Cancer – advances in medicine leading to extended insurability for cancer survivors

NOT IF, BUT HOW

Munich RE

Introduction

The layman's press regularly states that finally the break-through in curing cancer has been achieved. Unfortunately, that is obviously not the case and such headlines are probably not taken seriously by most of the readers (and physicians). Too often have these headlines been published. Too often without any actual result or real-world changes.

However, while the "cure for cancer" is something the world is waiting for, medical advances in cancer treatment, prevention and screening have made significant steps, often without being in the focus of the public.

These steps have led to a steadily declining mortality over the past years. As a consequence, it is of utmost importance for us as Munich Re to monitor these developments and to reflect mortality improvements in our evidence-based underwriting (UW) manual. This goes hand in hand with our ambition to extend insurability to as many customers as possible, while staying risk adequate. Regulatory changes, such as "the right to be forgotten" play an additional role in needing to have up to date assessments available, not least because of reputational issues.

Our medical research and development team recently reviewed the 22 most common and most relevant cancer types from an insurance medicine perspective, thus covering more than 90% of yearly cancer incidence, with a special focus on long-term mortality improvement after end of treatment.

Our analysis

The following cancer types were part of our recent analysis (see Figure 1).

We analysed stage distribution and state-of-the-art treatment per stage, using registry data and current medical literature. Due to potential long term sequelae of treatments like chemo-therapy or radiation therapy for certain stages, the type of treatment is highly relevant. Potential side effects of these treatments include cardiotoxicity or pulmonary damage, e.g. lung fibrosis, which can occur in some cases years after the end of treatment. Depending on the stage of cancer at diagnosis, treatment can vary from "simply" surgically removing the cancer only to an intense systemic treatment.

Figure 1: Incident cancer cases per year in Germany

Breast	70,620
Prostate	65,200
Colorectal	60,630
Lung	57,220
Malignant Melanoma of Skin	22,890
Pancreatic	19,020
Non-Hodkin Lymphoma	18,470
Bladder	18,270
Renal	14,830
Gastric	14,760
ENT	14,310
Leukemia	12,180
Endometrial	10,860
Liver	9,510
Oesophageal	7,550
Ovarian	7,300
Brain	7,230
Multiple Myeloma	6,350
Thyroid	6,200
Cervical	4,320
Testicular	4,160
Hodgkin Lymphoma	2,540
Gallbladder and Cholangio	5,080
Vulva	3,270
Anal	2,330
Small Bowel	2,680
...	...

In total there are around 500,000 incident cancers in Germany per year

Our analysis covers the 22 most common cancers in Germany, that are relevant from an insurance medicine point of view (approximately 450,000 cases) or

> 90% of all cancer cases*

* non-melanoma skin cancer excluded

Source: Krebs in Deutschland für 2017/2018. Zentrum für Krebsregisterdaten

We also focused on long term recurrence rates depending on stage at diagnosis, as recurrence rates are usually higher in more severe cancer stages.

From this data we derived relative 5- and 10- year survival and more importantly also long term conditional survival, i.e. the probability of further survival in relation to the years already survived. Extramortality was then calculated and, when applicable i.e. if adaptations were needed, applied to our UW manual, MIRA and the MIRA Digital Suite (MDS) resulting in a completely up to date cancer section.

Disability was also considered, as long term sequelae of e.g. chemo- and radiation therapy are not as common as in the past due to more focused therapy options. Appropriate changes were applied to MIRA/MDS accordingly.

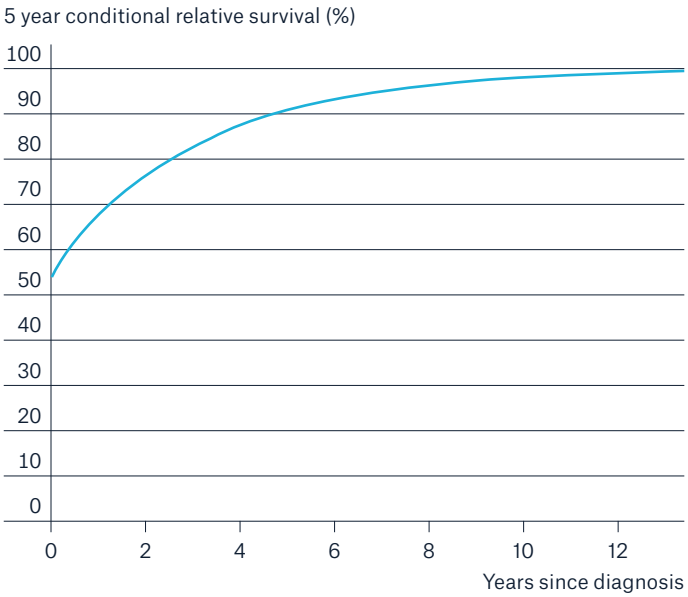
As one can imagine, a patient who has already survived for many years without any relapse or significant sequelae has a better long term prognosis than someone with a recent diagnosis, a recent relapse, or may even still be under treatment.

Examples of conditional survival for certain cancer types:

Colon Cancer

Calculation of extramortality showed that long term prognosis is comparable to the age- and sex-matched reference population after having survived without relapse for several years, even for high stages. Hence, we could adapt our ratings to these improvements in survival. The following graph shows the 5 year conditional relative survival after having survived a period of time from 0 to >10 years.

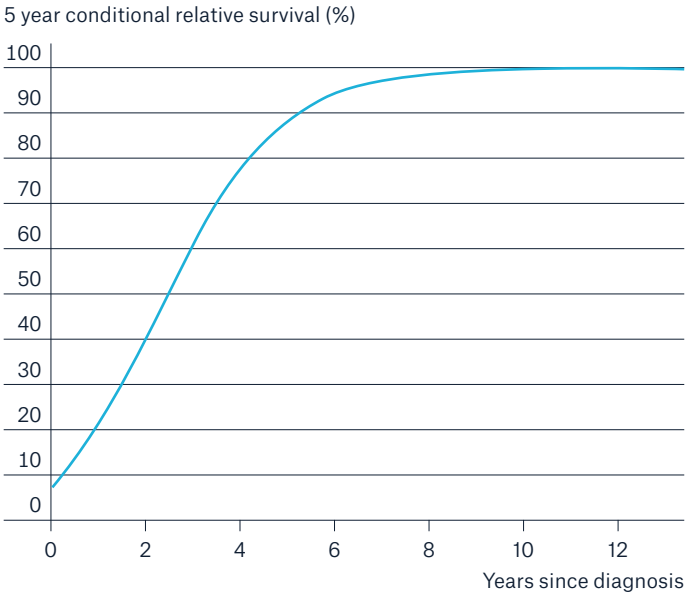
Figure 2: Graph showing relative conditional survival over all stages of colon cancer after having survived 0–13 years. Survival reaches that of the general comparison population after 10+ years.



Oesophageal Cancer

In analogy to colon cancer, our analysis and calculation of extramortality showed that surviving for a certain amount of time again leads to a long term prognosis that is comparable to the age- and sex-matched reference population.

Figure 3: Graph showing relative conditional survival over all stages of oesophageal cancer after having survived 0–13 years. Survival reaches that of the general comparison population after 7+ years.

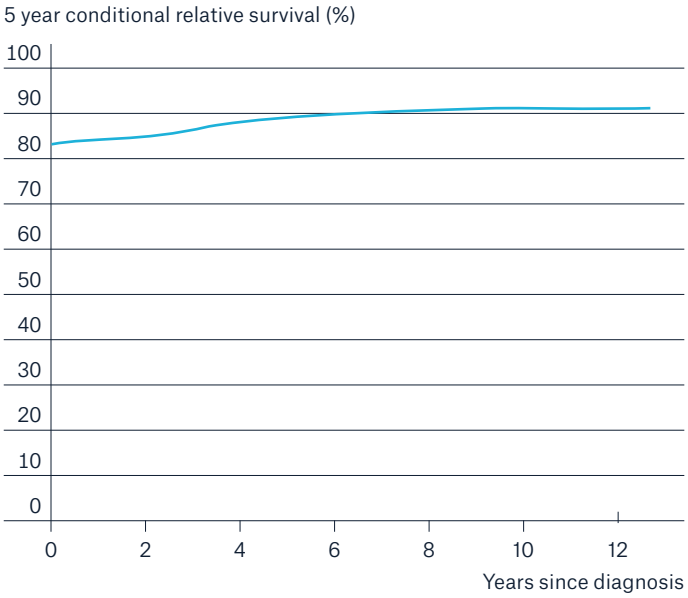


Both cancers could, of course, lead to sequelae due to the cancer itself or due to the treatment applied, including surgery or chemotherapy. However, these sequelae would likely have an impact within the first years of diagnosis as evidenced by numerous studies and registry data, and would be picked up at UW stage if persisting. The conditional survival we looked at includes these sequelae and hence considers their impact on extramortality already.

The impact and side effects of treatment are now generally considered in the applied ratings, making additional ratings for tumour therapy obsolete in most cases.

Adaptations due to advances in treatment weren't possible for all cancer types and all stages unfortunately. Certain stages of breast cancer for instance still need long term loadings, which is reflected in the following conditional survival curve:

Figure 4: Graph showing relative conditional survival over all stages of breast cancer after having survived 0–13 years. Survival never reaches that of the general comparison population.



Summary

It is our nature at Munich Re to keep up to date with medical advances. This is the basis for evidence-based assessments and a necessity to treat customers fairly. These are two of the most important pillars in our work.

We are happy to have been able to extend insurability to a significant amount of former cancer patients due to our newest research. As clinical medicine takes steps towards improvement, so do we at Munich Re for our part.

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References

Dal Maso et al. *Cancer cure for 32 cancer types: results from the EUROCARE-5 study.* International Journal of Epidemiology, 2020, 1517–1525. doi: 10.1093/ije/dyaa128 Int J Epidemiol. 2020

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Nekhlyudov et al. *Cancer-related impairments and functional limitations among long-term cancer survivors: Gaps and opportunities for clinical practice.* DOI: 10.1002/cncr.33913 Cancer 2022

Hedayati et al. *Outcome and presentation of heart failure in breast cancer patients: findings from a Swedish register-based study.* doi.org/10.1093/ehjqcco/qcz039 Eur Heart J Qual Care Clin Outcomes. 2020

Yang et al. *Risk of heart disease following treatment for breast cancer – results from a population-based cohort study.* doi.org/10.7554/eLife.71562 elifesciences 2022

Pruessmann et al. *Conditional Disease-Free and Overall Survival of 1,858 Young Women with Non-Metastatic Breast Cancer and with Participation in a Post-Therapeutic Rehab Programme according to Clinical Subtypes.* DOI: 10.1159/000507315 Breast Care (Basel) 2021

Thomas et al. *Incidence and Survival Among Young Women With Stage I–III Breast Cancer: SEER 2000–2015.* doi: 10.1093/jncics/pkz040 JNCI Cancer Spectr 2019

Tumorzentrum München

Eng et al. *Ten-year survival in women with primary stage IV breast cancer.* DOI: 10.1007/s10549-016-3974-x Breast Cancer Res Treat. 2016

Wallers et al. *Breast cancer survival and stage at diagnosis in Australia, Canada, Denmark, Norway, Sweden and the UK, 2000-2007: a population-based study.* British Journal of Cancer volume 108, pages1195–1208 (2013)

Wang et al. *Conditional Survival in Rectal Cancer: A SEER Database Analysis.* Gastrointest Cancer Res 1:84–89 2007

Cheng et al. *Analysis of Survival Among Adults With Early-Onset Colorectal Cancer in the National Cancer Database.* doi:10.1001/jamanetworkopen.2021.12539

Guan et al. *Association of Radiotherapy for Rectal Cancer and Second Gynecological Malignant Neoplasms.* DOI: 10.1001/jamanetworkopen.2020.31661

Brown et al. *Body Composition and Cardiovascular Events in Patients With Colorectal Cancer.* doi: 10.1001/jamaoncol.2019.0695

Varghese. *Chemotherapy for Stage II Colon Cancer.* doi: 10.1055/s-0035-1564430 Clin Colon Rectal Surg. 2015