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RESEARCH ARTICLE

Trends in cancer in the elderly population in Denmark, 1980–2012

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ABSTRACT

Background Age is the strongest risk factor for developing cancer. The aim of the present analysis is to give an overview of the trends in cancer incidence, mortality, prevalence, and relative survival in Denmark from 1980 to 2012 focusing on age, comparing persons aged 70 years or more with those aged less than 70 years.

Material and methods Data derived from the NORDCAN database with comparable data on cancer incidence, mortality, prevalence and relative survival in the Nordic countries. The Danish data originate from the Danish Cancer Registry and the Danish Cause of Death Registry with follow-up for death or emigration until the end of 2013.

Results Incidence and mortality rates of all sites, but non-melanoma skin cancer, were higher and relative survival was lower among persons aged 70 years or more than those aged less than 70 years. The age distribution (age group-specific percentages of total number of incident cases) remained constant over time while the percentage of persons dying from cancer decreased with time up to the age of 79 years but increased for those aged 80 years or more, in whom about a third of all cancer deaths occurred in 2012. In 2003–2007, the five-year relative survival was 48% for men aged 70–79 years, 38% for men aged 80–89 years, and 29% for men aged 90 years or more and the corresponding figures for women were 46%, 39%, and 36%, respectively. There was a substantial increase in the number of prevalent cancer cases aged 70 years or older, especially among those aged 90 years or more.

Conclusion An increase in elderly cancer patients is expected over the coming 20 years due to an increasing elderly population. Healthcare providers need to focus on developing specific strategies for treatment of elderly cancer patients in the future.

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Cancer has been the leading cause of death in Denmark since 2000. While the overall mortality rate has been decreasing by a few percent each year, the mortality from cardiovascular diseases has been decreasing even more and account for most of the decrease in overall mortality [1]. This together with the large birth cohorts after World War II has led to an unprecedented proportion of elderly in high income countries. Age is the strongest risk factor for developing cancer, and even if the incidence rates remained constant, the number of incident cancers is expected to increase by about 32% towards 2030 in Denmark solely due to an increasing elderly population [2]. In the US, it has been estimated that the total projected cancer incidence will increase by 45% from 2010 to 2030. This increase is driven by cancer diagnosed among persons aged 65 years or more where the incidence is expected to increase by 67% compared with 11% in younger persons [3].

Smoking is the most important preventable risk factor for cancer [4], causing about a quarter of all cancer deaths in the European Union and a third of all cancer deaths in the United States [5]. Other preventable risk factors mentioned in the European Code Against Cancer [4] include overweight and obesity, lack of physical activity, an unhealthy diet with high calorie foods (foods high in sugar or fat), sugary drinks, processed meat, excessive red meat, foods high in salt and lack of whole grain, pulses and fruits, excessive alcohol intake, and too much exposure to UV radiation. Secondary prevention like bowel and breast cancer screening has been shown to reduce the cancer-specific mortality, and for breast cancer, the most common cancer in women, by 20% [6]. Early detection and improvement in treatment of cancer and other diseases have resulted in an increasing number of persons surviving with a cancer diagnosis. In the US, the

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number of cancer survivors increased from less than 4 million in 1977 to approximately 13.7 million in 2012 and is projected to increase by 31% over the next decade to around 18 million [7].

The aim of the present analysis is to give an overview of the trends in cancer incidence, mortality, prevalence, and relative survival in Denmark from 1980 to 2012 focusing on age, comparing persons aged 70 years or more with those aged less than 70 years.

Material and methods

Data on all cancer cases in Denmark including year 2012 were derived from the NORDCAN database with comparable data on cancer incidence, mortality, prevalence, and relative survival in the Nordic countries [8]. The data in NORDCAN are delivered from the Danish Cancer Registry [9] and the Danish Cause of Death Registry with follow-up for death or emigration to the end of 2013 by use of the Population Register. The Danish Cancer Registry started population-based registration of all cancer cases in 1943. Groups of diagnosis include a summary site, all sites but non-melanoma skin cancer (ICD-10 CXX.X\(C44 + C46) + D09.0 + D41.4 + D32-33 + D42-43 + D46-47), and 39 sub-sites as seen in Table I. The sub-site leukemia was further described in the subgroups lymphatic, myeloid, chronic lymphatic and acute myeloid leukemia.

For the purpose of this study, with focus on the elderly population, age was categorized as 0–69, 70–79, 80–89 and 90 + years, where NORDCAN stratifies in five-year age groups with the last being 85+ years. For incidence and mortality, age group-specific numbers and rates per 100 000 person years are shown in tables and graphs with calendar periods for time of diagnosis 1978–1982, 1988–1992, 1998–2002, 2003–2007, 2010, 2011 and 2012.

For a specific cancer, prevalence is defined as the number of cancer patients with that specific diagnosis still alive at a specified date and this is shown in tables by the end of 1980, 1990, 2000, 2005, 2010, 2011 and 2012. If a person had more than one cancer diagnosis, only the first cancer diagnosis within each group was counted. The sum of prevalent numbers over all diagnosis groups except non-melanoma skin is thus larger than the prevalent number for the summary group, all sites but non-melanoma skin cancer.

Sex- and age-specific one- and five-year relative survival proportions were calculated for each of the diagnostic groups for the age groups 0–69, 70–79, 80–89 and 90+ years and for the five-year periods of diagnosis 1968–1972, 1973–1977, . . ., 2003–2007 and 2008–2012. Relative survival for a group of cancer patients was calculated as the observed survival (where all causes of death are considered events) divided by the expected survival for a group from the Danish population with the same age and year of birth composition, thus also including the prevalent patients. The actuarial method was used to calculate observed survival and Ederer II method for the expected survival [10]. Patients identified by death certificate only (1% from 1980 to 2003 and 0.3% from 2004 onwards) were excluded from the survival calculations. Relative survival can be interpreted as the survival if the cancer was the only cause of death.

Table I. Classification by ICD-10 of cancer sites analyzed in the study of elderly cancer patients in Denmark 1980–2012.

ICD-10	Label
C00.0-2, C00.5-9	Lip
C00.3-4, C02-C04, C05.0, C06	Oral cavity
C01, C05.1-9, C09-C10	Oropharynx
C07-08	Salivary glands
C11	Nasopharynx
C12-13	Hypopharynx
C15	Esophagus
C16	Stomach
C17	Small intestine
C18	Colon
C19-21	Rectum and anus
C22	Liver
C23-24	Gallbladder
C25	Pancreas
C30-31	Nose, sinuses
C32	Larynx
C33-34	Lung
C38.4 + C45.0	Pleura
C40-41 + C44 + C46.0	Bone and soft tissue
C43	Melanoma of skin
C44 + C46.0	Skin, non-melanoma
C50	Breast
C51-52, C57.7-9	Other female genital organs
C53	Cervix uteri
C54	Corpus uteri
C55 + C58	Uterus, other
C56, C57.0-4	Ovary etc.
C60 + C63	Penis etc.
C61	Prostate
C62	Testis
C64	Kidney
C65-68 + D09.0 + D41.4	Bladder etc.
C69	Eye
C70-72 + D32-33 + D42-43	Brain, central nervous system
C73	Thyroid
C81	Hodgkin lymphoma
C82-85, C96	Non-Hodgkin lymphoma
C90	Multiple myeloma
C91-95	Leukemia
C91.1	Chronic lymphatic leukemia
C92.0 + C93.0 + C94.0 + C94.2 + C94.4-5	Acute myeloid leukemia
CXX.X\(C44 + C46.0)+D09.0 + D41.4 + D32-33 + D42-43 + D46-47	All sites but non-melanoma skin cancer
C91	Lymphatic leukemia
C92-94	Myeloid leukemia

For patients diagnosed during the most recent period 2008–2012, follow-up for death could not be extended to five years in all patients and we used hybrid methods [11] for five-year survival where one-year survival was supplemented with survival experience from cancer patients diagnosed in earlier years and who had survived the first year after diagnosis.

Results

During the period 1980–2012 the number of incident cases per year of cancer of all sites but non-melanoma skin cancer increased by 73% in men, from 10 364 to 17 929, and by 62% in women, from 10 400 to 16 882, while the number of deaths per year from cancer only increased by about 14% from 7142 to 8128 in men and from 6473 to 7514 in women (16%). The prevalence tripled for men from 33 744 to 104 012 and more than doubled for women from 61 711 to 141 554 (Tables II and III).

For incidence, the age distribution, shown as age group-specific percentages of total numbers (Tables II and III), remained remarkably constant over time, while the site-specific

Table II. Cancer of all sites, but non-melanoma skin cancer, among males in Denmark, 1980–2012: age distribution and total number of incident cases, deaths, and prevalent cases.

	0–69%	70–74%	75–79%	80–84%	85–89%	90+%	All ages
Incident cases							
1980	52.5	18.2	14.6	9.3	4.2	1.1	10 364 (100%)
1990	51.2	17.2	15.7	10.1	4.5	1.3	11 305 (100%)
2000	51.2	16.2	15.5	10.6	5.1	1.4	12 598 (100%)
2005	52.5	16.1	14.8	10.5	4.7	1.5	15 256 (100%)
2010	54.1	16.5	13.8	9.6	4.6	1.3	17 437 (100%)
2011	55.1	16.4	13.5	9.0	4.7	1.4	17 955 (100%)
2012	54.8	16.4	13.2	9.1	4.9	1.5	17 929 (100%)
Deaths							
1980	45.4	18.8	16.6	11.6	5.7	1.8	7142 (100%)
1990	42.1	17.8	18.1	12.8	6.8	2.4	7701 (100%)
2000	40.3	16.2	18.1	14.1	8.2	3.0	7790 (100%)
2005	40.4	15.3	17.2	14.7	8.7	3.7	7848 (100%)
2010	39.0	16.6	16.5	14.8	9.3	4.0	7998 (100%)
2011	38.7	15.8	16.4	14.7	9.9	4.4	8135 (100%)
2012	38.7	16.2	16.0	14.4	10.1	4.7	8128 (100%)
Prevalent cases							
1980	57.1	16.5	13.1	8.4	3.9	1.1	33 744 (100%)
1990	54.7	15.2	14.2	9.8	4.6	1.5	44 794 (100%)
2000	55.9	13.6	13.6	10.0	5.1	1.8	57 879 (100%)
2005	55.8	13.7	13.2	10.1	5.2	2.0	71 476 (100%)
2010	54.4	15.4	13.2	9.8	5.2	2.0	94 392 (100%)
2011	54.1	15.6	13.5	9.7	5.2	2.0	99 233 (100%)
2012	53.2	16.1	13.7	9.8	5.2	2.0	104 012 (100%)

Table III. Cancer of all sites, but non-melanoma skin cancer, among females in Denmark, 1980–2012: age distribution and total number of incident cases, deaths, and prevalent cases.

	0–69%	70–74%	75–79%	80–84%	85–89%	90+%	All ages
Incident cases							
1980	57.2	13.9	12.7	9.6	5.0	1.6	10 400 (100%)
1990	56.2	13.6	12.6	10.0	5.6	2.1	12 088 (100%)
2000	56.3	12.8	12.7	9.8	5.9	2.6	13 707 (100%)
2005	57.5	12.0	12.0	9.9	5.9	2.6	15 019 (100%)
2010	60.0	11.7	11.4	8.5	5.8	2.7	17 265 (100%)
2011	58.3	12.5	11.6	9.3	5.8	2.4	17 345 (100%)
2012	58.5	12.5	11.4	9.2	5.8	2.6	16 882 (100%)
Deaths							
1980	45.9	15.3	15.2	12.6	7.9	3.1	6473 (100%)
1990	42.8	14.8	15.7	13.6	8.8	4.2	7394 (100%)
2000	39.8	14.0	15.8	14.0	10.3	6.1	7697 (100%)
2005	38.5	13.8	15.2	15.0	10.8	6.7	7533 (100%)
2010	38.5	13.9	15.0	14.6	11.7	6.3	7450 (100%)
2011	37.8	13.4	15.2	14.6	11.3	7.8	7402 (100%)
2012	37.5	14.3	15.2	14.8	11.0	7.3	7514 (100%)
Prevalent cases							
1980	61.1	14.0	11.7	7.9	4.1	1.3	61 711 (100%)
1990	55.4	14.3	12.7	9.8	5.4	2.3	79 268 (100%)
2000	54.7	12.5	13.0	10.3	6.3	3.3	98 783 (100%)
2005	56.1	11.9	11.6	10.3	6.7	3.5	112 375 (100%)
2010	56.9	12.5	10.9	9.2	6.6	3.9	133 128 (100%)
2011	56.7	12.9	11.0	8.9	6.5	4.0	137 602 (100%)
2012	56.1	13.3	11.1	8.9	6.5	4.1	141 554 (100%)

pattern of cancer in persons aged 70 years or older changed from 1980 to 2012 (Figure 1). In men, prostate cancer was the most frequent cancer in 2012 with lung and colon cancers being second and third. In women, breast cancer remained the most frequent cancer, followed by lung and colon. The percentage of persons dying from cancer decreased with time up to the age of 79 years but increased for those aged 80 years or more, in whom about a third (29.2% of men and 33.1% of women) of all cancer deaths in 2012 occurred. There was a substantial increase in the number of prevalent cancer cases aged 70 years or older, especially among the very old, 90 years or more, where the number of prevalent cancer cases increased from 360 to 2113 in men and from 818 to 5741 in women from 1980 to 2012 (Tables II and III).

Taking into account changes in population size and age structure, Figure 2 illustrates that the incidence rates were considerably higher in males (A) and females (B) aged 70 years or more compared with those less than 70 years. The incidence rates increased with age up to the age of 90 years but the trend curve was lower for the 90+ year old persons than those aged 70–74 years. Apart from the 90 + year old persons, there was a trend of increasing incidence with time since 2000 in men while the incidence rates increased more constantly with time in women.

Age-specific mortality rates among men for the oldest age group, 90+ years, increased over time, while the age-specific mortality rates for men aged 80–84 and 85–89 years were nearly stable, and for ages below 80 the mortality rates were slightly decreasing, especially since 2000 (Figure 3A). Among women aged 80–89 mortality rates increased from 1990 and decreased from about 2000 for women aged below 75 years (Figure 3B).

Trends of increasing relative survival with time were observed in both men and women for all age groups (Figure 4). In 2003–2007, the five-year relative survival was 48% for men aged 70–79 years, 38% for men aged 80–89 years, and 29% for men aged 90 years or more and the corresponding figures for women were 46%, 39%, and 36%, respectively.

Discussion

The present analysis confirms that cancer is a disease of the elderly population, aged 70 years or more, with substantially higher incidence rates than in persons less than 70 years. However, the age distribution of incident cancer cases has not changed over time, indicating that the general increase in cancer incidence has been similar in younger and older persons, supported by the figures shown by Pedersen et al. [12]. During the period 1980–2012, the population size increased by 8–9% and the average life expectancy from 71.1 to 77.2 years for men and from 78 and 81.9 years for women [13], thus rendering more elderly persons at risk of developing cancer. Changing prevalence of risk factors, such as smoking, has changed the site-specific cancer pattern as illustrated in Figure 1 with a decreasing number of lung cancers in males and an increasing number of lung cancers in females. Specific diagnostic efforts like assessment of prostate-specific antigen (PSA) have also contributed to this, but prostate cancer incidence increased later in Denmark than in the other Nordic countries due to Danish urologists only recommending PSA-tests to be used in men with urological symptoms [14]. At the same time, diagnostic efforts have increased in general with diagnostic work-ups being performed more frequently today among elderly persons. Among 5087 patients admitted to a geriatric ward, 20% of men with a mean age of 81.8 years and 15% of women with a mean age of 83.9 years had a diagnosis of cancer [15].

The major change in mortality was an increasing percentage of persons over the age of 80 years dying from cancer. Up to 2002, causes of death from death certificates were coded manually by the Danish National Board of Health, but since

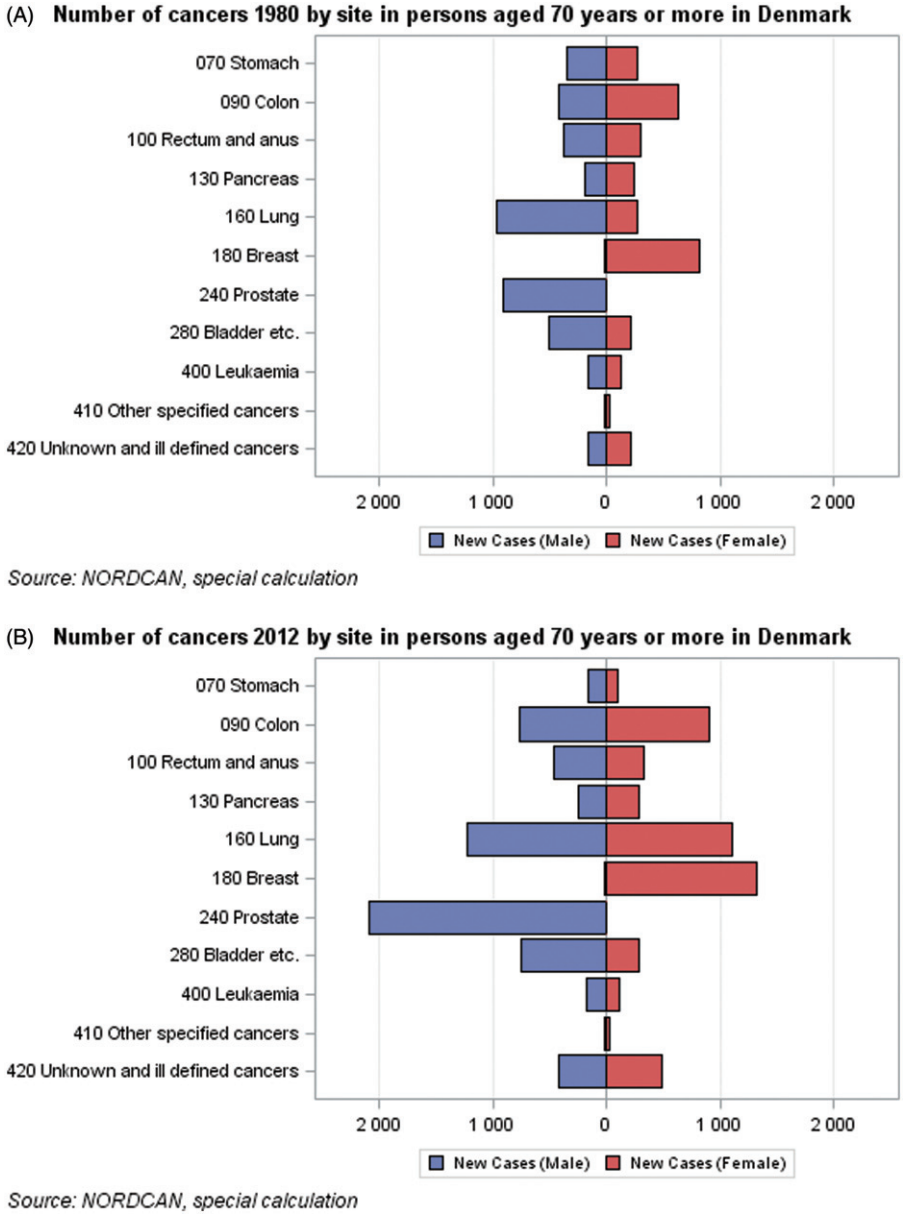

Figure 1. Distribution of number of cancers by site in persons aged 70 years or more in Denmark.

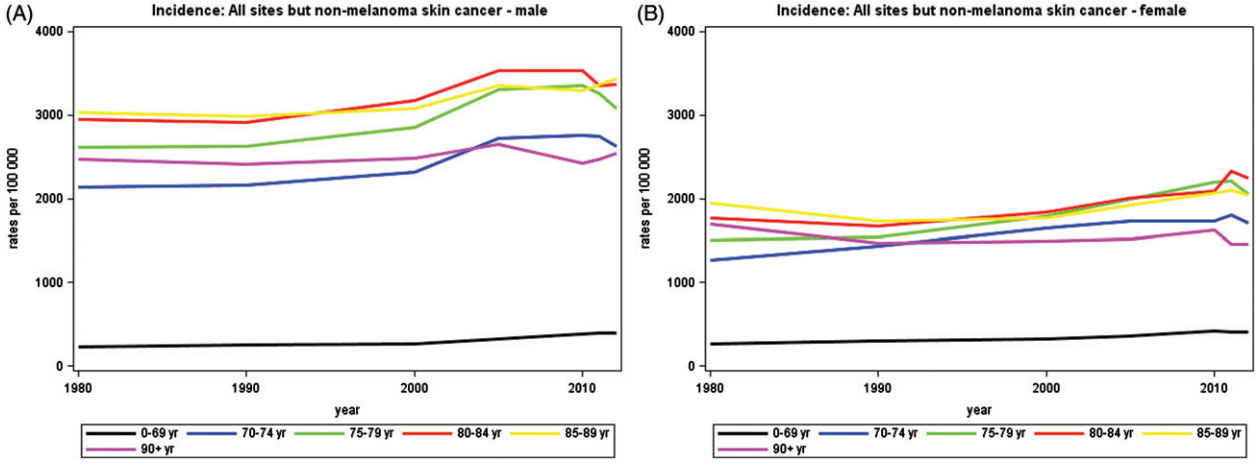

Figure 2. (A) Incidence rates of cancer in males in Denmark, 1980–2012, by age group. (B) Incidence rates of cancer in females in Denmark, 1980–2012, by age group.

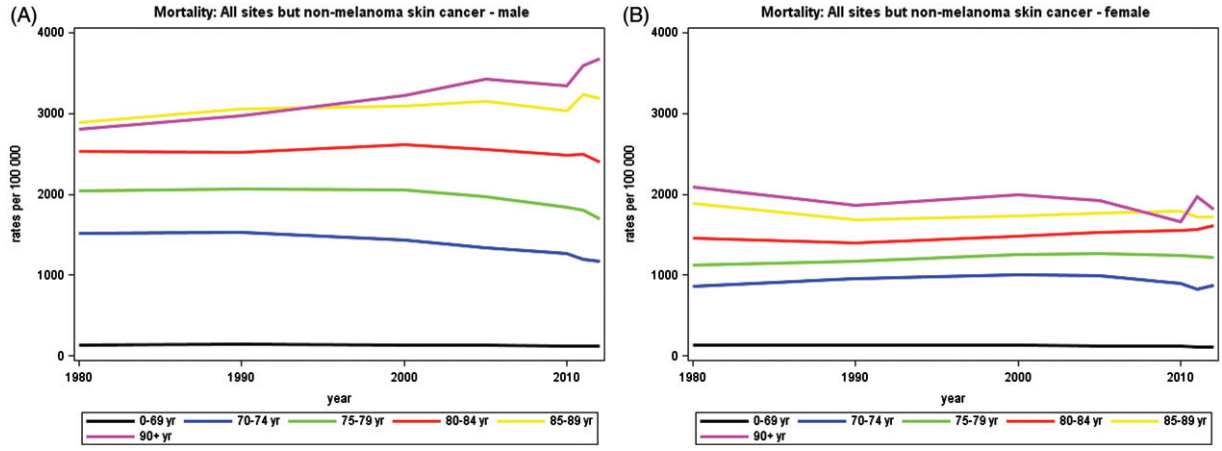

Figure 3. Mortality rates of cancer in males in Denmark, 1980–2012, by age group. (B) Mortality rates of cancer in females in Denmark, 1980–2012, by age group.

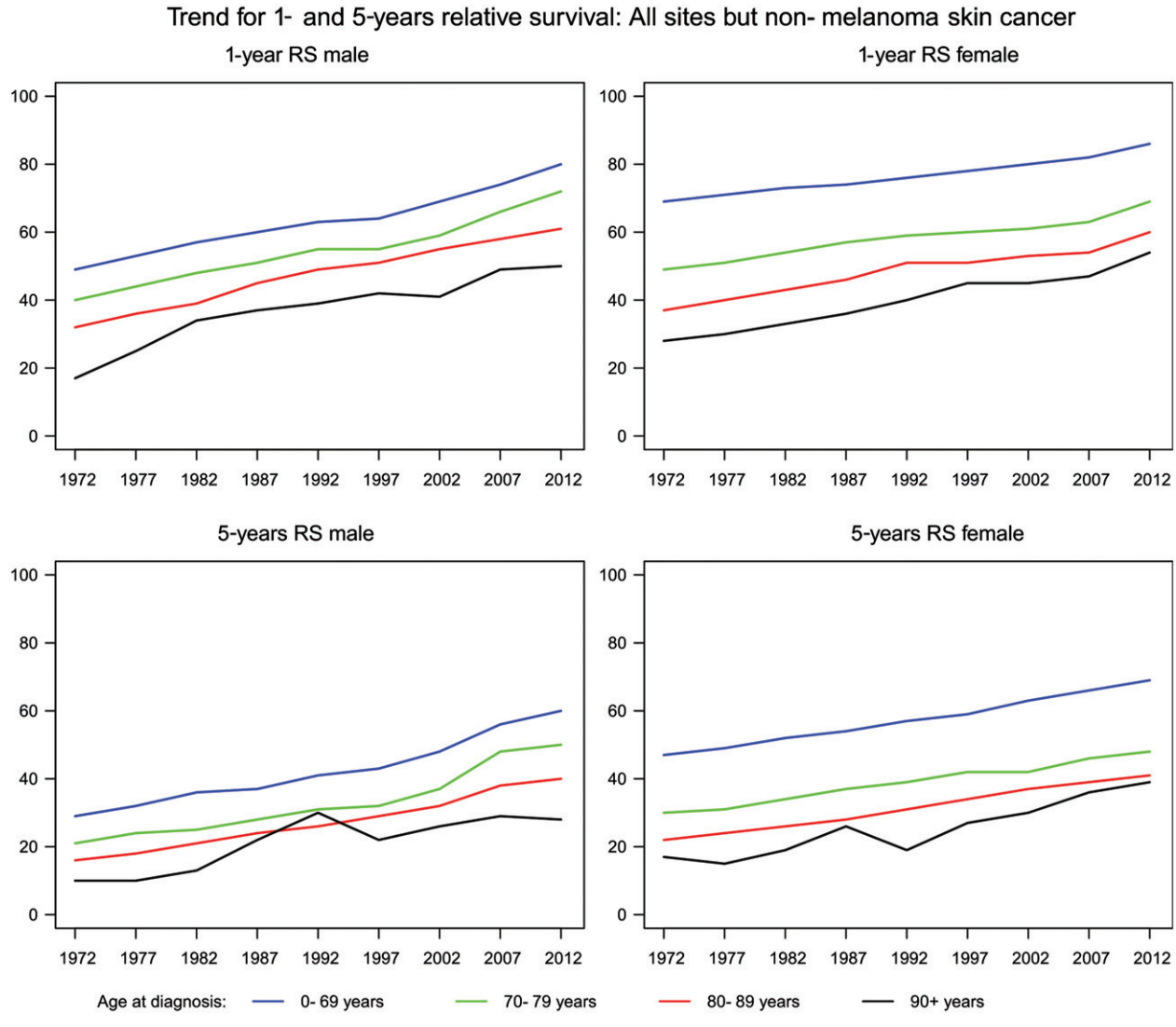

Figure 4. Age-specific relative survival after cancer in Denmark.

2003 the Automated Coding of Medical Entities (ACME) algorithm has been used. As a validation, a sample of 3307 death certificates from 2002 were coded both manually and by ACME and resulted in 760 deaths being classified as due to malignant disease by manual coding compared with 767 from ACME, i.e. a discrepancy of 7 or 0.9% [16]. No particular change in the trend in mortality rates from all cancer was observed 2002–2005 making it unlikely that the change in coding practice should have exerted a major influence on the rates.

While the mortality rates in the elderly population are much higher than in younger persons, the relative survival has

improved considerably from 1980 to 2012 and the improvement in survival has had a parallel course in persons aged more than 70 years compared with younger persons. Although the relative survival may be slightly overestimated, particularly in the very old [12], this can only explain a minor part of the improvement in survival observed. Our data thus indicate that the general improvement in cancer treatment over the past 20 years also include the elderly segment of the population. However, it should be remembered that patients do not suffer from ''all cancer'' but from specific cancers so this paper can only provide general trends and the reader is referred also to seek information on the specific cancer sites.

In treating elderly cancer patients, there are several challenges facing the clinicians, the first being physiological decline of organ function with age and an increasing prevalence of comorbidities. In a review of frailty, 32% (range 11–78%) of older cancer patients were classified as fit and 43% (range 6–86%) as frail [17]. Frail patients had an almost threefold increased 30-day post-operative mortality and also an increased risk of treatment complications. At diagnosis, 35% of Danish cancer patients over 70 years use five or more drugs, leading to potential drug interactions, especially when combined with cancer treatment [18]. Relatively little is known about pharmacokinetics of chemotherapy in persons over 65 years, but most studies show no major differences with ageing. However, the pharmacodynamics differs with older persons being at an increased risk of myelosuppression and non-hematological toxicities [19]. Neuropathy and gastrointestinal toxicity are more frequent in older cancer patients, while nausea and vomiting are more pronounced in the younger population [20]. Finally, there is a general lack of knowledge about effects of cancer treatments in elderly persons as they are under-represented in clinical trials. From 2007 to 2010, 24 drugs were approved by the FDA for treatment of cancer. On average, only 33% of patients included in the registration trials were aged 65 years or older compared with 59% in the US cancer population [21].

The Society of Geriatric Oncology (SIOG) suggested recommendations for geriatric assessment in older cancer patients in 2005 and these were updated recently addressing a number of key questions, such as the impact of geriatric assessment findings on oncology treatment decisions [22]. Internationally, there is a rapidly growing appreciation of the need for specific strategies for treatment and management of elderly cancer patients [23].

Conclusion

An increase in the number of elderly cancer patients is expected over the coming 20 years in Denmark due to an increasing elderly population. Health care providers need to focus on developing specific strategies for treatment of elderly cancer patients in the future.

References

1. Causes of death in Denmark 2012. Statens Seruminstitut (http://www.ssi.dk/Sundhedsdataogit/Registre%20og%20kliniske%20databaser/De%20nationale%20sundhedsregistre/Dodsaarsager%20biologisk%20materiale/Dodsaarsagsregisteret.aspx, accessed on November 25, 2014).
2. Engholm G, Ferlay J, Christensen N, Johannesen TB, Khan S, Køtlum JE, Milter MC, Ólafsdóttir E, Pukkala E, Storm HH. NORDCAN: Cancer Incidence, Mortality, Prevalence and Survival in the Nordic Countries, Version 6.1 (25.04.2014). Association of the Nordic Cancer Registries. Danish Cancer Society. Available from http://www.ancr.nu, accessed on December 8, 2014.
3. Smith BD, Smith GL, Hurria A, Hortobagyi G, Buchholz TA. Future of cancer incidence in the United States: Burdens upon an aging, changing nation. J Clin Oncol 2009;27:2758–65.
4. European Code Against cancer (http://cancer-code-europe.iarc.fr/, accessed on January 6, 2015).
5. Peto R, Lopez AD, Nordheim OF. Halving premature death. Science 2014;345:1272.
6. Independent UK Panel on Breast Cancer Screening. The benefits and harms of breast cancer screening: an independent review. Lancet 2012;380:1778–86.
7. De Moor JS, Mariotto AB, Parry C, Alfano CM, Padgett L, Kent EE, et al. Cancer survivors in the United States: Prevalence across the survivorship trajectory and implications for care. Cancer Epidemiol Biomarkers Prev 2013;22:561–70.
8. Engholm G, Ferlay J, Christensen N, Bray F, Gjerstorff ML, Klint A, et al. NORDCAN - a Nordic tool for cancer information, planning, quality control and research. Acta Oncol 2010;49:725–36.
9. Gjerstorff ML. The Danish Cancer Registry. Scand J Public Health 2011;39:42–5.
10. Dickman PW, Sloggett A, Hills M, Hakulinen T. Regression models for relative survival. Stat Med 2004;23:51–64.
11. Brenner H, Rachet B. Hybrid analysis for up-to-date long-term survival rates in cancer registries with delayed recording of incident cases. Eur J Cancer 2004;40:2494–501.
12. Pedersen JK, Engholm G, Skytthe A, Christensen K. Cancer and Aging: Epidemiology and Methodological Challenges. Acta Oncol 2015; doi: 10.3109/0284186X.2015.1114670.
13. www.statistikbanken.dk, Statistics Denmark, accessed on September 28, 2012.
14. Brasso K, Ingimarsdóttir IJ, Rusch E, Engholm G, Adolfsson J, Tryggvadóttir L, et al. Differences in survival from prostate cancer in Denmark, Iceland and Sweden. Eur J Cancer. 2013;49:1984–92.
15. Matzen LE, Jepsen DB, Ryg J, Masud T. Functional level at admission is a predictor of survival in older patients admitted to an acute geriatric unit. BMC Geriatrics 2012;12:32.
16. http://sundhedsstyrelsen.dk/publ/tidsskrifter/nyetal/pdf/2006/18_06.pdf (accessed on January 6, 2015).
17. Handsforth C, Clegg A, Young C, Simpkins S, Seymour MT, Selby PJ, et al. The prevalence and outcomes of frailty in older cancer patients: a systematic review. Ann Oncol. 2015;26:1091–101.
18. Jørgensen TL, Herrstedt J, Friis S, Hallas J. Polypharmacy and drug use in elderly Danish cancer patients during 1996 to 2006. J Geriatric Oncol 2012;3:33–40.
19. Hurria A, Lichtman SM. Pharmacokinetics of chemotherapy in the older patient.. Cancer Control 2007;14:32–43.
20. Jakobsen JN, Herrstedt J. Prevention of chemotherapy-induced nausea and vomiting in elderly cancer patients. Crit Rev Oncol Hematol 2009;71:214–21.
21. Scher KS, Hurria A. Under-representation of older adults in cancer registration trials: Known problem, little progress. J Clin Oncol 2012;30:2036–8.
22. Wildiers H, Heeren P, Puts M, Topinkova E, Janssen-Heijnen MLG, Extermann M, et al. International Society for Geriatric Oncology consensus on geriatric assessment in older patients with cancer. J Clin Oncol 2014;32:2596–603.
23. Lawler M, Selby P, Aapro MS, Duffy S. Ageism in cancer care. BMJ 2014;348:g1614; doi: 10.1136/bmj.g1614. PMID: 24585822.