Cancer Survival in Florida 1999-2003 with 10-year Follow-up

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Contents

Acknowledgments

The Florida cancer incidence data used in this report were collected by the Florida Cancer Data System (FCDS), the statewide cancer registry funded by the Florida Department of Health (DOH) and the Centers for Disease Control and Prevention's National Program of Cancer Registries (CDC-NPCR). The views expressed herein are solely those of the author and do not necessarily reflect those of the DOH or CDC-NPCR.

This work was supported by FDOH (Contract CODJU) and CDC through the NPCR (DP003872-04). The author thanks Tara Hylton from FDOH and the following FCDS people for helpful feedback : David Lee, Gary Levin, Brad Wohler, and Monique Hernandez. The author thanks Florida Vital Statistics, the National Death Index (NDI) and the Human Mortality Database (HMD) for providing the death information.

Executive Summary

This monograph, *Cancer Survival in Florida 1999-2003 with 10-year Follow-up*, uses life tables to estimate net survival rates of adult cancer patients diagnosed in Florida 1993-2003 with passive follow-up to the end of 2013. One- 5-, and 10-year survival rates are provided for each of the ten cancer site groups that FCDS publishes in its annual reports: Lung & Bronchus, Prostate, Breast, Colorectal, Bladder, Head & Neck, Non-Hodgkin[1], Melanoma, Ovary and Cervix. Comparison of 5-year Florida survival rates with data for the entire United States indicate that Floridians have higher (better) survival for 9 of 10 examined cancers. The absolute difference in rates ranged from .7% (melanoma) to 6.7% (colorectal). Five-year survival rates for non-Hodgkin's lymphoma were lower (worse) for Floridians relative to the US rate (absolute difference in rates: 2.3%).

All survival rates in the monograph are calculations based on the "net survival in the relative framework", which is considered superior to other calculation methods because net survival ignores competing risks and calculations do not require cause of death information. In addition to the application of this method, another objective of this monograph was to present results that can be easily reproducible by data requestors. One challenge in replicating these statistics is that FCDS has full birth dates which are used to efficiently calculate net survival, but only birth year is releasable to data requestors. Thus, data requestors seeking to replicate results must use life-table (actuarial) estimates. Currently, only one statistical package (Stata) can estimate net survival in the relative framework using this life table approach.

Therefore, to assist data users this monograph includes a companion technical report (Alexandersson, 2017b) with a separate supplement to both better explain survival analysis approaches and to facilitate reproducible analysis using Stata.

[1]Non-Hodgkin refers to Non-Hodgkin's lymphoma throughout this monograph.

Chapter 1

Introduction

Net survival is the survival in absence of competing risks. This monograph will provide net survival rates for each of the ten cancer site groups that FCDS publishes in the annual incidence reports: Lung & Bronchus, Prostate, Breast, Colorectal, Bladder, Head & Neck, Non-Hodgkin, Melanoma, Ovary and Cervix. Unlike previous FCDS monographs and the SEER monographs, this monograph does not publish survival statistics for all cancers combined because there is no international standard for it. The 5-year net survival rates will be compared with the CINA 2006-2012 U.S. relative survival ratios (Johnson et al., 2016a) and, for head and neck, with the SEER 2007 monograph (Ries et al., 2007). Those 5-year non-FCDS relative survival ratios are listed in Table 1.1.

Table 1.1: Relative survival ratios (%) for the United States

Cancer	Relative survival
Lung & Bronchus	20.0
Prostate	96.9
Female breast	88.6
Colorectal	64.4
Urinary bladder	77.0
Head & Neck	57.1
Non-Hodgkin	68.4
Melanoma of the skin	90.0
Ovary	41.9
Cervix	62.9

Source: (Johnson et al., 2016a, 22,24,25,26,32,34,35,39,41) and (Ries et al., 2007, 11)

Table 1 indicates that relative survival is the highest for prostate when all stages are considered. However, there are some reports that localized prostate cancer relative survival is estimated to exceed 100%. Survival over 100% suggests that a patient had a higher chance of survival than those in the general population of comparable age, sex, and calendar year.

Male breast cancer statistics are suppressed because it is the practice both for FCDS reporting and for SEER reporting in CINA. The next chapter describes how this issue was dealt with in the analysis. Typically, male breast cancer is slightly less than 1% of total breast cancers.[1]

[1] See https://www.cancer.org/cancer/breast-cancer-in-men/about/key-statistics.html.

Chapter 2

Methods

Survival analysis is just another name for time-to-event analysis. The point of survival analysis is to follow subjects over time and observe at which point in time they experience the event of interest. Population-based cancer survival analysis deals almost exclusively with the time from diagnosis of cancer to death. The concept of net (not crude) survival in a relative (not cause-specific) framework, as discussed in Dickman and Coviello (2015), is central to how survival analyses are calculated and reported in FCDS reports. Because of the common concept relative survival, it is important to distinguish between the relative framework and relative survival. The relative framework is an analysis *framework* for the chosen measure whereas relative survival typically refers to relative survival ratio, which is a *measure* of survival. This monograph and the companion technical report is based on the distinction between measure, framework, and estimator by Dickman and Coviello (2015). Dickman and Coviello (2015) distinguished between the measures crude and net survival, the cause-specific or relative framework for estimating the chosen measure, and the estimators available within the chosen framework.

There are four frequently reported measures of survival: overall survival, relative survival ratio, crude survival, and net survival. Overall (a.k.a. observed or all-cause) survival, is the probability that a patient is still alive at a certain time point t after the diagnosis. Relative survival ratio is the ratio of average overall survival to average population survival. Crude survival is the probability of survival where you may die of other causes than cancer. Net survival is the probability of survival where the specific cancer is the only possible cause of death.

Crude and net survival distinguish between two causes of death: death due to cancer and death due to other causes. Overall survival and relative survival ratio do **not** make this distinction.

Relative survival ratio used to be the main reported measure as it was thought to equal net survival. The relative survival ratio is used in CINA (Johnson et al., 2016b) and it is still useful if you do not want to distinguish between the hazard due to cancer and the hazard due to other causes. This FCDS monograph estimates net survival because here the only hazard of interest is the hazard due to cancer.

Net survival can be interpreted as the average ratio of overall and population survival. In contrast, as mentioned, relative survival ratio is the ratio of average overall survival to average population survival. The extent of the difference between the two measures depends on the demographics and on the cancer-specific hazards.

Pohar Perme showed that the relative survival ratio is a biased measure of net survival. The Pohar Perme estimates of net survival are considered unbiased because they only look at the hazard due to cancer; they do not depend on the hazard due to other causes. This is the measure to be used when you want to compare the cancer survival experience of groups with different population mortality. The Pohar Perme estimates are computed by using so called inverse probability weights. The weights inflate the number of people at risk and number of deaths to account for person-time and deaths not observed as a result of mortality due to competing causes. For more details, see Perme et al. (2016); Coviello et al. (2015); Dickman and Coviello (2015); Alexandersson (2017b).

This monograph uses the Stata command `stnet` to get unbiased Pohar Perme estimates of net survival in the relative framework using life tables (Coviello et al., 2015). The monograph uses life tables rather than continuous survival times because birth month and birth day are not releasable which affects diagnosis age. That is, the matching of survival times to life tables may be off by a year of age. A life table tabulates the general population mortality rate by various demographics – usually age, sex, and calendar period, but also sometimes by sub-region, ethnicity, and socio-economic status. Life table methods are well-suited to cancer registry data, where datasets are large and exact survival times in days cannot be established with any precision. The monograph uses the Human Mortality Database for the life table data which stratifies by age, sex, and calendar year. This population mortality file serves as the denominator in the analyses. For details, see the technical report.

Net survival generally depends on age of diagnosis, and the ages of cancer patients vary over time and across populations. Age standardization is recommended for comparing estimates between different populations or over time within the same population. The estimated net survival rates in the monograph are age-standardized with the International Cancer Survival Standard (ICSS). The FCDS analysis dataset includes adult patients diagnosed in 1999-2003 with follow-up until the end of 2013. Ages 15-99 at the time of diagnosis are used.

The race groups used are White, Black, Other, and Unknown but only White and Black are reported in order to be consistent with the annual reports. The standard SEER*Stat inclusion/exclusion criteria are used. For example, only the first primary cancer is used, and observations on patients alive with no survival time (i.e., invalid vital status or unknown survival duration) are dropped. For the stage groups, a combined variable of SEER Summary Stage 1977 (NAACCR item 760) and SEER Summary Stage 2000 (NAACCR item 759) is used. Localized stage includes in situ for urinary bladder cancer.

To estimate 10-year survival, what is referred to as the cohort approach

(Dickman and Coviello, 2015, 199-200), all patients must have a potential follow-up of at least 10 years. Such estimates, based on patients diagnosed at least 10 years in the past, will not be relevant for recently diagnosed patients.

The last chapter will show that the net survival rates vary widely, both between cancer sites and between time periods for a given cancer site. This is seen most easily in the summary graph on page 16 and in the summary table on page 17. Overall, the net survival rates are worse for lung cancer and better for prostate cancer. Some of the graphs have huge spikes for the confidence intervals. A spike means that the net survival estimate is uncertain. If the confidence interval includes 0, as sometimes for prostate cancer by stage group and for melanoma of the skin cancer by stage group, then those survival estimates are statistically insignificant. The most extreme example of uncertain estimates is localized prostate cancer which has no confidence interval because few died from it.

Monograph graphs were generated in Stata using the `twoway graph` command. The tables are produced using the user-written Stata command `tabout`. The Stata code is omitted since the focus here is on reporting, not on reproducibility. For reproducibility, see the companion technical report (Alexandersson, 2017b). Net survival rates are expressed as probabilities (range: 0-1) in the graphs and as percentages (range: 0-100) in the tables, which is inconsistent but conventional. The rates reflect the same survival outcome whether expressed as probabilities or as percentages. For example, a net survival probability of .60 is the same as 60% net survival. The tables do not have confidence intervals in order to keep the tables simple. If you want confidence intervals in the tables, please see the supplement to the technical report Alexandersson (2017a).

Chapter 3

Discussion

Table 6.1 in the final chapter includes 5-year net survival rates for Florida which are comparable to the 5-year relative survival ratios for United States. Table 3.1 below directly compares the Florida and national 5-year survival rates.

Table 3.1: 5-year survival rates (%) for the United States and Florida

Cancer	U.S. rates	Florida rates
Lung & Bronchus	20.0	20.9
Prostate	96.9	101.1
Female breast	88.6	93.3
Colorectal	64.4	71.1
Urinary bladder	77.0	83.3
Head & Neck	57.1	61.0
Non-Hodgkin	68.4	66.1
Melanoma of the skin	90.0	90.7
Ovary	41.9	44.6
Cervix	62.9	65.7

Source: (Johnson et al., 2016a, 22,24,25,26,32,34,35,39,41) and (Ries et al., 2007, 11) for U.S. and Table 6.1 for Florida.

Comparison of 5-year Florida survival rates with data for the entire United States indicate that Floridians have higher (better) survival for 9 of 10 examined cancers. The absolute difference in rates ranged from .7% (melanoma) to 6.7% (colorectal). Five-year survival rates for non-Hodgkin's lymphoma were lower (worse) for Floridians relative to the US rate (absolute difference in rates: 2.3%).

The typical recommended FCDS usage of survival analysis is to provide life tables. The life tables are estimated as net survival in the relative framework which is one of four common survival analysis approaches. The four survival analysis approaches are based on a simple typology of measure (crude or net) and framework (cause-specific or relative). For a discussion of the approaches, see the technical report (Alexandersson, 2017b). Dickman and Coviello (2015) recommended that the choice of survival analysis approach should be done in three steps. First, one determines the measure. Second, one determines the framework. Third, one determines the estimator. Alternative typologies are discussed in the technical report.

There are five available estimators of net survival in the relative framework (Dickman and Coviello, 2015, 187): Ederer I, Ederer II, Hakulinen, model-based, and Pohar Perme. The monograph and the technical report use the Pohar Perme estimator. The Stata commands `stnet, strs, and stns` all create Pohar Perme estimates of net survival in the relative framework. The command `stnet` is preferred because it is optimized for life tables. The command `stns` is not used because it cannot handle age standardization. The command `strs` is used in the appendix of the technical report for a sensitivity analysis.

The typology in the monograph and technical report includes a fourth step that is not in Dickman and Coviello (2015): recommended FCDS usage. The idea is to reduce technical jargon for a general audience interested in cancer survival analysis using FCDS data. The recommended FCDS usage for estimating net survival in the relative framework is life tables because life tables, unlike model-based approaches, do not require modeling assumptions. To estimate crude survival in the relative framework also typically involves using nonparametric life tables with parametric modeling as an optional second step. However, the recommended FCDS usage for estimating crude survival in the relative framework is risk communication, not life tables. Usage is how something is used. The core idea with life tables is to be technically correct in describing the survival data, as in the life tables, whereas the core idea with risk communication is to communicate effectively. Both approaches use life tables but the usage differs.

Any typology and approach needs to be evaluated on its usefulness. There are three advantages with the chosen typology and approach for survival analysis: reproducibility, NAACCR compatibility, and simplicity.

Reproducibility This FCDS monograph is the first one with statistical results that are easily reproduced. An outside investigator can replicate the findings by requesting the monograph data.

NAACCR Compatibility The FCDS monograph is NAACCR compatible in the sense that it uses a currently required SAS macro for creating NAACCR-defined survival months.

Simplicity The FCDS monograph is simple in that it uses an existing typology (Dickman and Coviello, 2015) for estimating net survival in the relative framework, and a well documented Stata command `stnet` (Coviello et al., 2015). Also, it extends the Dickman typology to recommend FCDS usage depending on the chosen approach.

The choice of estimating net survival in a relative framework using life tables also revealed issues with policy implications. The author notes three such policy issues below.

Lack of data and software The reproducibility comes at the cost of having to make a data request to reproduce the results and of having to use Stata at a fairly advanced level. The supplement to the technical report briefly describes how R can be used whereas SAS and SEER*Stat are not useful for Pohar Perme estimation of net survival. FDOH and FCDS may want to make a public use dataset for easier reproducibility. This may require approval of policy makers.

SEER Incompatibility FCDS unlike SEER does not release a variable for birth month. FCDS also does not release birth day. Not having full birth dates unnecessarily complicates both data management and statistical analysis. Woods et al. (2012) is the ultimate reference. Releasing full birth dates may require approval of policy makers.

Priorities Making recommendations about data release and data dissemination priorities is beyond the scope of the monograph. The monograph was submitted to FDOH in June 2017, and this updated version is from November 2017. Releasing monographs faster may require a different workflow.

The next chapter will discuss limitations. The graphs and tables in the final chapter will illustrate different but complementary information. The graphs focus on the trends in net survival rates by stage group whereas the tables add overall rates and rates by sex and rage group at 1-, 5-, and 10-year follow-up.

Chapter 4

Limitations

This monograph and the companion technical report have several limitations. The technical report (Alexandersson, 2017b) lists ten known limitations, listed in approximate order of importance depending on interest:

1. No sensitivity analysis of using different life tables
2. Dependency on SAS macro
3. Excluded children
4. Did not allow for multiple primary cancers per patient
5. Did not create more updated estimates
6. Did not do flexible parametric modeling
7. Did not create a cancer survival index
8. Did not discuss reporting guidelines in detail
9. Did not compare results with other than most recent CINA survival
10. Did not compare alternatives to Stata beyond the technical report supplement

The list is only tentative. Another limitation is that there was no coverage of ethnicity such as Hispanic vs. non-Hispanic. Interpretation of the rates is another limitation. For example, why does Florida have worse 5-year rate for non-Hodgkin's lymphoma? One possible eplanation is the Florida rates are older, from diagnoses in 1999-2003 rather than from 2006-2012. Survival rates from non-Hodgkin's lymphoma have been increasing since the late 1990s.[1] Another example, why do melanoma survival rates differ for race as in Table 6.9?

[1] See https://www.cancer.org/cancer/non-hodgkin-lymphoma/about/key-statistics.html.

The worse melanoma survival rates for Black versus White melanoma patients are consistent with previous research. Because of typically small numbers of Blacks with melanoma, FCDS typically does not report melanoma statistics for Blacks for patient confidentiality reasons and because the data may not be stable.

As an example, see Table 1 in the annual reports. FCDS may release tabulated data at or above the county code level with a count of 10 or greater. The total state count is 102 diagnosed cases for 1999-2003. Therefore, melanoma of the skin is reported for blacks as does CINA. Melanoma is by far the most common cancer in the United States.

A third example, why is survival of localized prostate cancer over 100%? There are a number of possible reasons for this. For example, it may reflect a selection effect of PSA screening. CINA caps rates at 100% (Johnson et al., 2016a, 16) in order to calculate a first use relative survival ratio for all cancers combined. Treatment of prostate cancer has changed over time from active to passive which also complicates interpretation.

The technical report mentions the issue of passive follow and operational issues but there is always room for improvement. For example, more years of diagnosis could have been covered.

The main limitation "No sensitivity analysis of using different life tables" is addressed mostly in two references. Schaffar et al. (2017) found that the use of different life tables did not compromise net survival in the relative framework for colorectal, lung, melanoma and breast cancer. For lung cancer, Stroup et al. (2014) found that differences between "relative survival" based on US life tables and state life tables were small, and state-based estimates were less reliable than US-based estimates for older populations.

The second limitation "Dependency on SAS macro" is covered at great length in the technical report. The issue is that the NAACCR variable "Survival Months Presumed Alive" (item 1787) currently requires a SAS macro. Therefore, the required SAS macro is used from within Stata.

Chapter 5

Conclusion

Overall, the 5-year survival rates are similar or better for Florida compared with the United States. The non-Hodgkin cancer is the only 5-year rate that is worse for Florida compared with the United States. The survival rates results, though interesting and encouraging for Florida, are merely a starting point for additional analyses.

In conclusion, this monograph *Cancer Survival in Florida 1999-2003 with 10-year Follow-up* is useful and the first of its kind in Florida. The monograph is easily reproducible because the related technical report both shows and explains the Stata code and how to access the data. The tables and graphs below estimate net survival of adult patients (ages 15-99 at diagnosis) in Florida 1999-2003 with 10-year follow-up. The estimates are age-standardized unbiased Pohar Perme estimates of net survival rates using a life-table approach. The life table data come from the Human Mortality Database. The 5-year net survival rates are somewhat better overall than comparable relative survival ratios for the United States. For example, as noted in Tables 1.1 and 6.1/6.2, for lung and bronchus cancer the 5-year net survival rate in Florida 1999-2003 was 20.9% whereas the comparable rate in the United States 2006-2012 was 20.0%. The Florida rates from FCDS and the United States rates from CINA are not directly comparable because different measures, frameworks, and estimators were used.

After determining the measure, framework, and estimator, we should choose the FCDS usage. The typically recommended FCDS usage when estimating net survival in the relative framework with the Pohar Perme estimator is life tables. The Pohar Perme estimator was developed for continuous survival times and it assumes full dates, including full birth dates. The technical report addresses four what-if scenarious for net survival rates of lung and bronchus cancer in appendices. The 10-year net survival rate was 15.33%. Using full birth dates instead of only birth year leeds to a very small 10-year net survival rate increase of 0.02% to 15.35%. Using an alternative life table formula that ignores birth dates leads to a small rate percentage increase of 0.3% to 15.6%. Ignoring the SAS macro to create NAACCR-defined survival months results in a large rate percentage decrease of 6.4% to 8.9%. Ignoring the SAS macro plus including incomplete survival months results in the largest rate percentage decrease of 7.4% to 7.9%. Further work may be needed to clarify these what-if issues to gain more confidence when comparing the net survival rates of Florida and the relative survival ratios of the United States.

The two largest limitations of the monograph are dependency on appropriate life tables and on a SAS macro for creating NAACCR-defined survival months. The author hopes to have a chance to address these two limitations in future updates.

The key measures in cancer control are incidence, mortality, and survival. By mortality we typically mean mortality in the population. In contrast, survival is merely mortality among those diagnosed with cancer transformed to the survival scale (rates or probabilities). In particular, we should consider incidence trends when interpreting trends in patient survival.

FDOH may want FCDS to change the focus in a next update of this monograph. For instance, it is likely that some net survival rates may be viewed as worse than others. For example, the non-Hodgkin cancer is the only 5-year net survival rate that is worse for Florida. The introduction mentioned that a reason could be a trend of increasing net survival rates because the Florida rates are older than the compared CINA rates. Flexible parametric modeling of the effect of covariates is a logical next step to analyze trends. Another possibility for analyzing survival trends is add the context of incidence and mortality trends. Typically the focus of survival analysis is on 5-year survival.

An important question that the monograph and the related technical report have not addressed is how frequent competing events must be in order to estimate crude survival instead of net survival. The typical FCDS usage for estimating crude survival is to communicate risk whereas the typical FCDS usage for estimating net survival is to provide life tables. A related unanswered question is how important and reliable cause of death is. This would require a careful comparison of the FCDS mortality data and the mortality data of the Office of Vital Statistics.

Perme et al. (2012) developed an unbiased estimator of net survival in a relative framework which significantly advanced the field. Coviello et al. (2015) implemented an important new Stata command, `stnet`, that helps to estimate net survival in the relative framework in cases of grouped survival times such as the NAACCR-defined variable of completed survival months, and in cases of restricted birth dates such as FCDS. This monograph *Cancer Survival in Florida 1999-2003 with 10-year Follow-up* used the Stata command `stnet` to give a first description of the data. In particular, the author hopes that the emphasis on reproducibility and the related technical report will be useful for survival analysis of FCDS data.

Chapter 6

Net Survival in Florida 1993-2003 with 10-year Follow-up

6.1 Summary

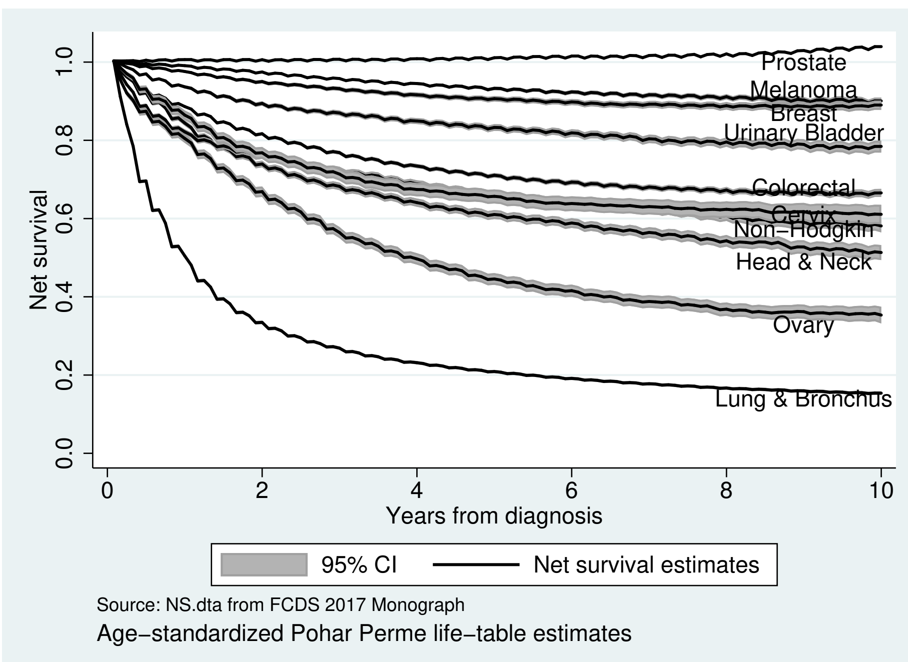

Figure 6.1: Net survival by FCDS cancer site group for adult patients diagnosed in Florida 1999-2003

Table 6.1: Net Survival by FCDS Cancer Site Group

	Net survival rate (%)		
	1-year	5-year	10-year
FCDS Cancer Site Group			
Lung & Bronchus	50.5	20.9	15.4
Prostate	100.6	101.1	104.0
Breast	99.1	93.3	90.1
Colorectal	88.6	71.1	66.6
Bladder	93.7	83.3	78.4
Head & Neck	84.4	61.0	51.3
Non-Hodgkin	82.2	66.1	58.1
Melanoma	97.6	90.7	89.0
Ovary	80.5	44.6	35.3
Cervix	86.4	65.7	61.1

Source: Dataset NS.dta from the FCDS 2017 Monograph. Age-standardized Pohar-Perme life-table estimates from `stnet`. Prostate uses prostate age groups and prostate ICSS 1 weights. Melanoma and Cervix use ICSS 2 weights. The seven other cancer sites use ICSS 1 weights.

6.2 Lung and bronchus cancer

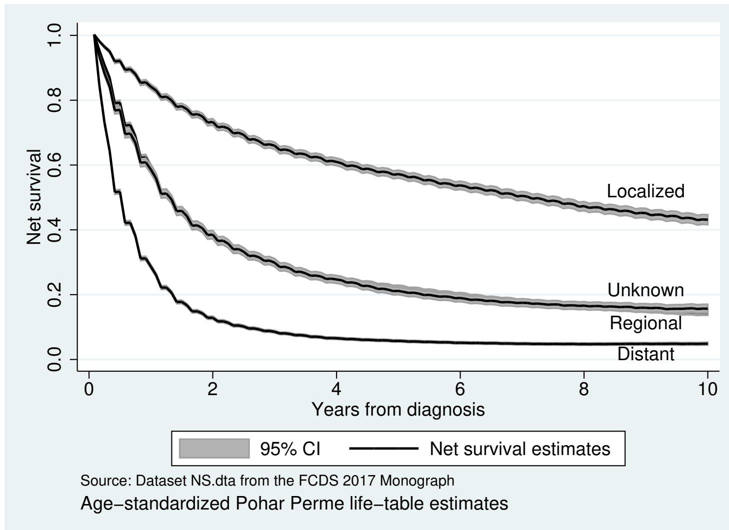

Figure 6.2: Net Survival by Stage Group of Lung and Bronchus Cancer

Table 6.2: Net Survival of Lung & Bronchus Cancer

	Net survival rate (%)		
	1-year	5-year	10-year
Age Standardized			
Total	50.5	20.9	15.4
Sex			
Male	46.6	18.0	13.3
Female	55.2	24.4	18.0
Race Group			
White	50.7	21.1	15.4
Black	47.0	17.6	15.4
Stage Group			
Localized	84.1	57.2	43.0
Regional	59.3	22.1	14.4
Distant	28.6	5.7	4.9
Unknown	58.6	21.2	15.8

Source: NS.dta from FCDS 2017 Monograph. Age-standardized Pohar-Perme life-table estimates from `stnet`. Age groups are ICSS standard age groups (15-44, 45-54, 55-64, 65-74, 75-99). Weight is ICSS 1.

6.3 Prostate cancer

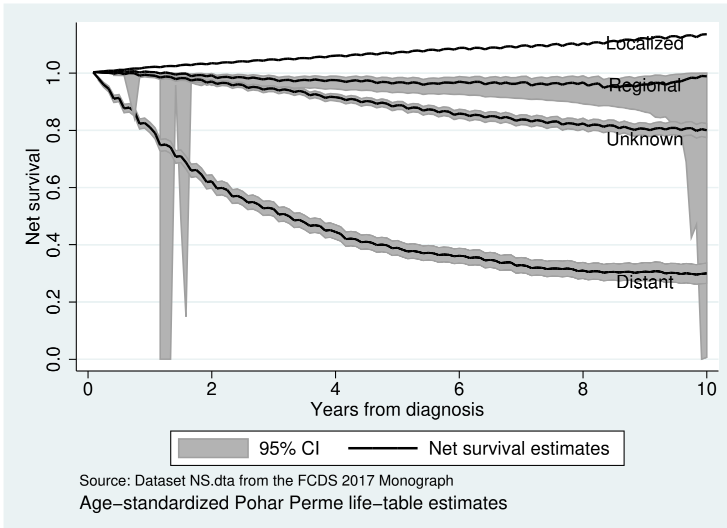

Figure 6.3: Net Survival by Stage Group of Prostate Cancer

Table 6.3: Net Survival of Prostate Cancer

	Net survival rate (%)		
	1-year	5-year	10-year
Age Standardized			
Total	100.6	101.1	104.0
Sex			
Male	100.6	101.1	104.0
Race Group			
White	100.9	101.8	104.4
Black	98.6	95.4	101.3
Stage Group			
Localized	102.1	107.3	113.6
Regional	100.4	96.8	98.9
Distant	81.1	39.0	30.0
Unknown	99.2	88.8	80.1

Source: NS.dta from FCDS 2017 Monograph. Age-standardized Pohar-Perme life-table estimates from `stnet`. Age groups are ICSS prostate age groups (15-55, 55-64, 65-74, 75-84, 85-99). Weight is ICSS 1, age-adjusted for prostate.

6.4 Female breast cancer

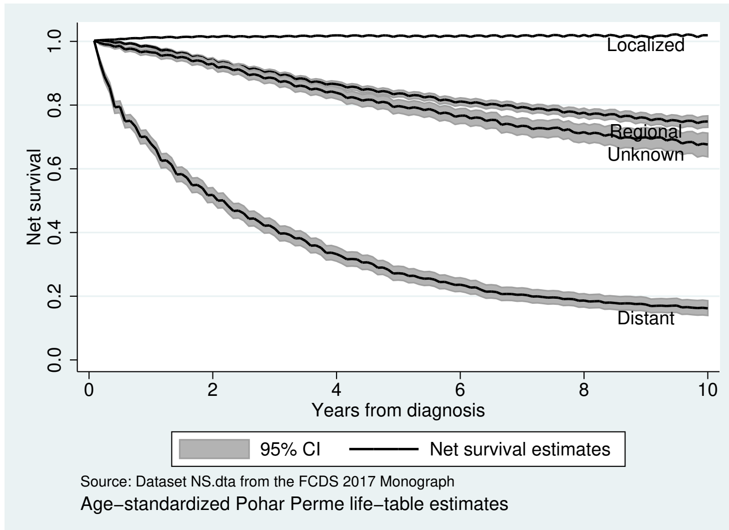

Figure 6.4: Net Survival by Stage Group of Female Breast Cancer

Table 6.4: Net Survival of Breast Cancer

	Net survival rate (%)		
	1-year	5-year	10-year
Age Standardized			
Total	99.1	93.3	90.1
Sex			
Female	99.1	93.3	90.0
Race Group			
White	99.4	94.4	91.4
Black	95.0	78.8	73.4
Stage Group			
Localized	101.3	101.8	101.9
Regional	98.3	83.7	74.9
Distant	67.9	27.2	16.2
Unknown	96.6	79.7	67.6

Source: NS.dta from FCDS 2017 Monograph. Age-standardized Pohar-Perme life-table estimates from `stnet`. Age groups are ICSS standard age groups (15-44, 45-54, 55-64, 65-74, 75-99). Weight is ICSS 1.

6.5 Colorectal cancer

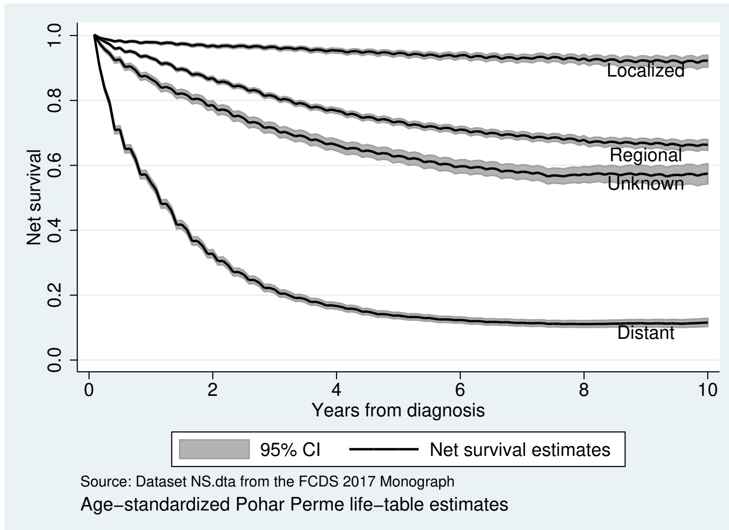

Figure 6.5: Net Survival by Stage Group of Colorectal Cancer

Table 6.5: Net Survival of Colorectal Cancer

	Net survival rate (%)		
	1-year	5-year	10-year
Age Standardized			
Total	88.6	71.1	66.6
Sex			
Male	88.9	70.6	65.3
Female	88.5	71.8	68.1
Race Group			
White	89.0	72.2	67.3
Black	83.8	58.3	57.6
Stage Group			
Localized	97.9	94.6	92.3
Regional	93.1	73.5	66.3
Distant	54.7	13.7	11.6
Unknown	86.6	62.9	57.5

Source: NS.dta from FCDS 2017 Monograph. Age-standardized Pohar-Perme life-table estimates from `stnet`. Age groups are ICSS standard age groups (15-44, 45-54, 55-64, 65-74, 75-99). Weight is ICSS 1.

6.6 Urinary bladder cancer

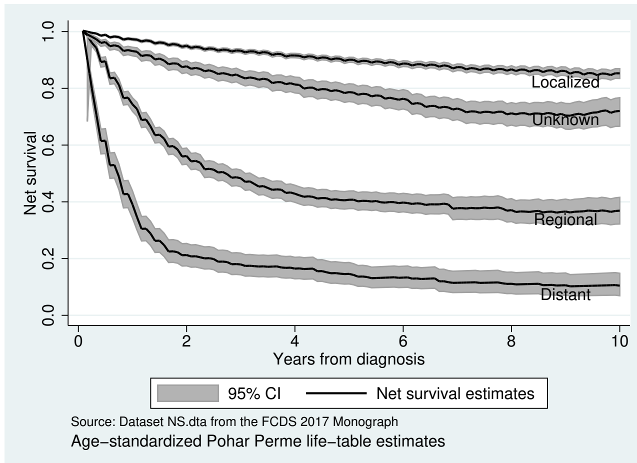

Figure 6.6: Net Survival by Stage Group of Urinary Bladder Cancer

Table 6.6: Net Survival of Bladder Cancer

	Net survival rate (%)		
	1-year	5-year	10-year
Age Standardized			
Total	93.7	83.3	78.4
Sex			
Male	94.5	84.1	78.8
Female	91.2	81.2	77.6
Race Group			
White	94.0	83.7	78.7
Black	81.5	65.5	54.5
Stage Group			
Localized	97.3	90.1	85.3
Regional	74.4	40.7	36.9
Distant	39.1	14.6	10.4
Unknown	93.1	78.7	72.0

Source: NS.dta from FCDS 2017 Monograph. Age-standardized Pohar-Perme life-table estimates from `stnet`. Age groups are ICSS standard age groups (15-44, 45-54, 55-64, 65-74, 75-99). Weight is ICSS 1.

6.7 Head and neck cancer

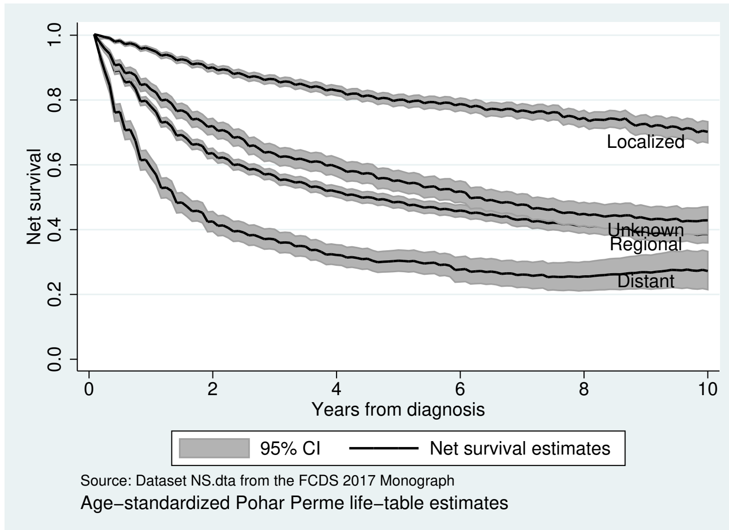

Figure 6.7: Net Survival by Stage Group of Head and Neck Cancer

Table 6.7: Net Survival of Head & Neck Cancer

	Net survival rate (%)		
	1-year	5-year	10-year
Age Standardized			
Total	84.4	61.0	51.3
Sex			
Male	84.6	61.2	50.7
Female	84.2	61.4	53.1
Race Group			
White	85.4	62.5	52.4
Black	72.6	42.7	34.5
Stage Group			
Localized	95.5	80.1	70.2
Regional	78.0	48.6	38.6
Distant	59.2	30.4	27.2
Unknown	83.3	55.2	42.9

Source: NS.dta from FCDS 2017 Monograph. Age-standardized Pohar-Perme life-table estimates from `stnet`. Age groups are ICSS standard age groups (15-44, 45-54, 55-64, 65-74, 75-99). Weight is ICSS 1.

6.8 Non-Hodgkin lymphoma cancer

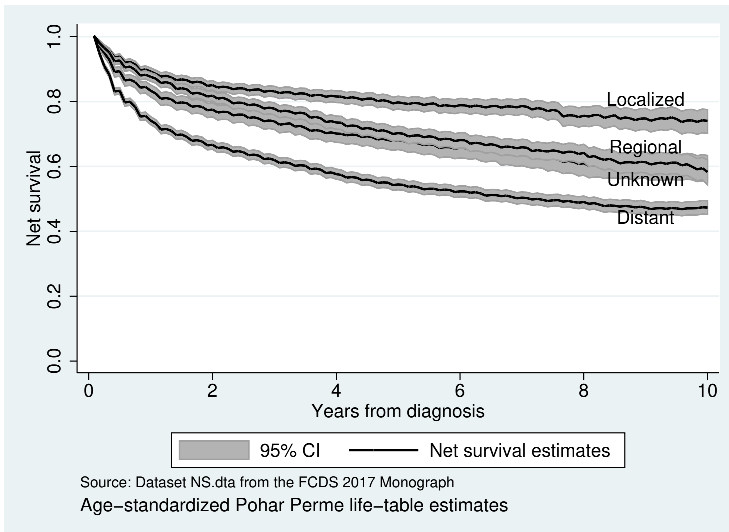

Figure 6.8: Net Survival by Stage Group of non-Hodgkin Lymphomas Cancer

Table 6.8: Net Survival of Non-Hodgkin Cancer

	Net survival rate (%)		
	1-year	5-year	10-year
Age Standardized			
Total	82.2	66.1	58.1
Sex			
Male	80.2	62.4	53.8
Female	84.4	70.3	62.9
Race Group			
White	82.9	67.2	59.2
Black	74.0	53.9	42.8
Stage Group			
Localized	89.2	79.8	74.2
Regional	83.3	68.1	59.6
Distant	74.1	54.4	47.4
Unknown	87.6	70.2	58.3

Source: NS.dta from FCDS 2017 Monograph. Age-standardized Pohar-Perme life-table estimates from `stnet`. Age groups are ICSS standard age groups (15-44, 45-54, 55-64, 65-74, 75-99). Weight is ICSS 1.

6.9 Melanoma of the skin cancer

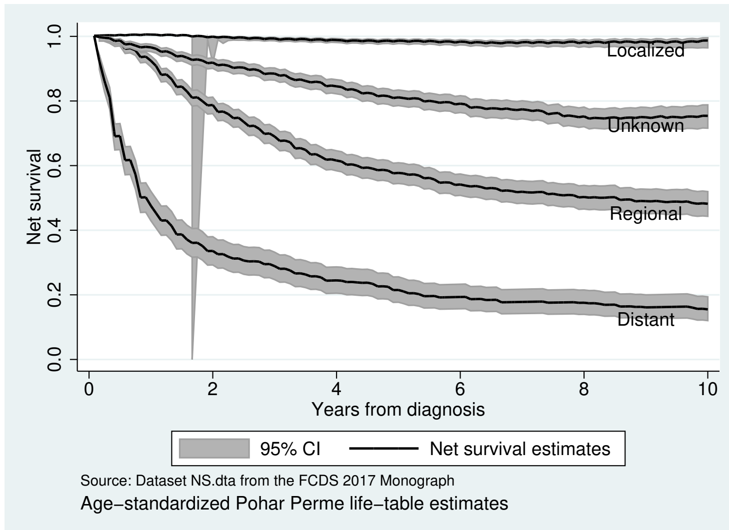

Figure 6.9: Net Survival by Stage Group of Melanoma Cancer

Table 6.9: Net Survival of Melanoma Cancer

	Net survival rate (%)		
	1-year	5-year	10-year
Age Standardized			
Total	97.6	90.7	89.0
Sex			
Male	96.7	88.4	86.2
Female	98.6	93.5	92.8
Race Group			
White	97.5	90.1	87.6
Black	90.2	80.8	73.8
Stage Group			
Localized	100.6	98.7	98.7
Regional	92.5	57.7	48.2
Distant	47.6	21.5	15.5
Unknown	96.6	81.1	75.4

Source: NS.dta from FCDS 2017 Monograph. Age-standardized Pohar-Perme life-table estimates from `stnet`. Age groups are ICSS standard age groups (15-44, 45-54, 55-64, 65-74, 75-99). Weight is ICSS 2.

6.10 Ovary cancer

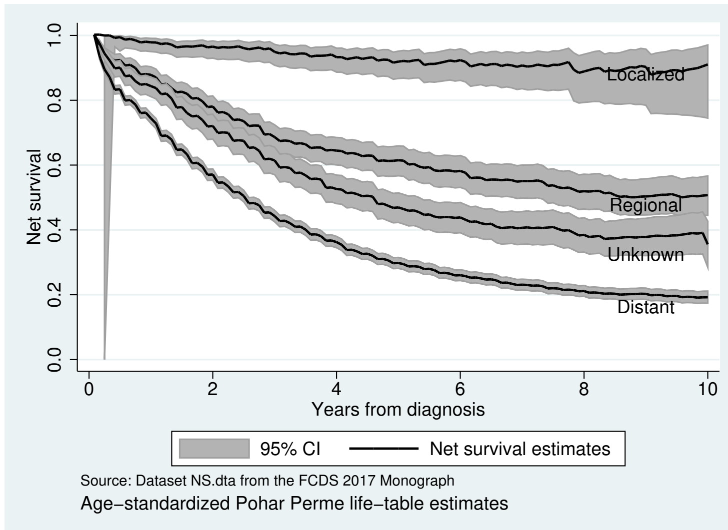

Figure 6.10: Net survival by Stage Group of Ovary Cancer

Table 6.10: Net Survival of Ovary Cancer

	Net survival rate (%)		
	1-year	5-year	10-year
Age Standardized			
Total	80.5	44.6	35.3
Sex			
Female	80.5	44.6	35.3
Race Group			
White	81.2	45.0	35.5
Black	68.5	35.0	28.9
Stage Group			
Localized	97.9	91.9	91.1
Regional	87.8	61.5	50.7
Distant	74.4	29.8	19.2
Unknown	84.4	46.9	35.6

Source: NS.dta from FCDS 2017 Monograph. Age-standardized Pohar-Perme life-table estimates from `stnet`. Age groups are ICSS standard age groups (15-44, 45-54, 55-64, 65-74, 75-99). Weight is ICSS 1.

6.11 Cervix cancer

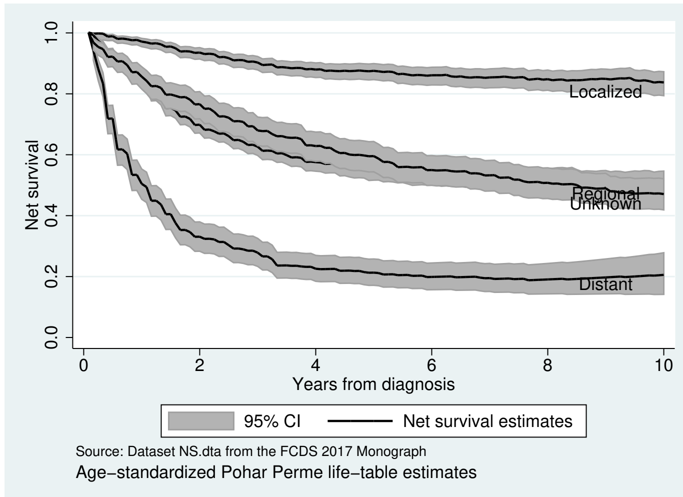

Figure 6.11: Net Survival by Stage Group of Cervix Cancer

Table 6.11: Net Survival of Cervix Cancer

	Net survival rate (%)		
	1-year	5-year	10-year
Age Standardized			
Total	86.4	65.7	61.1
Sex			
Female	86.4	65.7	61.1
Race Group			
White	87.2	66.7	60.0
Black	82.1	60.3	65.1
Stage Group			
Localized	97.1	87.5	83.8
Regional	85.2	54.7	50.3
Distant	50.5	21.3	20.6
Unknown	85.7	59.6	47.1

Source: NS.dta from FCDS 2017 Monograph. Age-standardized Pohar-Perme life-table estimates from `stnet`. Age groups are ICSS standard age groups (15-44, 45-54, 55-64, 65-74, 75-99). Weight is ICSS 2.

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