

INDICATORS OF LONG-TERM SURVIVAL AND CURE OF CANCER

Stefano Guzzinati (1), Luigino Dal Maso (2), Roberta De Angelis (3) and AIRTUM Working Group ((www.registri-tumori.it)

(1) Veneto Cancer Registry, Padova, Italy,
(2) Aviano National Cancer Institute-IRCCS, Aviano, Italy
(3) Italian National Institute of Health (ISS), Rome, Italy

Background

The number of persons living after a cancer diagnosis is increasing (recent diagnosis, long-term survivors and cured)

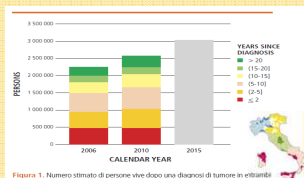
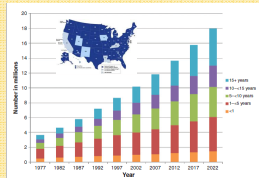
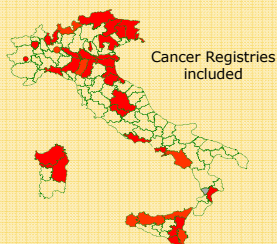


Figura 1. Numero stimato di persone vive dopo una diagnosi di tumore in entrambi i Paesi nel 2006 e nel 2010 in proiezione per il 2015 in Italia, per tempo dalla diagnosi.

Presently, they are 15 millions in USA and 3 million in Italy, approximately 5% of the overall population

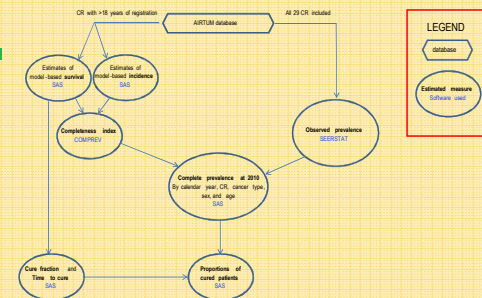


Materials

Data from 1.6 million of Italian cancer patients diagnosed between 1976 and 2010 were included.

Methods

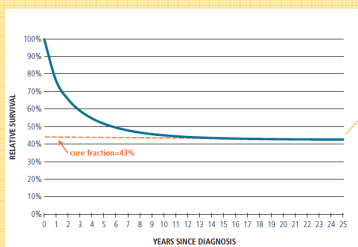
Validated statistical models had been used to estimate complete prevalence and four population-based original indicators of cancer cure, by cancer type, sex, age and period.



Results

1. Cure fraction

Proportion of cancer cases, starting from the date of diagnosis, expected to reach the same death rates of the general population (patients that will not die as a result of their cancer).



EXAMPLES

Colon-rectum

AGE AT DIAGNOSIS	CURE FRACTION %	
	MALE	FEMALE
0-44	60%	65%
45-59	52%	56%
60-74	43%	47%
75+	38%	41%

Breast

AGE AT DIAGNOSIS	CURE FRACTION %	
	MALE	FEMALE
0-44	46%	46%
45-59	64%	64%
60-74	52%	52%
75+	47%	47%

Thyroid

AGE AT DIAGNOSIS	CURE FRACTION %	
	MALE	FEMALE
0-44	96%	99%
45-59	84%	95%
60-74	50%	74%
75+	35%	38%

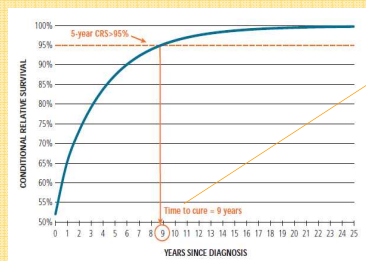
Pancreas

AGE AT DIAGNOSIS	CURE FRACTION %	
	MALE	FEMALE
0-44	7%	14%
45-59	4%	7%
60-74	2%	3%
75+	1%	1%

This proportion (dashed line) equals the plateau reached by the relative survival curve (43% in Italian men diagnosed with colorectal cancer aged 60-74 years).

2. Time to cure

Proportion of cancer cases, starting from the date of diagnosis, expected to reach the same (similar) death rates of the general population



EXAMPLES

Colon-rectum

AGE AT DIAGNOSIS	TIME TO CURE YEARS	
	MALE	FEMALE
0-44	7	7
45-59	8	7
60-74	9	8
75+	10	8

Breast

AGE AT DIAGNOSIS	TIME TO CURE YEARS	
	MALE	FEMALE
0-44	>25	7
45-59	15	7
60-74	20	8
75+	17	8

Thyroid

AGE AT DIAGNOSIS	TIME TO CURE YEARS	
	MALE	FEMALE
0-44	1	1
45-59	4	1
60-74	9	5
75+	4	5

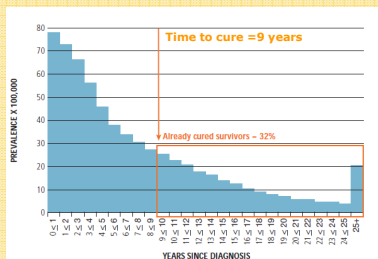
Pancreas

AGE AT DIAGNOSIS	TIME TO CURE YEARS	
	MALE	FEMALE
0-44	6	6
45-59	6	7
60-74	7	7
75+	7	7

When five-year conditional relative survival (blue line) becomes >95%, excess mortality can be classified as "hardly any" or negligible (9 years in Italian men diagnosed with colorectal cancer aged 60-74 years).

3. Already cured

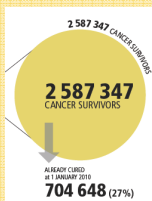
Patients who have survived longer than time to cure.



The rectangle encloses the already cured patients, i.e., those who have survived since more than time to cure (32% years in this example).

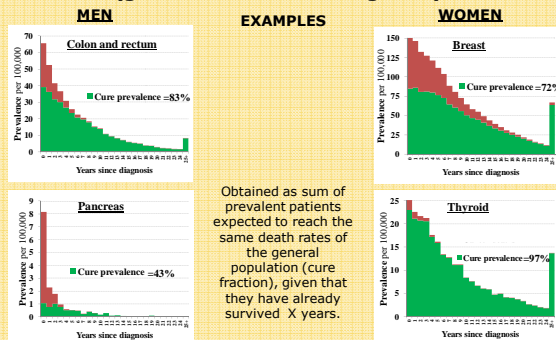
Cancer type (examples)	Men	Women
Stomach	40%	45%
Colorectum	30%	44%
Lung	22%	18%
Breast		16%
Cervix uteri		74%
Prostate	0%	
Testis	94%	
Bladder	1%	3%
Thyroid	62%	81%
Hodgkin lymphoma	69%	75%
Non-Hodgkin lymphoma	3%	1%

All cancer types* 20% 33%
*Obtained as sum of already cured by cancer type and sex



4. Cure prevalence

Proportion of all prevalent cases who will not die of that cancer (green bars of the histograms)



Obtained as sum of prevalent patients expected to reach the same death rates of the general population (cure fraction), given that they have already survived X years.

MAJOR LIMITATIONS:

- The presented estimates, in particular, those for cure fraction and time to cure, were average figures referred to groups of patients.
- The presented estimates depend, in different measures, on several assumptions and on the adopted statistical models

CONCLUSIONS:

The availability of these indicators has a high potential impact on health planning, clinical practice, and patients' perspective.

MORE DETAILS:

- AIRTUM Working Group. Epidemiol Prev. 2014; 38(6 Suppl 1):1-122. <http://www.registri-tumori.it/cms/it/Rapp2014>
- Dal Maso L, et al. Ann Oncol. 2014; 25(11):2251-60. doi:10.1093/annonc/mdu383

FUNDING
This work was supported by the Italian Association for Cancer Research (AIRC)

