

# Survival of Cancer Patients in Finland, 1955–1994

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Since the earliest days of scientific medicine, the proportion of patients who are cured of a disease has been considered the basic parameter by which to assess the effectiveness of care practices. The survival of patients treated in any given hospital, however, may be heavily biased because of the different selection practices of different hospitals or physicians. Population-based survival data (i.e. survival figures computed on all the cases occurring in a given period in defined populations, as provided by cancer registries), on the contrary, are suitable both for providing unbiased prognostic information to clinicians and for estimating the overall effectiveness of cancer control for those who are responsible for planning and financing health services.

The aims of studying survival include: monitoring the global effect of diagnostic and treatment improvements, establishing priorities for healthcare investment and research, estimating the potentialities for further improvement (e.g. by comparisons with other countries or within the country), planning clinical trials, carrying out studies on the equity of the health service, and estimating prevalence, i.e. the number of subjects requiring either treatment or clinical surveillance. Information about prevalence, together with incidence and survival, helps with quantifying the resources needed. In countries where population-based cancer registries have been established for several decades, e.g. in the Nordic countries, the planning of health measures against cancer may also be reliant on knowledge of temporal trends.

The cancer registry of Finland is now presenting a systematic analysis of cancer patients' survival over a period of 40 years, based on a highly reliable registration and follow-up system. This is an excellent outcome of a long tradition of epidemiological research and monitoring. It shows that cancer patients' survival increased dramatically for most cancer sites. In fact, today in Finland cancer patients' survival is above the European average for the great majority of cancer sites, and in most cases the

Finnish figures are close to the highest ever registered in European populations, similar to those reported from cancer registries in Switzerland, The Netherlands and Sweden. The issue today is how we can further improve these results and what kind of indicators we need to understand what is to be done.

Cancer, however, is still a highly lethal disease. The overall relative survival at 10 years for all cancer patients diagnosed in Finland between 1985 and 1994 was only 36% for male patients and 55% for females. But 10 years after diagnosis, some excess mortality attributable to cancer is still present for many cancer sites, notably breast and prostate, but also lung, brain, non-Hodgkin's lymphoma, multiple myeloma and leukaemia, as highlighted by the graphs showing the annual relative survival rates conditional on having survived the previous year (the first graph shown in the monograph for each cancer site).

Since 1990 the European Union has funded a concerted action of European population-based cancer registries (the EURO CARE project) whose major aims are to establish whether there are survival differences between European populations, their extent and the reasons for such differences (1–3).

Table 1 is a list of the most recent estimates of 5-year relative survival for adult cancer patients in Europe, based on over two million patients diagnosed in the late 1980s and followed-up for at least 5 years by cancer registries collaborating with the EURO CARE project from 17 countries. The table shows the European average and the age-adjusted relative survival rates for Finland compared with the country with the highest survival for selected cancer sites. The overall pattern suggests that although survival in Finland is very high, there is still room for improvement. The interpretation of survival differences, however, is not straightforward.

First, in most of the countries with the highest rates, cancer registration covers only a small fraction of the national population, usually less than 20%. The oncologi-

cal equipment and access to modern treatment may be more advanced in the areas where cancer registration has been first implemented than in the rest of the country. The actual survival for the whole country could therefore be considerably lower. Nevertheless, these are population-based data, suggesting that with proper investment the same rates are theoretically achievable.

Second, the same cancer sites in different countries are not necessarily comparable. The case mix of different subsites and histologies grouped under the same heading, as defined by the International Classification of Diseases, may actually be quite different. In Southern Europe, for instance, head and neck cancers include a higher proportion of subsites with a poor prognosis, such as hypopharynx versus oropharynx, and supraglottic versus glottic cancer. In contrast, in Northern European countries the rapid decrease in the incidence of stomach cancer may have left a higher proportion of more malignant histotypes with respect to Southern Europe, where the incidence of stomach cancer is still very high. A similar phenomenon is likely to have occurred for cervical cancer, for which organized screening programmes may lead to the selective prevention of the less aggressive biotypes.

Third, the quality of cancer registry data is not the same throughout Europe, in terms of both completeness of cancer registration and reliability of diagnosis. Some overestimation of survival, in particular, may be due to the exclusion from survival estimates those cases known to the registry from death certificates only, or to incomplete follow-up, but the size of this bias has been shown to be small with respect to genuine intercountry differences and time trends present in the EURO CARE data set. In some countries, however, a low diagnostic specificity for highly lethal visceral cancers such as pancreatic and liver cancer entailed gross overestimation of survival.

Fourth, longer survival does not necessarily imply later death. Theoretically, it might just reflect earlier diagnosis, without any advantage for the patients. In most cases, however, earlier diagnosis increases the effectiveness of treatment thus contributing to the postponement of death. In observational studies, distinguishing to what extent increasing survival is due to earlier diagnosis, or more effective stage-specific treatment, can be very difficult. When survival increases in both the overall series and stage-specific analyses it could be concluded that treatment is improving, but still the lead time due to early diagnosis

**Table 1**

*Age-standardized 5-year relative survival estimates % for selected cancers. (Source: EURO CARE-II (3), cases diagnosed in 1985–1989 in 17 countries)*

Cancer site, sex	European average	Finland (95% C.I.)	Highest rate* (95% C.I.)	
Head & Neck, males	34	35 (31–41)	50 (43–57)	Southern Sweden
Oesophagus, males	7	7 (5–10)	11 (7–18)	Swiss registries
Stomach, males	19	19 (18–21)	25 (23–28)	Spanish registries
Stomach, females	24	20 (18–22)	31 (24–39)	Tyrol, Austria
Colon, males	47	48 (44–51)	59 (54–64)	Dutch registries
Colon, females	46	50 (48–53)	56 (52–59)	Dutch registries
Rectum, males	42	49 (46–53)	53 (46–60)	Swiss registries
Rectum, females	43	46 (43–49)	54 (44–67)	Tyrol, Austria
Larynx, males	63	60 (55–66)	76 (67–85)	Dutch registries
Lung, males	9	10 (9–11)	12 (8–18)	Iceland
Melanoma, males	68	76 (73–80)	85 (81–90)	Southern Sweden
Melanoma, females	81	85 (82–88)	94 (89–99)	Swiss registries
Breast, females	73	78 (77–80)	81 (79–82)	Southern Sweden
Cervix uteri	62	60 (56–65)	69 (62–77)	Tyrol, Austria
Corpus uteri	73	76 (74–78)	84 (78–90)	Dutch registries
Ovary	33	36 (34–38)	45 (41–48)	Southern Sweden
Prostate	55	62 (60–64)	72 (68–77)	Swiss registries
Testis	90	89 (86–93)	93 (88–97)	Spanish registries
Kidney, males	47	45 (42–49)	57 (50–66)	French registries
Kidney, females	49	52 (49–55)	56 (49–65)	French registries
Brain, males	17	21 (19–24)	21	Finland
Brain, females	20	22 (19–25)	26 (20–34)	Saarland, Germany
Thyroid, females	78	82 (79–85)	90 (80–100)	Iceland
Non-Hodgkin, males	45	39 (36–43)	54 (48–60)	French registries
Non-Hodgkin, females	48	47 (44–50)	53 (48–59)	French registries
Hodgkin, males	71	71 (66–77)	76 (64, 90)	Saarland, Germany
Hodgkin, females	73	77 (72–82)	85 (78–93)	French registries
Leukaemia, males	33	34 (30–38)	45 (40–51)	French registries
Leukaemia, females	34	33 (30–37)	50 (44–57)	French registries

\*Or next to highest when the highest rate is based on very small numbers.

cannot be readily estimated. If the overall survival trend is steeper than stage-specific survival, as in the case of melanoma, one might speculate that most of the effect is due to the shift to early stages. If, on the contrary, stage-specific survival rates increase more steeply than overall survival, one might suspect a stage migration over time. This depends on the evolution of diagnostic practices and on the increasing availability of diagnostic techniques to detect metastatic dissemination that is not clinically overt. As a consequence, the present 'localized' cases are more localized than the previous ones, because several cases with silent metastatic spread are properly classified as advanced stage disease; the present 'advanced' stages, on the other hand, will also show up better because of the inclusion of less advanced metastatic cases that in the previous period were still classified as localized.

Frequently, the overall survival trend is steeper than the increasing trend for locally advanced or metastatic cases but less steep than the trend for localized cases, suggesting a mixed effect of improved treatment, stage shifting towards more localized lesions, and stage migration. This is

the case for stomach, lung and ovarian cancer. In other cases, e.g. for colon, breast, and prostate cancer, the overall trend appears to be as steep as the trend for localized cases, suggesting a major effect of stage shifting.

An accurate interpretation of these trends would be facilitated by the contemporary consideration of trends of incidence, stage-specific incidence, and mortality rates. This would provide further help to those who have to face the still enormous challenge of cancer control in order to address the right priorities.

#### REFERENCES

1. Berrino F, Sant M, Verdecchia A, Capocaccia R, Hakulinen T, Estève J, eds. Survival of cancer patients in Europe. The EURO CARE study. Lyon: IARC Scientific Publications N. 132, 1995.
2. Coebergh JWW, Sant M, Berrino F, Verdecchia A, eds. Survival of adult cancer patients in Europe diagnosed from 1985–1989: The EURO CARE II Study. *Eur J Cancer* 1998; 34: 2137–278.
3. Berrino F, Capocaccia R, Estève J, et al., eds. Survival of cancer patients in Europe. The EURO CARE II Study. Forthcoming IARC Scientific Publication N 151, 1999.