European Network of Cancer Registries

European Commission | Joint Research Centre

Life Expectancy of Italian cancer patients

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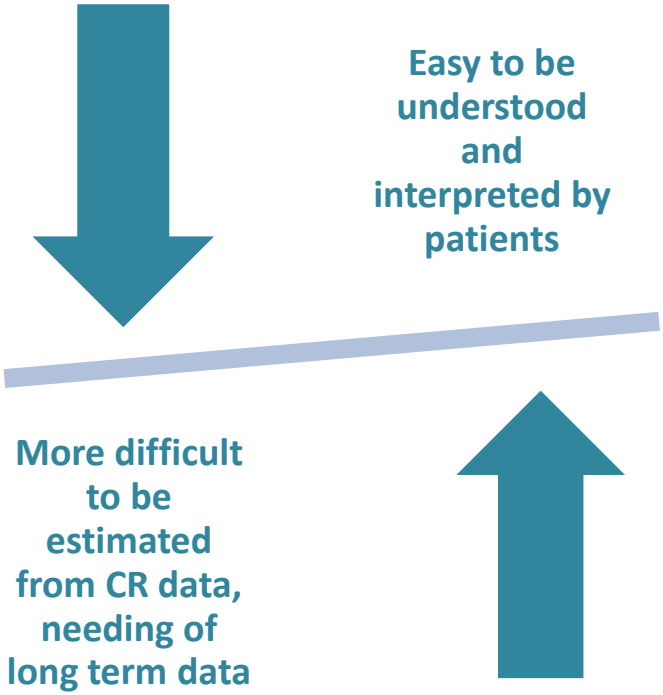
Life expectancy (LE)

•Patients LE: mean expected number of remaining life years for a **cancer patient** at a given age, sex, calendar year, and **time from diagnosis**

LE is indicated to express long-term effect of cancer and calculate how much cancer is still affecting the patient's future prospects.



Data

- Patients survival data: 8 registries from AIRTUM DB with >18 years of incidence *(Genova, Varese, Veneto, Parma, Modena, Ferrara, Ragusa, Sassari*)
- Period of diagnosis 1985-2011
- Period of follow-up 2013
- Age classes: (40-49, from 50 to 74 by 5 year age-classes, 75-84); for Testis, Thyroid and Non Hodgkin Lymphoma **age ≥15**.
- Italian population life tables 2013 from the National Institute of Statistics (ISTAT)

SITES
Stomach
Colon-rectum
Colon
Rectum
Liver
Larynx
Lung
Skin melanoma
Breast
Cervix
Corpus uterus
Ovary
Prostate
Testis
Bladder
Thyroid
Non Hodgkin Lymphoma
Leukemias

Methods

- Population life expectancy:

Population LE at age *i* :

$$LE_i = \sum_{x=i+1}^{\omega} S_x / S_i$$

S_i is probability of surviving up to age *i*, and the summation is extended from *i+1* to the maximum theoretical age ω (set to 119) years.

• Cancer Patients life expectancy:

1-year conditional RS of cancer patients diagnosed at age k was estimated with the period method and the Ederer II estimator.

RS estimates for cancer patients from age *k*+23 to age ω were obtained by a moving average procedure with base 10, recursively applied from age *k*+23 onward

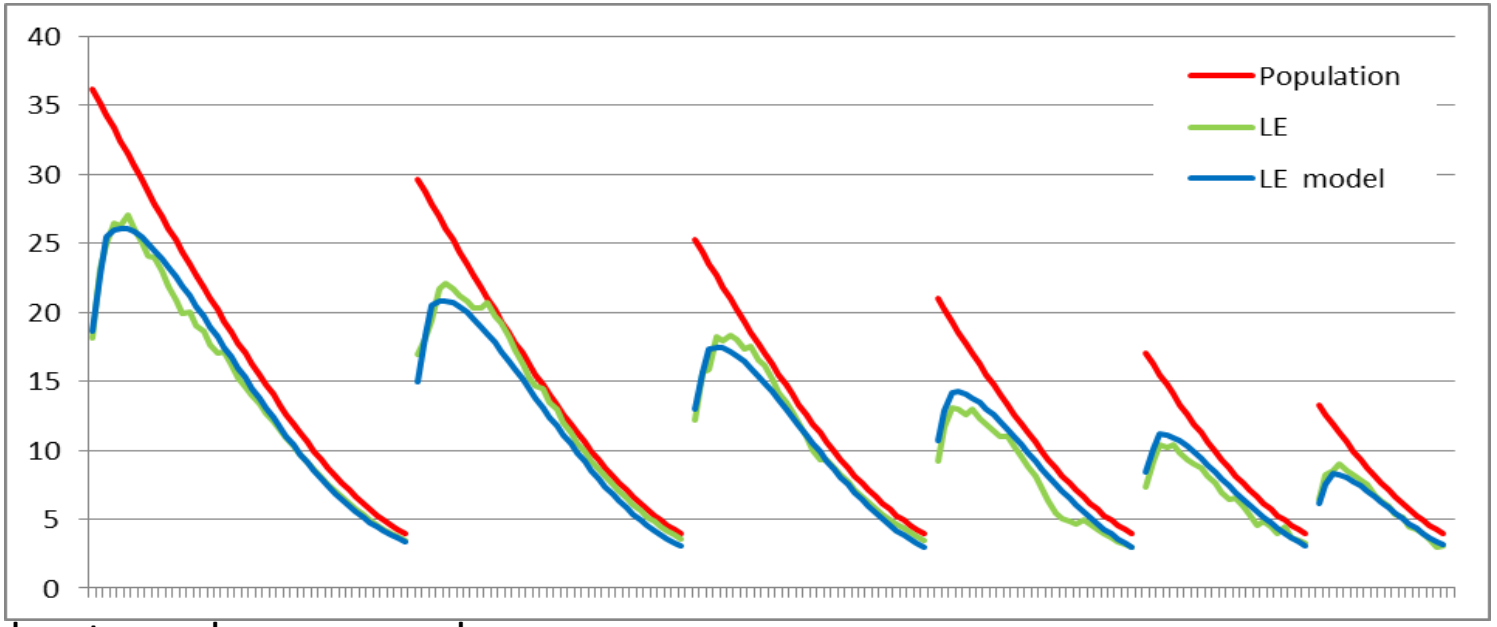
Interval and cumulative survival from all causes of death was calculated by:

$$S_{ik} = S_i S^R_{ik}$$

Patients LE at age *i* , dg. at age k: $LE_{ik} = \sum_{x=i+1}^{\omega} S_x S^R_{xk} / S_i S^R_{ik}$

LE standard error were computed by the delta method

Modelling Life Expectancy



Example: stomach cancer, males

To assure continuity of the life expectancy function with time after diagnosis and its consistency across age at diagnosis classes

$$Log(LE_p - LE_{pz}) = a_1*age + a_2*age^2 + a_3*age^3 + b_1*t + b_2*t^2 + b_3*t^3 + g_1*t_1 + g_2*t_2 + g_3*t_3$$

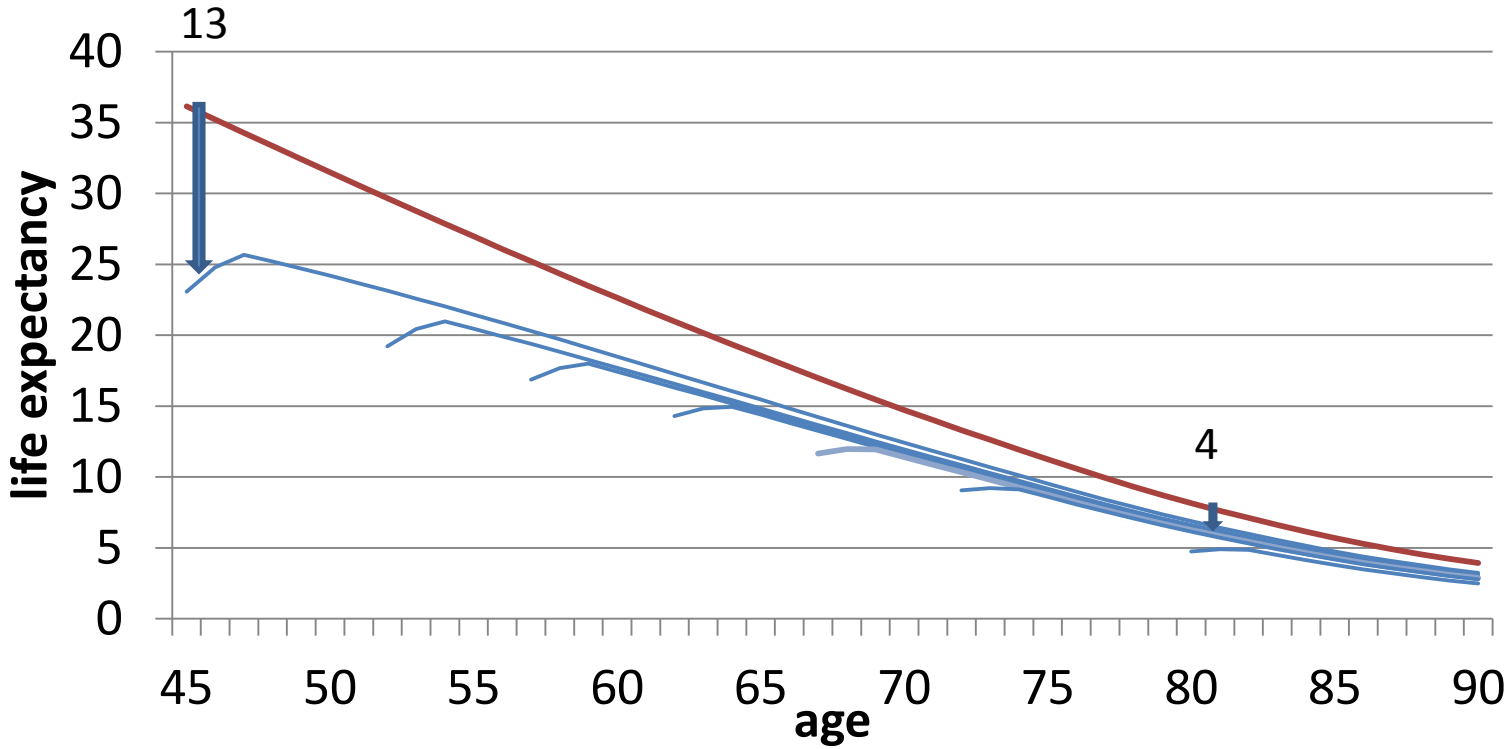
mortality risk is often high and rapidly changing

The model provided a very good fit of the data, with a squared correlation coefficient always >0.8

Results

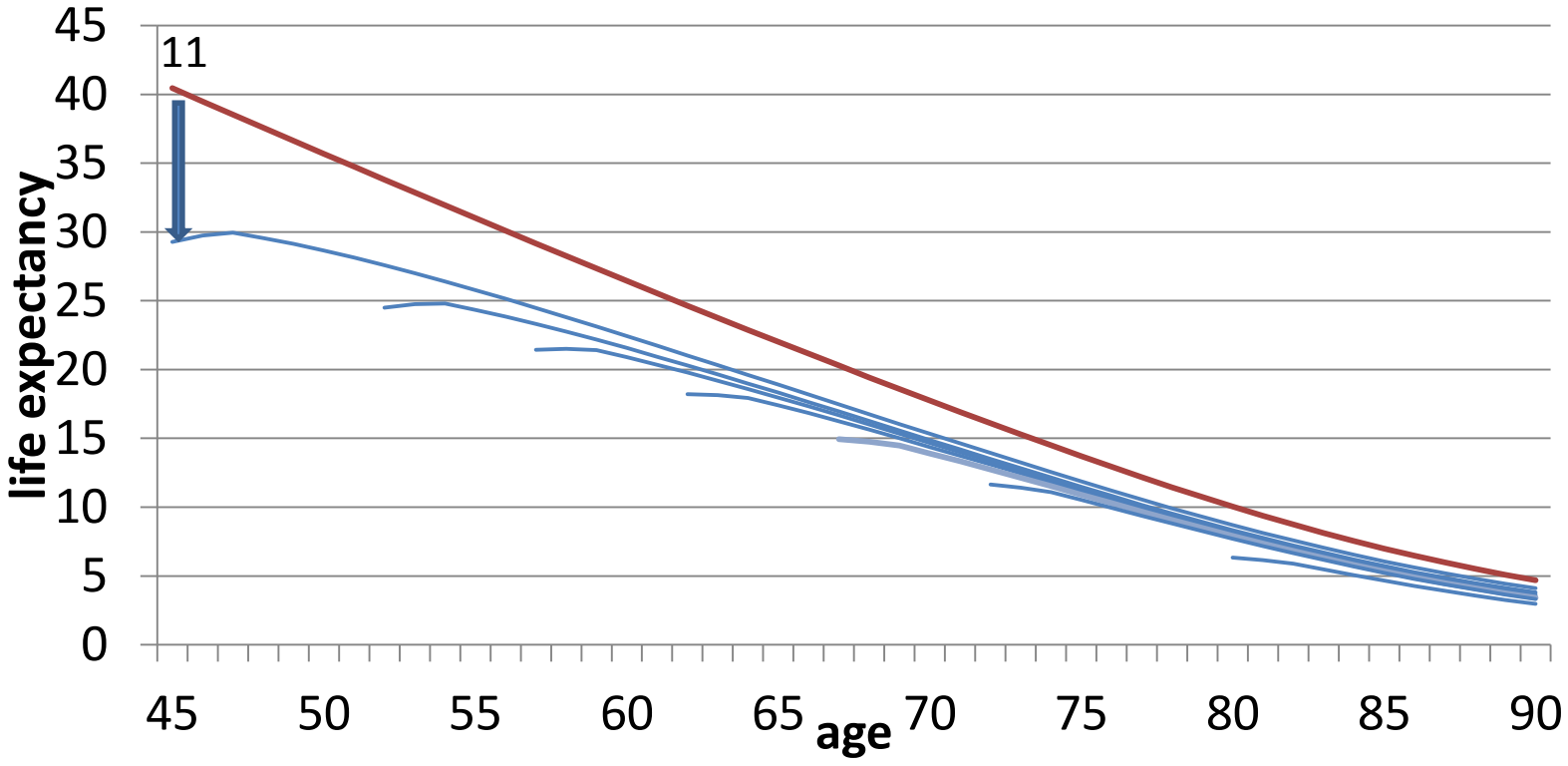
Life expectancy of males (all cancers)

	40-49	50-54	55-59	60-64	65-69	70-74	75-84
N.cases	1,626	1,663	2,684	4,475	5,774	6,489	9,995
10-years RS	65.7	61	61	59	60	54	40

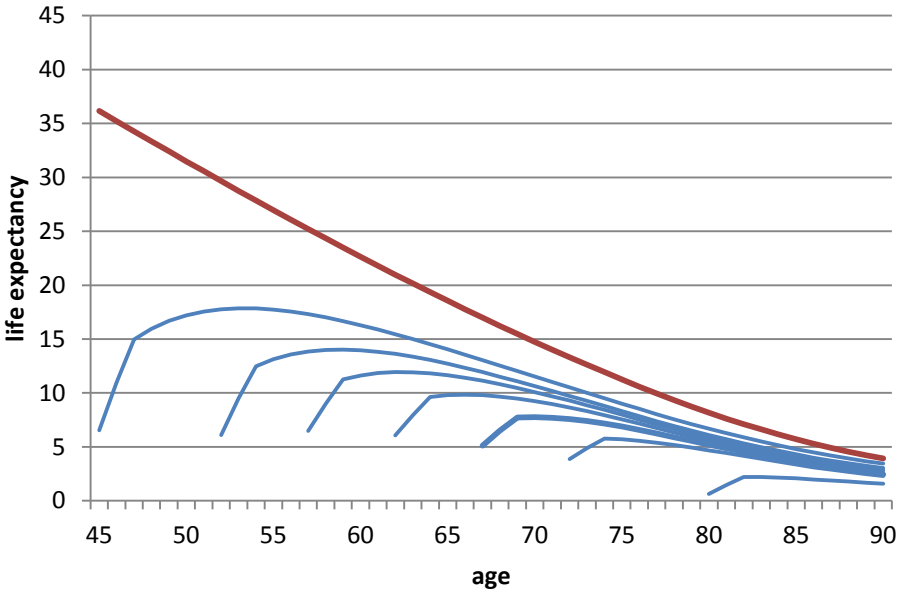


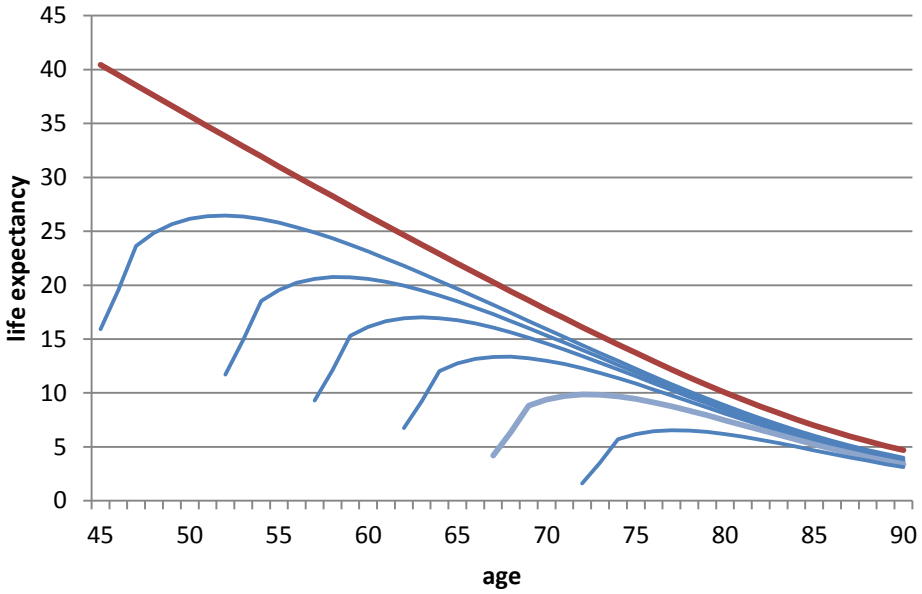
Life expectancy of females (all cancers)

	40-49	50-54	55-59	60-64	65-69	70-74	75-84
N.cases	3,567	2,399	2,648	3,265	3,654	3,911	7,477
10-years RS	82	76	72	69	64	53	41



Life expectancy of males/females (Lung cancer)

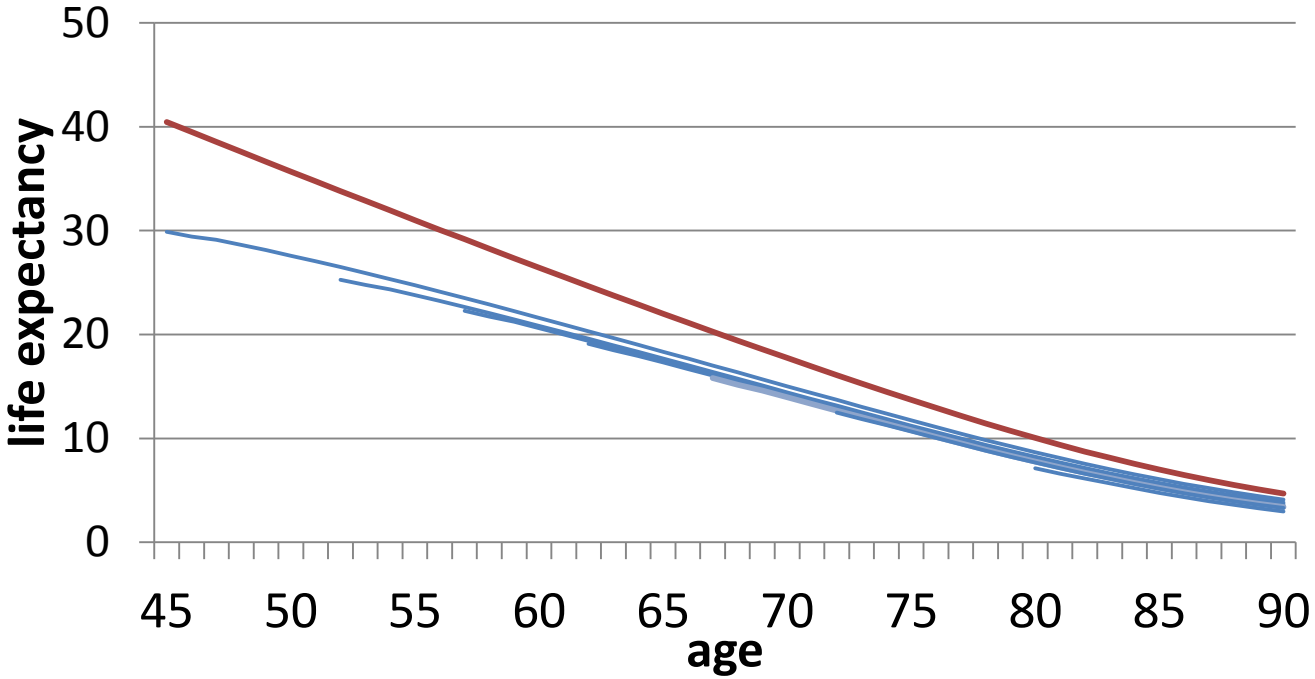




	40-49	50-54	55-59	60-64	65-69	70-74	75-84
N.cases	132	195	379	702	934	1,136	2,037
10-years RS	11	11	11	13	11	9	5

	40-49	50-54	55-59	60-64	65-69	70-74	75-84
N.cases	102	138	170	247	285	307	719
10-years RS	17	22	18	19	15	12	6

Life expectancy of females (Breast cancer)



	40-49	50-54	55-59	60-64	65-69	70-74	75-84
N.cases	1,895	1,082	1,032	1,207	1,363	1,244	1,850
10-years RS	88	86	86	85	85	76	66

Discussion and Conclusions

LE variations with time from diagnosis differs according to sex and cancer site.

LE is indicated to:

- express global measure of **lifelong impact** of cancer
- help to communicate the concept of cancer **cure** to patients (during the entire follow-up)
- plan optimal **cancer surveillance**
- better **allocation** of health service resources

Patients LE hardly ever reach the same value of comparable individuals from the general population.

Which the possible causes of long-term **excess hazard**?

- Relapse
- Effect of treatments
- Second cancers
- Common risk factors with other diseases

Thanks for your attention