Prevalence of Cured Patients and Survivorship

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Cancer prevalence is increasing

More than 4% of the whole population in high income countries is living after a cancer diagnosis. Prevalence is increasing of ~3% per year.

Cancer prevalence in Italy by time since diagnosis

60% of cancer patients lived ≥5 years after diagnosis (more than 2% of the overall population)

Cancer Survivorship

Defining Survivorship

1. One common definition is a person having no disease after the completion of his or her treatment.

2. Another common definition is the process of living with, through, and beyond cancer. By this definition, cancer survivorship begins when a person is diagnosed.

Some people do not feel comfortable calling themselves survivors

Cancer Cure

Cure: To fully restore health.

This term is sometimes used when a person’s cancer has not returned for at least five years after treatment.

However, some doctors do not use this term because undetectable cancer cells may remain in the body after treatment.


The goals of treatment are to “cure” the cancer ...

... Cancer patients, caregivers, and survivors must have the information ... that affect treatment and quality of life.

Which indicators of cure among cancer patients can be used?

The answer is the CURE FRACTION

Example:
48% of men with colorectal cancer will die due to other causes.
**Indicators of cure among cancer patients (2)**

Second question

“How many years should I await before considering myself cured?”
(Patient perspective)

The answer can be obtained using CONDITIONAL RELATIVE SURVIVAL.

Example: The thresholds were reached after 5, 7 and 8 years after diagnosis, respectively (colorectal cancer, men).

**Indicators of cure among cancer patients (3)**

Third question

How many patients will not die as a result of their cancer?
(Public health perspective)

The answer is the CURE PREVALENCE.

Example: 83% of prevalent patients will not die as a result of their cancer (colorectal cancer, men).

**Indicators of cure among cancer patients (4)**

Forth question

How many of the prevalent patients living after a cancer diagnosis are cured?
(Public health perspective)

The answer can be obtained combining results obtained combining CONDITIONAL RELATIVE SURVIVAL with COMPLETE PREVALENCE ESTIMATIONS.

Example: The thresholds have already been reached by 30%, and 27% of men living after a colorectal cancer diagnosis.

**Data**

- 23 Italian cancer registries
- 12 million inhabitants, 0.8 million cancer cases, period 1985-2005.
- Ages between 15 and 74 years.
Methods: models

All the indicators of “cancer cure” were estimated by:

- Cancer site (26 sites, 96% of all neoplasms)
- Sex
- Age
- Period

The relative survival functions for each site and gender were parameterized by means of mixture ‘cure-models’ (Weibull or age-specific exponential distribution)

\[ S(x,t) = [C + (1-C)\exp(-(\lambda(x-t))^\gamma)]^{\beta(x-t)^\gamma} \]

SAS ROUTINE

Methods: validation

<table>
<thead>
<tr>
<th>Years of follow up</th>
<th>Relative Survival</th>
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<tr>
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Relative Survival

Observed

95% CI

Estimated

Cured fraction 45%

Methods: Complete prevalence

Preliminary results (1):
CURE FRACTION (%)
Italy 1985-2005

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Colon and rectum (Men)</th>
<th>Breast (women)</th>
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<tbody>
<tr>
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<tr>
<td>45-54</td>
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<td>60</td>
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<tr>
<td>55-64</td>
<td>48</td>
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<td>65-74</td>
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</tr>
<tr>
<td><strong>15-74</strong></td>
<td><strong>47</strong></td>
<td><strong>54</strong></td>
</tr>
</tbody>
</table>

* Sum of age-specific estimates weighted for incidence

Preliminary analyses: not for citation or publication
Preliminary results (2):
YEARS TO 5-YEAR AND 10-YEAR CRS >95%
Italy 1985-2005

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Preliminary results (3):
CURE PREVALENCE (%)
Italy 1985-2005

Strengths
- A national-based estimation providing a wide spectrum of indicators of “cancer cure”;
- These estimators are reproducible;
- All models were validated by cancer type, sex, and age. All the used models converged and fittings were graphically assessed.

Major weaknesses
- When the survival curves do not tend to level off after a certain follow-up period, cure fraction and long-term survival could be overestimated;
- Hystological type, tumor stage, and treatments were not available.
Further studies

- The repetition of this experiment, in order to test the models and the validity of conclusions;
- More detailed analyses by cancer type are planned;
- More detailed estimates by period and projections are feasible.
- All these estimates of “cancer cure” are quantitative; parallel studies on rehabilitation needs, including quality of life, are necessary.

Conclusions

Reliable and accurate estimates of long-term survival and “cure” after cancer are feasible.

These estimates could be of overwhelming importance for the increasing number of persons living many years since cancer diagnosis, their caregivers, and health care planners.