1	6.7	0.8	5.5	3.6	0.9	1.3	1.8	-	1.5	1.2	23	23	71.4	0.0
	e. Other specified	0	1	4	3	2	8	10	1.3	7.6	1.1	7.9	-	0.9	2.7	1.8	1.2	1.7	1.6	26	32	100.0	0.0
	f. Unspecified CNS	3	6	4	4	8	17	25	2.7	16.2	2.8	19.7	10.7	5.3	2.7	2.4	4.7	4.0	4.2	57	81	0.0	16.0
IV	NEUROBLASTOMA	5	8	3	0	0	16	16	2.5	100.0	1.8	100.0	17.8	7.1	2.0	-	-	4.2	3.3	56	56	93.8	0.0
	a. (Ganglio)neuroblastoma	5	8	3	0	0	16	16	2.5	100.0	1.8	100.0	17.8	7.1	2.0	-	-	4.2	3.3	56	56	93.8	0.0
	b. Peripheral nervous	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
V	RETINOBLASTOMA	4	9	1	0	0	14	14	2.2	100.0	1.5	100.0	14.2	8.0	0.7	-	-	3.8	2.9	49	49	85.7	0.0
VI	RENAL TUMOURS	1	18	5	3	1	27	28	4.3	100.0	3.1	100.0	3.6	15.9	3.3	1.8	0.6	6.8	5.4	93	96	100.0	0.0
	a. Nephroblastoma	0	17	5	3	0	25	25	4.0	92.6	2.8	89.3	-	15.1	3.3	1.8	-	6.3	4.9	86	86	100.0	0.0
	b. Renal carcinoma	1	1	0	0	1	2	3	0.3	7.4	0.3	10.7	3.6	0.9	-	-	0.6	0.5	0.6	7	10	100.0	0.0
	c. Unspecified	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VII	HEPATIC TUMOURS	4	11	0	0	0	15	15	2.4	100.0	1.7	100.0	14.2	9.7	-	-	-	4.1	3.2	53	53	86.7	6.7
	a. Hepatoblastoma	4	9	0	0	0	13	13	2.1	86.7	1.4	86.7	14.2	8.0	-	-	-	3.6	2.8	46	46	100.0	0.0
	b. Hepatic carcinoma	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	c. Unspecified	0	2	0	0	0	2	2	0.3	13.3	0.2	13.3	-	1.8	-	-	-	0.5	0.4	7	7	0.0	50.0
VIII	BONE TUMOURS	1	2	7	16	27	26	53	4.1	100.0	5.8	100.0	3.6	1.8	4.6	9.7	15.9	5.1	7.6	82	162	92.5	7.5
	a. Osteosarcoma	0	1	2	6	17	9	26	1.4	34.6	2.9	49.1	-	0.9	1.3	3.6	10.0	1.8	3.6	28	78	100.0	0.0
	b. Chondrosarcoma	0	0	1	0	1	1	2	0.2	3.8	0.2	3.8	-	-	0.7	-	0.6	0.2	0.3	3	6	100.0	0.0
	c. Ewing & related	0	0	3	8	5	11	16	1.7	42.3	1.8	30.2	-	-	2.0	4.8	2.9	2.1	2.3	34	49	100.0	0.0
	d. Other specified	0	1	1	1	0	3	3	0.5	11.5	0.3	5.7	-	0.9	0.7	0.6	-	0.7	0.5	10	10	100.0	0.0
	e. Unspecified	1	0	0	1	4	2	6	0.3	7.7	0.7	11.3	3.6	-	-	0.6	2.4	0.5	0.9	7	18	33.3	66.7
IX	SOFT TISSUE SARCOMA	3	5	11	20	16	39	55	6.2	100.0	6.1	100.0	10.7	4.4	7.3	12.1	9.4	8.1	8.4	125	173	98.2	0.0
	a. Rhabdomyosarcoma	1	4	6	7	2	18	20	2.9	46.2	2.2	36.4	3.6	3.5	4.0	4.2	1.2	3.9	3.3	59	65	100.0	0.0
	b. Fibrosarcoma	1	0	1	3	5	5	10	0.8	12.8	1.1	18.2	3.6	-	0.7	1.8	2.9	1.0	1.4	16	31	100.0	0.0
	c. Kaposi sarcoma	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	d. Other specified	0	1	4	6	8	11	19	1.7	28.2	2.1	34.5	-	0.9	2.7	3.6	4.7	2.2	2.8	35	59	100.0	0.0
	e. Unspecified	1	0	0	4	1	5	6	0.8	12.8	0.7	10.9	3.6	-	-	2.4	0.6	1.0	0.9	16	19	83.3	0.0
X	GERM CELL TUMOURS	6	8	3	10	66	27	93	4.3	100.0	10.2	100.0	21.3	7.1	2.0	6.1	38.8	6.2	13.6	90	284	97.8	0.0
	a. CNS germ cell	0	0	0	1	2	1	3	0.2	3.7	0.3	3.2	-	-	-	0.6	1.2	0.2	0.4	3	9	100.0	0.0
	b. Other extragonadal	2	3	0	1	3	6	9	1.0	22.2	1.0	9.7	7.1	2.7	-	0.6	1.8	1.5	1.6	21	30	100.0	0.0
	c. Gonadal germ cell	4	5	3	7	55	19	74	3.0	70.4	8.1	79.6	14.2	4.4	2.0	4.2	32.4	4.3	10.6	63	225	100.0	0.0
	d. Gonadal carcinoma	0	0	0	0	3	0	3	-	-	0.3	3.2	-	-	-	-	1.8	-	0.4	-	9	100.0	0.0
	e. Unspecified gonadal	0	0	0	1	3	1	4	0.2	3.7	0.4	4.3	-	-	-	0.6	1.8	0.2	0.5	3	12	50.0	0.0
XI	CARCINOMA & MELANOMA	0	3	6	11	46	20	66	3.2	100.0	7.3	100.0	-	2.7	4.0	6.7	27.1	4.0	9.2	64	199	100.0	0.0
	a. Adrenocortical	0	0	1	0	0	1	1	0.2	5.0	0.1	1.5	-	-	0.7	-	-	0.2	0.2	3	3	100.0	0.0
	b. Thyroid	0	1	2	6	23	9	32	1.4	45.0	3.5	48.5	-	0.9	1.3	3.6	13.5	1.8	4.4	28	96	100.0	0.0
	c. Nasopharyngeal	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	d. Melanoma	0	2	0	0	5	2	7	0.3	10.0	0.8	10.6	-	1.8	-	-	2.9	0.5	1.1	7	22	100.0	0.0
	e. Skin carcinoma	0	0	2	1	2	3	5	0.5	15.0	0.6	7.6	-	-	1.3	0.6	1.2	0.6	0.7	10	16	100.0	0.0
	f. Other & unspecified	0	0	1	4	16	5	21	0.8	25.0	2.3	31.8	-	-	0.7	2.4	9.4	0.9	2.8	15	63	100.0	0.0
XII	OTHER & UNSPECIFIED	3	2	2	2	9	9	18	1.4	100.0	2.0	100.0	10.7	1.8	1.3	1.2	5.3	2.2	2.9	30	57	33.3	22.2
	a. Other specified	0	0	0	0	2	0	2	-	-	0.2	11.1	-	-	-	-	1.2	-	0.3	-	6	100.0	0.0
	b. Other unspecified	3	2	2	2	7	9	16	1.4	100.0	1.8	88.9	10.7	1.8	1.3	1.2	4.1	2.2	2.6	30	51	25.0	25.0
	TOTAL	61	238	158	173	279	630	909	100.0	100.0	100.0	100.0	216.7	210.7	104.9	104.9	164.2	146.3	150.3	2108	2929	93.8	1.4

† includes 23 non-malignant

Please consult the quality indicators for this pool and its constituent registries

Colombia

Colombia is located in the north-west of South America. It is bordered by Panama to the north-west, Venezuela and Brazil to the east, and Ecuador and Peru to the south. The country encompasses Andes mountains, Amazon rainforest, tropical grassland, and both Caribbean and Pacific coastlines. The climate ranges from tropical rainforests, savannas, and steppes to desert and mountain climates.

Colombia is an upper-middle-income country; the poverty rate of 28% is higher than the average for Latin America. Economic production is dominated by strong domestic demand. The service sector constitutes almost half of production; the rest consists of manufacturing, agriculture, construction, transportation, mining, and energy production.

In 2010, the population was 45.9 million, and 36% of the population was younger than 20 years (Table A.6). The population increased 10-fold over the past century, but the growth rate has decreased steadily since the 1970s. Most of the population is concentrated in the Andean highlands and along the Caribbean coast; about 75% live in urban areas. The official language is Spanish, and the official religion is Roman Catholic. Colombia is divided into 32 administrative departments, which are further divided into municipalities.

The Colombian health system was reformed in 1993, and by 2003 the Colombian Social Security System had greatly increased population coverage through the governmental universal mandatory health insurance system. People are assigned to one of two main insurance schemes on the basis of income: a contributory regime for workers and their families with an income above a certain level (financed through payroll and employer contributions) and a subsidized regime for those identified as poor. In addition, there are special and exceptional regimes for workers in certain sectors (e.g. military, education). The system covers 95% of citizens. Private insurance companies manage the health care of their clients.

In 1962, Colombia established the first population-based cancer registry in South America; the registry is located in Cali (Table A.10). Throughout the late 1980s and 1990s, the National Cancer Institute and the Ministry of Health developed a national cancer registry plan to cover additional areas of the country. Population-based cancer registries were established in Barranquilla, Bucaramanga, Manizales, and Pasto. The five above-mentioned registries, which are in different phases of development, cover 12% of the total population. The National Cancer Institute provides partial financial support to these registries. All registries manage their own databases and collaborate within the National Network of Cancer Registries. They provide data to the National Cancer Institute, which produces national and subnational estimates every 5 years using data from the registries and mortality statistics. Data are collected mainly manually, because the registries do not have access to electronic databases, such as the national mortality database. The information infrastructure was very limited in the 1990s. The health system reform of 1993 improved the availability of the identity data, such as exact date of birth, which opens the prospect of greater accuracy of the collected data.

Reporting of childhood leukaemia has been mandatory since 2008, and reporting of other malignant neoplasms in children has been mandatory since 2010. Several information systems at the national level were established as part of a 10-year national cancer control plan. The National Administrative Cancer Registry (NACR) was created in 2012 to cover all of Colombia and to provide information on this high-cost disease to help manage health-care costs. The NACR relies on passive mandatory reporting of cancer cases from health insurers and health-care providers; therefore, these data are incomplete.

PUBLICATIONS

de Vries E, Pardo C, Arias N, Bravo LE, Navarro E, Uribe C, et al. (2016). Estimating the cost of operating cancer registries: experience in Colombia. Cancer Epidemiol. 45(Suppl 1):S13–9. https://doi.org/10.1016/j.canep.2016.09.014 PMID:27760725

Valencia O, Lopes G, Sánchez P, Acuña L, Uribe D, González J (2018). Incidence and prevalence of cancer in Colombia: the methodology used matters. J Glob Oncol. 4(4):1–7. https://doi.org/10.1200/JGO.17.00008 PMID:30241220

POPULATION AT RISK

Population data were provided by the National Administrative Department of Statistics (https://www.dane.gov.co/). Data for 1992–2005 correspond to the estimates by interpolation from three consecutive unadjusted population censuses: those of 1985, 1993,

COLOMBIA, 4 registries (1992-2013)

Registry	Period	Cases	%	Person-years	%
Bucaramanga	2000-2012	725	20.5	4 810 057	20.3
Cali	1992-2013	2398	67.8	15 485 957	65.5
Manizales	2003-2012	143	4.0	1 234 994	5.2
Pasto	1998-2012	271	7.7	2 115 600	8.9
COLOMBIA	**1992-2013**	**3537**	**100.0**	**23 646 608**	**100.0**

Please consult the quality indicators for this pool and its constituent registries

and 2005 (Table A.7). For the period 2006–2013, the National Administrative Department of Statistics completed the periodic adjustments to census estimates, and these estimates and interpolations were used to make intercensal population projections to 2020. All four registries provided population data in all required detail.

EDITORS' COMMENTS

Four cancer registries contributed to IICC-3 (Bucaramanga, Cali, Manizales, and Pasto), and their combined dataset is presented in the IICC-3 book. The Cali Cancer Registry was included as from 1992, in a follow-up to the calendar years covered in IICC-1 and IICC-2 (Table A.1). Standard tables for the Bucaramanga and Cali registries and an abbreviated table for the Pasto registry (within the combined dataset for Colombia) are available online. No table is available for the Manizales registry, because of the small number of cases, but the registry contributed to the pooled dataset of the four registries (Table A.12).

In all four registries, some cases had imprecise dates of birth or diagnosis (Table A.8). Most of the MV cases with unspecified morphology were provided by the Bucaramanga registry (Table A.9). Non-malignant CNS tumours and skin carcinomas were reportable, with some exceptions, as specified in registry-specific sections below. Where it was reported, pilocytic astrocytoma was coded with uncertain behaviour. Laterality was complete for Bucaramanga and Manizales.

Cancer Registry of the Bucaramanga Metropolitan Area, 2000–2012

Claudia J. Uribe

The Bucaramanga Metropolitan Area is located in the Santander Department in north-eastern Colombia. The area comprises the city of Bucaramanga (the capital of Santander Department) and three contiguous towns (municipalities): Floridablanca, Girón, and Piedecuesta. The total area is 1479 km^2, and the average annual temperature is 24 °C. Each constituent town is politically independent, but they are all related economically and socially (https://www.amb.gov.co/). Bucaramanga has the highest GDP per capita in Colombia and the lowest unemployment rate.

In 2010, the population was 1.1 million, and 34% of the population was younger than 20 years (Table A.6). The population of the Bucaramanga Metropolitan Area is racially mixed, with little socioeconomic differentiation. Most of the population is Roman Catholic.

The cancer registry was established in 2000 (Table A.10) and covers all residents of the Bucaramanga Metropolitan Area. The registry collects data actively from various sources, including haematology and pathology laboratories, hospital discharge records, imaging centres, screening centres, volunteer organizations, cancer centres, autopsy reports and death certificates obtained from the Municipal Office of Vital Statistics of the Departmental Health Secretary, and medical specialists, including five paediatric oncologists. Registry staff members visit these sources and collect information on cancer cases, diagnosed by all methods, among residents of the registry region. Data are recorded on a special form at the source site and are reviewed and classified at the registry office. Cases ascertained from death certificates were verified by reviewing clinical records. In the absence of further clinical information, a case was recorded as DCO. Tumours were coded according to ICD-O-3 by a pathologist and registered according to the rules for multiple primary tumours.

Data entry and analysis were done using CanReg4. In addition, data were validated using IARCcrgTools and the Registry Plus Link Plus programs.

POPULATION AT RISK

See Colombia, above.

EDITORS' COMMENTS

The proportion of cases in age 0 year in the age group 0–14 years was low (4%), and the proportion of cases with unspecified morphology was very high (21%), including among MV cases (Table A.9), possibly because of suboptimal completeness and precision of data from paediatric oncology providers. The sex ratio in the age group 15–19 years was high (1.7) (Table A.9), especially for soft tissue sarcoma, germ cell tumours, bone tumours, and leukaemia (see the registry standard table, available online). Non-malignant CNS tumours were registered, but the proportion was low (12%) (Table A.9). Pilocytic astrocytoma was coded with uncertain behaviour. Skin carcinomas were reportable, with the exception of basal cell carcinomas. Laterality was almost complete for all tumours of interest. See also Colombia, above.

Cali Cancer Registry, 1992–2013

Luis Eduardo Bravo, Edwin Carrascal, Luz Stella García, Paola Collazos, Oscar Ramírez

Cali is the capital of the Cauca Valley Department, which is located in west-central Colombia. Cali is the third largest city in Colombia; its access to the Pacific Coast makes Cali an important urban and economic centre with a fast-growing economy. An estimated 23% of the population lives below the poverty threshold. The infant mortality rate is 11 per 1000 live births.

The Cali health-care system serves the residents of the city and of 41 municipalities of the province. Other neighbouring provinces with less-developed health services often refer patients with cancer to Cali.

Cali has two major paediatric oncology units. The larger one is located at the University Hospital of Valle and treats 45% of all paediatric cancer cases in the city. It is one of the largest public institutions in Colombia. The second

largest paediatric oncology unit is located at the non-profit private hospital Clínica Fundación Valle del Lili, which treats about 32% of cases. The remaining cases receive care at one or more of five smaller private centres. Two facilities have bone marrow transplant units for both adults and children. In 2009, there were five paediatric oncologists in Cali; in December 2015, there were eight.

The Cali Cancer Registry covers the urban area of Cali, which has an area of 121 km^2. The population is 2.2 million, and 34% of the population is younger than 20 years (Table A.6). The registry is located at the pathology department of the University of Valle (http://rpcc.univalle.edu.co/). The VIGICANCER surveillance system was implemented in 2009 and has contributed significantly to improving the registration process for childhood cancer. The system was designed to record clinical outcomes data and raise awareness of childhood cancer cases.

PUBLICATIONS

Bravo LE, García LS, Collazos P, Aristizabal P, Ramirez O (2013). Descriptive epidemiology of childhood cancer in Cali: Colombia 1977–2011. Colomb Med (Cali). 44(3):155–64. https://doi.org/10.25100/cm.v44i3.1243 PMID:24892613

POPULATION AT RISK

See Colombia, above.

EDITORS' COMMENTS

Date of birth was incomplete for a proportion of cases (Table A.8) because of a lack of precise data in medical records, especially for infants and adolescents. Non-malignant CNS tumours were registered systematically, with the exception of craniopharyngioma (only one case in the dataset) and pituitary tumours. Basal cell carcinomas and squamous cell carcinomas of skin were not registered. Laterality was not provided. See also Colombia, above.

Manizales Cancer Registry, 2003–2012

Nelson Enrique Arias Ortiz, Luz Elena Sepúlveda Gallego

Manizales is a medium-sized city located in the Andean region of Colombia. The population is about 0.4 million, and 30% of the population is younger than 20 years (Table A.6). Most cancer care facilities are part of a private network of providers, including imaging, cytology, and pathology services, as well as radiotherapy, chemotherapy, and cancer surgery services. Until 2008, the city had a specialized paediatric oncology unit, which treated most childhood cancer cases diagnosed in the resident population. In 2009, this paediatric oncology centre was closed because of administrative and financial difficulties, and children with cancer in Manizales were referred to other cities for diagnosis and treatment.

The population-based Manizales Cancer Registry covers the urban and rural population of the city from 2003. The registry collects data actively from 33 sources, including hospitals, clinics, cytology and pathology laboratories, imaging and radiology services, and municipal vital statistics offices. Data have been published in articles as well as in CI5 Volumes X and XI.

PUBLICATIONS

López Guarnizo G, Arias Ortiz N, Arboleda Ruiz W (2012). Cancer incidence and mortality in Manizales 2003–2007. Colomb Med (Cali). 43(4):281–9. PMID:24893301

Arias-Ortiz N, López-Guarnizo G (2013). Assessing the data quality of the population-based Cancer Registry of Manizales, Colombia. [in Spanish] Rev Colomb Cancerol. 17(4):132–41. https://doi.org/10.1016/S0123-9015(13)70160-4

POPULATION AT RISK

See Colombia, above.

EDITORS' COMMENTS

Non-malignant CNS tumours, pilocytic astrocytoma, and basal cell carcinomas of skin were not registered. Laterality was complete. For 2010–2012, the annual number of reported cases decreased because of the closure in 2009 of the single paediatric oncology unit in the covered area and the ensuing difficulties of collecting data on the resident patients from the new referral institutions. The resulting incidence rates were also affected. Because of the small available dataset, the registry is not presented in a separate table, but it contributes to the pooled dataset of Colombia (Table A.12). See also Colombia, above.

Pasto Cancer Registry, 1998–2012

María Clara Yépez Chamorro, Daniel Marcelo Jurado Fajardo, Luisa Mercedes Bravo Goyes, Luis Eduardo Bravo, Sonia María Gómez Erazo

Pasto is the capital of Nariño Department, which is located at the south-western tip of Colombia and is bordered by Ecuador to the south and the Pacific Ocean to the west. In 2010, Pasto had a population of 0.4 million, and 35% of the population was younger than 20 years (Table A.6). About 82% of residents live in urban areas. The main economic activities in rural areas are agriculture, livestock, and mining, and in urban areas are trade, industry, and services. More than half the population is considered to have low socioeconomic status.

For 1998–2012, health services covered 98% of all residents. Health services costs are covered by the government up to 55%. Paediatric cancers are diagnosed and treated in cytopathology laboratories, hospitals with radiotherapy and chemotherapy services, paediatric hospitals, and paediatric oncology units.

The Pasto Cancer Registry covers the population of the city of Pasto. The registry was created in 1998 as a permanent research project of the Centre for Health Studies of the University of Nariño. It is supported by the university, the Health Secretariat of Pasto, and the National Cancer Institute. The registry staff consists of a director, a director's assistant, a pathologist, a quality controller, a system technician, a collecting coordinator, and two data collectors. For specific topics, the registry receives professional advice from the Cali Cancer Registry. The registry obtained ethical approval from the university and follows the IARC confidentiality rules.

Information is actively collected from various sources, including hospitals, oncology units, cytopathology and imaging laboratories, specialized clinics, and death certificates. Data are checked for duplicate records, internal consistency, and accuracy using Link Plus, IARCcrgTools, and CanReg5.

Health organizations use information provided by the registry to make policy decisions and to implement promotion and prevention programmes in a local context. The registry has contributed to international projects such as CI5 Volumes X and XI, CONCORD-2, and *Cancer in Central and South America*, as well as national projects. Incidence, mortality, and survival rates have been published in several articles, and registry data have been used in specific epidemiological studies, including on childhood cancer.

PUBLICATIONS

Yépez MC, Bravo LE, Hidalgo Troya A, Jurado DM, Bravo LM (2012). Cancer incidence and mortality in the municipality of Pasto, 1998–2007. Colomb Med (Cali). 43(4):256–66. https://doi.org/10.25100/cm.v43i4.1179 PMID:24893298

Yépez MC, Bravo LE, Hidalgo Troya A, Jurado DM, Bravo LM (2012). Incidencia y mortalidad por cáncer. Municipio de Pasto 2003–2007. Pasto, Colombia: Editorial Universitaria, Universidad de Nariño.

POPULATION AT RISK

See Colombia, above.

EDITORS' COMMENTS

The dates of birth and incidence were incomplete in a proportion of cases (Table A.8) because of suboptimal registration of personal data in the data sources during the reporting period. In the registry, age is calculated from exact dates if available; otherwise, age is registered as stated by the patients. The proportion of cases aged 19 years in the age group 15–19 years was high (27%) (Table A.9), but this could be explained by random variation in a small dataset. All non-malignant CNS tumours were registered, but the proportion was relatively low (Table A.9). All skin carcinomas were registered, but the registry staff acknowledged that some cases may have been missed. Laterality was available for 64% of the cases of interest. See also Colombia, above.

COLOMBIA, 4 registries (1992-2013)

	Age group (years)	Males	Females
Person-years	0	544 787	519 337
	1-4	2 262 273	2 191 378
	5-9	2 950 800	2 864 275
	10-14	3 094 907	3 032 602
	15-19	3 037 248	3 149 001
	0-14	8 852 767	8 607 592
	0-19	11 890 015	11 756 593

Please consult the quality indicators for this pool and its constituent registries

COLOMBIA, 4 registries (1992-2013)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	LEUKAEMIA	40	383	313	239	249	**975**	**1224**	38.4	100.0	34.6	100.0	37.6	86.0	53.8	39.0	40.3	**58.4**	**54.3**	847	1049	98.9	0.5
	a. Lymphoid	24	312	250	170	137	**756**	**893**	29.8	77.5	25.2	73.0	22.6	70.1	43.0	27.7	22.1	**45.5**	**40.2**	658	769	99.7	0.1
	b. Acute myeloid	11	44	37	41	58	**133**	**191**	5.2	13.6	5.4	15.6	10.3	9.9	6.4	6.7	9.4	**7.9**	**8.2**	115	162	100.0	0.0
	c. CMD	1	2	3	8	17	**14**	**31**	0.6	1.4	0.9	2.5	0.9	0.4	0.5	1.3	2.7	**0.8**	**1.2**	12	26	100.0	0.0
	d. MDS & other	1	6	0	0	0	**7**	**7**	0.3	0.7	0.2	0.6	0.9	1.3	-	-	-	**0.5**	**0.4**	6	6	100.0	0.0
	e. Unspecified	3	19	23	20	37	**65**	**102**	2.6	6.7	2.9	8.3	2.8	4.3	4.0	3.3	6.0	**3.8**	**4.3**	56	86	90.2	4.9
II	LYMPHOMA & RELATED	5	91	136	127	169	**359**	**528**	14.2	100.0	14.9	100.0	4.7	20.4	23.4	20.7	27.3	**20.3**	**21.9**	308	444	99.1	0.0
	a. Hodgkin	0	11	40	53	84	**104**	**188**	4.1	29.0	5.3	35.6	-	2.5	6.9	8.6	13.6	**5.5**	**7.3**	88	156	100.0	0.0
	b. Non-Hodgkin except BL	2	29	42	46	68	**119**	**187**	4.7	33.1	5.3	35.4	1.9	6.5	7.2	7.5	11.0	**6.7**	**7.7**	102	157	99.5	0.0
	c. Burkitt (BL)	1	38	49	23	9	**111**	**120**	4.4	30.9	3.4	22.7	0.9	8.5	8.4	3.8	1.5	**6.5**	**5.4**	96	104	100.0	0.0
	d. Lymphoreticular	2	6	3	1	0	**12**	**12**	0.5	3.3	0.3	2.3	1.9	1.3	0.5	0.2	-	**0.8**	**0.6**	11	11	91.7	0.0
	e. Unspecified	0	7	2	4	8	**13**	**21**	0.5	3.6	0.6	4.0	-	1.6	0.3	0.7	1.3	**0.8**	**0.9**	11	18	85.7	0.0
III	CNS NEOPLASMS †	28	124	146	136	103	**434**	**537**	17.1	100.0	15.2	100.0	26.3	27.8	25.1	22.2	16.6	**25.2**	**23.3**	374	457	82.3	3.0
	a. Ependymoma	4	14	17	12	9	**47**	**56**	1.9	10.8	1.6	10.4	3.8	3.1	2.9	2.0	1.5	**2.8**	**2.5**	41	48	100.0	0.0
	b. Astrocytoma	5	47	56	54	34	**162**	**196**	6.4	37.3	5.5	36.5	4.7	10.6	9.6	8.8	5.5	**9.3**	**8.5**	139	167	97.4	0.0
	c. CNS embryonal	6	34	34	27	12	**101**	**113**	4.0	23.3	3.2	21.0	5.6	7.6	5.8	4.4	1.9	**6.0**	**5.1**	88	97	100.0	0.0
	d. Other gliomas	2	12	13	11	9	**38**	**47**	1.5	8.8	1.3	8.8	1.9	2.7	2.2	1.8	1.5	**2.2**	**2.1**	33	40	74.5	4.3
	e. Other specified	2	1	5	14	14	**22**	**36**	0.9	5.1	1.0	6.7	1.9	0.2	0.9	2.3	2.3	**1.2**	**1.4**	18	30	97.2	0.0
	f. Unspecified CNS	9	16	21	18	25	**64**	**89**	2.5	14.7	2.5	16.6	8.5	3.6	3.6	2.9	4.0	**3.8**	**3.8**	55	76	13.5	15.7
IV	NEUROBLASTOMA	16	33	8	4	4	**61**	**65**	2.4	100.0	1.8	100.0	15.0	7.4	1.4	0.7	0.6	**4.1**	**3.3**	55	58	96.9	0.0
	a. (Ganglio)neuroblastoma	16	33	7	3	2	**59**	**61**	2.3	96.7	1.7	93.8	15.0	7.4	1.2	0.5	0.3	**4.0**	**3.1**	53	54	96.7	0.0
	b. Peripheral nervous	0	0	1	1	2	**2**	**4**	0.1	3.3	0.1	6.2	-	-	0.2	0.2	0.3	**0.1**	**0.2**	2	3	100.0	0.0
V	RETINOBLASTOMA	22	65	7	0	0	**94**	**94**	3.7	100.0	2.7	100.0	20.7	14.6	1.2	-	-	**6.5**	**5.0**	85	85	90.4	0.0
VI	RENAL TUMOURS	7	76	27	3	7	**113**	**120**	4.5	100.0	3.4	100.0	6.6	17.1	4.6	0.5	1.1	**7.5**	**6.0**	101	107	93.3	0.8
	a. Nephroblastoma	7	75	26	2	0	**110**	**110**	4.3	97.3	3.1	91.7	6.6	16.8	4.5	0.3	-	**7.3**	**5.6**	98	98	97.3	0.0
	b. Renal carcinoma	0	0	0	0	4	**0**	**4**	-	-	0.1	3.3	-	-	-	-	0.6	**-**	**0.1**	-	3	100.0	0.0
	c. Unspecified	0	1	1	1	3	**3**	**6**	0.1	2.7	0.2	5.0	-	0.2	0.2	0.2	0.5	**0.2**	**0.2**	3	5	16.7	16.7
VII	HEPATIC TUMOURS	9	11	5	6	3	**31**	**34**	1.2	100.0	1.0	100.0	8.5	2.5	0.9	1.0	0.5	**2.0**	**1.6**	27	30	91.2	2.9
	a. Hepatoblastoma	7	11	3	2	1	**23**	**24**	0.9	74.2	0.7	70.6	6.6	2.5	0.5	0.3	0.2	**1.5**	**1.2**	21	21	100.0	0.0
	b. Hepatic carcinoma	0	0	1	2	2	**3**	**5**	0.1	9.7	0.1	14.7	-	-	0.2	0.3	0.3	**0.2**	**0.2**	2	4	100.0	0.0
	c. Unspecified	2	0	1	2	0	**5**	**5**	0.2	16.1	0.1	14.7	1.9	-	0.2	0.3	-	**0.3**	**0.2**	4	4	40.0	20.0
VIII	BONE TUMOURS	0	2	30	78	97	**110**	**207**	4.3	100.0	5.9	100.0	-	0.4	5.2	12.7	15.7	**5.5**	**7.8**	91	170	92.8	1.0
	a. Osteosarcoma	0	1	15	51	59	**67**	**126**	2.6	60.9	3.6	60.9	-	0.2	2.6	8.3	9.5	**3.3**	**4.7**	55	103	100.0	0.0
	b. Chondrosarcoma	0	0	0	3	4	**3**	**7**	0.1	2.7	0.2	3.4	-	-	-	0.5	0.6	**0.1**	**0.3**	2	6	100.0	0.0
	c. Ewing & related	0	1	10	18	23	**29**	**52**	1.1	26.4	1.5	25.1	-	0.2	1.7	2.9	3.7	**1.5**	**2.0**	24	43	100.0	0.0
	d. Other specified	0	0	1	0	2	**1**	**3**	0.0	0.9	0.1	1.4	-	-	0.2	-	0.3	**0.1**	**0.1**	1	2	100.0	0.0
	e. Unspecified	0	0	4	6	9	**10**	**19**	0.4	9.1	0.5	9.2	-	-	0.7	1.0	1.5	**0.5**	**0.7**	8	16	21.1	10.5
IX	SOFT TISSUE SARCOMA	11	43	41	63	66	**158**	**224**	6.2	100.0	6.3	100.0	10.3	9.7	7.1	10.3	10.7	**9.0**	**9.4**	136	189	99.6	0.0
	a. Rhabdomyosarcoma	8	27	21	22	19	**78**	**97**	3.1	49.4	2.7	43.3	7.5	6.1	3.6	3.6	3.1	**4.7**	**4.3**	68	83	100.0	0.0
	b. Fibrosarcoma	1	4	3	9	5	**17**	**22**	0.7	10.8	0.6	9.8	0.9	0.9	0.5	1.5	0.8	**0.9**	**0.9**	14	18	100.0	0.0
	c. Kaposi sarcoma	0	0	0	0	3	**0**	**3**	-	-	0.1	1.3	-	-	-	-	0.5	**-**	**0.1**	-	2	100.0	0.0
	d. Other specified	2	10	11	23	31	**46**	**77**	1.8	29.1	2.2	34.4	1.9	2.2	1.9	3.8	5.0	**2.5**	**3.1**	39	64	100.0	0.0
	e. Unspecified	0	2	6	9	8	**17**	**25**	0.7	10.8	0.7	11.2	-	0.4	1.0	1.5	1.3	**0.9**	**1.0**	14	21	96.0	0.0
X	GERM CELL TUMOURS	10	18	11	33	124	**72**	**196**	2.8	100.0	5.5	100.0	9.4	4.0	1.9	5.4	20.0	**4.1**	**7.7**	62	162	95.9	0.0
	a. CNS germ cell	0	0	3	6	5	**9**	**14**	0.4	12.5	0.4	7.1	-	-	0.5	1.0	0.8	**0.5**	**0.5**	7	12	100.0	0.0
	b. Other extragonadal	4	6	2	2	18	**14**	**32**	0.6	19.4	0.9	16.3	3.8	1.3	0.3	0.3	2.9	**0.9**	**1.4**	12	27	100.0	0.0
	c. Gonadal germ cell	6	11	6	22	88	**45**	**133**	1.8	62.5	3.8	67.9	5.6	2.5	1.0	3.6	14.2	**2.6**	**5.2**	39	110	100.0	0.0
	d. Gonadal carcinoma	0	0	0	1	6	**1**	**7**	0.0	1.4	0.2	3.6	-	-	-	0.2	1.0	**0.0**	**0.3**	1	6	100.0	0.0
	e. Unspecified gonadal	0	1	0	2	7	**3**	**10**	0.1	4.2	0.3	5.1	-	0.2	-	0.3	1.1	**0.2**	**0.4**	3	8	20.0	0.0
XI	CARCINOMA & MELANOMA	3	11	17	66	146	**97**	**243**	3.8	100.0	6.9	100.0	2.8	2.5	2.9	10.8	23.6	**5.1**	**9.2**	81	199	99.2	0.4
	a. Adrenocortical	0	3	2	0	0	**5**	**5**	0.2	5.2	0.1	2.1	-	0.7	0.3	-	-	**0.3**	**0.2**	4	4	100.0	0.0
	b. Thyroid	0	1	3	27	60	**31**	**91**	1.2	32.0	2.6	37.4	-	0.2	0.5	4.4	9.7	**1.5**	**3.4**	26	74	100.0	0.0
	c. Nasopharyngeal	0	0	0	3	3	**3**	**6**	0.1	3.1	0.2	2.5	-	-	-	0.5	0.5	**0.1**	**0.2**	2	5	100.0	0.0
	d. Melanoma	2	5	5	10	9	**22**	**31**	0.9	22.7	0.9	12.8	1.9	1.1	0.9	1.6	1.5	**1.2**	**1.3**	19	26	93.5	3.2
	e. Skin carcinoma	0	0	0	4	9	**4**	**13**	0.2	4.1	0.4	5.3	-	-	-	0.7	1.5	**0.2**	**0.5**	3	11	100.0	0.0
	f. Other & unspecified	1	2	7	22	65	**32**	**97**	1.3	33.0	2.7	39.9	0.9	0.4	1.2	3.6	10.5	**1.6**	**3.6**	27	79	100.0	0.0
XII	OTHER & UNSPECIFIED	7	9	10	7	32	**33**	**65**	1.3	100.0	1.8	100.0	6.6	2.0	1.7	1.1	5.2	**2.0**	**2.7**	29	55	29.2	21.5
	a. Other specified	0	1	1	2	1	**4**	**5**	0.2	12.1	0.1	7.7	-	0.2	0.2	0.3	0.2	**0.2**	**0.2**	3	4	100.0	0.0
	b. Other unspecified	7	8	9	5	31	**29**	**60**	1.1	87.9	1.7	92.3	6.6	1.8	1.5	0.8	5.0	**1.8**	**2.5**	25	50	23.3	23.3
	TOTAL	158	866	751	762	1000	**2537**	**3537**	100.0	100.0	100.0	100.0	148.5	194.4	129.1	124.4	161.6	**149.6**	**152.3**	2195	3004	94.1	1.2

† includes 102 non-malignant

Please consult the quality indicators for this pool and its constituent registries

Costa Rica

Costa Rica National Tumour Registry, 1993–2012

Guillermo Torres Alvarado, Ma. Estebana Guevara Obando, Bernardo Moreira Moreira, Henry Wasserman Taitelbaum

Costa Rica is in Central America. It covers an area of 51 100 km^2. Costa Rica has a tropical climate, generally characterized by high temperatures and abundant rainfall during much of the year. The economy is based on tourism, agriculture, and exports of electronic equipment and services. The poverty indicators were significantly improved from the 1950s to the 1980s as the result of strong support by the government to increase production for the domestic market and to provide strong social investment in education, health care, electricity, telecommunications, and water supply services, among others.

In 2010, the population of Costa Rica was 4.5 million, and 34% of the population was younger than 20 years (Table A.6). Most of the population (> 80%) are White or Mestizo, and about 2.4% are Indigenous peoples. The national social security system covers more than 90% of the population and is organized in three levels. People who are suspected to have cancer are referred to the secondary and tertiary (specialized) levels. The social security system includes 29 hospitals, of which seven have an oncology department. National Children's Hospital "Dr. Carlos Sáenz Herrera" has specialized paediatric and adolescent oncology services as well as other specialized services for the care of patients with cancer.

The Costa Rica National Tumour Registry covers the entire country. It was established in December 1976 by executive order, and nationwide coverage was achieved in 1980 (Table A.10). The registry collects data on cancer incidence and mortality by age, sex, tumour site, and geographical distribution from all health-care facilities, including private medical services. The registry is part of the Unit of Monitoring Health Indicators within the Bureau of Health Surveillance of the Ministry of Health, which provides financial support. The registry has three full-time technicians, two of whom are professionals in health information systems. They are supported by medical staff members, epidemiologists, and public health specialists. An evaluation team visits hospitals and private clinics to check the quality of information. Data are collected from biopsy reports and other histological examinations with a diagnosis of cancer from all pathology services, death certificates, hospital discharge information, and mortality databases from the National Statistics Department. The registry is fully computerized and uses databases from the National Civil Registry to complete information. The level of underreporting is assumed to be low, because of the characteristics of the health system and the vital statistics system.

Costa Rica has made significant efforts to establish early detection programmes for cancer, including cancer types that affect children. The registry information is used in cancer control decision-making at several levels and is also used for research and teaching purposes.

POPULATION AT RISK

Population data were provided by the National Institute of Statistics and Census (https://www.inec.go.cr/). Annual estimates were calculated based on the censuses of 1984, 2000, and 2011. Data were provided in all requested detail.

EDITORS' COMMENTS

The Costa Rica National Tumour Registry participated in IICC-1 and IICC-2 (Table A.1). The proportion of cases with unspecified morphology was high (11%) (Table A.9). Thus, the resulting incidence rates may be lower for some specific tumour types (e.g. leukaemia, retinoblastoma) and higher for unspecified cancer types. Non-malignant CNS tumours were not registered, and pilocytic astrocytoma was coded with malignant behaviour. Laterality was complete. Skin carcinomas were reportable.

COSTA RICA (1993-2012)

	Age group (years)	Males	Females
Person-years	0	758 323	723 546
	1-4	3 131 817	2 983 830
	5-9	4 118 268	3 915 025
	10-14	4 200 494	3 989 587
	15-19	4 079 960	3 875 498
	0-14	12 208 902	11 611 988
	0-19	16 288 862	15 487 486
Average annual population	0-14	610 445	580 599
	0-19	814 443	774 374

Please consult the quality indicators for this registry

COSTA RICA (1993-2012)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	LEUKAEMIA	48	552	391	260	239	1251	1490	40.2	100.0	32.7	100.0	32.4	90.3	48.7	31.7	30.0	55.5	49.8	797	947	99.9	0.0
	a. Lymphoid	26	480	338	194	168	1038	1206	33.4	83.0	26.5	80.9	17.5	78.5	42.1	23.7	21.1	46.2	40.6	662	767	100.0	0.0
	b. Acute myeloid	20	60	43	46	46	169	215	5.4	13.5	4.7	14.4	13.5	9.8	5.4	5.6	5.8	7.4	7.1	107	136	99.5	0.0
	c. CMD	1	6	5	8	8	20	28	0.6	1.6	0.6	1.9	0.7	1.0	0.6	1.0	1.0	0.8	0.9	13	18	100.0	0.0
	d. MDS & other	0	0	0	1	0	1	1	0.0	0.1	0.0	0.1	-	-	-	0.1	-	0.0	0.0	1	1	100.0	0.0
	e. Unspecified	1	6	5	11	17	23	40	0.7	1.8	0.9	2.7	0.7	1.0	0.6	1.3	2.1	0.9	1.2	14	25	100.0	0.0
II	LYMPHOMA & RELATED	3	82	150	178	268	413	681	13.3	100.0	15.0	100.0	2.0	13.4	18.7	21.7	33.7	16.7	20.5	258	426	100.0	0.0
	a. Hodgkin	0	19	80	86	168	185	353	5.9	44.8	7.7	51.8	-	3.1	10.0	10.5	21.1	7.2	10.4	115	220	100.0	0.0
	b. Non-Hodgkin except BL	0	37	43	66	88	146	234	4.7	35.4	5.1	34.4	-	6.1	5.4	8.1	11.1	6.0	7.1	91	147	100.0	0.0
	c. Burkitt (BL)	0	16	16	19	5	51	56	1.6	12.3	1.2	8.2	-	2.6	2.0	2.3	0.6	2.1	1.8	32	35	100.0	0.0
	d. Lymphoreticular	3	7	3	3	0	16	16	0.5	3.9	0.4	2.3	2.0	1.1	0.4	0.4	-	0.7	0.6	10	10	100.0	0.0
	e. Unspecified	0	3	8	4	7	15	22	0.5	3.6	0.5	3.2	-	0.5	1.0	0.5	0.9	0.6	0.7	9	14	100.0	0.0
III	CNS NEOPLASMS	26	130	166	108	93	430	523	13.8	100.0	11.5	100.0	17.5	21.3	20.7	13.2	11.7	18.4	16.9	272	330	79.3	3.1
	a. Ependymoma	4	27	17	9	4	57	61	1.8	13.3	1.3	11.7	2.7	4.4	2.1	1.1	0.5	2.6	2.1	36	39	100.0	0.0
	b. Astrocytoma	7	33	42	40	38	122	160	3.9	28.4	3.5	30.6	4.7	5.4	5.2	4.9	4.8	5.1	5.1	77	101	100.0	0.0
	c. CNS embryonal	5	39	52	37	19	133	152	4.3	30.9	3.3	29.1	3.4	6.4	6.5	4.5	2.4	5.6	4.9	84	96	100.0	0.0
	d. Other gliomas	3	4	9	7	13	23	36	0.7	5.3	0.8	6.9	2.0	0.7	1.1	0.9	1.6	1.0	1.1	14	23	100.0	0.0
	e. Other specified	0	1	1	1	1	3	4	0.1	0.7	0.1	0.8	-	0.2	0.1	0.1	0.1	0.1	0.1	2	3	100.0	0.0
	f. Unspecified CNS	7	26	45	14	18	92	110	3.0	21.4	2.4	21.0	4.7	4.3	5.6	1.7	2.3	4.0	3.6	58	70	1.8	14.5
IV	NEUROBLASTOMA	29	39	11	3	4	82	86	2.6	100.0	1.9	100.0	19.6	6.4	1.4	0.4	0.5	4.0	3.2	53	56	100.0	0.0
	a. (Ganglio)neuroblastoma	29	39	11	3	2	82	84	2.6	100.0	1.8	97.7	19.6	6.4	1.4	0.4	0.3	4.0	3.2	53	55	100.0	0.0
	b. Peripheral nervous	0	0	0	0	2	0	2	-	-	0.0	2.3	-	-	-	-	0.3	-	0.1	-	1	100.0	0.0
V	RETINOBLASTOMA	26	54	7	0	0	87	87	2.8	100.0	1.9	100.0	17.5	8.8	0.9	-	-	4.4	3.4	57	57	100.0	0.0
VI	RENAL TUMOURS	14	66	27	16	4	123	127	4.0	100.0	2.8	100.0	9.4	10.8	3.4	2.0	0.5	5.7	4.6	79	82	92.1	0.0
	a. Nephroblastoma	13	60	25	12	0	110	110	3.5	89.4	2.4	86.6	8.8	9.8	3.1	1.5	-	5.1	4.0	71	71	100.0	0.0
	b. Renal carcinoma	0	0	0	4	3	4	7	0.1	3.3	0.2	5.5	-	-	-	0.5	0.4	0.1	0.2	2	4	100.0	0.0
	c. Unspecified	1	6	2	0	1	9	10	0.3	7.3	0.2	7.9	0.7	1.0	0.2	-	0.1	0.4	0.4	6	6	0.0	0.0
VII	HEPATIC TUMOURS	11	18	8	13	14	50	64	1.6	100.0	1.4	100.0	7.4	2.9	1.0	1.6	1.8	2.3	2.1	32	41	90.6	4.7
	a. Hepatoblastoma	9	16	7	2	1	34	35	1.1	68.0	0.8	54.7	6.1	2.6	0.9	0.2	0.1	1.6	1.3	22	23	100.0	0.0
	b. Hepatic carcinoma	0	0	1	9	12	10	22	0.3	20.0	0.5	34.4	-	-	0.1	1.1	1.5	0.4	0.6	6	14	100.0	0.0
	c. Unspecified	2	2	0	2	1	6	7	0.2	12.0	0.2	10.9	1.3	0.3	-	0.2	0.1	0.3	0.2	4	4	14.3	42.9
VIII	BONE TUMOURS	0	3	27	84	118	114	232	3.7	100.0	5.1	100.0	-	0.5	3.4	10.3	14.8	4.2	6.6	70	144	92.7	1.7
	a. Osteosarcoma	0	1	16	48	71	65	136	2.1	57.0	3.0	58.6	-	0.2	2.0	5.9	8.9	2.4	3.9	40	85	100.0	0.0
	b. Chondrosarcoma	0	0	0	2	6	2	8	0.1	1.8	0.2	3.4	-	-	-	0.2	0.8	0.1	0.2	1	5	100.0	0.0
	c. Ewing & related	0	1	8	27	27	36	63	1.2	31.6	1.4	27.2	-	0.2	1.0	3.3	3.4	1.3	1.8	22	39	100.0	0.0
	d. Other specified	0	0	1	1	3	2	5	0.1	1.8	0.1	2.2	-	-	0.1	0.1	0.4	0.1	0.1	1	3	100.0	0.0
	e. Unspecified	0	1	2	6	11	9	20	0.3	7.9	0.4	8.6	-	0.2	0.2	0.7	1.4	0.3	0.6	6	12	15.0	20.0
IX	SOFT TISSUE SARCOMA	14	33	33	62	85	142	227	4.6	100.0	5.0	100.0	9.4	5.4	4.1	7.6	10.7	5.9	7.0	89	143	100.0	0.0
	a. Rhabdomyosarcoma	6	24	18	20	18	68	86	2.2	47.9	1.9	37.9	4.0	3.9	2.2	2.4	2.3	3.0	2.8	43	54	100.0	0.0
	b. Fibrosarcoma	4	1	5	11	8	21	29	0.7	14.8	0.6	12.8	2.7	0.2	0.6	1.3	1.0	0.8	0.9	13	18	100.0	0.0
	c. Kaposi sarcoma	0	0	0	1	0	1	1	0.0	0.7	0.0	0.4	-	-	-	0.1	-	0.0	0.0	1	1	100.0	0.0
	d. Other specified	2	5	6	25	51	38	89	1.2	26.8	2.0	39.2	1.3	0.8	0.7	3.1	6.4	1.5	2.6	24	56	100.0	0.0
	e. Unspecified	2	3	4	5	8	14	22	0.4	9.9	0.5	9.7	1.3	0.5	0.5	0.6	1.0	0.6	0.7	9	14	100.0	0.0
X	GERM CELL TUMOURS	11	23	13	63	215	110	325	3.5	100.0	7.1	100.0	7.4	3.8	1.6	7.7	27.0	4.5	9.6	69	204	91.4	0.3
	a. CNS germ cell	0	2	4	5	2	11	13	0.4	10.0	0.3	4.0	-	0.3	0.5	0.6	0.3	0.4	0.4	7	8	100.0	0.0
	b. Other extragonadal	4	9	0	3	17	16	33	0.5	14.5	0.7	10.2	2.7	1.5	-	0.4	2.1	0.8	1.1	10	21	100.0	0.0
	c. Gonadal germ cell	7	9	8	43	163	67	230	2.2	60.9	5.0	70.8	4.7	1.5	1.0	5.3	20.5	2.7	6.7	42	144	100.0	0.0
	d. Gonadal carcinoma	0	0	0	6	14	6	20	0.2	5.5	0.4	6.2	-	-	-	0.7	1.8	0.2	0.6	4	12	100.0	0.0
	e. Unspecified gonadal	0	3	1	6	19	10	29	0.3	9.1	0.6	8.9	-	0.5	0.1	0.7	2.4	0.4	0.9	6	18	3.4	3.4
XI	CARCINOMA & MELANOMA	2	3	43	131	293	179	472	5.8	100.0	10.4	100.0	1.3	0.5	5.4	16.0	36.8	6.6	13.4	110	294	100.0	0.0
	a. Adrenocortical	0	0	0	1	0	1	1	0.0	0.6	0.0	0.2	-	-	-	0.1	-	0.0	0.0	1	1	100.0	0.0
	b. Thyroid	0	2	15	30	91	47	138	1.5	26.3	3.0	29.2	-	0.3	1.9	3.7	11.4	1.8	3.9	29	86	100.0	0.0
	c. Nasopharyngeal	0	0	12	58	56	70	126	2.2	39.1	2.8	26.7	-	-	1.5	7.1	7.0	2.5	3.6	43	78	100.0	0.0
	d. Melanoma	2	1	3	7	19	13	32	0.4	7.3	0.7	6.8	1.3	0.2	0.4	0.9	2.4	0.5	0.9	8	20	100.0	0.0
	e. Skin carcinoma	0	0	8	21	39	29	68	0.9	16.2	1.5	14.4	-	-	1.0	2.6	4.9	1.1	1.9	18	42	100.0	0.0
	f. Other & unspecified	0	0	5	14	88	19	107	0.6	10.6	2.3	22.7	-	-	0.6	1.7	11.1	0.7	3.0	12	67	100.0	0.0
XII	OTHER & UNSPECIFIED	17	45	29	40	110	131	241	4.2	100.0	5.3	100.0	11.5	7.4	3.6	4.9	13.8	5.7	7.6	83	152	4.1	16.6
	a. Other specified	0	0	0	0	6	0	6	-	-	0.1	2.5	-	-	-	-	0.8	-	0.2	-	4	100.0	0.0
	b. Other unspecified	17	45	29	40	104	131	235	4.2	100.0	5.2	97.5	11.5	7.4	3.6	4.9	13.1	5.7	7.4	83	149	1.7	17.0
	TOTAL	201	1048	905	958	1443	3112	4555	100.0	100.0	100.0	100.0	135.6	171.4	112.7	117.0	181.4	133.9	144.6	1970	2877	91.2	1.4

Please consult the quality indicators for this registry

Cuba

Cuba National Cancer Registry, 2000–2012

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Cuba is an island country located in the Caribbean Sea. It covers an area of 110 922 km^2. In 2010, the population was 11.3 million, and 24% of the population was younger than 20 years (Table A.6). Cuba has a public health-care system based on extended primary care and equity of access. Services for cancer diagnoses and surgery are widely available throughout the country; there are 325 oncologists.

Since the 1970s, considerable efforts have been made to centralize the management of childhood cancer. These efforts culminated in 1989 with the creation of the National Programme for Childhood Cancer Control. Patients with cancer who are younger than 20 years are diagnosed and treated in Cuba's nine paediatric oncology centres, which provide specialized diagnostic facilities, radiotherapy, and chemotherapy. Concentrating resources and treatment in these nine centres enables increased specialization of the medical personnel as well as provision of the most advanced treatments enabled by the country's economy.

The Cuba National Cancer Registry was established in 1964 and covers the entire population of the country (Table A.10). In 1986, it was upgraded to include mandatory reporting and improved data management systems. In 1994, the information system was decentralized to each provincial level. The Network of Cancer Registries has been operational since 2004. Data collection is passive. The national registry coded data according to ICD-O-1 until 2007 and according to ICD-O-3 thereafter (Table A.10). The major information sources are hospitals and death certificate notification. Physicians report cancer cases using the Cuba National Cancer Registry report form. Records based on only clinical or radiological information are verified using the discharge records. At the central offices of the registry, staff members double-check all reports from the whole country to detect any possible inter-provincial duplicates and perform quality assurance.

Each year, the Cuba National Cancer Registry database is paired with all deaths occurring in the country using the death database provided by the National Office of Statistics of the Ministry of Public Health. The completeness of the death notifications and the existence of a unique identification number for each person in the country enable unambiguous matching of the cases stored in the national registry database with deaths, using record-linkage techniques. The cancer deaths not stored in the national registry database are included as DCO cases.

Cancer in the age group 0–19 years accounted for 1.5% of the total cancer cases. The annual incidence rates are presented by ICCC categories in the annual Statistical Yearbook published by the Ministry of Public Health (https://files.sld.cu/dne/files/2016/04/Anuario_2015_electronico-1.pdf).

The Comprehensive Cancer Control Program was established in 1987 and reorganized in 2006 with the creation of the Cancer Control Section, which is responsible for all cancer control actions. In 2010, the newly redesigned programme and national strategy for cancer control were implemented as a platform to integrate cancer control actions throughout the National Health System.

PUBLICATIONS

Galán Y, García M, Torres P, Fernández L, Lezcano M, Grueiro S, et al. (2010). Programa Integral para el Control del Cáncer en Cuba. Manual de procedimientos del Registro Nacional de Cáncer 2010. Ministerio de Salud Pública.

Torres P, Galán Y, Lence J, García M, Lezcano M, Fernández L (2010). Childhood cancer incidence in Cuba, 2001 to 2003. MEDICC Rev. 12(2):19–25. https://doi.org/10.37757/MR2010.V12.N2.6 PMID:20486410

POPULATION AT RISK

The source of the population data was the National Office of Statistics and Information (https://www.onei.gob.cu/). The most recent censuses were conducted in 2002 and 2012. Data were provided in all requested detail.

EDITORS' COMMENTS

The registry participated in IICC-1 and IICC-2 (Table A.1). The DCO% was high (7%), and the proportion of cases with unspecified morphology was high (13%); this may lead to underestimation of the rates for specific categories, such as leukaemia (Table A.9). Non-malignant CNS tumours were not registered systematically, and the proportion was low (3%). Pilocytic astrocytoma was coded with uncertain behaviour. Skin carcinomas were reportable. Laterality was not collected.

CUBA (2000-2012)

	Age group (years)	Males	Females
Person-years	0	849 045	800 870
	1-4	3 477 409	3 277 227
	5-9	4 588 159	4 333 020
	10-14	5 077 464	4 800 416
	15-19	5 325 753	5 037 341
	0-14	13 992 077	13 211 533
	0-19	19 317 830	18 248 874
Average annual population	0-14	1 076 314	1 016 272
	0-19	1 485 987	1 403 760

Please consult the quality indicators for this registry

CUBA (2000-2012)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	LEUKAEMIA	50	411	308	245	210	**1014**	**1224**	29.7	100.0	25.8	100.0	30.3	60.8	34.5	24.8	20.3	**39.6**	**35.2**	571	672	96.8	3.2
	a. Lymphoid	21	325	225	152	103	**723**	**826**	21.2	71.3	17.4	67.5	12.7	48.1	25.2	15.4	9.9	**28.5**	**24.4**	409	459	97.9	2.1
	b. Acute myeloid	13	38	50	50	62	**151**	**213**	4.4	14.9	4.5	17.4	7.9	5.6	5.6	5.1	6.0	**5.6**	**5.7**	84	114	98.1	1.9
	c. CMD	4	8	8	11	14	**31**	**45**	0.9	3.1	0.9	3.7	2.4	1.2	0.9	1.1	1.4	**1.2**	**1.2**	17	24	100.0	0.0
	d. MDS & other	1	3	0	1	0	**5**	**5**	0.1	0.5	0.1	0.4	0.6	0.4	-	0.1	-	**0.2**	**0.2**	3	3	100.0	0.0
	e. Unspecified	11	37	25	31	31	**104**	**135**	3.0	10.3	2.8	11.0	6.7	5.5	2.8	3.1	3.0	**4.0**	**3.8**	58	73	86.7	13.3
II	LYMPHOMA & RELATED	5	177	200	236	301	**618**	**919**	18.1	100.0	19.4	100.0	3.0	26.2	22.4	23.9	29.0	**22.6**	**24.0**	340	485	95.6	4.4
	a. Hodgkin	0	25	58	96	158	**179**	**337**	5.2	29.0	7.1	36.7	-	3.7	6.5	9.7	15.2	**6.1**	**8.1**	96	172	98.5	1.5
	b. Non-Hodgkin except BL	0	121	120	119	116	**360**	**476**	10.6	58.3	10.0	51.8	-	17.9	13.5	12.0	11.2	**13.4**	**12.9**	199	255	97.5	2.5
	c. Burkitt (BL)	0	11	10	8	3	**29**	**32**	0.9	4.7	0.7	3.5	-	1.6	1.1	0.8	0.3	**1.1**	**0.9**	16	18	100.0	0.0
	d. Lymphoreticular	5	16	5	3	3	**29**	**32**	0.9	4.7	0.7	3.5	3.0	2.4	0.6	0.3	0.3	**1.2**	**1.0**	17	18	96.9	3.1
	e. Unspecified	0	4	7	10	21	**21**	**42**	0.6	3.4	0.9	4.6	-	0.6	0.8	1.0	2.0	**0.7**	**1.0**	11	21	47.6	52.4
III	CNS NEOPLASMS †	20	173	187	185	114	**565**	**679**	16.6	100.0	14.3	100.0	12.1	25.6	21.0	18.7	11.0	**21.1**	**18.8**	313	368	72.3	12.2
	a. Ependymoma	6	26	14	9	9	**55**	**64**	1.6	9.7	1.3	9.4	3.6	3.8	1.6	0.9	0.9	**2.2**	**1.9**	31	36	93.8	6.3
	b. Astrocytoma	4	52	56	88	41	**200**	**241**	5.9	35.4	5.1	35.5	2.4	7.7	6.3	8.9	4.0	**7.2**	**6.5**	109	129	99.2	0.8
	c. CNS embryonal	1	37	31	24	13	**93**	**106**	2.7	16.5	2.2	15.6	0.6	5.5	3.5	2.4	1.3	**3.6**	**3.1**	52	58	98.1	1.9
	d. Other gliomas	0	19	23	20	12	**62**	**74**	1.8	11.0	1.6	10.9	-	2.8	2.6	2.0	1.2	**2.3**	**2.0**	34	40	100.0	0.0
	e. Other specified	1	3	4	7	0	**15**	**15**	0.4	2.7	0.3	2.2	0.6	0.4	0.4	0.7	-	**0.5**	**0.4**	8	8	93.3	0.0
	f. Unspecified CNS	8	36	59	37	39	**140**	**179**	4.1	24.8	3.8	26.4	4.8	5.3	6.6	3.7	3.8	**5.2**	**4.9**	78	97	0.0	41.9
IV	NEUROBLASTOMA	62	97	28	12	9	**199**	**208**	5.8	100.0	4.4	100.0	37.6	14.4	3.1	1.2	0.9	**8.7**	**6.9**	116	121	96.6	3.4
	a. (Ganglio)neuroblastoma	62	95	26	10	8	**193**	**201**	5.7	97.0	4.2	96.6	37.6	14.1	2.9	1.0	0.8	**8.5**	**6.7**	113	117	96.5	3.5
	b. Peripheral nervous	0	2	2	2	1	**6**	**7**	0.2	3.0	0.1	3.4	-	0.3	0.2	0.2	0.1	**0.2**	**0.2**	3	4	100.0	0.0
V	RETINOBLASTOMA	25	53	5	7	1	**90**	**91**	2.6	100.0	1.9	100.0	15.2	7.8	0.6	0.7	0.1	**4.0**	**3.1**	53	53	97.8	2.2
VI	RENAL TUMOURS	23	102	31	14	19	**170**	**189**	5.0	100.0	4.0	100.0	13.9	15.1	3.5	1.4	1.8	**7.3**	**6.1**	99	108	92.1	7.4
	a. Nephroblastoma	23	100	31	14	15	**168**	**183**	4.9	98.8	3.9	96.8	13.9	14.8	3.5	1.4	1.4	**7.2**	**5.9**	98	105	92.9	7.1
	b. Renal carcinoma	0	1	0	0	4	**1**	**5**	0.0	0.6	0.1	2.6	-	0.1	-	-	0.4	**0.0**	**0.1**	1	3	80.0	20.0
	c. Unspecified	0	1	0	0	0	**1**	**1**	0.0	0.6	0.0	0.5	-	0.1	-	-	-	**0.0**	**0.0**	1	1	0.0	0.0
VII	HEPATIC TUMOURS	11	9	3	9	9	**32**	**41**	0.9	100.0	0.9	100.0	6.7	1.3	0.3	0.9	0.9	**1.3**	**1.2**	18	22	82.9	12.2
	a. Hepatoblastoma	10	8	2	2	1	**22**	**23**	0.6	68.8	0.5	56.1	6.1	1.2	0.2	0.2	0.1	**1.0**	**0.8**	13	13	100.0	0.0
	b. Hepatic carcinoma	0	0	1	6	4	**7**	**11**	0.2	21.9	0.2	26.8	-	-	0.1	0.6	0.4	**0.2**	**0.3**	4	6	100.0	0.0
	c. Unspecified	1	1	0	1	4	**3**	**7**	0.1	9.4	0.1	17.1	0.6	0.1	-	0.1	0.4	**0.1**	**0.2**	2	4	0.0	71.4
VIII	BONE TUMOURS	1	11	31	123	136	**166**	**302**	4.9	100.0	6.4	100.0	0.6	1.6	3.5	12.5	13.1	**5.3**	**7.1**	87	152	90.4	6.6
	a. Osteosarcoma	0	1	18	76	77	**95**	**172**	2.8	57.2	3.6	57.0	-	0.1	2.0	7.7	7.4	**2.9**	**3.9**	49	86	97.7	2.3
	b. Chondrosarcoma	0	0	0	8	15	**8**	**23**	0.2	4.8	0.5	7.6	-	-	-	0.8	1.4	**0.2**	**0.5**	4	11	100.0	0.0
	c. Ewing & related	0	5	7	28	20	**40**	**60**	1.2	24.1	1.3	19.9	-	0.7	0.8	2.8	1.9	**1.3**	**1.4**	21	31	98.3	1.7
	d. Other specified	0	2	1	4	14	**7**	**21**	0.2	4.2	0.4	7.0	-	0.3	0.1	0.4	1.4	**0.2**	**0.5**	4	11	100.0	0.0
	e. Unspecified	1	3	5	7	10	**16**	**26**	0.5	9.6	0.5	8.6	0.6	0.4	0.6	0.7	1.0	**0.6**	**0.7**	9	14	7.7	57.7
IX	SOFT TISSUE SARCOMA	19	56	43	49	70	**167**	**237**	4.9	100.0	5.0	100.0	11.5	8.3	4.8	5.0	6.8	**6.4**	**6.5**	94	127	100.0	0.0
	a. Rhabdomyosarcoma	9	31	15	20	17	**75**	**92**	2.2	44.9	1.9	38.8	5.5	4.6	1.7	2.0	1.6	**3.0**	**2.7**	42	51	100.0	0.0
	b. Fibrosarcoma	2	5	10	4	10	**21**	**31**	0.6	12.6	0.7	13.1	1.2	0.7	1.1	0.4	1.0	**0.8**	**0.8**	12	17	100.0	0.0
	c. Kaposi sarcoma	0	0	0	1	4	**1**	**5**	0.0	0.6	0.1	2.1	-	-	-	0.1	0.4	**0.0**	**0.1**	1	2	100.0	0.0
	d. Other specified	4	9	8	14	22	**35**	**57**	1.0	21.0	1.2	24.1	2.4	1.3	0.9	1.4	2.1	**1.3**	**1.5**	19	30	100.0	0.0
	e. Unspecified	4	11	10	10	17	**35**	**52**	1.0	21.0	1.1	21.9	2.4	1.6	1.1	1.0	1.6	**1.3**	**1.4**	20	28	100.0	0.0
X	GERM CELL TUMOURS	9	36	20	42	78	**107**	**185**	3.1	100.0	3.9	100.0	5.5	5.3	2.2	4.3	7.5	**4.0**	**4.8**	59	97	94.6	1.6
	a. CNS germ cell	1	0	1	3	3	**5**	**8**	0.1	4.7	0.2	4.3	0.6	-	0.1	0.3	0.3	**0.2**	**0.2**	3	4	100.0	0.0
	b. Other extragonadal	3	11	0	1	6	**15**	**21**	0.4	14.0	0.4	11.4	1.8	1.6	-	0.1	0.6	**0.7**	**0.7**	9	12	100.0	0.0
	c. Gonadal germ cell	3	16	16	36	35	**71**	**106**	2.1	66.4	2.2	57.3	1.8	2.4	1.8	3.6	3.4	**2.5**	**2.7**	38	55	98.1	0.9
	d. Gonadal carcinoma	1	4	1	1	29	**7**	**36**	0.2	6.5	0.8	19.5	0.6	0.6	0.1	0.1	2.8	**0.3**	**0.9**	4	18	91.7	0.0
	e. Unspecified gonadal	1	5	2	1	5	**9**	**14**	0.3	8.4	0.3	7.6	0.6	0.7	0.2	0.1	0.5	**0.4**	**0.4**	5	8	64.3	14.3
XI	CARCINOMA & MELANOMA	8	23	22	116	325	**169**	**494**	5.0	100.0	10.4	100.0	4.8	3.4	2.5	11.7	31.4	**5.6**	**11.4**	89	246	98.8	0.8
	a. Adrenocortical	0	0	0	0	0	**0**	**0**	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
	b. Thyroid	0	0	4	45	99	**49**	**148**	1.4	29.0	3.1	30.0	-	-	0.4	4.6	9.6	**1.5**	**3.3**	25	73	100.0	0.0
	c. Nasopharyngeal	0	0	1	6	10	**7**	**17**	0.2	4.1	0.4	3.4	-	-	0.1	0.6	1.0	**0.2**	**0.4**	4	8	100.0	0.0
	d. Melanoma	0	3	5	7	13	**15**	**28**	0.4	8.9	0.6	5.7	-	0.4	0.6	0.7	1.3	**0.5**	**0.7**	8	14	96.4	3.6
	e. Skin carcinoma	6	8	5	21	87	**40**	**127**	1.2	23.7	2.7	25.7	3.6	1.2	0.6	2.1	8.4	**1.4**	**3.0**	22	64	98.4	0.0
	f. Other & unspecified	2	12	7	37	116	**58**	**174**	1.7	34.3	3.7	35.2	1.2	1.8	0.8	3.7	11.2	**2.0**	**4.1**	31	87	98.3	1.7
XII	OTHER & UNSPECIFIED	14	31	28	41	58	**114**	**172**	3.3	100.0	3.6	100.0	8.5	4.6	3.1	4.2	5.6	**4.3**	**4.6**	63	91	8.1	55.2
	a. Other specified	0	2	1	4	4	**7**	**11**	0.2	6.1	0.2	6.4	-	0.3	0.1	0.4	0.4	**0.2**	**0.3**	4	6	100.0	0.0
	b. Other unspecified	14	29	27	37	54	**107**	**161**	3.1	93.9	3.4	93.6	8.5	4.3	3.0	3.7	5.2	**4.0**	**4.3**	59	85	1.9	59.0
	TOTAL	247	1179	906	1079	1330	**3411**	**4741**	100.0	100.0	100.0	100.0	149.7	174.5	101.6	109.2	128.3	**130.2**	**129.7**	1902	2544	89.4	6.6

† includes 19 non-malignant

Please consult the quality indicators for this registry

Ecuador

Ecuador is located in the north-west of South America. It is bordered by Colombia to the north, Peru to the east and south, and the Pacific Ocean to the west. The Galápagos Islands are located about 1000 km west of the mainland in the Pacific Ocean.

Ecuador is a middle-income country, with a developing economy that is based on exports of commodities, i.e. petroleum and agricultural products. Tourism is also an important contributor to the economy. The capital city is Quito, and the largest city is Guayaquil. Ecuador is divided into 24 provinces; the provinces are divided into cantons, which are further subdivided into parishes.

As a result of historical movement of peoples in the area of what today is Ecuador, the country has a mixed population of Indigenous, Hispanic, European, and African descent. Most of the population is Mestizo, with large minorities of European, Amerindian, and African descent. Spanish is the official language and is spoken by most of the population; 13 Amerindian languages are also recognized. In 2010, the population of Ecuador was 14.9 million (Table A.7), and 41% of the population was younger than 20 years (Table A.6). Most of the population lives in the central provinces, in the Andes mountains, or along the Pacific coast. The tropical forest region to the east of the mountains is sparsely populated; only about 3% of the population lives there.

The National Health System of Ecuador is funded through the state and social insurance, which guarantee access to cancer treatment provided free of charge.

General practitioners in public general hospitals provide care and refer cancer cases for treatment by an oncologist. Oncology care costs are covered up to 75% by social security, the health ministry, and nongovernmental organizations. One quarter of patients with cancer receive care in the private sector. The Society to Fight Cancer (Sociedad de Lucha Contra el Cáncer del Ecuador [SOLCA]; https://www.solca.med.ec) is a non-profit nongovernmental organization that was founded in Guayaquil in 1951. SOLCA is responsible for cancer control by Legislative Decree of the Ecuadorian State of 15 October 1953 (published in Official Record No. 362 of 12 November 1953). Since then, several SOLCA centres have been created to fulfil the mission, including in Quito, Cuenca, Loja, Portoviejo, and Machala, which each serve the respective area of the country.

The six cancer registries in Ecuador collaborate within the framework of SOLCA and disseminate statistics on cancer incidence, trends, and mortality in the six covered regions and nationwide. This information is used for cancer monitoring and control in Ecuador as well as for epidemiological research. With support from the My Child Matters programme, the Quito, Cuenca, Manabí, and Loja registries have focused on registration and follow-up of patients with cancer who are younger than 20 years, in a project started in 2010. The project helped to improve and expand information on these patients with cancer from 2004. All registries use active case finding, and they exchange data on residents in other covered areas. Certification and reporting of all deaths to the National Institute of Statistics and Census is mandatory. The institute provides access to the records, which are recorded digitally from 2016. Death certificates of the residents in the covered areas are consulted by the registries for case ascertainment and for follow-up of the registered cases in regional offices of the population registry.

PUBLICATIONS

Cueva P, Yépez J, editors (2014). Cancer epidemiology in Quito 2006–2010. Epidemiología del cáncer en Quito 2006–2010. Quito, Ecuador: Registro Nacional de Tumores, SOLCA Quito.

POPULATION AT RISK

Population data were provided by the National Institute of Statistics and Census (https://www.ecuadorencifras.gob.ec/institucional/home/). Based on the censuses of 1990, 2001, and 2010, the population counts were estimated by administrative unit, sex, and age group, taking into account births, deaths, and migrations. All of the registries provided population data in all requested detail.

EDITORS' COMMENTS

Five cancer registries in Ecuador contributed to IICC-3; together, they cover almost 40% of the national population (Table A.6). A table with the combined data is presented in the IICC-3 book; the full tables for the Cuenca, Guayaquil, Manabí, and Quito registries, as well as an abbreviated

ECUADOR, 5 registries (1993-2013)

Registry	Period	Cases	%	Person-years	%
Cuenca	1996-2013	460	11.1	3 414 928	11.7
Guayaquil	2008-2012	758	18.3	4 469 368	15.3
Loja	1997-2013	226	5.5	1 403 326	4.8
Manabí	1995-2011	850	20.5	8 962 965	30.6
Quito	1993-2012	1851	44.7	11 023 570	37.7
ECUADOR	**1993-2013**	**4145**	**100.0**	**29 274 157**	**100.0**

Please consult the quality indicators for this pool and its constituent registries

table for the Loja registry (within the combined dataset for Ecuador), are available online (Table A.12). The Quito registry contributed to IICC-2 (Table A.1).

For three of the five registries, the proportion of cases with unspecified morphology was high. Non-malignant CNS tumours were not registered before 2012, which explains their small or zero proportion in the constituent registries (Table A.9). Registration and coding of pilocytic astrocytoma varied between the registries, as described below. Skin carcinomas were reportable, but some underregistration cannot be excluded. Laterality was collected in all registries, with variable completeness.

Cuenca Tumour Registry, 1996–2013

Fray Martinez-Reyes, Cristian Castro Hugo, Lorena Abril Mogrovejo

Cuenca is the capital and the largest city of Azuay Province. The city is located 2550 m above sea level and has an average temperature of 15 °C. Cuenca is also the name of the province's largest canton, which occupies the north-west quarter of the province and covers an area of 3190 km^2. In 2010, the population of the canton was 0.5 million, and 39% of the population was younger than 20 years (Table A.6).

The Cuenca Tumour Registry, located in the city of Cuenca, began operation in November 1996 (Table A.10), and in 2005 it became a member of IACR. Inclusion of the registry's data in CI5 Volumes X and XI and in the GLOBOCAN database is a credit to the quality of its information. The registered cases are all new neoplasms, invasive or in situ, with or without histological verification, diagnosed in residents of the canton of Cuenca, incident in the years of the reporting period.

Registry staff members actively search for cases in primary sources, such as the records of pathology and haematology laboratories of public and private hospitals. Data from death certificates and hospital discharge records are also reviewed. The registry strives to identify the most valid basis of diagnosis and to avoid duplicate registrations. The lack of direct access to official sources of data hinders confirmation of some variables, such as residence; this limitation is overcome through the detailed review of multiple data sources, such as medical records, laboratory reports, death certificates, and published information. These processes result in high completeness of case ascertainment.

Cuenca has two public specialized hospitals and one private cancer hospital, which receives public funds. There are also private institutions that provide diagnostic and treatment services for children with cancer; these are all captured by the Cuenca Tumour Registry. A small percentage of patients may seek treatment in Quito.

POPULATION AT RISK

See Ecuador, above.

EDITORS' COMMENTS

The proportion of cases with unspecified morphology was high (11%) (Table A.9). The proportion of non-malignant CNS tumours was low (Table A.9), and there were no cases of pilocytic astrocytoma in the dataset. Laterality was available for 91% of the cases of interest. See also Ecuador, above.

Guayaquil Cancer Registry, 2008–2012

Juan Tanca Campozano, Luis Espín Custodio, Leyda Jaramillo Feijoo, Rina Quinto Briones, Carlos Campoverde Ortiz, Ronald Bastidas Palacios, Geovanny Loor Mazamba, Jorge Villarroel Llerena

Guayaquil is the largest and most populous city in Ecuador and is the capital of Guayas Province. The city is located near the Pacific coast and has a humid tropical climate. There are two hospitals for paediatric oncology: a private non-profit hospital with a paediatric ward with all oncology facilities and specialists needed to provide medical care, and a public hospital with fewer facilities but with equally qualified medical care.

The Guayaquil Cancer Registry covers the population of the city of Guayaquil. In 2010, the population was 2.4 million, and 38% of the population was younger than 20 years (Table A.6). Data are collected by trained registrars at all registered private and public hospitals, clinics, pathology and cytology laboratories, and other sources, to ensure data completeness. Follow-up of the registered cases for vital status is conducted by the registrars by inspecting medical records and death certificates. The data are published online and include information on incidence and mortality, data of local interest, and cancer-specific reports.

POPULATION AT RISK

See Ecuador, above.

EDITORS' COMMENTS

The proportion of cases with unspecified morphology was high (13%) (Table A.9). Non-malignant CNS tumours were not reportable, but pilocytic astrocytoma was registered and coded with malignant behaviour. Laterality was complete. See also Ecuador, above.

Loja Cancer Registry, 1997–2013

Jhoanna Castillo Calvas, Anny Gomez

The city of Loja is the capital of Loja Canton and Loja Province. Loja Province is located in the Cuxibamba Valley between the Malacatos River and the Zamora River; it is the southernmost province in the Ecuadorian mountains on the border with Peru. Loja Canton occupies the eastern strip of the province and has four urban and 13 rural parishes, including Vilcabamba, which is called the Valley of Longevity. The city of Loja is located 2060 m above sea level. It has a mild Andean climate, with temperatures ranging between 16 °C and 30 °C. Most residents of the canton live in the urban area (79%). In 2010, the population was 0.2 million, and 41% of the population was younger than 20 years (Table A.6). There are three major hospitals in Loja Canton, which provide specialized care in oncology, paediatric oncology, pathology, surgery, and radiotherapy to 80% of residents with cancer.

The Loja Cancer Registry covers the population of Loja Canton. The registry uses standard methodology. Data are collected actively from all histopathology, cytology, and immunohistochemistry reports. Other data sources are hospital records and death certificates. Data quality control includes searches for duplicate registrations, as well as several routine automated checks. Excellent collaboration with pathologists and staff of all data sources results in a completeness of more than 95%, as shown in evaluation of case-finding in alternative sources. The registry publishes incidence data every 5 years. Registry data are used for a variety of academic activities, including research in Loja Province.

POPULATION AT RISK

See Ecuador, above.

EDITORS' COMMENTS

The dates of birth and incidence were imprecise in a proportion of cases (Table A.8); this may have affected the age-specific incidence rates. There were no cases of non-malignant CNS tumours or pilocytic astrocytoma in the dataset. Cases of pilocytic astrocytoma, for which the ICD behaviour code changed from malignant to uncertain in 2003, were removed from the registry database. Laterality was complete for retinoblastoma and nephroblastoma. See also Ecuador, above.

Manabí Cancer Registry, 1995–2011

Mariela Mendoza, Juan Carlos González, Vanessa Zambrano

Manabí Province, which is located in central coastal Ecuador, is divided into 22 counties and covers an area of 18 939 km^2. The province has a relatively flat profile, with elevations that vary between 100 m and 600 m above sea level. In 2010, the population of the province was 1.4 million, and 42% of the population was younger than 20 years (Table A.6). Almost 60% the population lives in urban areas.

The Manabí Cancer Registry is located in the city of Portoviejo, which is the capital of Manabí Province. The registry covers the entire province. Data are collected actively from histopathology, cytology, and immunohistochemistry reports and from hospital records in public and private institutions. Cases are also ascertained from death certificates. Internal processes enable the identification of duplicate records and the recording of multiple tumours. Coding and validation are conducted in collaboration with pathologists and other health-care professionals, which results in a completeness of more than 95%.

POPULATION AT RISK

See Ecuador, above.

EDITORS' COMMENTS

Date of birth was incomplete for more than 10% of cases; age was inconsistent with date of birth and date of incidence in 6% of cases (Table A.8). The proportion of cases with unspecified morphology was high (almost 13%) (Table A.9). The overall incidence rate for the age group 0–19 years was low, especially for infants and adolescents. The proportion of cases aged 0–14 years in the age group 0–19 years was higher than expected, and the proportion of cases in age 0 years in the age group 0–14 years was lower than expected (4.6%) (Table A.9). The high DCO% also suggests some underregistration. There were no non-malignant CNS tumours in the dataset, and pilocytic astrocytoma was coded with malignant behaviour. Laterality was almost complete for nephroblastoma. See also Ecuador, above.

Quito Cancer Registry, 1993–2012

Patricia Cueva, José Yépez, María Belén Morejón, Mónica Galarza, Doris Chauca, Paulina Bedón, Silvia Jacho

Quito, the capital city of Ecuador, is located in the western part of the Andes mountain range, on the slopes of the active volcano Pichincha, and is located 2800 m above sea level. It has a subtropical highland climate, with temperatures ranging between 10 °C and 27 °C.

Quito has a population of 1.6 million and is the second most populous city in Ecuador. The population density is 4050 per km^2. The proportion of residents younger than 20 years (36%) is the lowest of all covered populations in Ecuador (Table A.6). The economy of Quito accounts for a high percentage of the country's industrial, commercial, and financial activity.

Cancer diagnostic and treatment services are provided by two major hospitals for 75% of patients and include paediatric oncology, pathology, and neuro-oncology.

The Quito Cancer Registry has actively collected data since 1985 from all histopathology, cytology, and immunohistochemistry reports and hospital discharge records in the public and private sector. Death certificates are also screened to ascertain new cases and to update the vital status of registered cases. Procedures are defined to prevent duplicate registrations, identify multiple primary tumours, evaluate data consistency, and validate coded information entered into the computer system. Excellent collaboration of pathologists and other data providers results in almost complete coverage.

POPULATION AT RISK

See Ecuador, above.

EDITORS' COMMENTS

The proportion of non-malignant CNS tumours was low (Table A.9). Pilocytic astrocytoma was coded with malignant behaviour until 2011 and with uncertain behaviour thereafter. Laterality was complete for 88% of the cases of interest. See also Ecuador, above.

ECUADOR, 5 registries (1993-2013)

	Age group (years)	Males	Females
Person-years	0	665 204	645 634
	1-4	2 980 373	2 901 610
	5-9	3 700 749	3 623 561
	10-14	3 715 906	3 671 713
	15-19	3 627 287	3 742 120
	0-14	11 062 232	10 842 518
	0-19	14 689 519	14 584 638

Please consult the quality indicators for this pool and its constituent registries

ECUADOR, 5 registries (1993-2013)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	LEUKAEMIA	70	531	410	307	304	**1318**	**1622**	43.7	100.0	39.1	100.0	53.4	90.3	56.0	41.6	41.3	**62.5**	**57.7**	905	1112	96.0	2.7
	a. Lymphoid	33	433	326	217	183	**1009**	**1192**	33.4	76.6	28.8	73.5	25.2	73.6	44.5	29.4	24.8	**48.0**	**42.8**	693	818	100.0	0.0
	b. Acute myeloid	16	55	50	61	72	**182**	**254**	6.0	13.8	6.1	15.7	12.2	9.4	6.8	8.3	9.8	**8.4**	**8.7**	125	174	100.0	0.0
	c. CMD	6	9	5	6	26	**26**	**52**	0.9	2.0	1.3	3.2	4.6	1.5	0.7	0.8	3.5	**1.3**	**1.8**	18	36	100.0	0.0
	d. MDS & other	0	2	1	0	2	**3**	**5**	0.1	0.2	0.1	0.3	-	0.3	0.1	-	0.3	**0.2**	**0.2**	2	3	100.0	0.0
	e. Unspecified	15	32	28	23	21	**98**	**119**	3.2	7.4	2.9	7.3	11.4	5.4	3.8	3.1	2.8	**4.7**	**4.3**	67	82	45.4	37.0
II	LYMPHOMA & RELATED	14	113	155	135	189	**417**	**606**	13.8	100.0	14.6	100.0	10.7	19.2	21.2	18.3	25.6	**19.0**	**20.5**	285	414	95.7	1.2
	a. Hodgkin	1	25	53	50	66	**129**	**195**	4.3	30.9	4.7	32.2	0.8	4.3	7.2	6.8	9.0	**5.7**	**6.4**	88	133	99.5	0.0
	b. Non-Hodgkin except BL	0	48	71	53	99	**172**	**271**	5.7	41.2	6.5	44.7	-	8.2	9.7	7.2	13.4	**7.8**	**9.1**	118	185	100.0	0.0
	c. Burkitt (BL)	1	13	15	5	6	**34**	**40**	1.1	8.2	1.0	6.6	0.8	2.2	2.0	0.7	0.8	**1.6**	**1.4**	23	27	100.0	0.0
	d. Lymphoreticular	10	12	4	6	1	**32**	**33**	1.1	7.7	0.8	5.4	7.6	2.0	0.5	0.8	0.1	**1.6**	**1.3**	22	23	100.0	0.0
	e. Unspecified	2	15	12	21	17	**50**	**67**	1.7	12.0	1.6	11.1	1.5	2.6	1.6	2.8	2.3	**2.3**	**2.3**	34	46	62.7	10.4
III	CNS NEOPLASMS †	19	124	151	91	93	**385**	**478**	12.8	100.0	11.5	100.0	14.5	21.1	20.6	12.3	12.6	**17.9**	**16.7**	264	327	80.3	3.3
	a. Ependymoma	4	9	15	5	1	**33**	**34**	1.1	8.6	0.8	7.1	3.1	1.5	2.0	0.7	0.1	**1.6**	**1.2**	23	23	100.0	0.0
	b. Astrocytoma	3	43	66	34	52	**146**	**198**	4.8	37.9	4.8	41.4	2.3	7.3	9.0	4.6	7.1	**6.7**	**6.8**	100	135	93.4	0.0
	c. CNS embryonal	4	46	35	30	17	**115**	**132**	3.8	29.9	3.2	27.6	3.1	7.8	4.8	4.1	2.3	**5.4**	**4.7**	79	90	99.2	0.0
	d. Other gliomas	0	9	8	6	6	**23**	**29**	0.8	6.0	0.7	6.1	-	1.5	1.1	0.8	0.8	**1.1**	**1.0**	16	20	69.0	0.0
	e. Other specified	0	3	0	4	4	**7**	**11**	0.2	1.8	0.3	2.3	-	0.5	-	0.5	0.5	**0.3**	**0.4**	5	8	100.0	0.0
	f. Unspecified CNS	8	14	27	12	13	**61**	**74**	2.0	15.8	1.8	15.5	6.1	2.4	3.7	1.6	1.8	**2.8**	**2.6**	42	51	4.1	21.6
IV	NEUROBLASTOMA	8	16	7	10	3	**41**	**44**	1.4	100.0	1.1	100.0	6.1	2.7	1.0	1.4	0.4	**2.0**	**1.6**	28	30	88.6	0.0
	a. (Ganglio)neuroblastoma	7	16	7	9	2	**39**	**41**	1.3	95.1	1.0	93.2	5.3	2.7	1.0	1.2	0.3	**1.9**	**1.5**	27	28	87.8	0.0
	b. Peripheral nervous	1	0	0	1	1	**2**	**3**	0.1	4.9	0.1	6.8	0.8	-	-	0.1	0.1	**0.1**	**0.1**	1	2	100.0	0.0
V	RETINOBLASTOMA	28	99	8	0	0	**135**	**135**	4.5	100.0	3.3	100.0	21.4	16.8	1.1	-	-	**7.2**	**5.6**	94	94	94.8	0.0
VI	RENAL TUMOURS	14	80	28	5	4	**127**	**131**	4.2	100.0	3.2	100.0	10.7	13.6	3.8	0.7	0.5	**6.5**	**5.2**	88	91	83.2	3.8
	a. Nephroblastoma	11	76	26	5	1	**118**	**119**	3.9	92.9	2.9	90.8	8.4	12.9	3.5	0.7	0.1	**6.0**	**4.7**	82	82	89.9	1.7
	b. Renal carcinoma	0	0	0	0	2	**0**	**2**	-	-	0.0	1.5	-	-	-	-	0.3	**-**	**0.1**	-	1	100.0	0.0
	c. Unspecified	3	4	2	0	1	**9**	**10**	0.3	7.1	0.2	7.6	2.3	0.7	0.3	-	0.1	**0.5**	**0.4**	6	7	0.0	30.0
VII	HEPATIC TUMOURS	15	29	11	11	9	**66**	**75**	2.2	100.0	1.8	100.0	11.4	4.9	1.5	1.5	1.2	**3.3**	**2.8**	46	52	81.3	5.3
	a. Hepatoblastoma	14	23	7	5	2	**49**	**51**	1.6	74.2	1.2	68.0	10.7	3.9	1.0	0.7	0.3	**2.5**	**2.0**	34	35	96.1	2.0
	b. Hepatic carcinoma	0	0	2	5	5	**7**	**12**	0.2	10.6	0.3	16.0	-	-	0.3	0.7	0.7	**0.3**	**0.4**	5	8	100.0	0.0
	c. Unspecified	1	6	2	1	2	**10**	**12**	0.3	15.2	0.3	16.0	0.8	1.0	0.3	0.1	0.3	**0.5**	**0.5**	7	8	0.0	25.0
VIII	BONE TUMOURS	0	4	36	101	94	**141**	**235**	4.7	100.0	5.7	100.0	-	0.7	4.9	13.7	12.8	**5.8**	**7.3**	96	159	94.9	0.9
	a. Osteosarcoma	0	0	26	80	66	**106**	**172**	3.5	75.2	4.1	73.2	-	-	3.5	10.8	9.0	**4.3**	**5.3**	72	117	98.8	0.0
	b. Chondrosarcoma	0	0	3	3	1	**6**	**7**	0.2	4.3	0.2	3.0	-	-	0.4	0.4	0.1	**0.3**	**0.2**	4	5	100.0	0.0
	c. Ewing & related	0	4	6	10	15	**20**	**35**	0.7	14.2	0.8	14.9	-	0.7	0.8	1.4	2.0	**0.9**	**1.1**	14	24	100.0	0.0
	d. Other specified	0	0	0	2	5	**2**	**7**	0.1	1.4	0.2	3.0	-	-	-	0.3	0.7	**0.1**	**0.2**	1	5	100.0	0.0
	e. Unspecified	0	0	1	6	7	**7**	**14**	0.2	5.0	0.3	6.0	-	-	0.1	0.8	0.9	**0.3**	**0.4**	5	9	28.6	14.3
IX	SOFT TISSUE SARCOMA	14	34	30	56	66	**134**	**200**	4.4	100.0	4.8	100.0	10.7	5.8	4.1	7.6	9.0	**6.1**	**6.7**	92	137	98.5	0.5
	a. Rhabdomyosarcoma	7	20	16	26	18	**69**	**87**	2.3	51.5	2.1	43.5	5.3	3.4	2.2	3.5	2.4	**3.2**	**3.0**	47	60	98.9	1.1
	b. Fibrosarcoma	3	4	3	5	13	**15**	**28**	0.5	11.2	0.7	14.0	2.3	0.7	0.4	0.7	1.8	**0.7**	**0.9**	10	19	100.0	0.0
	c. Kaposi sarcoma	0	0	0	1	1	**1**	**2**	0.0	0.7	0.0	1.0	-	-	-	0.1	0.1	**0.0**	**0.1**	1	1	100.0	0.0
	d. Other specified	2	6	7	15	22	**30**	**52**	1.0	22.4	1.3	26.0	1.5	1.0	1.0	2.0	3.0	**1.3**	**1.7**	20	35	100.0	0.0
	e. Unspecified	2	4	4	9	12	**19**	**31**	0.6	14.2	0.7	15.5	1.5	0.7	0.5	1.2	1.6	**0.9**	**1.0**	13	21	93.5	0.0
X	GERM CELL TUMOURS	13	37	21	41	170	**112**	**282**	3.7	100.0	6.8	100.0	9.9	6.3	2.9	5.5	23.1	**5.2**	**9.2**	77	192	95.4	0.7
	a. CNS germ cell	1	3	1	3	3	**8**	**11**	0.3	7.1	0.3	3.9	0.8	0.5	0.1	0.4	0.4	**0.4**	**0.4**	5	8	90.9	0.0
	b. Other extragonadal	2	5	2	3	13	**12**	**25**	0.4	10.7	0.6	8.9	1.5	0.9	0.3	0.4	1.8	**0.6**	**0.8**	8	17	96.0	0.0
	c. Gonadal germ cell	10	29	15	30	130	**84**	**214**	2.8	75.0	5.2	75.9	7.6	4.9	2.0	4.1	17.6	**3.9**	**7.0**	58	146	100.0	0.0
	d. Gonadal carcinoma	0	0	0	1	15	**1**	**16**	0.0	0.9	0.4	5.7	-	-	-	0.1	2.0	**0.0**	**0.5**	1	11	100.0	0.0
	e. Unspecified gonadal	0	0	3	4	9	**7**	**16**	0.2	6.3	0.4	5.7	-	-	0.4	0.5	1.2	**0.3**	**0.5**	5	11	31.3	12.5
XI	CARCINOMA & MELANOMA	4	7	22	47	165	**80**	**245**	2.7	100.0	5.9	100.0	3.1	1.2	3.0	6.4	22.4	**3.4**	**7.7**	54	166	99.6	0.0
	a. Adrenocortical	0	0	0	0	1	**0**	**1**	-	-	0.0	0.4	-	-	-	-	0.1	**-**	**0.0**	-	1	100.0	0.0
	b. Thyroid	0	0	7	22	64	**29**	**93**	1.0	36.3	2.2	38.0	-	-	1.0	3.0	8.7	**1.2**	**2.9**	20	63	100.0	0.0
	c. Nasopharyngeal	0	0	0	0	1	**0**	**1**	-	-	0.0	0.4	-	-	-	-	0.1	**-**	**0.0**	-	1	100.0	0.0
	d. Melanoma	4	4	6	3	6	**17**	**23**	0.6	21.3	0.6	9.4	3.1	0.7	0.8	0.4	0.8	**0.8**	**0.8**	12	16	95.7	0.0
	e. Skin carcinoma	0	2	5	12	27	**19**	**46**	0.6	23.8	1.1	18.8	-	0.3	0.7	1.6	3.7	**0.8**	**1.4**	13	31	100.0	0.0
	f. Other & unspecified	0	1	4	10	66	**15**	**81**	0.5	18.8	2.0	33.1	-	0.2	0.5	1.4	9.0	**0.6**	**2.5**	10	55	100.0	0.0
XII	OTHER & UNSPECIFIED	7	18	13	24	30	**62**	**92**	2.1	100.0	2.2	100.0	5.3	3.1	1.8	3.2	4.1	**2.9**	**3.1**	42	63	14.1	21.7
	a. Other specified	0	2	0	1	3	**3**	**6**	0.1	4.8	0.1	6.5	-	0.3	-	0.1	0.4	**0.1**	**0.2**	2	4	100.0	0.0
	b. Other unspecified	7	16	13	23	27	**59**	**86**	2.0	95.2	2.1	93.5	5.3	2.7	1.8	3.1	3.7	**2.7**	**2.9**	40	59	8.1	23.3
	TOTAL	206	1092	892	828	1127	**3018**	**4145**	100.0	100.0	100.0	100.0	157.2	185.7	121.8	112.1	152.9	**141.7**	**144.2**	2072	2836	91.8	2.4

† includes 5 non-malignant

Please consult the quality indicators for this pool and its constituent registries

France

France, 3 registries, 1990–2012

Three of the overseas administrative units of France that are located in Latin America are covered by cancer registries: French Guiana, Guadeloupe, and Martinique. As part of France, these areas are also part of the European Union and use the euro currency. The citizens have French nationality and vote for the president of France. The official language is French, but each ethnic community also speaks their variant of Creole language. The dominant religion is Roman Catholicism. Medical care is equivalent to that in mainland France, and all citizens participate in a compulsory national social security insurance system. The national health insurance can be complemented by optional private insurance.

Cancer registration follows the same principles as in mainland France. Support is provided by national institutions – the National Cancer Institute (INCa) and the National Institute for Public Health Surveillance (InVS) – and is conditioned on satisfactory periodic appraisals of the completeness and quality of cancer registration data. Registries are certified by the National Committee of Registries, which is part of the National Institute of Health and Medical Research (INSERM) and InVS. Registration is subject to approval by the National Commission for Information Technology and Civil Liberties (CNIL).

The three cancer registries in the French Caribbean – those of French Guiana, Guadeloupe, and Martinique – collaborate closely and aim to conduct studies using combined data on cancer. All three registries are members of the French Network of Cancer Registries (FRANCIM) and contribute to the FRANCIM database. They also exchange data with the French National Childhood Cancer Registries (see Europe, France).

POPULATION AT RISK

Population data were provided by the French National Institute of Statistics and Economic Studies (INSEE; https://www.insee.fr/fr/accueil) and are based on population censuses, vital statistics, and population movement. The last general population census was conducted in 1999. Since January 2004, a rolling census method has been used, with the goal of producing population updates annually and spreading the cost of the census over several years.

EDITORS' COMMENTS

The pooled dataset comprises the data provided by the three registries of the French Caribbean. Selected data are also available online in abbreviated tables for the two larger registries (French Guiana and Martinique) but not for Guadeloupe (Table A.12). Registration practices and data quality differ somewhat between the three registries, as described below.

FRANCE, 3 registries (1990-2012)

Registry	Period	Cases	%	Person-years	%
French Guiana	2003-2012	149	30.2	950 976	22.6
Guadeloupe	2008-2012	69	14.0	590 976	14.0
Martinique	1990-2012	275	55.8	2 668 301	63.4
FRANCE	**1990-2012**	**493**	**100.0**	**4 210 253**	**100.0**

Please consult the quality indicators for this pool and its constituent registries

French Guiana Cancer Registry, 2003–2012

Tristan Roué, Sophie Belliardo, Juliette Plenet, Angela Fior

French Guiana is an overseas department and region of France, located on the north Atlantic coast of South America on the Guiana Shield. It is bordered by Brazil to the east and south and Suriname to the west. French Guiana has a tropical rainforest climate.

The main traditional industries are fishing, gold mining, and timber. A large part of the economy derives from jobs and businesses associated with the European Space Agency; the tourism sector is also growing. The region depends on mainland France for subsidies and has poor infrastructure, a high cost of living, a high unemployment rate, and high levels of crime; social unrest is common.

French Guiana covers a land area of 83 534 km^2. The population density is only 3.4 per km^2. In 2010, the population was 0.2 million (Table A.7), and 44% of the population was younger than 20 years (Table A.6). Half of the population lives in the metropolitan area of Cayenne, the capital. A large proportion of the general population is Creole; about 15% are of European descent, and less than 5% are of Asian descent. The region attracts numerous immigrants from South America and the Caribbean seeking better socioeconomic conditions. Immigrants account for 30% of the population. Immigrants can gain access to health insurance. Patients who require specialized care

are transferred to Metropolitan France or Martinique for treatment.

The French Guiana Cancer Registry was established in 2005, with retrospective data collection from 2003 (Table A.10). It is housed within the Regional Union of Health Care Professionals. The registry was officially certified in 2011; since then, it has undergone a quality audit every 3 years. The registry is staffed by three trained research technicians, a statistician, a secretary, and two medical doctors. It has a scientific board and an ethical review board.

Cases are actively identified from three main sources: pathology laboratories, medical information offices of public and private hospitals, and health insurance notifications. After first case notification, every medical file is checked at different laboratories, private and public hospital departments, administrative services, and medical specialists within and outside the registration area. Data coding strictly follows the FRANCIM and European Network of Cancer Registries (ENCR) recommendations. The capture–recapture method was used to estimate the completeness of cancer registration. For 2003–2008, the completeness of registration of childhood cancers was estimated to be 96%. The registered cases are followed up for vital status actively by linking with the National Directory for the Identification of Natural Persons (RNIPP) at INSEE, or passively by matching death certificates stored in the town hall.

POPULATION AT RISK

Data were provided by sex and 5-year age group for each calendar year of the period 2003–2005 and by sex and single year of age for each calendar year of the period 2006–2012. The data for the missing year–age–sex categories were estimated at IARC using the methods described in Chapter 2. See also France, 3 registries, above.

EDITORS' COMMENTS

The MV% was low (85%), and the basis of diagnosis was unknown in almost 5% of cases. As a result, the proportion of cases with unspecified morphology was high (18%) (Table A.9). Thus, the resulting incidence rates may be lower for specific and higher for unspecified cancer types than expected. Non-malignant CNS tumours were reportable, and their percentage was high (40%) (Table A.9). The one case of pilocytic astrocytoma was registered with malignant behaviour. The unlikely dates of birth and incidence (Table A.8) and the high proportion of cases at the extremes of the considered age range shown in Table A.9 may be chance findings in the small dataset. Basal cell carcinomas of skin were not reportable. Laterality was not collected.

Guadeloupe Cancer Registry, 2008–2012

Jacqueline Deloumeaux, Bernard Bhakkan, Jessica Peruvien, Sara Kouyate

Guadeloupe is an insular overseas region and department of France. It is located in the Leeward Islands, part of the Lesser Antilles in the Caribbean Sea. The archipelago covers a total area of 1628 km^2. The population is mainly of African, Indian, and European descent. In 2010, the population was 0.5 million, and 30% of the population was younger than 20 years (Table A.6). The population lives mostly in urban areas, in which the population density is 326 per km^2. The economy is based on tourism, agriculture, light industry, and services. Guadeloupe is dependent on mainland France for subsidies and imports. The unemployment rate is especially high among young people.

Guadeloupe benefits from the French national health insurance, which is available for all citizens and is governed locally by a regional health agency. However, because there are few oncologists in Guadeloupe, most paediatric cases are managed in the university hospital and transferred to Metropolitan France for treatment.

The Guadeloupe Cancer Registry was established in 2008 and is located at the University Hospital of Pointe-à-Pitre. The registry is financed by INCa and InVS. It covers the entire population of Guadeloupe and records in a continuous and exhaustive manner all cancer-related data (date of incidence, stage and grade of diagnosis, treatment provided, and place of treatment). Data on follow-up and vital status are also collected, and survival statistics are provided in 5-year intervals. About 1700 incident cases are recorded annually; less than 1% of these occur in patients younger than 20 years.

Data are collected actively from the records of pathology laboratories, hospital registries, and the health insurance system. Information from all sources is linked to avoid duplicates and then validated by trained staff members according to IARC and IACR recommendations. Active collaboration with the French National Childhood Cancer Registries helps to achieve complete registration of children with cancer.

The incidence of most cancers is low in Guadeloupe, including in people younger than 20 years. A similar pattern is found in Martinique. Reports on incidence and mortality are routinely provided to both regional and national public health policy institutions. The registry conducts epidemiological research on environmental factors (pesticide contamination, infectious agents, and cancer in tropical areas) and social inequalities as determinants of cancer risk.

POPULATION AT RISK

Data were provided in all requested detail. The decimal numbers of the estimated population counts provided for some sex and age categories were rounded to the nearest integer at IARC (Table A.8). See also France, 3 registries, above.

EDITORS' COMMENTS

The registry only has access to de-identified death certificates; thus, a proportion of new cases may have been missed. Non-malignant CNS tumours were registered, but only cases with uncertain behaviour were found in the dataset, including cases of pilocytic astrocytoma. Basal cell carcinomas of skin were not reportable. Laterality was complete for retinoblastoma.

Martinique Cancer Registry, 1990–2012

Clarisse Joachim, Jonathan Macni, Mylène Vestris, Audrey Pomier, Stephen Ulric-Gervaise, Marie-Josée Dorival, Juliette Smith-Ravin, Jacqueline Véronique Baudin, Patrick Escarmant

Martinique is an insular overseas region of France located in the Lesser Antilles in the eastern Caribbean Sea. It covers a land area of 1128 km^2 and has a humid tropical climate in the north of the island and a drier climate in the south. The economy is sustained mainly by the service sector (82%) and to a lesser extent by industry (9%) and agriculture (4%). Tourism employs 7% of the total workforce.

The total population is 0.4 million, and 27% of the population is younger than 20 years (Table A.6). The residents are mainly of African descent, often mixed with French; other ethnicities include Amerindian, Indo-Martinican (the descendants of 19th-century immigrants from India), Lebanese, and Chinese. About 94% live in urban areas.

The diagnostic and treatment facilities include two pathology laboratories, a haematology laboratory, two public hospitals with facilities located throughout the region, and two private clinics. There is centralized organized screening for breast, colorectal, and cervical cancers, and there is a National Cancer Plan and Programme at the regional and public health levels.

The Martinique Cancer Registry was established in 1981 to conduct continuous recording of cancer in the entire population of the region. The registry complies with a legal framework for the registration with respect to data confidentiality, which includes encryption of data and informed consent.

The registry is financed by InVS, INCa, the University Hospital of Martinique, and local authorities. The staff consists of a medical director, a biostatistician and data manager, a scientific manager, clinical research associates, and a secretary.

Data are collected passively and actively from private and public pathology laboratories and from health insurance records on long-term illness; patient records are actively reviewed. Data on childhood cancer are also received from the French National Childhood Cancer Registries. The completeness of registration is estimated to be 98%. Data quality control is performed as recommended by FRANCIM and IARC.

The registry publishes a report every 5 years. The collected data are used to measure the effects of environmental pollutants on the incidence of cancer or in the workplace and the effects of new cancer treatments on survival. Cancer information is also provided to health authorities, who use it to evaluate health services and the effect of organized screening programmes.

POPULATION AT RISK

Data were provided in all requested detail. The decimal numbers of the estimated population counts provided for some sex and age categories were rounded to the nearest integer at IARC (Table A.8). See also France, 3 registries, above.

EDITORS' COMMENTS

The registry only has access to de-identified death certificates; thus, a proportion of new cases may have been missed. The basis of diagnosis was unknown in almost 3% of cases (Table A.9). Exact dates of birth and incidence are recorded, but they were not provided for data protection reasons (Table A.8); thus, the consistency between the dates and the age could not be verified at IARC. The proportion of cases aged 19 years in the age group 15–19 years is high (28%) (Table A.9), which probably reflects the age-related increase in incidence. Non-malignant CNS tumours were registered, and pilocytic astrocytoma was coded with uncertain behaviour. Laterality was collected and was available for two thirds of the cases of interest.

FRANCE, 3 registries (1990-2012)

	Age group (years)	Males	Females
Person-years	0	102 218	99 695
	1-4	413 914	402 161
	5-9	531 176	519 475
	10-14	549 211	532 167
	15-19	537 620	522 616
	0-14	1 596 519	1 553 498
	0-19	2 134 139	2 076 114

Please consult the quality indicators for this pool and its constituent registries

FRANCE, 3 registries (1990-2012)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	**LEUKAEMIA**	9	37	35	29	32	**110**	**142**	32.1	100.0	28.8	100.0	44.6	45.3	33.3	26.8	30.2	**36.0**	**34.7**	527	677	97.9	0.7
	a. Lymphoid	1	29	22	21	15	**73**	**88**	21.3	66.4	17.8	62.0	5.0	35.5	20.9	19.4	14.1	**23.8**	**21.6**	349	420	100.0	0.0
	b. Acute myeloid	3	2	8	8	7	**21**	**28**	6.1	19.1	5.7	19.7	14.9	2.5	7.6	7.4	6.6	**6.5**	**6.5**	100	133	89.3	3.6
	c. CMD	0	4	2	0	6	**6**	**12**	1.7	5.5	2.4	8.5	-	4.9	1.9	-	5.7	**2.1**	**2.9**	29	57	100.0	0.0
	d. MDS & other	3	0	1	0	2	**4**	**6**	1.2	3.6	1.2	4.2	14.9	-	1.0	-	1.9	**1.4**	**1.5**	19	29	100.0	0.0
	e. Unspecified	2	2	2	0	2	**6**	**8**	1.7	5.5	1.6	5.6	9.9	2.5	1.9	-	1.9	**2.1**	**2.1**	29	39	100.0	0.0
II	**LYMPHOMA & RELATED**	1	4	9	19	27	**33**	**60**	9.6	100.0	12.2	100.0	5.0	4.9	8.6	17.6	25.5	**9.8**	**13.3**	155	283	100.0	0.0
	a. Hodgkin	1	0	3	10	18	**14**	**32**	4.1	42.4	6.5	53.3	5.0	-	2.9	9.2	17.0	**4.0**	**6.9**	65	150	100.0	0.0
	b. Non-Hodgkin except BL	0	2	5	7	8	**14**	**22**	4.1	42.4	4.5	36.7	-	2.5	4.8	6.5	7.5	**4.2**	**4.9**	66	104	100.0	0.0
	c. Burkitt (BL)	0	2	1	2	0	**5**	**5**	1.5	15.2	1.0	8.3	-	2.5	1.0	1.8	-	**1.6**	**1.2**	24	24	100.0	0.0
	d. Lymphoreticular	0	0	0	0	0	**0**	**0**	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
	e. Unspecified	0	0	0	0	1	**0**	**1**	-	-	0.2	1.7	-	-	-	-	0.9	**-**	**0.2**	-	5	100.0	0.0
III	**CNS NEOPLASMS** †	5	24	19	18	18	**66**	**84**	19.2	100.0	17.0	100.0	24.8	29.4	18.1	16.6	17.0	**21.7**	**20.6**	316	401	71.4	0.0
	a. Ependymoma	1	8	1	1	2	**11**	**13**	3.2	16.7	2.6	15.5	5.0	9.8	1.0	0.9	1.9	**4.0**	**3.5**	54	63	92.3	0.0
	b. Astrocytoma	0	6	7	3	3	**16**	**19**	4.7	24.2	3.9	22.6	-	7.4	6.7	2.8	2.8	**5.2**	**4.7**	77	91	94.7	0.0
	c. CNS embryonal	0	6	9	0	2	**15**	**17**	4.4	22.7	3.4	20.2	-	7.4	8.6	-	1.9	**5.0**	**4.3**	72	82	88.2	0.0
	d. Other gliomas	0	1	0	3	1	**4**	**5**	1.2	6.1	1.0	6.0	-	1.2	-	2.8	0.9	**1.2**	**1.1**	19	23	40.0	0.0
	e. Other specified	1	0	1	7	8	**9**	**17**	2.6	13.6	3.4	20.2	5.0	-	1.0	6.5	7.5	**2.6**	**3.7**	42	80	76.5	0.0
	f. Unspecified CNS	3	3	1	4	2	**11**	**13**	3.2	16.7	2.6	15.5	14.9	3.7	1.0	3.7	1.9	**3.7**	**3.3**	53	62	0.0	0.0
IV	**NEUROBLASTOMA**	2	9	6	3	0	**20**	**20**	5.8	100.0	4.1	100.0	9.9	11.0	5.7	2.8	-	**6.8**	**5.3**	96	96	80.0	0.0
	a. (Ganglio)neuroblastoma	2	9	6	1	0	**18**	**18**	5.2	90.0	3.7	90.0	9.9	11.0	5.7	0.9	-	**6.3**	**4.9**	87	87	83.3	0.0
	b. Peripheral nervous	0	0	0	2	0	**2**	**2**	0.6	10.0	0.4	10.0	-	-	-	1.8	-	**0.5**	**0.4**	9	9	50.0	0.0
V	**RETINOBLASTOMA**	1	9	0	0	0	**10**	**10**	2.9	100.0	2.0	100.0	5.0	11.0	-	-	-	**3.8**	**2.9**	49	49	80.0	0.0
VI	**RENAL TUMOURS**	0	11	4	2	5	**17**	**22**	5.0	100.0	4.5	100.0	-	13.5	3.8	1.8	4.7	**5.9**	**5.7**	82	106	95.5	0.0
	a. Nephroblastoma	0	11	4	2	1	**17**	**18**	5.0	100.0	3.7	81.8	-	13.5	3.8	1.8	0.9	**5.9**	**4.8**	82	87	94.4	0.0
	b. Renal carcinoma	0	0	0	0	4	**0**	**4**	-	-	0.8	18.2	-	-	-	-	3.8	**-**	**0.8**	-	19	100.0	0.0
	c. Unspecified	0	0	0	0	0	**0**	**0**	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
VII	**HEPATIC TUMOURS**	1	1	1	0	1	**3**	**4**	0.9	100.0	0.8	100.0	5.0	1.2	1.0	-	0.9	**1.1**	**1.0**	15	19	100.0	0.0
	a. Hepatoblastoma	1	1	1	0	0	**3**	**3**	0.9	100.0	0.6	75.0	5.0	1.2	1.0	-	-	**1.1**	**0.8**	15	15	100.0	0.0
	b. Hepatic carcinoma	0	0	0	0	1	**0**	**1**	-	-	0.2	25.0	-	-	-	-	0.9	**-**	**0.2**	-	5	100.0	0.0
	c. Unspecified	0	0	0	0	0	**0**	**0**	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
VIII	**BONE TUMOURS**	0	2	4	12	11	**18**	**29**	5.2	100.0	5.9	100.0	-	2.5	3.8	11.1	10.4	**5.2**	**6.4**	84	136	86.2	0.0
	a. Osteosarcoma	0	1	2	9	5	**12**	**17**	3.5	66.7	3.4	58.6	-	1.2	1.9	8.3	4.7	**3.4**	**3.7**	56	80	100.0	0.0
	b. Chondrosarcoma	0	0	1	2	2	**3**	**5**	0.9	16.7	1.0	17.2	-	-	1.0	1.8	1.9	**0.8**	**1.1**	14	23	100.0	0.0
	c. Ewing & related	0	0	1	0	3	**1**	**4**	0.3	5.6	0.8	13.8	-	-	1.0	-	2.8	**0.3**	**0.9**	5	19	75.0	0.0
	d. Other specified	0	0	0	0	0	**0**	**0**	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
	e. Unspecified	0	1	0	1	1	**2**	**3**	0.6	11.1	0.6	10.3	-	1.2	-	0.9	0.9	**0.6**	**0.7**	10	14	0.0	0.0
IX	**SOFT TISSUE SARCOMA**	4	8	11	11	14	**34**	**48**	9.9	100.0	9.7	100.0	19.8	9.8	10.5	10.2	13.2	**10.9**	**11.4**	162	228	100.0	0.0
	a. Rhabdomyosarcoma	1	5	7	2	4	**15**	**19**	4.4	44.1	3.9	39.6	5.0	6.1	6.7	1.8	3.8	**5.0**	**4.7**	72	91	100.0	0.0
	b. Fibrosarcoma	1	0	0	1	2	**2**	**4**	0.6	5.9	0.8	8.3	5.0	-	-	0.9	1.9	**0.6**	**0.9**	10	19	100.0	0.0
	c. Kaposi sarcoma	1	0	0	0	0	**1**	**1**	0.3	2.9	0.2	2.1	5.0	-	-	-	-	**0.4**	**0.3**	5	5	100.0	0.0
	d. Other specified	0	2	3	6	8	**11**	**19**	3.2	32.4	3.9	39.6	-	2.5	2.9	5.5	7.5	**3.3**	**4.2**	52	90	100.0	0.0
	e. Unspecified	1	1	1	2	0	**5**	**5**	1.5	14.7	1.0	10.4	5.0	1.2	1.0	1.8	-	**1.6**	**1.2**	24	24	100.0	0.0
X	**GERM CELL TUMOURS**	4	3	3	8	16	**18**	**34**	5.2	100.0	6.9	100.0	19.8	3.7	2.9	7.4	15.1	**5.7**	**7.8**	86	161	97.1	0.0
	a. CNS germ cell	2	0	1	1	0	**4**	**4**	1.2	22.2	0.8	11.8	9.9	-	1.0	0.9	-	**1.3**	**1.0**	19	19	75.0	0.0
	b. Other extragonadal	1	0	1	0	2	**2**	**4**	0.6	11.1	0.8	11.8	5.0	-	1.0	-	1.9	**0.7**	**1.0**	10	19	100.0	0.0
	c. Gonadal germ cell	1	3	1	6	12	**11**	**23**	3.2	61.1	4.7	67.6	5.0	3.7	1.0	5.5	11.3	**3.4**	**5.2**	52	109	100.0	0.0
	d. Gonadal carcinoma	0	0	0	0	1	**0**	**1**	-	-	0.2	2.9	-	-	-	-	0.9	**-**	**0.2**	-	5	100.0	0.0
	e. Unspecified gonadal	0	0	0	1	1	**1**	**2**	0.3	5.6	0.4	5.9	-	-	-	0.9	0.9	**0.3**	**0.4**	5	9	100.0	0.0
XI	**CARCINOMA & MELANOMA**	0	1	1	10	23	**12**	**35**	3.5	100.0	7.1	100.0	-	1.2	1.0	9.2	21.7	**3.4**	**7.5**	56	164	100.0	0.0
	a. Adrenocortical	0	0	0	0	0	**0**	**0**	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
	b. Thyroid	0	0	0	2	12	**2**	**14**	0.6	16.7	2.8	40.0	-	-	-	1.8	11.3	**0.5**	**3.0**	9	66	100.0	0.0
	c. Nasopharyngeal	0	0	0	3	1	**3**	**4**	0.9	25.0	0.8	11.4	-	-	-	2.8	0.9	**0.8**	**0.8**	14	19	100.0	0.0
	d. Melanoma	0	0	0	0	2	**0**	**2**	-	-	0.4	5.7	-	-	-	-	1.9	**-**	**0.4**	-	9	100.0	0.0
	e. Skin carcinoma	0	0	0	0	0	**0**	**0**	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
	f. Other & unspecified	0	1	1	5	8	**7**	**15**	2.0	58.3	3.0	42.9	-	1.2	1.0	4.6	7.5	**2.0**	**3.3**	33	71	100.0	0.0
XII	**OTHER & UNSPECIFIED**	0	1	1	0	3	**2**	**5**	0.6	100.0	1.0	100.0	-	1.2	1.0	-	2.8	**0.7**	**1.2**	10	24	20.0	0.0
	a. Other specified	0	0	0	0	0	**0**	**0**	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
	b. Other unspecified	0	1	1	0	3	**2**	**5**	0.6	100.0	1.0	100.0	-	1.2	1.0	-	2.8	**0.7**	**1.2**	10	24	20.0	0.0
	TOTAL	27	110	94	112	150	**343**	**493**	100.0	100.0	100.0	100.0	133.7	134.8	89.5	103.6	141.5	**111.0**	**117.9**	1638	2345	91.3	0.2

† includes 31 non-malignant

Please consult the quality indicators for this pool and its constituent registries

Honduras

Francisco Morazán, Honduras National Cancer Registry, 2002–2012

Flora Duarte Muñoz, Eda Sofía Cálix Santos, Nelli Saraí Padilla Ruíz

Honduras is located in Central America, between the Caribbean Sea and the Pacific Ocean. It is bordered by Guatemala to the north-west, El Salvador to the south-west, and Nicaragua to the south. Honduras covers an area of 112 492 km^2, with mountainous terrain and a tropical climate.

Honduras has a lower-middle-income economy with a medium Human Development Index. The unemployment rate is high, and in 2010 50% of the population was living below the poverty threshold. The main economic activity is agriculture. The availability of drinking-water and sanitation differs greatly between urban centres and rural villages. Natural disasters, such as Hurricane Mitch in 1998, contribute to high inequality in income levels because they particularly affect low-income rural areas.

The country is multi-ethnic; the four major ethnic groups are Mestizo (90%), Indigenous Amerindian (7%), English-speaking Black Creole (2%), and White (1%). In 2010, the population was 7.5 million (Table A.7), and 47% of the population was younger than 20 years (Table A.6).

On average, there are 0.80 doctors and 0.97 hospital beds per 1000 people. Cancer care is provided by 26 oncologists. Patients with cancer are managed in three public hospitals, the Honduran Social Security Institute, one private hospital, and two nongovernmental organizations: the Honduran Association Against Cancer (AHLC) and the League Against Cancer.

The Honduras National Cancer Registry is run by AHLC at the Cancer Centre Emma Romero de Callejas. This responsibility was entrusted to AHLC by the Ministry of Health in 2004. Since 2002, data have been collected in all hospitals involved in cancer care, the main pathology laboratories of the Cancer Centre Emma Romero de Callejas, departments of forensic medicine, and the National Registry of Persons. The registry covered 31% of the national childhood population in 2002–2006. However, for financial reasons the registration area was restricted thereafter to Francisco Morazán Department, which reduced the population coverage to 17.5% (Table A.6).

Francisco Morazán Department is one of the 18 departments of Honduras. This mountainous department is located in the centre of the country and covers a total area of 7946 km^2. In 2010, the population was 1.4 million, and 43% of the population was younger than 20 years (Table A.6). The city of Tegucigalpa is the capital of the country and of the department.

Data are collected actively by trained personnel. Data entry, validation, and storage are done using CanReg5. Registry staff members compare data from multiple sources to avoid missing cases and manually check for duplicate records and those with inconsistent information.

The data produced by the registry convey useful information on cancer burden in the country. Students and medical doctors use these data to generate knowledge on cancer in Honduras.

POPULATION AT RISK

The source of the population data was the National Statistics Institute (https://ine.gob.hn). The population projections for 2001–2015 were based on the 2001 census of population and housing (Table A.7). Data were provided by sex and 5-year age group for each calendar year of the reporting period. The data for the missing year–age–sex categories were estimated at IARC using the methods described in Chapter 2.

EDITORS' COMMENTS

The proportion of cases in infants (aged < 1 year) is lower than expected (5%) (Table A.9); this may be because of late diagnosis. Non-malignant CNS tumours are reportable, but the proportion was relatively low (20%) (Table A.9). Pilocytic astrocytoma was coded mostly with uncertain behaviour, but one case with malignant behaviour was also included in that dataset. Skin carcinomas were reportable, but some may have been missed because of limited access by the registry to some relevant data sources. Laterality was complete.

HONDURAS, Francisco Morazán (2002-2012)

	Age group (years)	Males	Females
Person-years	0	189 341	181 622
	1-4	732 472	705 247
	5-9	875 933	848 364
	10-14	802 938	793 682
	15-19	733 837	757 751
	0-14	2 600 684	2 528 915
	0-19	3 334 521	3 286 666
Average annual population	0-14	236 426	229 901
	0-19	303 138	298 788

Please consult the quality indicators for this registry

HONDURAS, Francisco Morazán (2002-2012)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	**LEUKAEMIA**	6	69	62	50	45	**187**	**232**	38.3	100.0	34.3	100.0	16.2	48.0	36.0	31.3	30.2	**36.7**	**35.3**	544	695	99.6	0.0
	a. Lymphoid	4	62	50	39	27	**155**	**182**	31.8	82.9	26.9	78.4	10.8	43.1	29.0	24.4	18.1	**30.6**	**27.8**	450	540	100.0	0.0
	b. Acute myeloid	0	3	5	8	8	**16**	**24**	3.3	8.6	3.6	10.3	-	2.1	2.9	5.0	5.4	**3.0**	**3.6**	48	75	100.0	0.0
	c. CMD	0	0	2	2	4	**4**	**8**	0.8	2.1	1.2	3.4	-	-	1.2	1.3	2.7	**0.7**	**1.2**	12	25	100.0	0.0
	d. MDS & other	2	0	0	1	0	**3**	**3**	0.6	1.6	0.4	1.3	5.4	-	-	0.6	-	**0.6**	**0.5**	9	9	100.0	0.0
	e. Unspecified	0	4	5	0	6	**9**	**15**	1.8	4.8	2.2	6.5	-	2.8	2.9	-	4.0	**1.8**	**2.3**	26	46	93.3	0.0
II	**LYMPHOMA & RELATED**	0	9	18	34	17	**61**	**78**	12.5	100.0	11.5	100.0	-	6.3	10.4	21.3	11.4	**11.5**	**11.5**	184	241	100.0	0.0
	a. Hodgkin	0	3	9	26	9	**38**	**47**	7.8	62.3	7.0	60.3	-	2.1	5.2	16.3	6.0	**7.1**	**6.8**	116	146	100.0	0.0
	b. Non-Hodgkin except BL	0	3	7	5	7	**15**	**22**	3.1	24.6	3.3	28.2	-	2.1	4.1	3.1	4.7	**2.9**	**3.3**	44	68	100.0	0.0
	c. Burkitt (BL)	0	3	2	2	0	**7**	**7**	1.4	11.5	1.0	9.0	-	2.1	1.2	1.3	-	**1.4**	**1.1**	20	20	100.0	0.0
	d. Lymphoreticular	0	0	0	0	0	**0**	**0**	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
	e. Unspecified	0	0	0	1	1	**1**	**2**	0.2	1.6	0.3	2.6	-	-	-	0.6	0.7	**0.2**	**0.3**	3	6	100.0	0.0
III	**CNS NEOPLASMS** †	0	20	29	31	19	**80**	**99**	16.4	100.0	14.6	100.0	-	13.9	16.8	19.4	12.7	**15.3**	**14.8**	236	300	79.8	1.0
	a. Ependymoma	0	4	5	1	2	**10**	**12**	2.0	12.5	1.8	12.1	-	2.8	2.9	0.6	1.3	**2.0**	**1.8**	29	35	100.0	0.0
	b. Astrocytoma	0	4	9	15	7	**28**	**35**	5.7	35.0	5.2	35.4	-	2.8	5.2	9.4	4.7	**5.3**	**5.1**	84	108	100.0	0.0
	c. CNS embryonal	0	6	4	3	1	**13**	**14**	2.7	16.3	2.1	14.1	-	4.2	2.3	1.9	0.7	**2.6**	**2.1**	38	41	100.0	0.0
	d. Other gliomas	0	1	5	4	5	**10**	**15**	2.0	12.5	2.2	15.2	-	0.7	2.9	2.5	3.4	**1.9**	**2.2**	30	47	60.0	0.0
	e. Other specified	0	2	1	4	3	**7**	**10**	1.4	8.8	1.5	10.1	-	1.4	0.6	2.5	2.0	**1.3**	**1.5**	21	31	90.0	0.0
	f. Unspecified CNS	0	3	5	4	1	**12**	**13**	2.5	15.0	1.9	13.1	-	2.1	2.9	2.5	0.7	**2.3**	**1.9**	35	39	0.0	7.7
IV	**NEUROBLASTOMA**	1	5	2	0	0	**8**	**8**	1.6	100.0	1.2	100.0	2.7	3.5	1.2	-	-	**1.7**	**1.3**	22	22	87.5	0.0
	a. (Ganglio)neuroblastoma	1	5	2	0	0	**8**	**8**	1.6	100.0	1.2	100.0	2.7	3.5	1.2	-	-	**1.7**	**1.3**	22	22	87.5	0.0
	b. Peripheral nervous	0	0	0	0	0	**0**	**0**	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
V	**RETINOBLASTOMA**	6	11	4	0	0	**21**	**21**	4.3	100.0	3.1	100.0	16.2	7.7	2.3	-	-	**4.4**	**3.4**	59	59	100.0	0.0
VI	**RENAL TUMOURS**	4	16	1	2	0	**23**	**23**	4.7	100.0	3.4	100.0	10.8	11.1	0.6	1.3	-	**4.8**	**3.7**	64	64	91.3	4.3
	a. Nephroblastoma	3	16	1	0	0	**20**	**20**	4.1	87.0	3.0	87.0	8.1	11.1	0.6	-	-	**4.3**	**3.3**	55	55	95.0	5.0
	b. Renal carcinoma	0	0	0	2	0	**2**	**2**	0.4	8.7	0.3	8.7	-	-	-	1.3	-	**0.4**	**0.3**	6	6	100.0	0.0
	c. Unspecified	1	0	0	0	0	**1**	**1**	0.2	4.3	0.1	4.3	2.7	-	-	-	-	**0.2**	**0.2**	3	3	0.0	0.0
VII	**HEPATIC TUMOURS**	1	6	1	12	16	**20**	**36**	4.1	100.0	5.3	100.0	2.7	4.2	0.6	7.5	10.7	**3.9**	**5.4**	60	113	88.9	0.0
	a. Hepatoblastoma	0	5	1	1	1	**7**	**8**	1.4	35.0	1.2	22.2	-	3.5	0.6	0.6	0.7	**1.4**	**1.3**	20	23	100.0	0.0
	b. Hepatic carcinoma	0	1	0	10	12	**11**	**23**	2.3	55.0	3.4	63.9	-	0.7	-	6.3	8.0	**2.0**	**3.4**	34	74	100.0	0.0
	c. Unspecified	1	0	0	1	3	**2**	**5**	0.4	10.0	0.7	13.9	2.7	-	-	0.6	2.0	**0.4**	**0.8**	6	16	20.0	0.0
VIII	**BONE TUMOURS**	0	1	5	19	23	**25**	**48**	5.1	100.0	7.1	100.0	-	0.7	2.9	11.9	15.4	**4.6**	**7.0**	77	154	97.9	0.0
	a. Osteosarcoma	0	0	3	13	14	**16**	**30**	3.3	64.0	4.4	62.5	-	-	1.7	8.1	9.4	**2.9**	**4.4**	49	96	100.0	0.0
	b. Chondrosarcoma	0	0	0	2	2	**2**	**4**	0.4	8.0	0.6	8.3	-	-	-	1.3	1.3	**0.4**	**0.6**	6	13	100.0	0.0
	c. Ewing & related	0	1	2	2	4	**5**	**9**	1.0	20.0	1.3	18.8	-	0.7	1.2	1.3	2.7	**1.0**	**1.3**	15	28	100.0	0.0
	d. Other specified	0	0	0	0	2	**0**	**2**	-	-	0.3	4.2	-	-	-	-	1.3	**-**	**0.3**	-	7	100.0	0.0
	e. Unspecified	0	0	0	2	1	**2**	**3**	0.4	8.0	0.4	6.3	-	-	-	1.3	0.7	**0.4**	**0.4**	6	10	66.7	0.0
IX	**SOFT TISSUE SARCOMA**	3	7	3	7	16	**20**	**36**	4.1	100.0	5.3	100.0	8.1	4.9	1.7	4.4	10.7	**4.0**	**5.5**	58	112	100.0	0.0
	a. Rhabdomyosarcoma	2	7	1	4	2	**14**	**16**	2.9	70.0	2.4	44.4	5.4	4.9	0.6	2.5	1.3	**2.8**	**2.5**	40	47	100.0	0.0
	b. Fibrosarcoma	0	0	1	2	1	**3**	**4**	0.6	15.0	0.6	11.1	-	-	0.6	1.3	0.7	**0.6**	**0.6**	9	13	100.0	0.0
	c. Kaposi sarcoma	0	0	0	0	0	**0**	**0**	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
	d. Other specified	1	0	0	1	12	**2**	**14**	0.4	10.0	2.1	38.9	2.7	-	-	0.6	8.0	**0.4**	**2.1**	6	46	100.0	0.0
	e. Unspecified	0	0	1	0	1	**1**	**2**	0.2	5.0	0.3	5.6	-	-	0.6	-	0.7	**0.2**	**0.3**	3	6	100.0	0.0
X	**GERM CELL TUMOURS**	0	2	2	13	14	**17**	**31**	3.5	100.0	4.6	100.0	-	1.4	1.2	8.1	9.4	**3.2**	**4.6**	52	99	90.3	0.0
	a. CNS germ cell	0	0	0	2	0	**2**	**2**	0.4	11.8	0.3	6.5	-	-	-	1.3	-	**0.4**	**0.3**	6	6	100.0	0.0
	b. Other extragonadal	0	0	0	1	2	**1**	**3**	0.2	5.9	0.4	9.7	-	-	-	0.6	1.3	**0.2**	**0.4**	3	10	66.7	0.0
	c. Gonadal germ cell	0	2	2	10	8	**14**	**22**	2.9	82.4	3.3	71.0	-	1.4	1.2	6.3	5.4	**2.6**	**3.2**	43	69	100.0	0.0
	d. Gonadal carcinoma	0	0	0	0	2	**0**	**2**	-	-	0.3	6.5	-	-	-	-	1.3	**-**	**0.3**	-	7	100.0	0.0
	e. Unspecified gonadal	0	0	0	0	2	**0**	**2**	-	-	0.3	6.5	-	-	-	-	1.3	**-**	**0.3**	-	7	0.0	0.0
XI	**CARCINOMA & MELANOMA**	1	6	7	8	34	**22**	**56**	4.5	100.0	8.3	100.0	2.7	4.2	4.1	5.0	22.8	**4.3**	**8.4**	65	179	100.0	0.0
	a. Adrenocortical	1	1	0	0	0	**2**	**2**	0.4	9.1	0.3	3.6	2.7	0.7	-	-	-	**0.4**	**0.3**	6	6	100.0	0.0
	b. Thyroid	0	0	4	2	20	**6**	**26**	1.2	27.3	3.8	46.4	-	-	2.3	1.3	13.4	**1.1**	**3.9**	18	85	100.0	0.0
	c. Nasopharyngeal	0	0	0	0	1	**0**	**1**	-	-	0.1	1.8	-	-	-	-	0.7	**-**	**0.2**	-	3	100.0	0.0
	d. Melanoma	0	1	0	1	1	**2**	**3**	0.4	9.1	0.4	5.4	-	0.7	-	0.6	0.7	**0.4**	**0.5**	6	9	100.0	0.0
	e. Skin carcinoma	0	3	1	2	2	**6**	**8**	1.2	27.3	1.2	14.3	-	2.1	0.6	1.3	1.3	**1.2**	**1.2**	17	24	100.0	0.0
	f. Other & unspecified	0	1	2	3	10	**6**	**16**	1.2	27.3	2.4	28.6	-	0.7	1.2	1.9	6.7	**1.1**	**2.4**	18	51	100.0	0.0
XII	**OTHER & UNSPECIFIED**	2	0	0	2	4	**4**	**8**	0.8	100.0	1.2	100.0	5.4	-	-	1.3	2.7	**0.8**	**1.2**	12	25	62.5	0.0
	a. Other specified	0	0	0	0	2	**0**	**2**	-	-	0.3	25.0	-	-	-	-	1.3	**-**	**0.3**	-	7	100.0	0.0
	b. Other unspecified	2	0	0	2	2	**4**	**6**	0.8	100.0	0.9	75.0	5.4	-	-	1.3	1.3	**0.8**	**0.9**	12	18	50.0	0.0
	TOTAL	24	152	134	178	188	**488**	**676**	100.0	100.0	100.0	100.0	64.7	105.7	77.7	111.5	126.0	**95.1**	**102.1**	1433	2063	94.8	0.3

† includes 20 non-malignant

Please consult the quality indicators for this registry

Jamaica

Kingston and St. Andrew, Jamaica Cancer Registry, 1982–2012

Barrie Hanchard, Tracey N. Gibson, Karen L. Bishop, Nadeen Waugh, Dawn McNaughton

The island of Jamaica is located in the central Caribbean Sea. It is divided into 14 parishes and covers a total area of 11 424 km^2, with a mountainous interior encircled by the northern, southern, western, and eastern coasts. The island has a semi-tropical climate. The capital city is Kingston, and the adjacent parishes of Kingston and St. Andrew, located in the south-east of the island, are administered together by the Kingston and St. Andrew Corporation. The population is 2.7 million, and 37% of the population is younger than 20 years (Table A.6). Most of the population is of African ancestry (92%), and the remainder is of European, East Indian, Chinese, and mixed ancestry. Tourism is the country's main income generator. Jamaica has a high Human Development Index.

Registration of cancer cases is restricted to the Kingston and St. Andrew region, which covers an area of 480 km^2. The region has a population of 0.7 million (~25% of the national population), and 33% of the population is younger than 20 years (Table A.6). This region is predominantly urban and provides the greatest density of medical facilities on the island, with widespread access to primary health-care providers and a wide range of specialists, including oncologists, paediatric surgeons, and paediatricians of various subspecialties, among many others. The proportion of the population covered by health insurance is variable, with coverage predominating among the middle- and upper-income groups. In one low-income suburban community in Kingston and St. Andrew, the prevalence of health insurance is about 32%.

The Jamaica Cancer Registry (Kingston and St. Andrew) was established in 1958 and since its inception has been housed in the Department of Pathology at the University of the West Indies, Mona. The registry receives all its funding from that department.

The routine work of the registry is conducted by two research nurses, who collect data from the following facilities in Kingston and St. Andrew: pathology departments at the University of the West Indies and the National Public Health Laboratory; private pathology laboratories; medical records offices and wards of public and private hospitals, including the country's main paediatric hospital; radiotherapy treatment facilities; and physicians' offices. Because cancer is not a legally reportable disease in Jamaica, registry staff members routinely visit these facilities to collect information.

Data collected on each patient are recorded on a cancer registration card and filed by site and year of diagnosis. Data are also filed alphabetically by patient name, to avoid duplication. Patients are registered more than once only when there is more than one primary malignancy as confirmed by microscopy. Data are entered into an electronic database (CanReg4). Each case is coded twice, according to ICD-10 and ICD-O-3. Limited human and capital resources prevent the routine follow-up of patients. The registry publishes regular 5-year cancer incidence reports, as well as papers dedicated to more detailed evaluation of incidence and demographic trends of specific cancers.

PUBLICATIONS

Gibson TN, Hanchard B, Waugh N, McNaughton D (2013). Cancer in adolescents and young adults, Kingston and St Andrew, Jamaica, 1988–2007. West Indian Med J. 62(1):21–7. PMID:24171323

Bishop KL, Hanchard B, Gibson TN, Lowe D, McNaughton D, Waugh N, et al. (2013). Incidence of childhood cancer in Kingston and St Andrew, Jamaica, 1983–2002. West Indian Med J. 62(7):575–81. PMID:24831892

POPULATION AT RISK

Population data were provided by the Statistical Institute of Jamaica (https://statinja.gov.jm) and are based on the censuses of 1982, 1991, 2001, and 2011 (Table A.7). Data were provided by sex and 5-year age group (0–4, 5–9, and 10–14 years) for 1982–2007 and by sex and single year of age for 2003–2012. The data for the missing year–age–sex categories in 1982–2002 were estimated at IARC using the methods described in Chapter 2.

EDITORS' COMMENTS

The Jamaica Cancer Registry (Kingston and St. Andrew) participated in IICC-1. The IICC-3 dataset covers an extended period, covering the target years of both IICC-2 and IICC-3. The extended period resulted in a sufficiently large dataset, which ensured the continuity throughout the IICC volumes (Table A.1). The date of birth was unknown in more than 50% of cases (Table A.8). Registration of DCO cases may have been incomplete during the initial part of the covered period, when the cases ascertained from death certificates were registered only if they were also confirmed by checking medical records. Non-malignant CNS tumours were reportable, but the proportion was low (6%) (Table A.9), partly because radiology department records were not searched to ascertain such tumours. Pilocytic astrocytoma was coded with uncertain behaviour. Skin carcinomas were reportable, but none were registered. Laterality was complete for retinoblastoma. The registry covers a relatively small population, and the incidence rates are low (Table A.9). Because most of the residents who are treated abroad are first diagnosed in Jamaica, all are believed to be captured by the registry.

JAMAICA, Kingston and St Andrew (1982-2012)

	Age group (years)	Males	Females
Person-years	0	179 148	174 653
	1-4	789 690	763 942
	5-9	968 145	965 745
	10-14	991 961	999 742
	15-19	977 058	1 050 292
	0-14	2 928 944	2 904 082
	0-19	3 906 002	3 954 374
Average annual population	0-14	94 482	93 680
	0-19	126 000	127 560

Please consult the quality indicators for this registry

JAMAICA, Kingston and St Andrew (1982-2012)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	LEUKAEMIA	7	33	37	32	24	109	133	25.2	100.0	21.6	100.0	19.8	21.2	19.1	16.1	11.8	19.0	17.4	281	340	99.2	0.0
	a. Lymphoid	4	28	25	17	14	74	88	17.1	67.9	14.3	66.2	11.3	18.0	12.9	8.5	6.9	13.1	11.7	191	226	98.9	0.0
	b. Acute myeloid	1	3	8	13	9	25	34	5.8	22.9	5.5	25.6	2.8	1.9	4.1	6.5	4.4	4.0	4.1	64	86	100.0	0.0
	c. CMD	2	1	1	2	0	6	6	1.4	5.5	1.0	4.5	5.7	0.6	0.5	1.0	-	1.1	0.8	15	15	100.0	0.0
	d. MDS & other	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	e. Unspecified	0	1	3	0	1	4	5	0.9	3.7	0.8	3.8	-	0.6	1.6	-	0.5	0.7	0.7	10	13	100.0	0.0
II	LYMPHOMA & RELATED	0	10	22	33	36	65	101	15.0	100.0	16.4	100.0	-	6.4	11.4	16.6	17.8	10.5	12.1	166	255	98.0	0.0
	a. Hodgkin	0	1	5	7	13	13	26	3.0	20.0	4.2	25.7	-	0.6	2.6	3.5	6.4	2.1	3.0	33	65	100.0	0.0
	b. Non-Hodgkin except BL	0	5	13	24	21	42	63	9.7	64.6	10.2	62.4	-	3.2	6.7	12.0	10.4	6.7	7.5	107	159	100.0	0.0
	c. Burkitt (BL)	0	2	1	0	0	3	3	0.7	4.6	0.5	3.0	-	1.3	0.5	-	-	0.6	0.4	8	8	100.0	0.0
	d. Lymphoreticular	0	2	0	0	0	2	2	0.5	3.1	0.3	2.0	-	1.3	-	-	-	0.4	0.3	5	5	100.0	0.0
	e. Unspecified	0	0	3	2	2	5	7	1.2	7.7	1.1	6.9	-	-	1.6	1.0	1.0	0.8	0.8	13	18	71.4	0.0
III	CNS NEOPLASMS †	3	16	27	15	19	61	80	14.1	100.0	13.0	100.0	8.5	10.3	14.0	7.5	9.4	10.5	10.3	157	204	76.3	1.3
	a. Ependymoma	0	3	2	0	0	5	5	1.2	8.2	0.8	6.3	-	1.9	1.0	-	-	0.9	0.7	13	13	100.0	0.0
	b. Astrocytoma	0	5	4	8	9	17	26	3.9	27.9	4.2	32.5	-	3.2	2.1	4.0	4.4	2.8	3.2	44	66	96.2	0.0
	c. CNS embryonal	2	3	12	2	5	19	24	4.4	31.1	3.9	30.0	5.7	1.9	6.2	1.0	2.5	3.3	3.1	49	61	91.7	0.0
	d. Other gliomas	0	4	8	3	1	15	16	3.5	24.6	2.6	20.0	-	2.6	4.1	1.5	0.5	2.6	2.1	39	41	37.5	0.0
	e. Other specified	1	0	0	1	0	2	2	0.5	3.3	0.3	2.5	2.8	-	-	0.5	-	0.3	0.3	5	5	100.0	0.0
	f. Unspecified CNS	0	1	1	1	4	3	7	0.7	4.9	1.1	8.8	-	0.6	0.5	0.5	2.0	0.5	0.8	8	18	14.3	14.3
IV	NEUROBLASTOMA	4	21	10	2	3	37	40	8.5	100.0	6.5	100.0	11.3	13.5	5.2	1.0	1.5	7.0	5.8	96	104	97.5	0.0
	a. (Ganglio)neuroblastoma	4	20	10	2	0	36	36	8.3	97.3	5.8	90.0	11.3	12.9	5.2	1.0	-	6.8	5.3	94	94	97.2	0.0
	b. Peripheral nervous	0	1	0	0	3	1	4	0.2	2.7	0.6	10.0	-	0.6	-	-	1.5	0.2	0.5	3	10	100.0	0.0
V	RETINOBLASTOMA	6	22	2	1	1	31	32	7.2	100.0	5.2	100.0	17.0	14.2	1.0	0.5	0.5	6.2	4.9	81	84	93.8	0.0
VI	RENAL TUMOURS	4	29	9	0	3	42	45	9.7	100.0	7.3	100.0	11.3	18.7	4.7	-	1.5	8.2	6.7	110	117	93.3	0.0
	a. Nephroblastoma	4	29	9	0	0	42	42	9.7	100.0	6.8	93.3	11.3	18.7	4.7	-	-	8.2	6.4	110	110	92.9	0.0
	b. Renal carcinoma	0	0	0	0	3	0	3	-	-	0.5	6.7	-	-	-	-	1.5	-	0.3	-	7	100.0	0.0
	c. Unspecified	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VII	HEPATIC TUMOURS	3	3	0	0	5	6	11	1.4	100.0	1.8	100.0	8.5	1.9	-	-	2.5	1.2	1.5	16	28	81.8	0.0
	a. Hepatoblastoma	3	2	0	0	1	5	6	1.2	83.3	1.0	54.5	8.5	1.3	-	-	0.5	1.0	0.9	13	16	100.0	0.0
	b. Hepatic carcinoma	0	1	0	0	4	1	5	0.2	16.7	0.8	45.5	-	0.6	-	-	2.0	0.2	0.6	3	12	60.0	0.0
	c. Unspecified	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VIII	BONE TUMOURS	0	0	4	12	24	16	40	3.7	100.0	6.5	100.0	-	-	2.1	6.0	11.8	2.4	4.5	40	100	100.0	0.0
	a. Osteosarcoma	0	0	4	11	21	15	36	3.5	93.8	5.8	90.0	-	-	2.1	5.5	10.4	2.3	4.1	38	90	100.0	0.0
	b. Chondrosarcoma	0	0	0	1	1	1	2	0.2	6.3	0.3	5.0	-	-	-	0.5	0.5	0.1	0.2	3	5	100.0	0.0
	c. Ewing & related	0	0	0	0	1	0	1	-	-	0.2	2.5	-	-	-	-	0.5	-	0.1	-	2	100.0	0.0
	d. Other specified	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	e. Unspecified	0	0	0	0	1	0	1	-	-	0.2	2.5	-	-	-	-	0.5	-	0.1	-	2	100.0	0.0
IX	SOFT TISSUE SARCOMA	3	5	8	8	18	24	42	5.5	100.0	6.8	100.0	8.5	3.2	4.1	4.0	8.9	4.1	5.2	62	106	97.6	0.0
	a. Rhabdomyosarcoma	0	3	3	1	3	7	10	1.6	29.2	1.6	23.8	-	1.9	1.6	0.5	1.5	1.3	1.3	18	26	100.0	0.0
	b. Fibrosarcoma	2	0	0	1	1	3	4	0.7	12.5	0.6	9.5	5.7	-	-	0.5	0.5	0.6	0.5	8	10	100.0	0.0
	c. Kaposi sarcoma	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	d. Other specified	0	0	3	4	11	7	18	1.6	29.2	2.9	42.9	-	-	1.6	2.0	5.4	1.1	2.1	18	45	100.0	0.0
	e. Unspecified	1	2	2	2	3	7	10	1.6	29.2	1.6	23.8	2.8	1.3	1.0	1.0	1.5	1.2	1.3	18	25	90.0	0.0
X	GERM CELL TUMOURS	2	4	6	6	20	18	38	4.2	100.0	6.2	100.0	5.7	2.6	3.1	3.0	9.9	3.1	4.6	46	96	94.7	0.0
	a. CNS germ cell	0	0	2	0	0	2	2	0.5	11.1	0.3	5.3	-	-	1.0	-	-	0.3	0.3	5	5	100.0	0.0
	b. Other extragonadal	2	2	0	0	3	4	7	0.9	22.2	1.1	18.4	5.7	1.3	-	-	1.5	0.8	1.0	10	18	85.7	0.0
	c. Gonadal germ cell	0	2	4	6	12	12	24	2.8	66.7	3.9	63.2	-	1.3	2.1	3.0	5.9	1.9	2.8	31	60	100.0	0.0
	d. Gonadal carcinoma	0	0	0	0	4	0	4	-	-	0.6	10.5	-	-	-	-	2.0	-	0.4	-	10	100.0	0.0
	e. Unspecified gonadal	0	0	0	0	1	0	1	-	-	0.2	2.6	-	-	-	-	0.5	-	0.1	-	2	0.0	0.0
XI	CARCINOMA & MELANOMA	0	0	1	16	24	17	41	3.9	100.0	6.7	100.0	-	-	0.5	8.0	11.8	2.5	4.6	43	102	100.0	0.0
	a. Adrenocortical	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	b. Thyroid	0	0	0	2	5	2	7	0.5	11.8	1.1	17.1	-	-	-	1.0	2.5	0.3	0.8	5	17	100.0	0.0
	c. Nasopharyngeal	0	0	1	8	7	9	16	2.1	52.9	2.6	39.0	-	-	0.5	4.0	3.5	1.3	1.8	23	40	100.0	0.0
	d. Melanoma	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	e. Skin carcinoma	0	0	0	0	2	0	2	-	-	0.3	4.9	-	-	-	-	1.0	-	0.2	-	5	100.0	0.0
	f. Other & unspecified	0	0	0	6	10	6	16	1.4	35.3	2.6	39.0	-	-	-	3.0	4.9	0.9	1.8	15	40	100.0	0.0
XII	OTHER & UNSPECIFIED	2	3	0	2	6	7	13	1.6	100.0	2.1	100.0	5.7	1.9	-	1.0	3.0	1.3	1.7	18	33	84.6	15.4
	a. Other specified	0	0	0	1	3	1	4	0.2	14.3	0.6	30.8	-	-	-	0.5	1.5	0.1	0.4	3	10	100.0	0.0
	b. Other unspecified	2	3	0	1	3	6	9	1.4	85.7	1.5	69.2	5.7	1.9	-	0.5	1.5	1.2	1.2	16	23	77.8	22.2
	TOTAL	34	146	126	127	183	433	616	100.0	100.0	100.0	100.0	96.1	94.0	65.2	63.8	90.3	76.1	79.3	1116	1568	94.3	0.5

† includes 5 non-malignant

Please consult the quality indicators for this registry

Mexico

Mexico City Paediatric Cancer Registry, 1997–2013

Arturo Fajardo-Gutiérrez, Guadalupe González-Miranda, Liria Mitzuko Fajardo-Yamamoto

Mexico is located in the southern part of North America. The country is bordered by the USA to the north and Guatemala and Belize to the south-east. It is also bordered by the Pacific Ocean from the west to the south, the Caribbean Sea to the south-east, and the Gulf of Mexico to the east. Mexico covers an area of almost 2 million km^2. In 2010, the population was 118.6 million (Table A.7). Mexico is a federal democratic republic that is divided into 31 states and Mexico City, which is the capital and the most populous city.

Mexico is an upper-middle-income country with a high Human Development Index. The country is undergoing an epidemiological transition. Modern medical infrastructure is available in major cities, but rural communities lack the equipment needed to perform advanced medical procedures; thus, migration for treatment is common. The social security system is financed by state institutions such as the Mexican Social Security Institute (IMSS), which covers about 50% of the population, and the Institute for Social Security and Services for State Workers (ISSSTE). Private health services account for 13% of health-care delivery units.

Since 2008, the National Cancer Institute has coordinated the development and implementation of the first National Cancer Control Plan, which includes plans for national cancer registration. A national cancer registry was created in 1982, and registration cards were implemented in four hospitals. The registry was computerized in 1988, but in 1994 it was largely transformed into a histopathology registry. In 1996, IMSS established the Mexico City Paediatric Cancer Registry.

Mexico City is located in a large valley in the high plateau in the centre of the country, at an altitude of 2240 m. The city covers an area of 1485 km^2. In 2010, the population of the city was almost 9 million; the agglomeration of Greater Mexico City has a population of 21 million.

Mexico City is one of the most important economic hubs in Latin America and produces 16% of the national GDP. The high spending power of the residents makes the city attractive to companies that offer prestige and luxury goods. In the 1990s, the city was notorious for its high level of pollution. Although air quality had improved considerably by 2014, the metropolitan area is still the most ozone-polluted part of the country.

In Mexico City, 64% of the population (5.7 million) is affiliated with a social security plan. IMSS serves 54% of this insured population (3.0 million in 2010), of whom 20% (0.6 million) are younger than 15 years (Table A.6).

The Mexico City Paediatric Cancer Registry is located in the Unit of Medical Research in the Clinical Epidemiology Department of the Paediatric Hospital at the National Medical Centre Siglo XXI of IMSS. The registry began collecting records prospectively in 1996 (Table A.10) for all IMSS beneficiaries who reside in Mexico City. Information on cancer cases is obtained from the Paediatric Hospital and from the General Hospital of the National Medical Centre La Raza, both of which provide highly specialized care. Medical care for IMSS beneficiaries is regionalized. Patients who reside in the northern region of the city are referred to the General Hospital of the National Medical Centre La Raza, and those in the southern region are referred to the Paediatric Hospital. The study population (children who are IMSS beneficiaries) is eligible for care only in these hospitals.

Information on patients with cancer is obtained by two trained cancer registrars, who ascertain new cases in each hospital twice a week. Cases are ascertained from the oncology, haematology, surgery, neurosurgery, endocrinology, and ophthalmology paediatric services.

No follow-up of the registered cases is conducted. The registry data are used primarily to estimate the number of cases expected in other states in Mexico, to estimate the quantities of medications and the numbers of medical staff needed for patient care, and for the development of clinical, epidemiological, and basic research related to cancer in children.

PUBLICATIONS

Fajardo-Gutiérrez A, González-Miranda G (2011). The quality of cancer registry. From a methodology approach. [in Spanish] Rev Med Inst Mex Seguro Soc. 49(Suppl 1):S39–42. PMID:23383474

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Reynoso-Noverón N, Meneses-García A, Erazo-Valle A, Escudero-de Los Ríos P, Kuri-Morales PA, Mohar-Betancourt A (2016). Challenges in the development and implementation of the National Comprehensive Cancer Control Program in Mexico. Salud Publica Mex. 58(2):325–33. https://doi.org/10.21149/spm.v58i2.7804 PMID:27557393

POPULATION AT RISK

The source of the population data was the National Institute of Statistics and Geography (INEGI; https://www.inegi.org.mx/default.html), which also conducted the population censuses (Table A.7). The registry conducted linear interpolation of the INEGI data from the censuses of 2000, 2005, and 2010 to obtain annual figures for the intercensal years. The denominators for 1997–1999 were obtained from the Coordination of Medical Treatment of the Medical Financing Board of IMSS. The registry provided the population counts by sex and four age groups (0, 1–4, 5–9, and 10–14 years) in each calendar year covered. The data for the missing year–age–sex categories were estimated at IARC using the methods described in Chapter 2.

EDITORS' COMMENTS

This paediatric cancer registry focused on registration of cases diagnosed in the age range 0–14 years. Data for the age groups 15–19 years and 0–19 years, which were collected less consistently, are not shown in the tables. Death certificates were not available for case

ascertainment; thus, a proportion of new cases may have been missed. The MV% is high (Table A.9), which may also suggest that some clinically diagnosed cases were missed and may thus affect the resulting incidence rates overall or in some diagnostic categories. Day of birth and day of incidence were not registered (Table A.8); this affects the accuracy of the age, which is calculated from the incomplete dates, and may slightly bias the age-specific incidence rates. All non-malignant CNS tumours are registered systematically; the low proportion (6%) (Table A.9) may be explained partly by pilocytic astrocytoma being coded with malignant behaviour and partly by limited use of CT and MRI technology. Skin carcinomas were registered, and registration is believed to be complete. Laterality was complete for retinoblastoma and nephroblastoma.

MEXICO, Mexico City, paediatric (1997-2013)

	Age group (years)	Males	Females
Person-years	0	314 088	296 612
	1-4	1 657 299	1 586 068
	5-9	2 093 030	2 012 494
	10-14	2 012 812	1 950 610
	0-14	6 077 229	5 845 784
Average annual population	0-14	357 484	343 870

Please consult the quality indicators for this registry

MEXICO, Mexico City, paediatric (1997-2013)

		Number of cases					Percentage		Incidence rates per million person-years						MV	DCO
		Age group (years)					0-14		Age-specific				ASR	Cumulative	%	%
		0	1-4	5-9	10-14	0-14	All	Group	0	1-4	5-9	10-14	0-14	0-14	0-14	0-14
I	LEUKAEMIA	31	292	212	171	**706**	45.3	100.0	50.8	90.0	51.6	43.1	**61.6**	893	100.0	0.0
	a. Lymphoid	24	247	182	126	**579**	37.1	82.0	39.3	76.2	44.3	31.8	**50.7**	732	100.0	0.0
	b. Acute myeloid	4	39	25	40	**108**	6.9	15.3	6.5	12.0	6.1	10.1	**9.2**	137	100.0	0.0
	c. CMD	1	3	3	3	**10**	0.6	1.4	1.6	0.9	0.7	0.8	**0.9**	13	100.0	0.0
	d. MDS & other	1	2	0	1	**4**	0.3	0.6	1.6	0.6	-	0.3	**0.4**	5	100.0	0.0
	e. Unspecified	1	1	2	1	**5**	0.3	0.7	1.6	0.3	0.5	0.3	**0.4**	6	100.0	0.0
II	LYMPHOMA & RELATED	10	42	59	67	**178**	11.4	100.0	16.4	12.9	14.4	16.9	**14.8**	224	99.4	0.0
	a. Hodgkin	0	5	14	25	**44**	2.8	24.7	-	1.5	3.4	6.3	**3.4**	55	100.0	0.0
	b. Non-Hodgkin except BL	0	23	30	32	**85**	5.4	47.8	-	7.1	7.3	8.1	**7.0**	107	100.0	0.0
	c. Burkitt (BL)	1	3	12	8	**24**	1.5	13.5	1.6	0.9	2.9	2.0	**1.9**	30	100.0	0.0
	d. Lymphoreticular	9	10	1	1	**21**	1.3	11.8	14.7	3.1	0.2	0.3	**2.1**	27	100.0	0.0
	e. Unspecified	0	1	2	1	**4**	0.3	2.2	-	0.3	0.5	0.3	**0.3**	5	75.0	0.0
III	CNS NEOPLASMS †	10	74	79	58	**221**	14.2	100.0	16.4	22.8	19.2	14.6	**18.9**	278	93.2	0.0
	a. Ependymoma	1	13	11	9	**34**	2.2	15.4	1.6	4.0	2.7	2.3	**2.9**	43	97.1	0.0
	b. Astrocytoma	4	27	35	29	**95**	6.1	43.0	6.5	8.3	8.5	7.3	**8.0**	119	93.7	0.0
	c. CNS embryonal	3	25	20	15	**63**	4.0	28.5	4.9	7.7	4.9	3.8	**5.5**	80	95.2	0.0
	d. Other gliomas	0	1	6	2	**9**	0.6	4.1	-	0.3	1.5	0.5	**0.7**	11	66.7	0.0
	e. Other specified	2	6	6	3	**17**	1.1	7.7	3.3	1.8	1.5	0.8	**1.5**	21	100.0	0.0
	f. Unspecified CNS	0	2	1	0	**3**	0.2	1.4	-	0.6	0.2	-	**0.3**	4	33.3	0.0
IV	NEUROBLASTOMA	14	17	5	0	**36**	2.3	100.0	22.9	5.2	1.2	-	**3.5**	46	100.0	0.0
	a. (Ganglio)neuroblastoma	14	17	5	0	**36**	2.3	100.0	22.9	5.2	1.2	-	**3.5**	46	100.0	0.0
	b. Peripheral nervous	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
V	RETINOBLASTOMA	6	39	1	0	**46**	2.9	100.0	9.8	12.0	0.2	-	**4.6**	60	97.8	0.0
VI	RENAL TUMOURS	6	29	14	6	**55**	3.5	100.0	9.8	8.9	3.4	1.5	**5.1**	70	100.0	0.0
	a. Nephroblastoma	6	29	14	6	**55**	3.5	100.0	9.8	8.9	3.4	1.5	**5.1**	70	100.0	0.0
	b. Renal carcinoma	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
	c. Unspecified	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
VII	HEPATIC TUMOURS	6	22	4	2	**34**	2.2	100.0	9.8	6.8	1.0	0.5	**3.3**	44	100.0	0.0
	a. Hepatoblastoma	6	22	3	0	**31**	2.0	91.2	9.8	6.8	0.7	-	**3.0**	40	100.0	0.0
	b. Hepatic carcinoma	0	0	1	2	**3**	0.2	8.8	-	-	0.2	0.5	**0.2**	4	100.0	0.0
	c. Unspecified	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
VIII	BONE TUMOURS	0	9	25	50	**84**	5.4	100.0	-	2.8	6.1	12.6	**6.5**	105	100.0	0.0
	a. Osteosarcoma	0	6	17	35	**58**	3.7	69.0	-	1.8	4.1	8.8	**4.5**	73	100.0	0.0
	b. Chondrosarcoma	0	0	0	1	**1**	0.1	1.2	-	-	-	0.3	**0.1**	1	100.0	0.0
	c. Ewing & related	0	3	5	13	**21**	1.3	25.0	-	0.9	1.2	3.3	**1.6**	26	100.0	0.0
	d. Other specified	0	0	2	1	**3**	0.2	3.6	-	-	0.5	0.3	**0.2**	4	100.0	0.0
	e. Unspecified	0	0	1	0	**1**	0.1	1.2	-	-	0.2	-	**0.1**	1	100.0	0.0
IX	SOFT TISSUE SARCOMA	3	21	23	31	**78**	5.0	100.0	4.9	6.5	5.6	7.8	**6.5**	98	100.0	0.0
	a. Rhabdomyosarcoma	2	13	13	11	**39**	2.5	50.0	3.3	4.0	3.2	2.8	**3.3**	49	100.0	0.0
	b. Fibrosarcoma	1	3	3	3	**10**	0.6	12.8	1.6	0.9	0.7	0.8	**0.9**	13	100.0	0.0
	c. Kaposi sarcoma	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
	d. Other specified	0	5	7	17	**29**	1.9	37.2	-	1.5	1.7	4.3	**2.3**	36	100.0	0.0
	e. Unspecified	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
X	GERM CELL TUMOURS	8	24	11	61	**104**	6.7	100.0	13.1	7.4	2.7	15.4	**8.5**	132	100.0	0.0
	a. CNS germ cell	1	1	5	17	**24**	1.5	23.1	1.6	0.3	1.2	4.3	**1.8**	30	100.0	0.0
	b. Other extragonadal	1	2	0	3	**6**	0.4	5.8	1.6	0.6	-	0.8	**0.5**	8	100.0	0.0
	c. Gonadal germ cell	6	21	6	40	**73**	4.7	70.2	9.8	6.5	1.5	10.1	**6.1**	93	100.0	0.0
	d. Gonadal carcinoma	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
	e. Unspecified gonadal	0	0	0	1	**1**	0.1	1.0	-	-	-	0.3	**0.1**	1	100.0	0.0
XI	CARCINOMA & MELANOMA	0	2	6	9	**17**	1.1	100.0	-	0.6	1.5	2.3	**1.3**	21	100.0	0.0
	a. Adrenocortical	0	1	0	1	**2**	0.1	11.8	-	0.3	-	0.3	**0.2**	3	100.0	0.0
	b. Thyroid	0	0	4	7	**11**	0.7	64.7	-	-	1.0	1.8	**0.8**	14	100.0	0.0
	c. Nasopharyngeal	0	0	0	1	**1**	0.1	5.9	-	-	-	0.3	**0.1**	1	100.0	0.0
	d. Melanoma	0	1	1	0	**2**	0.1	11.8	-	0.3	0.2	-	**0.2**	3	100.0	0.0
	e. Skin carcinoma	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
	f. Other & unspecified	0	0	1	0	**1**	0.1	5.9	-	-	0.2	-	**0.1**	1	100.0	0.0
XII	OTHER & UNSPECIFIED	0	0	0	1	**1**	0.1	100.0	-	-	-	0.3	**0.1**	1	100.0	0.0
	a. Other specified	0	0	0	1	**1**	0.1	100.0	-	-	-	0.3	**0.1**	1	100.0	0.0
	b. Other unspecified	0	0	0	0	**0**	-	-	-	-	-	-	**-**	-	-	-
	TOTAL	94	571	439	456	**1560**	100.0	100.0	153.9	176.1	106.9	115.1	**134.7**	1973	98.9	0.0

† includes 15 non-malignant

Please consult the quality indicators for this registry

Peru

Peru is located in the west of South America. It is bordered Ecuador and Colombia to the north, Brazil to the east, Bolivia to the south-east, Chile to the south, and the Pacific Ocean to the west. The country encompasses a variety of habitats, ranging from the arid plains of the Pacific coastal region to the peaks of the Andes mountains, which extend from the north to the south-east of the country, and the tropical Amazon basin rainforest in the east.

Peru is an upper-middle-income country with a high Human Development Index. The proportion of the population living below the poverty threshold decreased from 49% in 2005 to 23% in 2014. The main economic activities include mining, manufacturing, agriculture, and fishing, along with other growing sectors, such as telecommunications and biotechnology.

In 2010, the population was 29.4 million (Table A.7), and 39% of the population was younger than 20 years (Table A.6). The annual population growth rate decreased from 2.6% in 1950 to 1.6% in 2000. The fertility rate decreased to 2.5 children per woman in 2015, and the infant mortality rate decreased to 17 per 1000 live births in 2012. The life expectancy was 75 years in 2014. Peru has multiple ethnic groups, including Amerindian, European, African, and Asian. Most residents have mixed ancestry (Spanish and Indigenous), and a minority of residents are Black or White. The main spoken language is Spanish; several Indigenous languages are also widely spoken.

Health care is provided by the national health system and a set of subsystems for different sections of the population, such as low-income people, employees, and staff of security forces. Health insurance is financed by the Ministry of Health (37%), the social security system (18%), and private agencies (5%).

In 2012, the government approved a national cancer control plan, Plan Esperanza, which included funds for patients with cancer who were unable to access or afford care. Plan Esperanza initially focused on reducing the burden of cancers of the cervix, breast, stomach, lung, and prostate; in 2012, leukaemia and lymphoma were added.

Initially, three metropolitan regions in Peru were covered by population-based cancer registries: Lima, Trujillo, and Arequipa. The Trujillo Cancer Registry was closed in 2002, but the other two registries are active and are members of IACR. A mandatory cancer reporting system was established in 2006, in accordance with Plan Esperanza, but the Metropolitan Lima Cancer Registry still collects data actively. A web-based surveillance system includes 59 reporting hospitals, but ensuring data accuracy and completeness is challenging. The cancer registries have access to the records of the National Identification and Civil Registration Registry and to the vital statistics managed by the National Statistics Institute, but a large proportion of deaths are uncertified.

PUBLICATIONS

Piñeros M, Ramos W, Antoni S, Abriata G, Medina LE, Miranda JJ, et al. (2017). Cancer patterns, trends, and transitions in Peru: a regional perspective. Lancet Oncol. 18(10):e573–86. https://doi.org/10.1016/S1470-2045(17)30377-7 PMID:28971824

POPULATION AT RISK

Population data were provided by the Peruvian National Statistics Institute (https://www.inei.gob.pe/). The data are based on the censuses of 1981, 1993, 2005, and 2007, with adjustments for births, deaths, and migration. The 2017 census was not reflected in the data provided to IICC-3.

EDITORS' COMMENTS

Two cancer registries, the Metropolitan Lima Cancer Registry and the Trujillo Cancer Registry, are presented separately in full tables in the IICC-3 book (Table A.12), because they covered distinct and non-overlapping reporting periods. The Metropolitan Lima Cancer Registry was not able to provide data for 1992–2008 in a follow-up of the calendar years 1990–1991 presented in IICC-2 (Table A.1). Despite the different reporting periods and areas covered, the two cancer registries in Peru had a high proportion of cases with unspecified morphology (Table A.9).

Metropolitan Lima Cancer Registry, 2010–2012

Eduardo Payet, Patricia Pérez, Ebert Poquioma, Edgar Diaz, Saria Villanueva

Lima is the capital and the largest city in Peru. It is located in west-central Peru, on the Pacific coast. It is part of the Lima Metropolitan Area, which also includes the seaport of Callao. The Lima Metropolitan Area covers a total area of 2811 km^2 and is made up of 43 districts of Lima Province and 6 districts of Callao Province. Lima is the industrial and financial centre of the country, accounting for more than two thirds of the industrial sector and an even larger proportion of the tertiary sector.

About one third of the national population lives in this metropolitan area, in which the population increased from about 2 million in the early 1960s to 9.2 million in 2010; in 2010, 35% of the population was younger than 20 years (Table A.6).

The Metropolitan Lima Cancer Registry covers both provinces that constitute the Lima Metropolitan Area: Lima Province and Callao Province. The registry was active from 1968 to 1978; it was reactivated in 1990 at the Maes-Heller Cancer Research Centre. Currently, the registry is managed by the Department of Epidemiology and Statistics of the National Institute of Neoplastic Diseases (Instituto Nacional de Enfermedades Neoplásicas [INEN]). The oncology care facilities include radiology, pathology, surgery, radiotherapy, and chemotherapy departments, and they provide services to both paediatric and adult populations.

Data are collected actively from all health-care facilities in the Lima Metropolitan Area. The registry uses the IARC/IACR rules for multiple primary tumours. Quality control is performed using IARCcrgTools, and the residence status of the registered patients is assessed with particular attention. Registry staff members follow local regulations to ensure confidentiality.

The registry generates reports for health organizations and contributes to cancer control planning, policy development, and evaluation of the cancer plan. In addition, the registry provides cancer data to fellows, for staff research initiatives, for training of health-care providers, and to decision-makers.

PUBLICATIONS

Instituto Nacional de Enfermedades Neoplasicas, Metropolitan Lima Cancer Registry Commission (2013). Metropolitan Lima Cancer Registry, 2004–2005. Incidence and mortality study. Volume IV. Lima, Peru: Metropolitan Lima Cancer Registry.

POPULATION AT RISK

Data were provided in all requested detail. See also Peru, above.

EDITORS' COMMENTS

The MV% is low, which contributes to the high proportion of cases with unspecified morphology (Table A.9). Non-malignant CNS tumours were reportable (Table A.9), and pilocytic astrocytoma was coded with uncertain behaviour. Skin carcinomas were reportable, and registration is believed to be complete. Laterality was close to complete for retinoblastoma and nephroblastoma.

PERU, Lima (2010-2012)

	Age group (years)	Males	Females
Person-years	0	240 787	228 417
	1-4	961 714	922 924
	5-9	1 197 509	1 143 614
	10-14	1 194 767	1 155 912
	15-19	1 308 202	1 332 438
	0-14	3 594 777	3 450 867
	0-19	4 902 979	4 783 305
Average annual population	0-14	1 198 259	1 150 289
	0-19	1 634 326	1 594 435

Please consult the quality indicators for this registry

Trujillo Cancer Registry, 1990–2002

Pedro F. Albújar, Berenice S. Balarezo

The city of Trujillo is the capital of the La Libertad region, which is located on the northern part of the Pacific coast. The climate is subtropical, with an average temperature of 30 °C in summer and 14 °C in winter and an average annual rainfall of 5 mm.

The Trujillo Metropolitan Area covers an area of 1100 km^2. In 2010, the population was 0.8 million, and 35% of the population was younger than 20 years (Table A.6). Only 4% of the population of the Trujillo Metropolitan Area lives in rural areas. A sanitation service provides drinking-water to 85% of residences, and 87% of houses are connected to public sewage services. Electricity is available in 82% of homes. The illiteracy rate was 6.3% in people 15 years and older.

The main economic activities were commerce and services (68%). Transformative industries, including agro-industry, leather, metal, and mechanics processing, accounted for 26% of economic activity, and the extractive sector for 4%.

The Trujillo Cancer Registry covered the population of the Trujillo Metropolitan Area. The registry began collecting histopathology records in 1983 and became a population-based cancer registry in 1984 (Table A.10). Financial and technical assistance was provided by IARC until 2002 under a collaborative research agreement with the National University of Trujillo. The registry office was staffed by a pathologist (head of the registry), a statistician, a computer analyst, and a part-time statistical technician.

Trujillo has three general hospitals with paediatric units. Data were collected actively from these hospitals, the radiotherapy service, private clinics, pathology laboratories, and oncologists. An oncology hospital opened in 2008. Mortality data were obtained from original death certificates provided by the Regional Health Authority. The registry staff visited the data sources to screen the hospital discharge notes and scrutinize the cancer medical records to abstract the required information.

Registration was complete for all sites with the exception of skin carcinomas. No follow-up of patients was performed, except in the framework of specific studies.

POPULATION AT RISK

Population data were provided by sex and 5-year age group for 1996 and 2002 (Table A.8). The data for the missing year–age–sex categories were estimated at IARC using the methods described in Chapter 2. See also Peru, above.

EDITORS' COMMENTS

Date of birth was incomplete in 26% of cases, and date of incidence was limited to the year; the provided age was inconsistent with the provided dates in 2% of cases (Table A.8). The imprecise dates may be the reason for the low proportion of infants among children aged 0–14 years (3.6%) (Table A.9). Despite a high MV%, the proportion of cases with unspecified morphology was high (16%), including among MV cases (Table A.9). Non-malignant CNS tumours (including pilocytic astrocytoma) were not reportable; this affects the resulting rates for the ICCC groups III, Xa, and overall. Skin carcinomas were reportable, but registration may have been incomplete. Laterality was not collected.

PERU, Trujillo (1990-2002)

	Age group (years)	Males	Females
Person-years	0	80 657	78 442
	1-4	322 628	313 768
	5-9	387 325	384 750
	10-14	403 250	412 490
	15-19	408 685	466 555
	0-14	1 193 860	1 189 450
	0-19	1 602 545	1 656 005
Average annual population	0-14	91 835	91 496
	0-19	123 273	127 385

Please consult the quality indicators for this registry

PERU, Lima (2010-2012)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	LEUKAEMIA	28	184	112	102	113	426	539	40.5	100.0	36.0	100.0	59.7	97.6	47.8	43.4	42.8	62.9	58.4	906	1120	88.9	7.6
	a. Lymphoid	9	132	76	74	75	291	366	27.7	68.3	24.4	67.9	19.2	70.0	32.5	31.5	28.4	42.8	39.6	619	761	94.0	6.0
	b. Acute myeloid	8	19	15	11	20	53	73	5.0	12.4	4.9	13.5	17.1	10.1	6.4	4.7	7.6	7.9	7.8	113	151	95.9	4.1
	c. CMD	3	6	2	5	8	16	24	1.5	3.8	1.6	4.5	6.4	3.2	0.9	2.1	3.0	2.4	2.5	34	49	100.0	0.0
	d. MDS & other	3	5	3	1	2	12	14	1.1	2.8	0.9	2.6	6.4	2.7	1.3	0.4	0.8	1.9	1.6	26	29	92.9	7.1
	e. Unspecified	5	22	16	11	8	54	62	5.1	12.7	4.1	11.5	10.7	11.7	6.8	4.7	3.0	8.0	6.9	115	130	45.2	24.2
II	LYMPHOMA & RELATED	0	34	39	44	48	117	165	11.1	100.0	11.0	100.0	-	18.0	16.7	18.7	18.2	16.4	16.8	249	340	90.3	3.6
	a. Hodgkin	0	7	12	10	12	29	41	2.8	24.8	2.7	24.8	-	3.7	5.1	4.3	4.5	4.0	4.2	62	84	95.1	4.9
	b. Non-Hodgkin except BL	0	15	17	22	29	54	83	5.1	46.2	5.5	50.3	-	8.0	7.3	9.4	11.0	7.5	8.3	115	170	98.8	1.2
	c. Burkitt (BL)	0	5	6	3	1	14	15	1.3	12.0	1.0	9.1	-	2.7	2.6	1.3	0.4	2.0	1.7	30	32	100.0	0.0
	d. Lymphoreticular	0	3	1	0	1	4	5	0.4	3.4	0.3	3.0	-	1.6	0.4	-	0.4	0.6	0.6	9	10	80.0	20.0
	e. Unspecified	0	4	3	9	5	16	21	1.5	13.7	1.4	12.7	-	2.1	1.3	3.8	1.9	2.2	2.1	34	44	42.9	9.5
III	CNS NEOPLASMS †	8	64	78	62	72	212	284	20.2	100.0	19.0	100.0	17.1	34.0	33.3	26.4	27.3	30.2	29.6	451	588	65.1	3.9
	a. Ependymoma	2	10	8	7	2	27	29	2.6	12.7	1.9	10.2	4.3	5.3	3.4	3.0	0.8	3.9	3.2	57	61	100.0	0.0
	b. Astrocytoma	3	8	17	15	12	43	55	4.1	20.3	3.7	19.4	6.4	4.2	7.3	6.4	4.5	6.0	5.7	92	114	90.9	1.8
	c. CNS embryonal	1	19	11	5	8	36	44	3.4	17.0	2.9	15.5	2.1	10.1	4.7	2.1	3.0	5.4	4.9	77	92	97.7	0.0
	d. Other gliomas	0	5	8	7	5	20	25	1.9	9.4	1.7	8.8	-	2.7	3.4	3.0	1.9	2.8	2.6	43	52	56.0	0.0
	e. Other specified	0	6	18	16	27	40	67	3.8	18.9	4.5	23.6	-	3.2	7.7	6.8	10.2	5.4	6.5	85	136	64.2	1.5
	f. Unspecified CNS	2	16	16	12	18	46	64	4.4	21.7	4.3	22.5	4.3	8.5	6.8	5.1	6.8	6.6	6.7	98	132	9.4	14.1
IV	NEUROBLASTOMA	7	5	0	0	0	12	12	1.1	100.0	0.8	100.0	14.9	2.7	-	-	-	2.0	1.5	25	25	100.0	0.0
	a. (Ganglio)neuroblastoma	7	5	0	0	0	12	12	1.1	100.0	0.8	100.0	14.9	2.7	-	-	-	2.0	1.5	25	25	100.0	0.0
	b. Peripheral nervous	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
V	RETINOBLASTOMA	7	26	4	0	0	37	37	3.5	100.0	2.5	100.0	14.9	13.8	1.7	-	-	6.0	4.6	79	79	91.9	0.0
VI	RENAL TUMOURS	2	35	6	1	2	44	46	4.2	100.0	3.1	100.0	4.3	18.6	2.6	0.4	0.8	7.0	5.6	94	97	89.1	2.2
	a. Nephroblastoma	2	34	6	1	1	43	44	4.1	97.7	2.9	95.7	4.3	18.0	2.6	0.4	0.4	6.9	5.4	91	93	93.2	2.3
	b. Renal carcinoma	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	c. Unspecified	0	1	0	0	1	1	2	0.1	2.3	0.1	4.3	-	0.5	-	-	0.4	0.2	0.2	2	4	0.0	0.0
VII	HEPATIC TUMOURS	5	7	6	4	11	22	33	2.1	100.0	2.2	100.0	10.7	3.7	2.6	1.7	4.2	3.3	3.5	47	68	72.7	3.0
	a. Hepatoblastoma	1	5	2	1	0	9	9	0.9	40.9	0.6	27.3	2.1	2.7	0.9	0.4	-	1.4	1.1	19	19	100.0	0.0
	b. Hepatic carcinoma	0	0	4	3	7	7	14	0.7	31.8	0.9	42.4	-	-	1.7	1.3	2.7	0.9	1.3	15	28	100.0	0.0
	c. Unspecified	4	2	0	0	4	6	10	0.6	27.3	0.7	30.3	8.5	1.1	-	-	1.5	1.0	1.1	13	20	10.0	10.0
VIII	BONE TUMOURS	2	1	12	30	32	45	77	4.3	100.0	5.1	100.0	4.3	0.5	5.1	12.8	12.1	5.9	7.3	96	156	85.7	2.6
	a. Osteosarcoma	0	0	9	24	19	33	52	3.1	73.3	3.5	67.5	-	-	3.8	10.2	7.2	4.2	4.9	70	106	98.1	1.9
	b. Chondrosarcoma	0	0	1	0	5	1	6	0.1	2.2	0.4	7.8	-	-	0.4	-	1.9	0.1	0.5	2	12	100.0	0.0
	c. Ewing & related	0	0	1	3	3	4	7	0.4	8.9	0.5	9.1	-	-	0.4	1.3	1.1	0.5	0.6	9	14	100.0	0.0
	d. Other specified	0	1	0	0	0	1	1	0.1	2.2	0.1	1.3	-	0.5	-	-	-	0.2	0.1	2	2	100.0	0.0
	e. Unspecified	2	0	1	3	5	6	11	0.6	13.3	0.7	14.3	4.3	-	0.4	1.3	1.9	0.8	1.1	13	22	9.1	9.1
IX	SOFT TISSUE SARCOMA	8	18	14	16	28	56	84	5.3	100.0	5.6	100.0	17.1	9.6	6.0	6.8	10.6	8.2	8.7	119	172	95.2	2.4
	a. Rhabdomyosarcoma	5	7	5	6	5	23	28	2.2	41.1	1.9	33.3	10.7	3.7	2.1	2.6	1.9	3.4	3.1	49	58	92.9	7.1
	b. Fibrosarcoma	0	1	1	0	5	2	7	0.2	3.6	0.5	8.3	-	0.5	0.4	-	1.9	0.3	0.7	4	14	100.0	0.0
	c. Kaposi sarcoma	0	1	0	0	0	1	1	0.1	1.8	0.1	1.2	-	0.5	-	-	-	0.2	0.1	2	2	100.0	0.0
	d. Other specified	2	4	5	6	13	17	30	1.6	30.4	2.0	35.7	4.3	2.1	2.1	2.6	4.9	2.4	3.0	36	61	100.0	0.0
	e. Unspecified	1	5	3	4	5	13	18	1.2	23.2	1.2	21.4	2.1	2.7	1.3	1.7	1.9	1.9	1.9	28	37	88.9	0.0
X	GERM CELL TUMOURS	6	13	3	13	44	35	79	3.3	100.0	5.3	100.0	12.8	6.9	1.3	5.5	16.7	5.1	7.7	74	158	92.4	1.3
	a. CNS germ cell	0	0	0	1	1	1	2	0.1	2.9	0.1	2.5	-	-	-	0.4	0.4	0.1	0.2	2	4	100.0	0.0
	b. Other extragonadal	1	2	0	1	5	4	9	0.4	11.4	0.6	11.4	2.1	1.1	-	0.4	1.9	0.6	0.9	8	18	100.0	0.0
	c. Gonadal germ cell	5	11	1	7	36	24	60	2.3	68.6	4.0	75.9	10.7	5.8	0.4	3.0	13.6	3.6	5.9	51	119	100.0	0.0
	d. Gonadal carcinoma	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	e. Unspecified gonadal	0	0	2	4	2	6	8	0.6	17.1	0.5	10.1	-	-	0.9	1.7	0.8	0.8	0.8	13	17	25.0	12.5
XI	CARCINOMA & MELANOMA	0	1	8	15	75	24	99	2.3	100.0	6.6	100.0	-	0.5	3.4	6.4	28.4	3.1	8.8	51	193	100.0	0.0
	a. Adrenocortical	0	1	1	0	0	2	2	0.2	8.3	0.1	2.0	-	0.5	0.4	-	-	0.3	0.2	4	4	100.0	0.0
	b. Thyroid	0	0	4	8	39	12	51	1.1	50.0	3.4	51.5	-	-	1.7	3.4	14.8	1.5	4.5	26	99	100.0	0.0
	c. Nasopharyngeal	0	0	0	1	1	1	2	0.1	4.2	0.1	2.0	-	-	-	0.4	0.4	0.1	0.2	2	4	100.0	0.0
	d. Melanoma	0	0	2	1	3	3	6	0.3	12.5	0.4	6.1	-	-	0.9	0.4	1.1	0.4	0.6	6	12	100.0	0.0
	e. Skin carcinoma	0	0	1	1	5	2	7	0.2	8.3	0.5	7.1	-	-	0.4	0.4	1.9	0.3	0.6	4	14	100.0	0.0
	f. Other & unspecified	0	0	0	4	27	4	31	0.4	16.7	2.1	31.3	-	-	-	1.7	10.2	0.5	2.7	9	60	100.0	0.0
XII	OTHER & UNSPECIFIED	2	4	4	12	21	22	43	2.1	100.0	2.9	100.0	4.3	2.1	1.7	5.1	8.0	3.0	4.1	47	87	41.9	16.3
	a. Other specified	0	0	0	2	1	2	3	0.2	9.1	0.2	7.0	-	-	-	0.9	0.4	0.2	0.3	4	6	100.0	0.0
	b. Other unspecified	2	4	4	10	20	20	40	1.9	90.9	2.7	93.0	4.3	2.1	1.7	4.3	7.6	2.8	3.9	43	80	37.5	17.5
	TOTAL	75	392	286	299	446	1052	1498	100.0	100.0	100.0	100.0	159.8	208.0	122.2	127.2	168.9	153.1	156.7	2239	3083	84.1	4.8

† includes 114 non-malignant

Please consult the quality indicators for this registry

PERU, Trujillo (1990-2002)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	LEUKAEMIA	4	38	29	28	29	99	128	39.3	100.0	36.8	100.0	25.1	59.7	37.6	34.3	33.1	42.5	40.4	623	789	99.2	0.8
	a. Lymphoid	2	27	22	19	16	70	86	27.8	70.7	24.7	67.2	12.6	42.4	28.5	23.3	18.3	30.1	27.4	441	533	100.0	0.0
	b. Acute myeloid	2	7	3	7	7	19	26	7.5	19.2	7.5	20.3	12.6	11.0	3.9	8.6	8.0	8.1	8.1	119	159	100.0	0.0
	c. CMD	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	d. MDS & other	0	0	1	0	0	1	1	0.4	1.0	0.3	0.8	-	-	1.3	-	-	0.4	0.3	6	6	100.0	0.0
	e. Unspecified	0	4	3	2	6	9	15	3.6	9.1	4.3	11.7	-	6.3	3.9	2.5	6.9	3.9	4.6	57	91	93.3	6.7
II	LYMPHOMA & RELATED	0	12	13	17	11	42	53	16.7	100.0	15.2	100.0	-	18.9	16.8	20.8	12.6	17.3	16.3	264	327	98.1	1.9
	a. Hodgkin	0	4	8	2	1	14	15	5.6	33.3	4.3	28.3	-	6.3	10.4	2.5	1.1	6.0	4.9	89	95	100.0	0.0
	b. Non-Hodgkin except BL	0	5	4	9	9	18	27	7.1	42.9	7.8	50.9	-	7.9	5.2	11.0	10.3	7.3	8.0	112	164	96.3	3.7
	c. Burkitt (BL)	0	3	1	3	0	7	7	2.8	16.7	2.0	13.2	-	4.7	1.3	3.7	-	2.9	2.3	44	44	100.0	0.0
	d. Lymphoreticular	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	e. Unspecified	0	0	0	3	1	3	4	1.2	7.1	1.1	7.5	-	-	-	3.7	1.1	1.1	1.1	18	24	100.0	0.0
III	CNS NEOPLASMS	1	7	21	10	12	39	51	15.5	100.0	14.7	100.0	6.3	11.0	27.2	12.3	13.7	16.2	15.7	248	316	62.7	7.8
	a. Ependymoma	0	0	1	2	0	3	3	1.2	7.7	0.9	5.9	-	-	1.3	2.5	-	1.1	0.9	19	19	100.0	0.0
	b. Astrocytoma	0	1	7	5	3	13	16	5.2	33.3	4.6	31.4	-	1.6	9.1	6.1	3.4	5.2	4.8	82	99	100.0	0.0
	c. CNS embryonal	0	3	4	0	2	7	9	2.8	17.9	2.6	17.6	-	4.7	5.2	-	2.3	3.1	2.9	45	56	100.0	0.0
	d. Other gliomas	0	0	1	0	1	1	2	0.4	2.6	0.6	3.9	-	-	1.3	-	1.1	0.4	0.6	6	12	100.0	0.0
	e. Other specified	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	f. Unspecified CNS	1	3	8	3	6	15	21	6.0	38.5	6.0	41.2	6.3	4.7	10.4	3.7	6.9	6.4	6.5	95	130	9.5	19.0
IV	NEUROBLASTOMA	0	3	0	1	0	4	4	1.6	100.0	1.1	100.0	-	4.7	-	1.2	-	1.8	1.4	25	25	100.0	0.0
	a. (Ganglio)neuroblastoma	0	3	0	1	0	4	4	1.6	100.0	1.1	100.0	-	4.7	-	1.2	-	1.8	1.4	25	25	100.0	0.0
	b. Peripheral nervous	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
V	RETINOBLASTOMA	0	8	2	0	0	10	10	4.0	100.0	2.9	100.0	-	12.6	2.6	-	-	4.7	3.7	63	63	100.0	0.0
VI	RENAL TUMOURS	2	2	3	0	0	7	7	2.8	100.0	2.0	100.0	12.6	3.1	3.9	-	-	3.2	2.5	45	45	100.0	0.0
	a. Nephroblastoma	2	2	2	0	0	6	6	2.4	85.7	1.7	85.7	12.6	3.1	2.6	-	-	2.8	2.2	38	38	100.0	0.0
	b. Renal carcinoma	0	0	1	0	0	1	1	0.4	14.3	0.3	14.3	-	-	1.3	-	-	0.4	0.3	6	6	100.0	0.0
	c. Unspecified	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VII	HEPATIC TUMOURS	0	4	1	0	2	5	7	2.0	100.0	2.0	100.0	-	6.3	1.3	-	2.3	2.4	2.3	32	43	85.7	14.3
	a. Hepatoblastoma	0	3	1	0	0	4	4	1.6	80.0	1.1	57.1	-	4.7	1.3	-	-	1.9	1.5	25	25	100.0	0.0
	b. Hepatic carcinoma	0	0	0	0	2	0	2	-	-	0.6	28.6	-	-	-	-	2.3	-	0.5	-	11	100.0	0.0
	c. Unspecified	0	1	0	0	0	1	1	0.4	20.0	0.3	14.3	-	1.6	-	-	-	0.5	0.4	6	6	0.0	100.0
VIII	BONE TUMOURS	0	0	6	5	10	11	21	4.4	100.0	6.0	100.0	-	-	7.8	6.1	11.4	4.3	5.9	70	127	90.5	4.8
	a. Osteosarcoma	0	0	6	5	6	11	17	4.4	100.0	4.9	81.0	-	-	7.8	6.1	6.9	4.3	4.9	70	104	94.1	5.9
	b. Chondrosarcoma	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	c. Ewing & related	0	0	0	0	2	0	2	-	-	0.6	9.5	-	-	-	-	2.3	-	0.5	-	11	100.0	0.0
	d. Other specified	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	e. Unspecified	0	0	0	0	2	0	2	-	-	0.6	9.5	-	-	-	-	2.3	-	0.5	-	11	50.0	0.0
IX	SOFT TISSUE SARCOMA	0	6	5	5	10	16	26	6.3	100.0	7.5	100.0	-	9.4	6.5	6.1	11.4	6.8	7.8	101	158	100.0	0.0
	a. Rhabdomyosarcoma	0	5	2	1	1	8	9	3.2	50.0	2.6	34.6	-	7.9	2.6	1.2	1.1	3.6	3.1	51	56	100.0	0.0
	b. Fibrosarcoma	0	0	0	0	3	0	3	-	-	0.9	11.5	-	-	-	-	3.4	-	0.8	-	17	100.0	0.0
	c. Kaposi sarcoma	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	d. Other specified	0	0	2	2	2	4	6	1.6	25.0	1.7	23.1	-	-	2.6	2.5	2.3	1.5	1.7	25	37	100.0	0.0
	e. Unspecified	0	1	1	2	4	4	8	1.6	25.0	2.3	30.8	-	1.6	1.3	2.5	4.6	1.6	2.3	25	48	100.0	0.0
X	GERM CELL TUMOURS	1	4	1	6	9	12	21	4.8	100.0	6.0	100.0	6.3	6.3	1.3	7.4	10.3	5.0	6.2	75	126	100.0	0.0
	a. CNS germ cell	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	b. Other extragonadal	0	0	0	2	3	2	5	0.8	16.7	1.4	23.8	-	-	-	2.5	3.4	0.7	1.3	12	29	100.0	0.0
	c. Gonadal germ cell	1	3	1	4	6	9	15	3.6	75.0	4.3	71.4	6.3	4.7	1.3	4.9	6.9	3.8	4.5	56	90	100.0	0.0
	d. Gonadal carcinoma	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	e. Unspecified gonadal	0	1	0	0	0	1	1	0.4	8.3	0.3	4.8	-	1.6	-	-	-	0.5	0.4	6	6	100.0	0.0
XI	CARCINOMA & MELANOMA	1	0	1	4	13	6	19	2.4	100.0	5.5	100.0	6.3	-	1.3	4.9	14.9	2.3	5.1	37	112	100.0	0.0
	a. Adrenocortical	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	b. Thyroid	0	0	0	2	7	2	9	0.8	33.3	2.6	47.4	-	-	-	2.5	8.0	0.7	2.4	12	52	100.0	0.0
	c. Nasopharyngeal	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	d. Melanoma	0	0	0	1	0	1	1	0.4	16.7	0.3	5.3	-	-	-	1.2	-	0.4	0.3	6	6	100.0	0.0
	e. Skin carcinoma	0	0	0	0	1	0	1	-	-	0.3	5.3	-	-	-	-	1.1	-	0.3	-	6	100.0	0.0
	f. Other & unspecified	1	0	1	1	5	3	8	1.2	50.0	2.3	42.1	6.3	-	1.3	1.2	5.7	1.3	2.3	19	47	100.0	0.0
XII	OTHER & UNSPECIFIED	0	1	0	0	0	1	1	0.4	100.0	0.3	100.0	-	1.6	-	-	-	0.5	0.4	6	6	0.0	0.0
	a. Other specified	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	b. Other unspecified	0	1	0	0	0	1	1	0.4	100.0	0.3	100.0	-	1.6	-	-	-	0.5	0.4	6	6	0.0	0.0
	TOTAL	9	85	82	76	96	252	348	100.0	100.0	100.0	100.0	56.6	133.6	106.2	93.2	109.7	107.1	107.6	1588	2136	92.8	2.3

Please consult the quality indicators for this registry

USA, Puerto Rico

USA, Puerto Rico Central Cancer Registry, 1992–2012

Diego Zavala-Zegarra, Guillermo Tortolero-Luna, Yadira Román-Ruiz, Carlos Torres-Cintrón, Nivia Vázquez-Cubano, Omar Centeno-Rodríguez, Julio Arce, Mariela Alvarado-Ortiz, Yarenid Santiago-Colón

Puerto Rico is a territory of the USA and is located in the north-eastern Caribbean Sea, about 1600 km south-east of Miami, Florida. The territory comprises an archipelago of the Greater Antilles that is exposed to natural disasters. It covers a total area of 13 792 km^2 (8868 km^2 land, 4924 km^2 water) and has a tropical rainforest climate. The largest island, Puerto Rico, is mostly mountainous, with large coastal areas in the north and south. San Juan is the capital and the most populous city.

The heterogeneity of the population is the result of Amerindian settlement, European colonization, slavery, economic migration, and the status as a territory of the USA; however, most of the population (98%) is of Hispanic origin. The official languages are Spanish and English, with Spanish predominating. In 2010, the population was 3.7 million (a decrease from the 2000 census), and 27% of the population was younger than 20 years (Table A.6). About 40% of the population lives in urban areas.

Puerto Ricans are citizens of the USA and may move freely between the island and the mainland. However, as a territory, Puerto Rico does not have a vote in the United States Congress and its residents do not vote for president and vice president of the USA and do not pay federal income tax.

The high-income economy of Puerto Rico is driven mainly by manufacturing (pharmaceuticals, textiles, petrochemicals, and electronics) and the service industries (finance, insurance, real estate, and tourism). Agriculture contributes less than 1%. The cost of living is high, and the poverty rate is 45%.

Puerto Rico has 70 hospitals; 20 of them are located in San Juan, and half of these are operated by the government. The largest hospital is the Río Piedras Medical Center, a network of eight hospitals, including a paediatric hospital. The city of San Juan operates nine other hospitals. There are also 10 private hospitals in San Juan, including San Jorge Children's Hospital. Patients with cancer from primary and secondary care facilities are referred to hospitals in the metropolitan areas of San Juan, Ponce, Mayagüez, and Fajardo. An undetermined number of patients seek medical care on the United States mainland.

Puerto Rico Health Reform is a government-run programme instituted in 2006 that provides medical and health-care services to people without sufficient income. The programme covers a population of more than 1.5 million.

The Puerto Rico Central Cancer Registry (PRCCR) covers all 78 municipalities in Puerto Rico, including the islands of Vieques and Culebra. The registry is located at the University of Puerto Rico Comprehensive Cancer Center and is supported by United States federal and commonwealth funds. Since 1997, it has been a member of the United States National Program of Cancer Registries. It has 22 full-time employees and four units: Case Finding, Quality Control and Case Processing, Education and Training, and Information Technology.

Cancer has been a reportable disease since 1951. In 2010, a new law was approved to enhance the authority of the PRCCR and formalize electronic reporting. Active case finding is performed in general and oncology hospitals, pathology laboratories, and the Vital Statistics Office. The death registration system is adequate and complete; death certificates are required legal documents, and the registry reviews them all systematically. Currently, 95% of the institutions report electronically.

It is difficult to estimate the number of undiagnosed or unregistered cases, because of the high level of migration between Puerto Rico and the United States mainland. However, Puerto Rico has a wide range of diagnostic facilities, and the PRCCR has data exchange agreements with several states on the mainland, including Florida, New Jersey, New York, and Texas, to identify cases diagnosed and/or treated outside Puerto Rico. Data from the PRCCR are provided annually for inclusion in United States national cancer statistics reports.

The registry data are used for programme planning and evaluation, research, cluster investigations, annual reports, special reports, and various other uses. The PRCCR often participates in academic activities to disseminate and stimulate use of the data among stakeholders. In addition, the PRCCR actively collaborates in national and international projects.

POPULATION AT RISK

Data were provided by 5-year age group for 1992–1999 and by individual years of age for 2000–2012. The source of the population data was the United States Census Bureau. The most recent censuses were conducted in 1990, 2000, and 2010 (Table A.7). The data for the missing year–age–sex categories were estimated at IARC using the methods described in Chapter 2.

EDITORS' COMMENTS

The registry participated in IICC-1 and IICC-2 (Table A.1). The proportion of MV cases with unspecified morphology was high (7%) (Table A.9). Non-malignant CNS tumours have been reportable only since 2004, which may explain the low proportion (Table A.9). Pilocytic astrocytoma was coded with malignant behaviour, with the exception of one case coded with uncertain behaviour. Basal cell and squamous cell carcinomas of skin were not reportable. Laterality was not sufficiently complete for the registry to be included in the tables in Chapter 13 in the IICC-3 book.

USA, Puerto Rico (1992-2012)

	Age group (years)	Males	Females
Person-years	0	564 894	542 416
	1-4	2 327 983	2 221 724
	5-9	3 067 789	2 925 929
	10-14	3 205 660	3 076 451
	15-19	3 237 985	3 127 188
	0-14	9 166 326	8 766 520
	0-19	12 404 311	11 893 708
Average annual population	0-14	436 492	417 453
	0-19	590 681	566 367

Please consult the quality indicators for this registry

USA, Puerto Rico (1992-2012)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	**LEUKAEMIA**	41	283	183	175	170	**682**	**852**	31.2	100.0	26.5	100.0	37.0	62.2	30.5	27.9	26.7	**40.1**	**37.1**	578	712	95.2	2.0
	a. Lymphoid	16	218	124	94	66	**452**	**518**	20.7	66.3	16.1	60.8	14.4	47.9	20.7	15.0	10.4	**27.0**	**23.3**	385	437	98.5	0.8
	b. Acute myeloid	9	22	28	53	65	**112**	**177**	5.1	16.4	5.5	20.8	8.1	4.8	4.7	8.4	10.2	**6.1**	**7.0**	93	144	96.0	2.8
	c. CMD	4	13	11	8	18	**36**	**54**	1.6	5.3	1.7	6.3	3.6	2.9	1.8	1.3	2.8	**2.1**	**2.3**	31	45	72.2	0.0
	d. MDS & other	4	1	1	6	2	**12**	**14**	0.5	1.8	0.4	1.6	3.6	0.2	0.2	1.0	0.3	**0.7**	**0.6**	10	12	78.6	7.1
	e. Unspecified	8	29	19	14	19	**70**	**89**	3.2	10.3	2.8	10.4	7.2	6.4	3.2	2.2	3.0	**4.2**	**3.9**	60	75	91.0	7.9
II	**LYMPHOMA & RELATED**	6	40	81	127	252	**254**	**506**	11.6	100.0	15.7	100.0	5.4	8.8	13.5	20.2	39.6	**13.4**	**19.3**	209	407	98.4	0.4
	a. Hodgkin	1	12	38	78	166	**129**	**295**	5.9	50.8	9.2	58.3	0.9	2.6	6.3	12.4	26.1	**6.5**	**10.9**	105	236	99.3	0.0
	b. Non-Hodgkin except BL	2	12	29	33	69	**76**	**145**	3.5	29.9	4.5	28.7	1.8	2.6	4.8	5.3	10.8	**4.0**	**5.6**	63	117	97.9	0.0
	c. Burkitt (BL)	0	12	9	11	6	**32**	**38**	1.5	12.6	1.2	7.5	-	2.6	1.5	1.8	0.9	**1.8**	**1.6**	27	32	100.0	0.0
	d. Lymphoreticular	3	2	1	1	1	**7**	**8**	0.3	2.8	0.2	1.6	2.7	0.4	0.2	0.2	0.2	**0.4**	**0.4**	6	7	87.5	0.0
	e. Unspecified	0	2	4	4	10	**10**	**20**	0.5	3.9	0.6	4.0	-	0.4	0.7	0.6	1.6	**0.5**	**0.8**	8	16	90.0	10.0
III	**CNS NEOPLASMS** †	21	150	159	136	133	**466**	**599**	21.3	100.0	18.6	100.0	19.0	33.0	26.5	21.6	20.9	**26.5**	**25.3**	392	496	93.8	2.0
	a. Ependymoma	3	23	17	8	10	**51**	**61**	2.3	10.9	1.9	10.2	2.7	5.1	2.8	1.3	1.6	**3.1**	**2.7**	44	51	98.4	0.0
	b. Astrocytoma	6	67	72	57	51	**202**	**253**	9.2	43.3	7.9	42.2	5.4	14.7	12.0	9.1	8.0	**11.5**	**10.7**	170	210	97.6	0.8
	c. CNS embryonal	8	40	39	32	19	**119**	**138**	5.4	25.5	4.3	23.0	7.2	8.8	6.5	5.1	3.0	**6.9**	**6.0**	100	115	100.0	0.0
	d. Other gliomas	0	2	12	10	8	**24**	**32**	1.1	5.2	1.0	5.3	-	0.4	2.0	1.6	1.3	**1.2**	**1.2**	20	26	81.3	3.1
	e. Other specified	0	10	9	16	25	**35**	**60**	1.6	7.5	1.9	10.0	-	2.2	1.5	2.5	3.9	**1.9**	**2.4**	29	49	95.0	0.0
	f. Unspecified CNS	4	8	10	13	20	**35**	**55**	1.6	7.5	1.7	9.2	3.6	1.8	1.7	2.1	3.1	**2.0**	**2.2**	29	45	61.8	16.4
IV	**NEUROBLASTOMA**	37	68	25	4	3	**134**	**137**	6.1	100.0	4.3	100.0	33.4	14.9	4.2	0.6	0.5	**8.7**	**6.9**	117	119	97.1	0.7
	a. (Ganglio)neuroblastoma	37	68	24	3	2	**132**	**134**	6.0	98.5	4.2	97.8	33.4	14.9	4.0	0.5	0.3	**8.6**	**6.7**	115	117	97.0	0.7
	b. Peripheral nervous	0	0	1	1	1	**2**	**3**	0.1	1.5	0.1	2.2	-	-	0.2	0.2	0.2	**0.1**	**0.1**	2	2	100.0	0.0
V	**RETINOBLASTOMA**	12	29	2	1	0	**44**	**44**	2.0	100.0	1.4	100.0	10.8	6.4	0.3	0.2	-	**3.0**	**2.3**	39	39	79.5	0.0
VI	**RENAL TUMOURS**	15	74	23	9	13	**121**	**134**	5.5	100.0	4.2	100.0	13.5	16.3	3.8	1.4	2.0	**7.7**	**6.5**	105	115	95.5	3.0
	a. Nephroblastoma	13	70	20	8	1	**111**	**112**	5.1	91.7	3.5	83.6	11.7	15.4	3.3	1.3	0.2	**7.1**	**5.6**	96	97	98.2	0.9
	b. Renal carcinoma	0	1	2	1	11	**4**	**15**	0.2	3.3	0.5	11.2	-	0.2	0.3	0.2	1.7	**0.2**	**0.6**	3	12	100.0	0.0
	c. Unspecified	2	3	1	0	1	**6**	**7**	0.3	5.0	0.2	5.2	1.8	0.7	0.2	-	0.2	**0.4**	**0.3**	5	6	42.9	42.9
VII	**HEPATIC TUMOURS**	13	4	4	6	2	**27**	**29**	1.2	100.0	0.9	100.0	11.7	0.9	0.7	1.0	0.3	**1.7**	**1.4**	23	25	82.8	13.8
	a. Hepatoblastoma	11	3	0	0	0	**14**	**14**	0.6	51.9	0.4	48.3	9.9	0.7	-	-	-	**1.0**	**0.7**	12	12	92.9	0.0
	b. Hepatic carcinoma	1	1	3	6	2	**11**	**13**	0.5	40.7	0.4	44.8	0.9	0.2	0.5	1.0	0.3	**0.6**	**0.5**	9	11	84.6	15.4
	c. Unspecified	1	0	1	0	0	**2**	**2**	0.1	7.4	0.1	6.9	0.9	-	0.2	-	-	**0.1**	**0.1**	2	2	0.0	100.0
VIII	**BONE TUMOURS**	2	4	30	67	72	**103**	**175**	4.7	100.0	5.4	100.0	1.8	0.9	5.0	10.7	11.3	**5.1**	**6.5**	84	140	96.0	2.3
	a. Osteosarcoma	0	1	17	51	41	**69**	**110**	3.2	67.0	3.4	62.9	-	0.2	2.8	8.1	6.4	**3.3**	**4.0**	56	88	96.4	0.9
	b. Chondrosarcoma	0	0	0	1	7	**1**	**8**	0.0	1.0	0.2	4.6	-	-	-	0.2	1.1	**0.0**	**0.3**	1	6	100.0	0.0
	c. Ewing & related	0	1	13	11	13	**25**	**38**	1.1	24.3	1.2	21.7	-	0.2	2.2	1.8	2.0	**1.3**	**1.4**	20	31	100.0	0.0
	d. Other specified	1	1	0	2	4	**4**	**8**	0.2	3.9	0.2	4.6	0.9	0.2	-	0.3	0.6	**0.2**	**0.3**	3	7	100.0	0.0
	e. Unspecified	1	1	0	2	7	**4**	**11**	0.2	3.9	0.3	6.3	0.9	0.2	-	0.3	1.1	**0.2**	**0.4**	3	9	72.7	27.3
IX	**SOFT TISSUE SARCOMA**	17	39	37	52	69	**145**	**214**	6.6	100.0	6.7	100.0	15.4	8.6	6.2	8.3	10.8	**8.2**	**8.8**	122	176	98.6	0.5
	a. Rhabdomyosarcoma	8	29	16	17	17	**70**	**87**	3.2	48.3	2.7	40.7	7.2	6.4	2.7	2.7	2.7	**4.2**	**3.8**	60	73	98.9	1.1
	b. Fibrosarcoma	5	1	3	4	3	**13**	**16**	0.6	9.0	0.5	7.5	4.5	0.2	0.5	0.6	0.5	**0.8**	**0.7**	11	13	100.0	0.0
	c. Kaposi sarcoma	0	0	0	0	1	**0**	**1**	-	-	0.0	0.5	-	-	-	-	0.2	**-**	**0.0**	-	1	100.0	0.0
	d. Other specified	3	6	17	28	43	**54**	**97**	2.5	37.2	3.0	45.3	2.7	1.3	2.8	4.5	6.8	**2.8**	**3.7**	44	78	99.0	0.0
	e. Unspecified	1	3	1	3	5	**8**	**13**	0.4	5.5	0.4	6.1	0.9	0.7	0.2	0.5	0.8	**0.5**	**0.5**	7	11	92.3	0.0
X	**GERM CELL TUMOURS**	11	16	13	33	112	**73**	**185**	3.3	100.0	5.7	100.0	9.9	3.5	2.2	5.3	17.6	**4.1**	**7.1**	61	149	98.4	0.5
	a. CNS germ cell ‡	0	2	5	7	5	**14**	**19**	0.6	19.2	0.6	10.3	-	0.4	0.8	1.1	0.8	**0.7**	**0.7**	12	15	100.0	0.0
	b. Other extragonadal	7	9	1	4	15	**21**	**36**	1.0	28.8	1.1	19.5	6.3	2.0	0.2	0.6	2.4	**1.3**	**1.6**	18	30	97.2	0.0
	c. Gonadal germ cell	3	4	7	20	80	**34**	**114**	1.6	46.6	3.5	61.6	2.7	0.9	1.2	3.2	12.6	**1.8**	**4.2**	28	91	100.0	0.0
	d. Gonadal carcinoma	0	0	0	0	8	**0**	**8**	-	-	0.2	4.3	-	-	-	-	1.3	**-**	**0.3**	-	6	100.0	0.0
	e. Unspecified gonadal	1	1	0	2	4	**4**	**8**	0.2	5.5	0.2	4.3	0.9	0.2	-	0.3	0.6	**0.2**	**0.3**	3	7	75.0	12.5
XI	**CARCINOMA & MELANOMA**	1	2	12	73	188	**88**	**276**	4.0	100.0	8.6	100.0	0.9	0.4	2.0	11.6	29.5	**4.2**	**9.9**	71	218	99.6	0.0
	a. Adrenocortical	0	1	1	0	1	**2**	**3**	0.1	2.3	0.1	1.1	-	0.2	0.2	-	0.2	**0.1**	**0.1**	2	3	100.0	0.0
	b. Thyroid	0	1	4	41	112	**46**	**158**	2.1	52.3	4.9	57.2	-	0.2	0.7	6.5	17.6	**2.2**	**5.6**	37	125	100.0	0.0
	c. Nasopharyngeal	0	0	0	6	9	**6**	**15**	0.3	6.8	0.5	5.4	-	-	-	1.0	1.4	**0.3**	**0.5**	5	12	100.0	0.0
	d. Melanoma	1	0	4	4	11	**9**	**20**	0.4	10.2	0.6	7.2	0.9	-	0.7	0.6	1.7	**0.5**	**0.8**	7	16	95.0	0.0
	e. Skin carcinoma	0	0	0	0	0	**0**	**0**	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
	f. Other & unspecified	0	0	3	22	55	**25**	**80**	1.1	28.4	2.5	29.0	-	-	0.5	3.5	8.6	**1.2**	**2.9**	20	63	100.0	0.0
XII	**OTHER & UNSPECIFIED**	10	12	9	20	16	**51**	**67**	2.3	100.0	2.1	100.0	9.0	2.6	1.5	3.2	2.5	**2.9**	**2.8**	43	55	67.2	23.9
	a. Other specified	0	1	0	0	2	**1**	**3**	0.0	2.0	0.1	4.5	-	0.2	-	-	0.3	**0.1**	**0.1**	1	2	100.0	0.0
	b. Other unspecified	10	11	9	20	14	**50**	**64**	2.3	98.0	2.0	95.5	9.0	2.4	1.5	3.2	2.2	**2.8**	**2.7**	42	53	65.6	25.0
	TOTAL	186	721	578	703	1030	**2188**	**3218**	100.0	100.0	100.0	100.0	168.0	158.5	96.4	111.9	161.8	**125.7**	**133.8**	1843	2652	95.5	1.9

† includes 77 non-malignant ‡ includes 1 non-malignant

Please consult the quality indicators for this registry

Uruguay

Uruguay National Cancer Registry, 1993–2012

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Uruguay covers an area of 176 215 km^2 and is bordered by Argentina, Brazil, and the Atlantic Ocean. Uruguay is located entirely within the temperate zone; thus, the climate is relatively mild and uniform nationwide.

Uruguay is a democratic constitutional republic, with a president who serves as head of state and head of government. It is a high-income country with a very high Human Development Index. Uruguay is a global exporter of combed wool, rice, soybeans, frozen beef, malt, and milk. Nearly 95% of the country's electricity is generated by renewable energy from hydroelectric facilities and wind parks. The country had a major economic and financial crisis in 1999–2002, when the unemployment rate reached 21%. In 2005, the Ministry of Social Development launched a plan, which resulted in a reduction in the poverty rate from 33% in 2002 to 22% in 2008. In exchange for the support received, the low-income families were expected to participate in community work, ensure that their children attended school daily, and undergo regular health check-ups.

In 2010, the population was 3.4 million, and 30% of the population was younger than 20 years (Table A.6). Overall, 95% of the population lives in urban areas and about 50% lives in the capital of Montevideo and its metropolitan area. The population is predominantly White; an estimated 88% of the population is of European ancestry.

The life expectancy at birth is 76 years. The infant mortality rate decreased from 20.2 per 1000 live births in 1993 to 9.8 per 1000 live births in 2012. The demographic pyramid corresponds to a stationary phase of the demographic transition.

Health care is provided by private facilities and free public services. Until 2007, the public State Health Services Administration provided health services free of charge to predominantly people with low income, and a collective of small insurers and lenders covered cancer care for employees, managed within a network of private hospitals and clinics. In 2007, the National Integrated Health System brought together the private and public systems to provide comprehensive, equitable, universal health coverage under a single benefits plan. This Integrated Health Care Plan shifted the focus of service delivery back towards primary health care, prevention of noncommunicable diseases, and health promotion activities.

The Uruguay National Cancer Registry (UNCR) was created in 1984 (Table A.10), and population-based data have been collected at the national level since 1991. The registry is currently hosted by the Honorary Committee for the Fight Against Cancer.

The UNCR employs 7 staff in its central unit and actively collects data throughout the country through 30 registrars. All staff members sign confidentiality agreements. Documents and databases are protected according to national and international guidelines.

The UNCR accesses all the death certificates of the whole country and records cancer deaths, linked to the corresponding incidence, when they have already been registered. Non-registered cases identified through a death certificate are traced back to medical records.

The Paediatric Haemato-Oncology Centre is a National Reference Centre that provides full assistance for people who receive public health services, and for most of those covered by the private system. A few additional patients are assisted in private services, but most of them have at least one outpatient evaluation in the Reference Centre. A paediatric cancer registry operates in this centre and records all incident cases. The UNCR receives these data annually, and the few remaining cases are collected by the registrars in the usual registration process.

New cases are checked for duplication, coded according to ICD-O-3 (ICD-O was used until 2004) (Table A.10) and according to IARC rules for multiple primary tumours, and recorded using software developed by the registry. Quality control procedures are performed both manually and automatically through Can-Check and UNCR software. No follow-up for vital status is done by the UNCR.

Incidence and mortality atlases are regularly published, usually involving data for a 5-year period. More frequently published reports as well as specific reports are also produced.

The UNCR has been involved in several projects at the national and international level and in cancer epidemiological research.

POPULATION AT RISK

Population data were provided by the National Institute of Statistics (https://www.ine.gub.uy/) and are based on the censuses of 1985, 1996, 2004, and 2011 (Table A.7) and intercensal estimates. Linear interpolation and extrapolation were performed by the registry. Data were provided in all requested detail.

EDITORS' COMMENTS

The registry participated in IICC-2 (Table A.1). Day of incidence was unknown in more than 50% of cases, and month of incidence was unknown in 20% of cases (Table A.8). The registry considers age to be recorded correctly and independently of the collected dates. The DCO% was high (8%) (Table A.9). Non-malignant CNS tumours were not reportable, but pilocytic astrocytoma was registered and coded with malignant behaviour throughout the reporting period. Skin carcinomas were reportable, and registration is believed to be complete. Malignant carcinoid of appendix made up 1.1% of all cases (Table A.11). Laterality was not collected.

URUGUAY (1993-2012)

	Age group (years)	Males	Females
Person-years	0	484 433	465 542
	1-4	2 023 794	1 949 459
	5-9	2 653 987	2 548 474
	10-14	2 652 255	2 557 155
	15-19	2 637 084	2 550 149
	0-14	7 814 469	7 520 630
	0-19	10 451 553	10 070 779
Average annual population	0-14	390 723	376 032
	0-19	522 578	503 539

Please consult the quality indicators for this registry

URUGUAY (1993-2012)

		Number of cases							Percentage				Incidence rates per million person-years									MV	DCO
		Age group (years)							0-14		0-19		Age-specific					ASR		Cumulative		%	%
		0	1-4	5-9	10-14	15-19	0-14	0-19	All	Group	All	Group	0	1-4	5-9	10-14	15-19	0-14	0-19	0-14	0-19	0-19	0-19
I	LEUKAEMIA	29	278	190	157	146	654	800	30.9	100.0	27.3	100.0	30.5	70.0	36.5	30.1	28.1	44.7	41.0	645	786	87.6	12.4
	a. Lymphoid	12	221	136	98	64	467	531	22.1	71.4	18.1	66.4	12.6	55.6	26.1	18.8	12.3	32.2	27.7	461	523	91.1	8.9
	b. Acute myeloid	13	37	33	44	42	127	169	6.0	19.4	5.8	21.1	13.7	9.3	6.3	8.4	8.1	8.4	8.4	125	165	87.6	12.4
	c. CMD	0	6	2	3	16	11	27	0.5	1.7	0.9	3.4	-	1.5	0.4	0.6	3.1	0.8	1.3	11	26	92.6	7.4
	d. MDS & other	2	0	0	3	10	5	15	0.2	0.8	0.5	1.9	2.1	-	-	0.6	1.9	0.3	0.7	5	15	100.0	0.0
	e. Unspecified	2	14	19	9	14	44	58	2.1	6.7	2.0	7.2	2.1	3.5	3.7	1.7	2.7	2.9	2.9	43	57	50.0	50.0
II	LYMPHOMA & RELATED	9	57	117	114	184	297	481	14.0	100.0	16.4	100.0	9.5	14.3	22.5	21.9	35.5	18.8	22.5	289	466	94.6	5.4
	a. Hodgkin	0	8	38	64	104	110	214	5.2	37.0	7.3	44.5	-	2.0	7.3	12.3	20.0	6.6	9.6	106	206	98.1	1.9
	b. Non-Hodgkin except BL	3	15	33	30	43	81	124	3.8	27.3	4.2	25.8	3.2	3.8	6.3	5.8	8.3	5.1	5.8	79	120	98.4	1.6
	c. Burkitt (BL)	0	18	34	9	5	61	66	2.9	20.5	2.3	13.7	-	4.5	6.5	1.7	1.0	4.0	3.3	60	64	100.0	0.0
	d. Lymphoreticular	6	10	5	6	1	27	28	1.3	9.1	1.0	5.8	6.3	2.5	1.0	1.2	0.2	1.9	1.5	27	28	89.3	10.7
	e. Unspecified	0	6	7	5	31	18	49	0.9	6.1	1.7	10.2	-	1.5	1.3	1.0	6.0	1.2	2.3	18	48	65.3	34.7
III	CNS NEOPLASMS	16	134	133	99	61	382	443	18.1	100.0	15.1	100.0	16.8	33.7	25.6	19.0	11.8	25.6	22.5	375	434	78.6	11.1
	a. Ependymoma	1	27	12	23	5	63	68	3.0	16.5	2.3	15.3	1.1	6.8	2.3	4.4	1.0	4.2	3.5	62	67	88.2	11.8
	b. Astrocytoma	8	29	41	27	13	105	118	5.0	27.5	4.0	26.6	8.4	7.3	7.9	5.2	2.5	7.0	6.0	103	115	90.7	2.5
	c. CNS embryonal	3	30	31	15	10	79	89	3.7	20.7	3.0	20.1	3.2	7.6	6.0	2.9	1.9	5.4	4.6	78	87	93.3	4.5
	d. Other gliomas	3	20	31	22	17	76	93	3.6	19.9	3.2	21.0	3.2	5.0	6.0	4.2	3.3	5.0	4.6	74	91	83.9	3.2
	e. Other specified	0	1	3	5	4	9	13	0.4	2.4	0.4	2.9	-	0.3	0.6	1.0	0.8	0.5	0.6	9	13	92.3	7.7
	f. Unspecified CNS	1	27	15	7	12	50	62	2.4	13.1	2.1	14.0	1.1	6.8	2.9	1.3	2.3	3.5	3.2	50	61	12.9	48.4
IV	NEUROBLASTOMA	44	78	19	7	7	148	155	7.0	100.0	5.3	100.0	46.3	19.6	3.7	1.3	1.3	11.2	9.0	149	156	94.2	5.8
	a. (Ganglio)neuroblastoma	44	78	19	7	7	148	155	7.0	100.0	5.3	100.0	46.3	19.6	3.7	1.3	1.3	11.2	9.0	149	156	94.2	5.8
	b. Peripheral nervous	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
V	RETINOBLASTOMA	23	39	7	0	0	69	69	3.3	100.0	2.4	100.0	24.2	9.8	1.3	-	-	5.3	4.1	70	70	95.7	4.3
VI	RENAL TUMOURS	16	52	15	4	3	87	90	4.1	100.0	3.1	100.0	16.8	13.1	2.9	0.8	0.6	6.5	5.2	87	90	96.7	2.2
	a. Nephroblastoma	16	50	13	3	0	82	82	3.9	94.3	2.8	91.1	16.8	12.6	2.5	0.6	-	6.2	4.8	82	82	98.8	1.2
	b. Renal carcinoma	0	1	1	1	1	3	4	0.1	3.4	0.1	4.4	-	0.3	0.2	0.2	0.2	0.2	0.2	3	4	100.0	0.0
	c. Unspecified	0	1	1	0	2	2	4	0.1	2.3	0.1	4.4	-	0.3	0.2	-	0.4	0.1	0.2	2	4	50.0	25.0
VII	HEPATIC TUMOURS	4	9	5	2	3	20	23	0.9	100.0	0.8	100.0	4.2	2.3	1.0	0.4	0.6	1.4	1.2	20	23	91.3	0.0
	a. Hepatoblastoma	4	8	2	0	0	14	14	0.7	70.0	0.5	60.9	4.2	2.0	0.4	-	-	1.1	0.8	14	14	100.0	0.0
	b. Hepatic carcinoma	0	1	2	1	3	4	7	0.2	20.0	0.2	30.4	-	0.3	0.4	0.2	0.6	0.3	0.3	4	7	100.0	0.0
	c. Unspecified	0	0	1	1	0	2	2	0.1	10.0	0.1	8.7	-	-	0.2	0.2	-	0.1	0.1	2	2	0.0	0.0
VIII	BONE TUMOURS	1	8	38	77	71	124	195	5.9	100.0	6.7	100.0	1.1	2.0	7.3	14.8	13.7	7.4	8.8	120	188	97.4	1.5
	a. Osteosarcoma	0	1	19	43	33	63	96	3.0	50.8	3.3	49.2	-	0.3	3.7	8.3	6.4	3.7	4.3	61	92	97.9	1.0
	b. Chondrosarcoma	0	0	0	0	2	0	2	-	-	0.1	1.0	-	-	-	-	0.4	-	0.1	-	2	100.0	0.0
	c. Ewing & related	1	6	17	32	31	56	87	2.6	45.2	3.0	44.6	1.1	1.5	3.3	6.1	6.0	3.4	4.0	54	84	97.7	2.3
	d. Other specified	0	0	1	1	2	2	4	0.1	1.6	0.1	2.1	-	-	0.2	0.2	0.4	0.1	0.2	2	4	100.0	0.0
	e. Unspecified	0	1	1	1	3	3	6	0.1	2.4	0.2	3.1	-	0.3	0.2	0.2	0.6	0.2	0.3	3	6	83.3	0.0
IX	SOFT TISSUE SARCOMA	13	48	41	41	41	143	184	6.8	100.0	6.3	100.0	13.7	12.1	7.9	7.9	7.9	9.6	9.2	141	180	94.6	5.4
	a. Rhabdomyosarcoma	5	32	21	16	10	74	84	3.5	51.7	2.9	45.7	5.3	8.1	4.0	3.1	1.9	5.1	4.4	73	83	94.0	6.0
	b. Fibrosarcoma	2	6	5	7	8	20	28	0.9	14.0	1.0	15.2	2.1	1.5	1.0	1.3	1.5	1.3	1.4	20	27	100.0	0.0
	c. Kaposi sarcoma	1	0	0	0	0	1	1	0.0	0.7	0.0	0.5	1.1	-	-	-	-	0.1	0.1	1	1	100.0	0.0
	d. Other specified	3	4	8	17	15	32	47	1.5	22.4	1.6	25.5	3.2	1.0	1.5	3.3	2.9	2.0	2.2	31	46	100.0	0.0
	e. Unspecified	2	6	7	1	8	16	24	0.8	11.2	0.8	13.0	2.1	1.5	1.3	0.2	1.5	1.1	1.2	16	24	79.2	20.8
X	GERM CELL TUMOURS	14	20	10	25	107	69	176	3.3	100.0	6.0	100.0	14.7	5.0	1.9	4.8	20.6	4.7	8.3	68	171	92.6	4.5
	a. CNS germ cell	0	1	3	3	3	7	10	0.3	10.1	0.3	5.7	-	0.3	0.6	0.6	0.6	0.4	0.5	7	10	90.0	10.0
	b. Other extragonadal	12	4	0	0	11	16	27	0.8	23.2	0.9	15.3	12.6	1.0	-	-	2.1	1.3	1.5	16	27	88.9	11.1
	c. Gonadal germ cell	2	11	5	20	69	38	107	1.8	55.1	3.7	60.8	2.1	2.8	1.0	3.8	13.3	2.4	4.9	37	104	100.0	0.0
	d. Gonadal carcinoma	0	0	1	1	12	2	14	0.1	2.9	0.5	8.0	-	-	0.2	0.2	2.3	0.1	0.6	2	13	92.9	7.1
	e. Unspecified gonadal	0	4	1	1	12	6	18	0.3	8.7	0.6	10.2	-	1.0	0.2	0.2	2.3	0.4	0.9	6	18	55.6	16.7
XI	CARCINOMA & MELANOMA	1	4	17	67	152	89	241	4.2	100.0	8.2	100.0	1.1	1.0	3.3	12.9	29.3	5.2	10.6	86	232	99.6	0.4
	a. Adrenocortical	0	0	0	1	0	1	1	0.0	1.1	0.0	0.4	-	-	-	0.2	-	0.1	0.0	1	1	100.0	0.0
	b. Thyroid	0	0	4	28	57	32	89	1.5	36.0	3.0	36.9	-	-	0.8	5.4	11.0	1.8	3.9	31	86	100.0	0.0
	c. Nasopharyngeal	0	0	1	2	9	3	12	0.1	3.4	0.4	5.0	-	-	0.2	0.4	1.7	0.2	0.5	3	12	100.0	0.0
	d. Melanoma	0	2	0	2	9	4	13	0.2	4.5	0.4	5.4	-	0.5	-	0.4	1.7	0.3	0.6	4	13	100.0	0.0
	e. Skin carcinoma	0	1	3	7	20	11	31	0.5	12.4	1.1	12.9	-	0.3	0.6	1.3	3.9	0.7	1.4	11	30	100.0	0.0
	f. Other & unspecified	1	1	9	27	57	38	95	1.8	42.7	3.2	39.4	1.1	0.3	1.7	5.2	11.0	2.2	4.2	37	92	98.9	1.1
XII	OTHER & UNSPECIFIED	4	8	4	16	41	32	73	1.5	100.0	2.5	100.0	4.2	2.0	0.8	3.1	7.9	2.1	3.4	31	71	53.4	15.1
	a. Other specified	0	3	0	1	1	4	5	0.2	12.5	0.2	6.8	-	0.8	-	0.2	0.2	0.3	0.3	4	5	100.0	0.0
	b. Other unspecified	4	5	4	15	40	28	68	1.3	87.5	2.3	93.2	4.2	1.3	0.8	2.9	7.7	1.8	3.1	27	66	50.0	16.2
	TOTAL	174	735	596	609	816	2114	2930	100.0	100.0	100.0	100.0	183.2	185.0	114.6	116.9	157.3	142.4	145.7	2080	2867	89.8	7.5

Please consult the quality indicators for this registry