

# Report on incidence and mortality trends of cervical cancer in northern Sardinia, Italy

A. Cossu<sup>1</sup>, G. Capobianco<sup>2</sup>, M. Budroni<sup>3</sup>, D. Surico<sup>4</sup>, R. Cesaraccio<sup>3</sup>, F. Tanda<sup>1</sup>,  
M. Dessole<sup>2</sup>, S. Dessole<sup>2</sup>, G. Palmieri<sup>5</sup>

<sup>1</sup> Department of Surgical, Microsurgical and Medical Sciences, University of Sassari, Sassari

<sup>2</sup> Gynecologic and Obstetric Clinic, Department of Surgical, Microsurgical and Medical Sciences, University of Sassari

<sup>3</sup> Service of Epidemiology, A.S.L. 1, Sassari

<sup>4</sup> Gynecologic and Obstetric Clinic, Department of Clinical and Experimental Medicine, University of Piemonte Orientale "Amedeo Avogadro", Novara

<sup>5</sup> Institute of Biomolecular Chemistry, Cancer Genetics Unit, C.N.R., Sassari (Italy)

## Summary

**Introduction:** The aim of this study was to analyze and describe the incidence and mortality trends of cervical cancer in northern Sardinia, Italy, in the period 1992–2010. **Materials and Methods:** Data were obtained from the tumor registry of Sassari province which is part of a wider registry web, coordinated today by the Italian Association for Tumor Registries. **Results:** The overall number of cervical cancer cases registered in the period under investigation was 311. The mean age of the patients was 51.8 years. The standardized incidence and mortality rates were 6.6 / 100.000 and 0.7 / 100.000, respectively. A stable trend in incidence and mortality of cervical cancer was evidenced. Relative survival at five years from diagnosis was fairly good (66.3%). **Conclusions:** The incidence and mortality trends of cervical cancer in northern Sardinia remained relatively stable in the last decades. Furthermore, survival of patients with cervical cancer is good in the area, sanctioning the adequacy of the preventive and clinical measures in use.

**Key words:** Cervix cancer; Adenocarcinoma; Squamous carcinoma; Screening; Pap test; Sardinia.

## Introduction

Cervical cancer is one of the most common malignant neoplasias in women worldwide, with more than 500,000 new cases and more than 275,000 deaths estimated in 2008 [1]. Large part of these cases are registered in developing countries, especially in Africa and South America, while incidence and mortality rates in Western countries were reduced in the last decades, due to the improvements in the detection and treatment of cervical infections and pre-neoplastic or early neoplastic neoplasias [2]. Previous reports [3–5] investigated the epidemiological characteristics of cervical cancer in northern Sardinia, Italy from 1965 to 2000.

The aim of this population-based study was to analyze and describe the incidence and mortality trends of cervical cancer in northern Sardinia (Italy), in the period 1992–2010, and to compare them with previous reports [3–5] in order to investigate the epidemiological evolution of the disease in the area.

## Materials and Methods

The epidemiological data presented in this article were obtained from the "Registry of the Tumors of the Province of Sassari". This registry was created in 1992 by the local health agency for the epidemiological surveillance of tumors in the province. In 1999 it

became part of a wider web of tumor registries, coordinated today by the Italian Association for Tumor Registries (Associazione Italiana Registri Tumori, AIRTUM). The association coordinates 34 registries in the country, collects and publishes data, and collaborates with international organizations in the field.

Every registry collects data on tumoral diseases affecting inhabitants in the territory of jurisdiction through the local hospitals and health care services, as with other registries (e.g., death registries). Demographic, clinical, pathological, and prognostic data are collected for each case of cancer and are registered in a digital database. This database was the data source for the present population-based report and for other reports published in the past, depicting the burden of the principal malignant tumors in the area [6–11].

The demographic characteristics of the patients affected by cervix cancer were collected. Crude incidence and mortality rates per 100,000 inhabitants per year were calculated, as were standardized rates adjusted for European age-population standards. A comparison between incidence and mortality in the province of Sassari and those in other Italian provinces was performed. Additionally, the cumulative risk of developing the disease and of deaths between zero and 74 years of age was estimated. The age-class distribution and time-trends of incidence, mortality and histology were evaluated. Finally, relative five-year survival was calculated with the Hakulinen method.

## Results

The overall number of cases of cervix cancer registered in the period under investigation was 311. Diagnosis was obtained by histological or cytological reports in 307 cases (98.7%) and using other information sources (clinical re-

Table 1. — Age-class incidence distribution of cervical cancer in north Sardinia, 1992-2010.

Age class (years)	% of cases
0-14	0
15-29	1.93
30-44	32.15
45-59	37.94
60-74	20.58
75+	7.40

ports, radiological referrals, death certifications, etc) in four cases (1.3%). The mean age of the sufferers was 51.8 years. The cumulative risk of developing the disease between zero and 74 years of age was 0.52%.

Among the 307 tumors that had a histological or cytological diagnosis, 238 (77.5%) were squamous cell carcinomas, 41 (13.5%) were adenocarcinomas, 21 (6.8%) were other histotypes, while in the remaining seven (2.3%) cases the exact histologic subtype was not specified.

The crude and standardized incidence rates of cervix cancer in the period under investigation were 7.3 / 100,000 and 6.6 / 100,000 respectively.

Table 1 shows the distribution of cases in percentages in relation to age, while Table 2 shows the distribution of incidence rates per age-class. Peak incidence occurred at 45-49 years.

Figure 1 depicts the trend of incidence rates in the period 1992-2010; there was no registered substantial modification in the incidence rates oscillating between 5 / 100,000 and 7.7 / 100,000; a stable trend was registered with mortality rates oscillating between 3 / 100,000 and 9 / 100,000. In fact, from the early 1990s until 2000, the authors observed a reduction in the incidence of cervical cancer due

Table 2. — Age-class incidence and mortality rates of cervical cancer in North Sardinia, 1992-2010.

Age (years)	Incidence/100,000	Mortality/100,000
0-4	0	0
5-9	0	0
10-14	0	0
15-19	0	0
20-24	0	0
25-29	1.9	0
30-34	7.3	0.3
35-39	9.3	1.2
40-44	13.9	0.3
45-49	16.7	1.7
50-54	15	1.8
55-59	10.9	0.4
60-64	11.7	0.8
65-69	7.7	2.3
70-74	10	3.2
75-79	6	1.3
80-84	5.6	2.8
85+	8.7	6.5

to the wide spread of the screening campaign by Papanicolaou test in hospitals and in family counseling. Finally, relative survival at five years from diagnosis was 66.3%.

Analysis of the trend of mean age at disease onset for the same period of time did not reveal any relevant changes. Furthermore, no substantial modifications of the proportions of the histological types mentioned before were found. Table 3 shows the comparison of the incidence and mortality in the province of Sassari with those in other Italian provinces.

There were 41 deaths registered in the period under investigation. Crude overall mortality rate was 1 / 100,000, while standardized mortality rate was 0.7 / 100,000. Mean

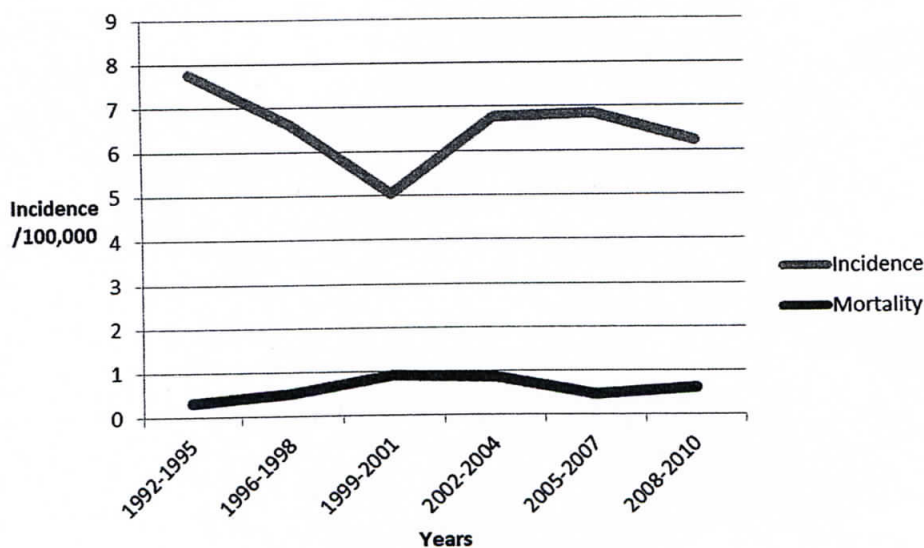


Figure 1. — Incidence and mortality rates trends of cervical cancer in northern Sardinia, 1992-2010.

Table 3. — Comparison of incidence and mortality rates of cervical cancer in North Sardinia with those of other Italian provinces [13-14].

Province	Incidence/100,000	Mortality/100,000
Alto Adige	9.1	1.3
Biella	10.2	1.3
Ferrara	9.1	0.8
Firenze	6.9	0.8
Friuli V.G.	10	1.3
Genova	8.7	1.3
Macerata	6.4	0.9
Modena	8.3	1
Napoli	6.4	-
Parma	8.4	0.3
Ragusa	7.9	0.8
Reggio Emilia	7.9	0.9
Romagna	9.5	1
Salerno	7.5	0.9
<b>Sassari</b>	<b>6.6</b>	<b>0.7</b>
Torino	7.5	1.7
Trento	4.6	1
Umbria	6.4	0.9
Varese	5	0.9
Veneto	6.3	1

age at death was 63.6 years. The cumulative risk of death between zero and 74 years of age was 0.06%. Table 2 shows the age-class distribution of mortality rates. There was a relevant increase in mortality rates after the sixth decade of life.

## Discussion

Cervical cancer is the most incident cancer of the female reproductive apparatus. More than 530,000 new cases and more than 275,000 deaths were estimated in the world in 2008 [1]. Cervical cancer is substantially more common in developing areas of the globe; 85% of the new cases and 88% of the deaths registered in 2008 worldwide occurred in those areas, where it accounts for approximately the 13% of all female malignancies [1, 11-13]. In several countries in Eastern Africa and South-Central Asia, cervical cancer is the most frequent malignancy and cause of neoplastic death in women [1]. The causes of such a geographical variations in incidence and mortality rates of cervical cancer are linked to the high incidence of human papilloma virus (HPV) infections and to the lack of adequate facilities for surveillance, early detection, and treatment in most unindustrialized countries [12-15].

In Europe there were estimated more than 54,000 new cervix cancer cases in 2008 and the standardized incidence rate of the disease was 10.6 / 100,000 [16]. High risk European regions include North-Eastern countries (Russian Federation, Ukraine, Lithuania, Estonia) and the Balkans (Romania, Serbia, FYR Macedonia). More than 25,000

deaths were estimated in 2008 in Europe (standardized mortality rate: 3.9 / 100,000) [16].

In Italy it is estimated that there will be approximately 2,000 new cases of cervical cancer in 2013 [17]. This signifies that it will be one case for every 163 woman in the country. These figures make cervical cancer the fifth most frequent malignancy in women with less than 50 years of age. However, a steady decrease in incidence rates (-3.8% / year) was registered in the last decade in the country, along with a parallel decreasing of mortality rates for all uterine cancers (-2.1 % / year) [17]. The five-year survival of patients with cervical cancer was considerably improved in Italy in the last decades, and it is currently estimated in approximately 71% [17].

Concerning Sardinia, the incidence of cervical cancer remained quite stable in the last four decades, according to previous reports. Estimated incidence rates were 10.15 / 100,000, 6.17 / 100,000, and 9.8 / 100,000 in the periods 1965-1969, 1974-1983, and 1992-2000, respectively [3-5]. The standardized incidence rate the present authors found for the period 1992-2010 was 6.6 / 100,000 confirming the steady trend of incidence previously reported. Nevertheless, this rate was considerably inferior to those of several other Italian regions, especially the northern ones (Table 3). Other reports evidenced a discrepancy in cervix cancer incidence rates between the northern, central, and southern regions of Italy; it was estimated that central and southern areas present respectively the -8% and -12% of incidence in comparison to northern regions [17]. These results could be due to the fact that in the Sardinia region, there has been an enhanced screening campaign with more extensive involvement of the population.

Concerning mortality, no relevant modifications in time trends were registered in the present region. The standardized mortality rate in northern Sardinia was 0.7 / 100,000 and it is one of the lowest in Italy; also the cumulative risk to die from the disease was extremely low (0.06%). As regards survival, the relative five-years rate estimated in the present region was 66.3%. This figure was slightly lower to that estimated for the entire country, but also in the case of survival, a certain discrepancy between rates in northern, central, and southern areas was evidenced. Five-year survival rates in the South and the Islands was estimated in approximately 65%, while the corresponding rate in the central regions of Italy was approximately 70% [17].

## Conclusions

The incidence and mortality trends of cervical cancer in northern Sardinia remained relatively stable in the last decades. Mortality and cumulative risk of death from the disease were extremely low. Furthermore, survival of patients with cervical cancer was relatively good in the area, sanctioning the adequacy of the preventive and clinical measures employed in the management of the disease.

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Address reprint requests to:  
 G. CAPOBIANCO, M.D., Ph.D  
 Gynecologic and Obstetric Clinic  
 Department of Surgical,  
 Microsurgical and Medical Sciences  
 University of Sassari  
 Viale San Pietro 12, 07100 - Sassari (Italy)  
 e-mail: capobia@uniss.it