MORPHOLOGICAL CHARACTERIZATION OF BONE AND SOFT TISSUE SARCOMAS BASED ON ITALIAN NETWORK OF CANCER REGISTRIES

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Introduction. Sarcomas are a heterogeneous group of malignant neoplasms of mesenchymal origin. They are one of the major groups of rare cancers in Europe. Soft tissue sarcomas are more frequent than bone sarcoma, with world age-standardized incidence rates of 1.5-3.0/100,000/year and 0.5-2.0/100,000/year respectively. In Europe, soft tissue sarcomas constitute about 84% of the sarcomas; bone sarcomas constitute around 14% of all sarcomas. The aim of the present study was to provide estimates of the incidence and survival for soft tissue and bone sarcomas in Italy. To do this we analysed a large series of population-based cases archived by Italian cancer registries.

Methods. We asked Italian cancer registries to provide data on bone sarcoma and soft tissue sarcoma cases incident between January 1st 2009 and December 31st 2012, that had at least five years of follow-up. Fifteen Italian population-based cancer registries, all affiliated to the Italian Association of Cancer Registries (AIRTUM), sent in data. Bone sarcoma cases were defined by topographic codes C40*-C41*; soft tissue sarcoma cases were defined by topographic codes C47*-C49*, according to the 3rd edition of the International Classification of Disease for Oncology (ICD-O-3). Not otherwise specified (NOS) cases were included as this was a population-based study, and we were interested in completeness rather than morphological precision.

Fig 1,2: Age-standardized incidence rates for bone and soft tissue sarcomas, by cancer registry and age class

Incidence rates x 100 000

Registry	Bone	Soft tissue
Aosta	0.8 (0.1-2.4)	1 (0.4-2.4)
Bolzano	0.8 (0.4-1.3)	1.7 (1.2-2.4)
Genova	0.6 (0.3-1.1)	1.4 (1.0-2.0)
Modena	0 (0.0-0.2)	1.5 (1.0-2.1)
Parma	0.1 (0.0-2.2)	1.4 (0.9-2.1)
Pavia	1.4 (0.8-2.2)	2.5 (1.9-3.3)
Reggio Emilia	0.8 (0.4-1.4)	1.3 (0.9-1.8)
Sondrio	0.9 (0.3-2.1)	1.2 (0.6-2.3)
Varese	0.8 (0.5-1.3)	2.1 (1.6-2.6)
Firenze-Prato	1.0 (0.6-1.5)	2.3 (1.7-2.9)
Brindisi	1.0 (0.4-2.1)	1.2 (0.7-2.1)
CataniaMessinaEnna	0.8 (0.6-1.0)	1.4 (1.2-1.7)
Nuoro	0.4 (0.1-1.1)	1.3 (0.7-2.3)
Ragusa	0.6 (0.3-1.2)	1.9 (1.2-2.8)
Siracusa	0.9 (0.4-1.6)	1.5 (1.0-2.2)

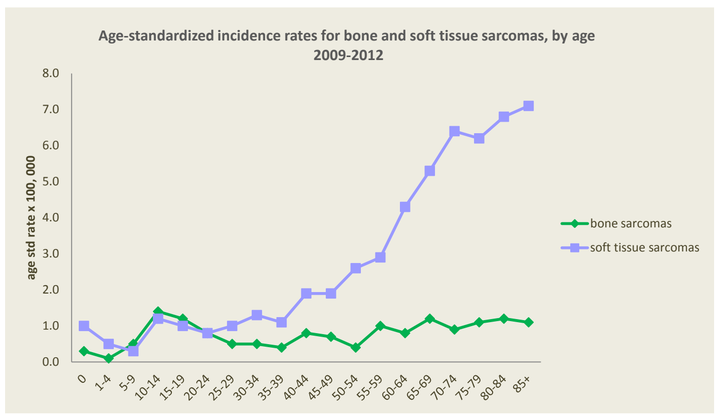
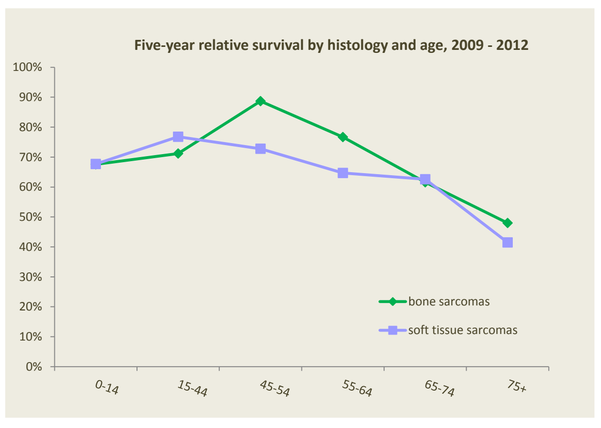
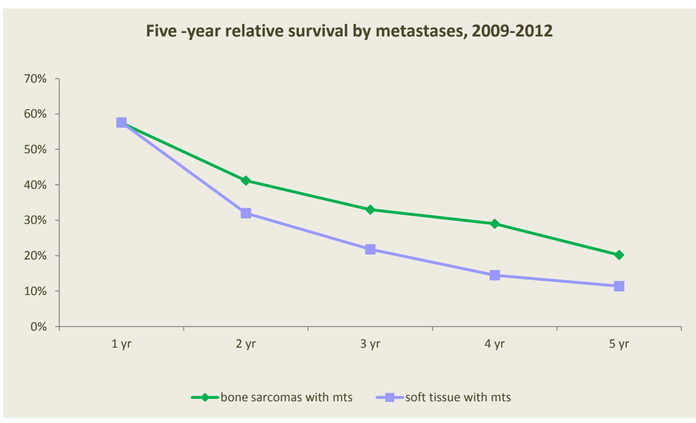


Fig 3,4: Five-years relative survival





The highest incidence rates were observed in the provinces of Pavia and Florence-Prato. For soft tissue sarcomas, there were two peaks at 0 and 10 years of age and a constant increase over 50 years; also for the bone sarcomas a peak appeared at 10 years, followed by a slight and constant increase in incidence with increasing age.

Five-years survival was good for both bone and soft tissue sarcomas, which was reduced when there are metastases at diagnosis. The best survival was observed in adults (bone) while the worst survival in the elderly (for both bone and soft tissue).

Tab. 1, 2: the most frequent morphologies by site and Italian macro areas

	Bone sarcomas				
macro areas	pelvis	lower limbs	upper limbs	face	trunk
North Italy	chondrosarcomas	osteosarcomas	chondrosarcomas	osteosarcomas	chondrosarcomas
Central Italy	cordomas	chondrosarcomas	chondrosarcomas	osteosarcomas	chondrosarcomas Ewing
South Italy	chondrosarcomas Ewing	osteosarcomas	chondrosarcomas	osteosarcomas chondrosarcomas	chondrosarcomas

Bone

North: chondrosarcomas (pelvis and upper limb) and osteosarcomas that arise in the lower limb and in the bones of the face.
Center: cordomas are observed in the pelvis (small numbers!), followed by chondrosarcomas in the lower and upper limbs; Ewing and chondrosarcomas in the trunk.
South: chondrosarcomas and Ewing in the pelvis, chondrosarcomas in the upper limbs, in the bones of the face and trunk, osteosarcomas in the lower limbs.

Soft tissue

North: leiomyosarcomas arise in the abdomen and in the head and neck, liposarcomas lower limbs and in the trunk.
Center: NOS sarcomas arise in the abdomen while mixosarcomas and leiomyosarcomas arise in the head and neck.
South: leiomyosarcomas arise in the abdomen, liposarcomas in the lower limbs, fibrosarcomas arise in the upper limbs and in the trunk while hemangiosarcomas originated in the head neck district.

	Soft tissue				
macro areas	abdonmen	lower limbs	upper limbs	head & neck	trunk
North Italy	leiomyosarcomas	liposarcomas	fibrosarcoma	leiomyosarcomas	liposarcomas
Central Italy	NOS sarcomas	fibrosarcomas	leiomyosarcomas	mixosarcomas leiomyosarcomas	fibrosarcomas leiomyosarcomas
South Italy	leiomyosarcomas	liposarcomas	fibrosarcoma	fibrosarcomas hemangiosarcomas	fibrosarcomas

Conclusions. This is a descriptive epidemiological study of sarcomas arising mostly in the limbs, pelvis, head and neck and trunk in the network of Italian cancer registries (AIRTUM). Sarcomas are rare tumors and significant analysis can only be performed by collecting data from a large population network.
Thanks to the large number of cases it was possible, for example, to link the morphologies with sites of sarcomas for the first time in the italian registries and thanks to the cancer network it was possible to obtain cases even for highly specific and rare cancer to study any differences that arise in the different geographical areas.

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