

Childhood cancer survival in the province of Granada, 2004-2013

María José Sánchez Pérez^{1,2,3}, Miguel Rodríguez Barranco^{1,2,3}, Daniel Redondo Sánchez^{1,2,3}, David López López^{1,3}, Eloísa Bayo⁴

1. Granada Cancer Registry, Andalusian School of Public Health, Granada, Spain.

2. Instituto de Investigación Biosanitaria de Granada (ibs.Granada), Universidad de Granada, Granada, Spain.

3. CIBER of Epidemiology and Public Health (CIBERESP), Madrid, Spain.

4. Radiation Oncology and Radiophysics Unit. University Hospital Virgen Macarena, Sevilla, Spain

OBJECTIVES

To analyze, by sex, age and diagnostic group, the survival in children in the province of Granada diagnosed for the first time with cancer in the period 2004-2013.

METHODS

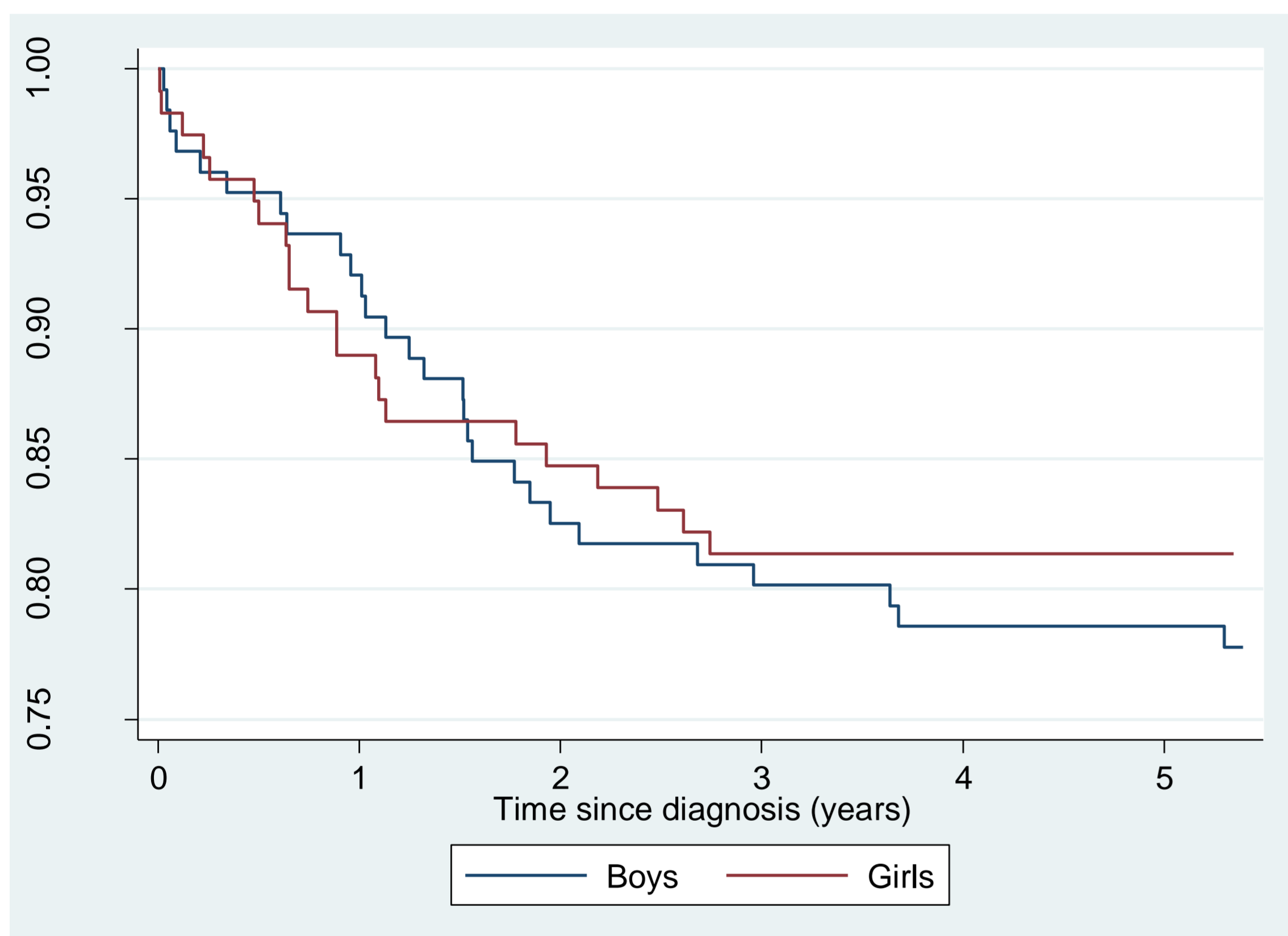
The Granada Cancer Registry database contains data for all incident cancer cases diagnosed in children (age 0-14 years) from 2004 to 2013. Life status follow-up of the patients was uniformly updated until December 31st, 2018 through multiple sources of information (National Death Index, hospital, outpatient and primary care records). Cancers were grouped into diagnostic categories defined according to the International Classification of Childhood Cancer, third edition (ICCC-3). Cases were stratified into four age groups (<1, 1-4, 5-9, 10-14).

The observed survival was estimated using the Kaplan-Meier method. Cases only known by death certificate and diagnosed at autopsy were excluded from the analysis. For each sex, age group and diagnostic group, the probability of surviving 1, 3 and 5 years from diagnosis was estimated, together with its 95% confidence intervals (95% CI).

RESULTS

In the period 2004-2013, 244 newly cases of childhood cancer were diagnosed in the province of Granada. For all cancers combined for children, 5-year survival was 79.9% (95% CI: 74.3-84.4), 81.4% in girls and 78.6% in boys. Children aged 10-14 years had the lowest survival rate (76.3%), mainly for the result obtained among boys (68.3%).

Kaplan-Meier survival function by sex



Survival (%) by sex and age groups. Period 2004-2013

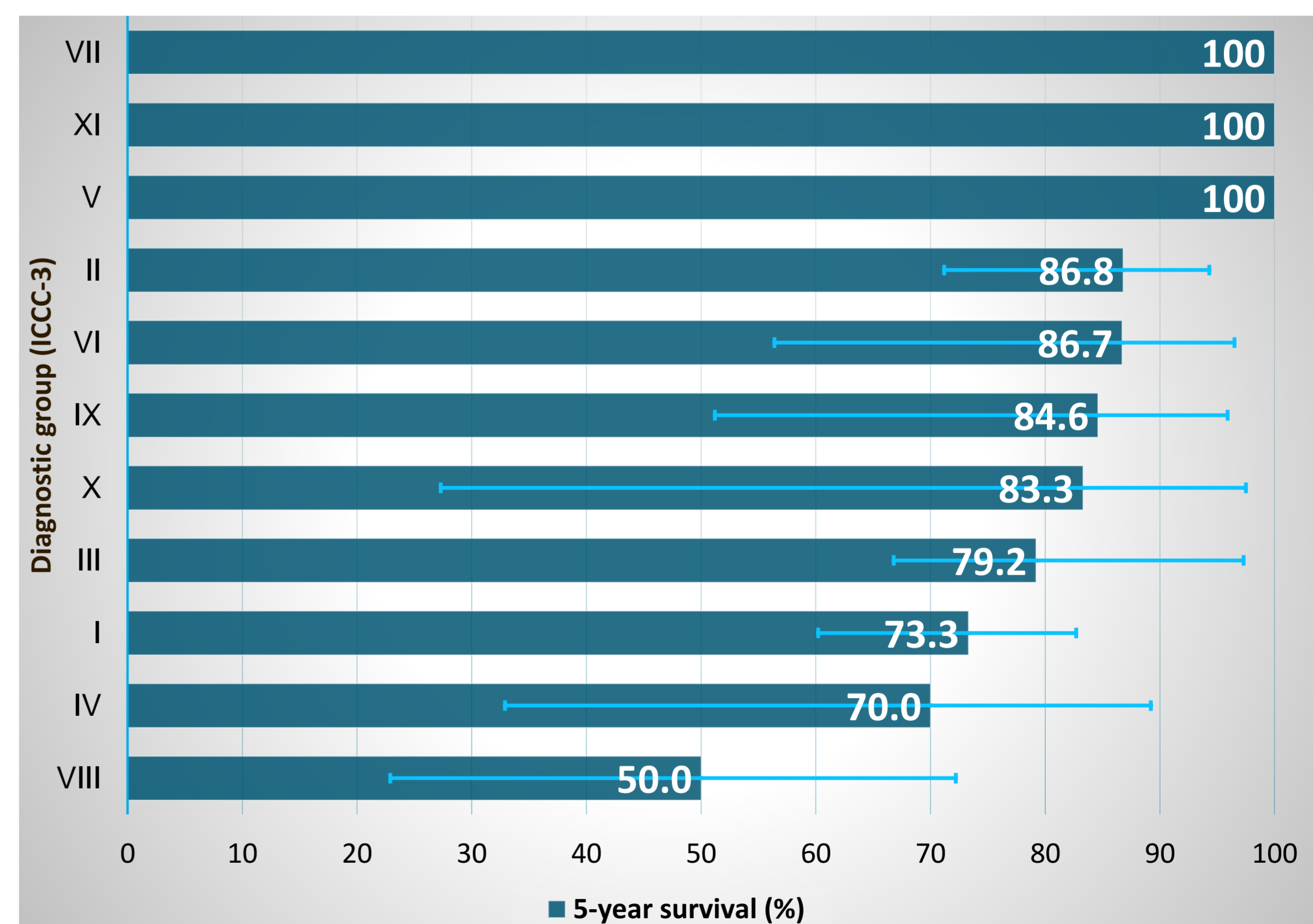
		Time since diagnosis					
		1-year		3-years		5-years	
		Survival	95% CI	Survival	95% CI	Survival	95% CI
Boys	Total	92.1	(85.8-95.7)	80.2	(72.1-86.1)	78.6	(70.3-84.8)
	<1	100	-	77.8	(36.5-93.9)	77.8	(36.5-93.9)
	1-4	87.2	(71.9-94.5)	82.1	(66.0-91.0)	82.1	(66.0-91.0)
	5-9	97.3	(82.3-99.6)	86.5	(70.5-94.1)	86.5	(70.5-94.1)
	10-14	90.2	(76.1-96.2)	73.2	(56.8-84.1)	68.3	(51.7-80.2)
Girls	Total	89.0	(81.8-93.5)	81.4	(73.1-87.3)	81.4	(73.1-87.3)
	<1	100	-	87.5	(38.7-98.1)	87.5	(38.7-98.1)
	1-4	85.7	(70.9-93.3)	78.6	(62.9-88.2)	78.6	(62.9-88.2)
	5-9	84.8	(67.4-93.4)	78.8	(60.6-89.3)	78.8	(60.6-89.3)
	10-14	94.3	(79.0-98.5)	85.7	(69.0-93.8)	85.7	(69.0-93.8)
Both sexes	Total	90.6	(86.2-93.6)	80.7	(75.2-85.2)	79.9	(74.3-84.4)
	<1	100	-	82.6	(37.6-96.0)	82.6	(37.6-96.0)
	1-4	86.4	(71.4-93.9)	80.3	(64.4-89.6)	80.3	(64.4-89.6)
	5-9	91.1	(74.8-96.5)	82.6	(65.6-91.7)	82.6	(65.6-91.7)
	10-14	92.3	(77.5-97.4)	79.4	(62.9-89.0)	77.0	(60.4-87.0)

5-year survival according to diagnostic groups varied between 50% of bone tumors to 100% of liver tumors, skin melanomas and retinoblastomas. Among the most frequent diagnostic groups, 5-year survival for leukemias was 73.3% (95% CI: 60.2-82.7), for lymphomas 86.8% (95% CI: 71.2-94.3) and for central nervous system tumors 79.4% (95% CI: 67.1-87.5).

Number of cases by diagnostic group. Children 0-14 years old, period 2004-2013

Diagnostic group (ICCC-3)	n (%)
I. Leukemias, myeloproliferative diseases, and myelodysplastic diseases	60 (24.6)
II. Lymphomas and reticuloendothelial neoplasms	38 (15.6)
III. CNS and miscellaneous intracranial and intraspinal neoplasms	63 (25.8)
IV. Neuroblastoma and other peripheral nervous cell tumors	10 (4.1)
V. Retinoblastoma	7 (2.9)
VI. Renal tumors	15 (6.1)
VII. Hepatic tumors	2 (0.8)
VIII. Malignant bone tumors	14 (5.7)
IX. Soft tissue and other extrasosseous sarcomas	13 (5.3)
X. Germ cell tumors, trophoblastic tumors, and neoplasms of gonads	6 (2.5)
XI. Other malignant epithelial neoplasms and malignant melanomas	16 (6.6)
XII. Other and unspecified malignant neoplasms	0 (0)
Total	244 (100)

5-year survival (%) and 95% confidence interval by diagnostic group



CONCLUSIONS

Childhood cancer survival rates in Granada are similar to those estimated for Spain and other European countries (which are around 80%), showing differences by sex, age and diagnostic group. Boys 10-14 years old and bone tumours showed the worst survival rates in our region for that period. In spite of the advances in the last decades, efforts must be remained to continue improving the life expectancy in the child population.

All authors declare no conflict of interest.