Supplemental Methods to: Accelerated Aging in Childhood Cancer Survivors: Early Onset and Excess Risk of Chronic Conditions

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1 Overview of COMPASS Model

The Cancer Outcomes Microsimulation: Pediatric and Adolescent SurvivorShip (COMPASS) model simulates the clinical course of survivorship, including late recurrence of childhood cancer, chronic health condition (CHC) risks and treatment-related excess mortality. The model includes 8 index CHCs (i-CHCs) comprising 4 index cancers (i-Cancers) (breast, colorectal, glial tumors, sarcomas) and 4 index cardiovascular diseases (i-CVD) (congestive heart failure, coronary artery disease/myocardial infarction CAD/MI, stroke, valvular disease). Excess mortality risks include late recurrence and the i-CHCs, as well as other treatment-related risks (other malignancies, infections, external causes, all other causes). Background mortality is also included in the model. Individuals are simulated until death (from any cause) or upon reaching age 100. The model was programmed in Java (v1.8.0) and outcomes summarized in R (v4.3.1).

List of Abbreviations

Diagnoses
ALL = acute lymphoblastic leukemia
AML = acute myeloid leukemia
CNS = central nervous system
HL = Hodgkin Lymphoma
NHL = Non-Hodgkin lymphoma
NBL = neuroblastoma
PNET = primitive neuroectodermal tumor
WT = Wilms tumor

Chemotherapy exposures (mg/m2)
Anth = anthracyclines
Alk = alkylators
Cisp = cisplatins
Plat = platinums

Radiation exposures, Gy
Chest = Chest RT
Heart = Heart RT
CRT = Cranial RT
Ovary = Ovarian RT
Abdpel = Abdomial/pelvic RT
RT, radiation

Chronic health conditions
i-CHC = index chronic health condition
CAD/MI = coronary artery disease/myocardial infarction
HF = heart failure
CRC = colorectal cancer

Other
Dx = diagnosis
RR = relative risk
UI = uncertainty interval

2 Childhood Cancer Survivor Study (CCSS) Data

Supplemental Table 1 summarizes the data sources for model development. Model parameters for late recurrence, i-CHCs and excess mortality risks were based on CCSS participants from 31 institutions with completed baseline questionnaires, medical records abstract forms and mortality data (n = 22,585)(1).

For model development and calibration, we used data from all sites (n= 18,465), except St. Jude Children's Research Hospital (SJCRH), Children's Hospital of Orange County, University of Chicago, Ann & Robert H. Lurie Children's Hospital of Chicago and Cook Children's Medical Center which were reserved for model validation (n = 4120) (Supplemental Tables 2 and 3) and Hospital for Sick Children which lacked mortality data. Treatment exposures were based on baseline surveys. CHCs were scored using Common Terminology Criteria for Adverse Events (CTCAE; version 4.03) as grade 3 (severe), 4 (life-threatening or disabling) or fatal (grade 5); all events were collected through Follow-up Survey 5 (June 2016) (16). Mortality data through 2017 were based on the National Death Index. We imputed missing variables by matching individuals to similar individuals in the dataset who had no missing variables (n=15,634). We matched individual patients by diagnosis, institution, sex, year of diagnosis, and age at diagnosis. We iteratively loosened the age/year windows and institution matching until at least 10 potential donors were available. Variables were randomly imputed in each simulation iteration.

Each respondent was weighted by a final sample weight that combined ALL sampling weights (to account for oversampling) and participation weights (IPW) (to account for participation bias).

For model calibration, CCSS data were available for 18,465 respondents. The following variables were used for all participants:

Variable	Min	25%	Median	Mean	75%	Max	Missing
SEX	0	0	0	0.47	1	1	0
fweight	1	1	1	1.11	1	3.6	0
a_dx	0	3	7	7.84	13	20	0
anthd5	0	0	0	103.18	177.054	1,183	770
ptd5	0	0	0	59.95	0	4,668	300
cispd5	0	0	0	40.37	0	7,075	219
procd5	0	0	0	372.56	0	31,938	414
crtd	0	0	20	978.17	1800	30,900	752
chestd	0	0	20	717.19	200	9,500	749
heartd	0	0	6.7	549.09	210	7,270	940
abdpel	0	0	20	704.32	200	11,400	750
anth1	0	0	0	0.26	1	1	770
maxrtgy	0	0	12	18.29	35	309	794
bmt_yn5i	0	0	0	0.05	0	1	0
alk1	0	0	0	0.26	1	1	1534
alk2	0	0	0	0.24	0	1	1534
yearDx	1970	1979	1985	1985.58	1993	1,999	0
recurei	0	0	0	0.1	0	1	43
chemo	0	1	1	0.8	1	1	128
rad	0	0	1	0.56	1	1	174
surg	0	1	1	0.79	1	1	169

The following variables were used for female participants only (n = 8,714):

Variable	Min	25%	Median	Mean	75%	Max	Missing
minovar	0	0	1.2	153.72	21	7,000	472
ovar1	0	0	0	0.47	1	1	472

Variable	Min	25%	Median	Mean	75%	Max	Missing
ovar2	0	0	0	0.04	0	1	472
ovar3	0	0	0	0.02	0	1	472
fldchest1	0	0	0	0.29	1	1	332
fldchest2	0	0	0	0.05	0	1	332
fldchest4	0	0	0	0.02	0	1	332
fldchest5	0	0	0	0.06	0	1	332
fldchest6	0	0	0	0	0	1	332
fldchest7	0	0	0	0.04	0	1	332
fldchest8	0	0	0	0.08	0	1	332

The following variables were used for ALL participants only (n = 4,224):

Variable	Min	25%	Median	Mean	75%	Max	Missing
maxsegrtdose	0	0	1800	1154.79	2200	7,400	157
dexa5	0	0	0	0.23	0	1	120
cyta_risk	1	1	2	1.53	2	2	32
cyclodose5	0	0	0	2461.27	3011.904762	47,278	35

We imputed missing variables by matching individuals to similar individuals in the dataset who had no missing variables (n=15,634). We matched individual patients by diagnosis, institution, sex, year of diagnosis, and age at diagnosis. We iteratively loosened the age/year windows and institution matching until at least 10 potential donors were available. Variables were randomly imputed in each simulation iteration.

Here we report the distribution of window expansions.

Same Institution	Age/Year Window	Count	Cum. Percent
Yes	0 (Exact match)	0	0%
Yes	1	18	0.6%
Yes	2	183	7.1%
Yes	3	320	18.4%
Yes	4	388	32.1%
Yes	5	1051	69.2%
No	0	650	92.2%
No	1	119	96.4%
No	2	57	98.4%
No	3	21	99.2%
No	4	7	99.4%
No	5	5	99.6%
No	6	6	99.8%
No	7	4	99.9%
No	8	1	100.0%
No	9	0	100.0%
No	10	1	100.0%

Each respondent was weighted by a final sample weight: ALL weight (to account for undersampling) X participation weight (IPW).

2.1 Patient Characteristics and Treatment Exposures

CCSS data used for model calibration

Characteristic	Overall	1970s	1980s	1990s
Total	18465 (100%)	4812 (24.2%)	7155 (36.2%)	6498 (39.7%)
Males	9751 (55.4%)	2473 (54.1%)	3831 (55.8%)	3447 (55.9%)
Females	8714 (44.6%)	2339 (45.9%)	3324 (44.2%)	3051 (44.1%)
Age at diagnosis				
0-4 years	7206 (41.3%)	1706 (35.4%)	2987 (42.9%)	2513 (43.3%)
5-9 years	4065 (23.2%)	1087 (22.9%)	1533 (22.2%)	1445 (24.3%)
10-14 years	3923 (19.5%)	1023 (21.1%)	1425 (19.0%)	1475 (19.1%)
15-20 years	2893 (14.1%)	868 (18.0%)	1059 (14.0%)	966 (12.0%)
Mean age, years	7.8 (0-20)	8.4 (0-20)	7.6 (0-20)	7.7 (0-20)
Missing age	378 (1.8%)	128 (2.6%)	151 (2.0%)	99 (1.2%)
Diagnosis				
Acute lymphoblastic leukemia	4224 (30.3%)	1268 (25.6%)	1967 (31.5%)	989 (32.0%)
Acute myeloid leukemia	702 (3.3%)	97 (1.9%)	268 (3.4%)	337 (4.0%)
Other leukemia	238 (1.2%)	57 (1.2%)	78 (1.0%)	103 (1.2%)
Hodgkin lymphoma	2280 (11.2%)	833 (17.6%)	774 (10.2%)	673 (8.2%)
Non-Hodgkin lymphoma	1499 (7.2%)	352 (7.3%)	560 (7.3%)	587 (7.1%)
Astrocytoma	2123 (10.6%)	376 (8.1%)	773 (10.5%)	974 (12.3%)
Medulloblastoma or PNET	779 (4.0%)	100 (2.2%)	277 (3.8%)	402 (5.3%)
Other CNS	557 (2.8%)	74 (1.6%)	203 (2.7%)	280 (3.5%)
Wilms' tumor	1665 (7.9%)	381 (7.8%)	654 (8.4%)	630 (7.5%)
Neuroblastoma	1461 (7.0%)	324 (6.6%)	495 (6.4%)	642 (7.9%)
Rhabdomyosarcoma	1339 (6.6%)	514 (10.8%)	520 (6.9%)	305 (3.8%)
Ewing's sarcoma	569 (2.8%)	142 (3.0%)	206 (2.8%)	221 (2.8%)
Osteosarcoma	943 (4.6%)	275 (5.6%)	354 (4.7%)	314 (3.9%)
Other bone tumor	86 (0.4%)	19 (0.4%)	26 (0.3%)	41 (0.5%)
Follow-up, years since diagnosis				
Mean (range)	24.0 (5.0-46.7)	31.2 (5.0-46.7)	24.5 (5.0-36.6)	18.1 (5.0-26.7)
Attained age, years				
Mean (range)	31.8 (5.0-65.0)	39.6 (6.0-65.0)	32.1 (5.0-56.0)	25.8 (6.0-46.0)
Radiation				
Any	10160 (52.3%)	3536 (73.7%)	3979 (54.6%)	2645 (37.1%)
None	8131 (46.8%)	1227 (25.2%)	3107 (44.4%)	3797 (62.2%)
Missing	174 (0.9%)	49 (1.1%)	69 (0.9%)	56 (0.7%)
Cranial RT				
None	8131 (46.8%)	1227 (25.3%)	3107 (44.4%)	3797 (62.1%)
<20 Gy	6131 (31.3%)	2079 (43.1%)	2482 (33.7%)	1570 (22.0%)
20+ Gy	3451 (17.8%)	1304 (27.1%)	1266 (17.5%)	881 (12.4%)
Missing	752 (4.1%)	202 (4.6%)	300 (4.4%)	250 (3.5%)
Chest RT				
None	8131 (46.8%)	1227 (25.3%)	3107 (44.4%)	3797 (62.1%)
<10 Gy	5363 (27.7%)	1937 (39.8%)	2230 (30.5%)	1196 (17.7%)
10-19 Gy	1031 (5.5%)	227 (4.7%)	428 (6.0%)	376 (5.6%)
20-29 Gy	1080 (5.3%)	306 (6.3%)	326 (4.3%)	448 (5.6%)
30+ Gy	2111 (10.6%)	901 (19.1%)	767 (10.4%)	443 (5.7%)
Missing	749 (4.1%)	214 (5.0%)	297 (4.3%)	238 (3.3%)
Heart RT				
None	8059 (46.3%)	1229 (25.3%)	3093 (44.2%)	3737 (61.1%)
<5 Gy	356 (1.9%)	73 (1.5%)	151 (2.1%)	132 (1.9%)
5-14 Gy	1631 (8.6%)	403 (8.2%)	765 (10.4%)	463 (7.2%)

Characteristic	Overall	1970s	1980s	1990s
15-34 Gy	1460 (7.6%)	596 (12.1%)	659 (9.2%)	205 (3.3%)
35+ Gy	6019 (30.4%)	2282 (47.6%)	2149 (29.1%)	1588 (21.1%)
Missing	940 (5.3%)	229 (5.2%)	338 (5.0%)	373 (5.5%)
Ovarian RT				
None	3883 (21.2%)	620 (12.2%)	1511 (20.5%)	1752 (27.2%)
<10 Gy	3880 (18.6%)	1439 (28.1%)	1502 (19.5%)	939 (12.1%)
10-19 Gy	307 (1.5%)	62 (1.2%)	96 (1.2%)	149 (2.0%)
20+ Gy	172 (0.8%)	110 (2.2%)	46 (0.6%)	16 (0.2%)
Missing	10223 (57.9%)	2581 (56.4%)	4000 (58.2%)	3642 (58.6%)
Abdominal/pelvic RT				
None	8131 (46.8%)	1227 (25.3%)	3107 (44.4%)	3797 (62.1%)
<15 Gy	6167 (31.9%)	2003 (41.1%)	2544 (34.8%)	1620 (23.5%)
15-24 Gy	1086 (5.5%)	354 (7.3%)	401 (5.5%)	331 (4.5%)
25-34 Gy	715 (3.5%)	327 (6.8%)	250 (3.3%)	138 (1.7%)
35+ Gy	1616 (8.2%)	692 (14.8%)	553 (7.5%)	371 (4.8%)
Missing	750 (4.1%)	209 (4.9%)	300 (4.4%)	241 (3.3%)
Max RT				
None	8204 (47.3%)	1237 (25.5%)	3154 (45.2%)	3813 (62.6%)
<20 Gy	2203 (11.9%)	421 (8.5%)	1084 (15.1%)	698 (10.9%)
20-29 Gy	2248 (11.3%)	1023 (20.5%)	747 (10.1%)	478 (6.8%)
30+ Gy	5016 (25.1%)	1907 (40.2%)	1861 (25.1%)	1248 (16.0%)
Missing	794 (4.3%)	224 (5.1%)	309 (4.5%)	261 (3.6%)
Anthracycline dose				
None	10002 (51.4%)	3391 (70.1%)	3781 (51.5%)	2830 (39.9%)
<250 mg/m2	4607 (28.5%)	408 (8.5%)	1724 (25.5%)	2475 (43.4%)
250+ mg/m2	3086 (15.8%)	783 (16.3%)	1320 (18.0%)	983 (13.3%)
Missing	770 (4.3%)	230 (5.1%)	330 (4.9%)	210 (3.3%)
Alkylator dose, CED				
None	8446 (44.5%)	2546 (52.0%)	3173 (44.0%)	2727 (40.5%)
<8000 mg/m2	4351 (26.3%)	620 (12.8%)	1829 (26.2%)	1902 (34.5%)
8000+ mg/m2	4134 (20.9%)	1034 (21.8%)	1597 (21.7%)	1503 (19.7%)
Missing	1534 (8.3%)	612 (13.4%)	556 (8.1%)	366 (5.3%)
Platinum dose				
None	16209 (88.7%)	4723 (98.1%)	6378 (89.5%)	5108 (82.3%)
<400 mg/m2	772 (3.8%)	29 (0.6%)	276 (3.6%)	467 (5.8%)
400+ mg/m2	1184 (5.9%)	28 (0.6%)	393 (5.3%)	763 (9.7%)
Missing	300 (1.6%)	32 (0.7%)	108 (1.5%)	160 (2.1%)
Cisplatin dose				
None	16598 (90.7%)	4723 (98.1%)	6398 (89.8%)	5477 (87.0%)
<400 mg/m2	812 (4.0%)	29 (0.6%)	281 (3.7%)	502 (6.3%)
400+ mg/m2	836 (4.2%)	28 (0.6%)	384 (5.2%)	424 (5.5%)
Missing	219 (1.1%)	32 (0.7%)	92 (1.3%)	95 (1.3%)
Bone marrow transplant	883 (100%)	36 (100%)	270 (100%)	577 (100%)

CED, cyclophosphamide equivalent dose; Gy, Gray; PNET, Primitive Neuro-Ectodermal Tumors; RT, radiotherapy

2.2 Subgroups

CCSS respondents were categorized into multiple subgroups for model calibration and validation. Subgroups included:

Overall, Sex (Male/Female), Era (70s,80s,90s), Age at diagnosis (0-4,5-9,10-14,15-20), Diagnosis group (Brain, Bone, STS, Solid, Leukemia, Lymphoma), Diagnosis group 2 (HL, NHL, Astrocytoma, Other CNS).

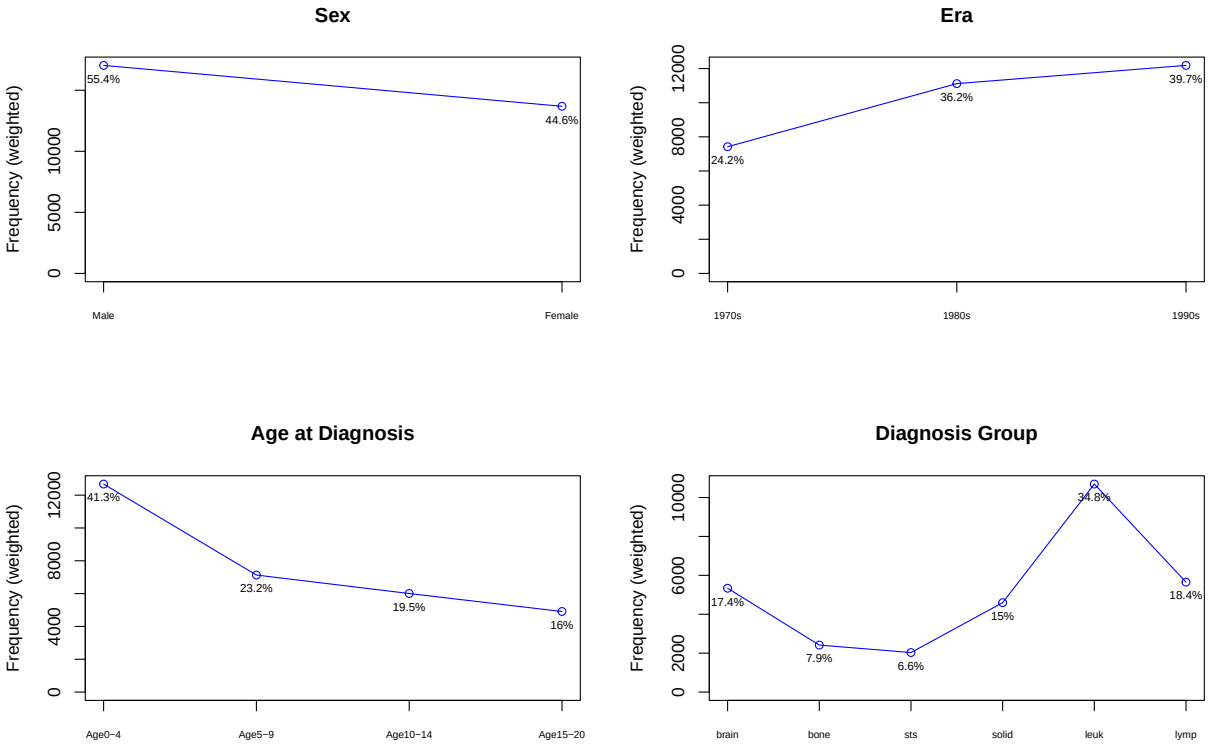
In addition to individual diagnoses, 6 diagnosis subgroups were defined as follows: leukemia (acute lymphoblastic leukemia ALL, acute myeloid leukemia AML, other leukemia), lymphoma (Hodgkin's lymphoma HL, non-Hodgkin's lymphoma NHL, CNS tumors (astrocytoma, medulloblastoma or primitive neuroectodermal tumor [PNET], other CNS tumors), solid (Wilms' tumors, neuroblastoma), soft tissue sarcomas (rhabdomyosarcoma), and bone tumors (Ewing's sarcoma, osteosarcoma, other bone tumors).

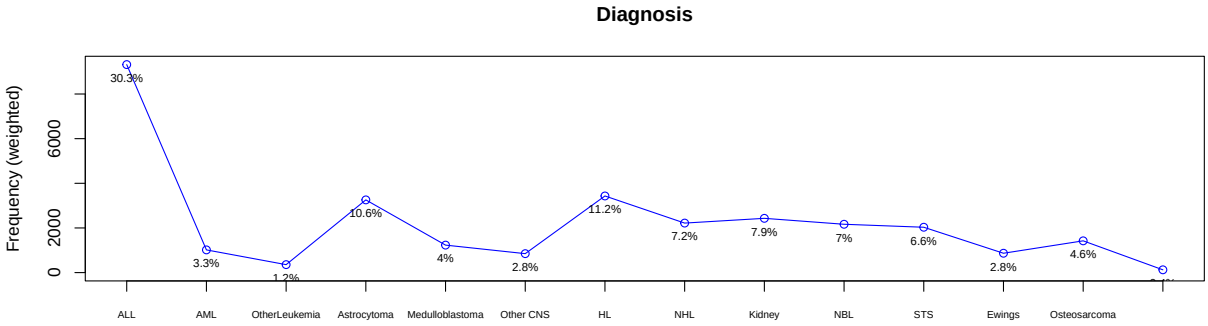
Treatment exposure subgroups: Anthracycline dose, Alkylating agent dose, Cisplatin, Platinum, Chest RT, Heart RT, Cranial RT, Ovary RT, Abdominal/Pelvic RT, Max RT, HL+ALL-specific treatment exposures.

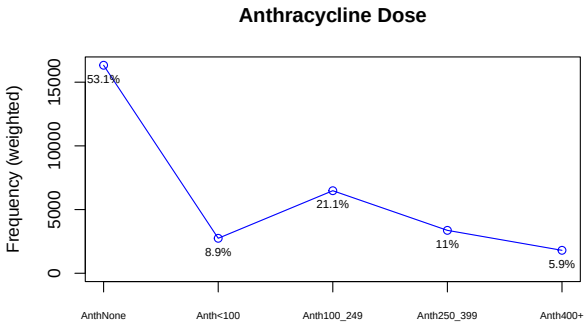
Cyclophosphamide Equivalent Dose (CED) was used for alkylating agent dose.

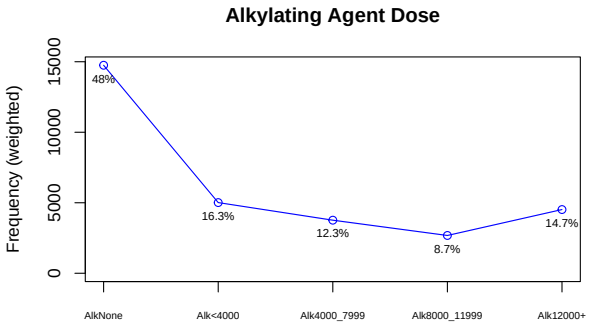
HL and ALL specific treatment exposure groups are based on (Oeffinger et al. JCO 2021 and Dixon et al JCO 2020.

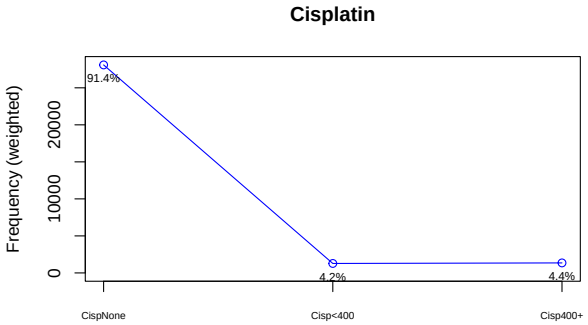
Here we plot the (weighted) frequencies of subgroups.

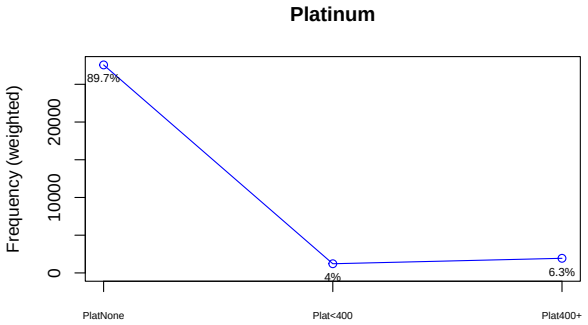


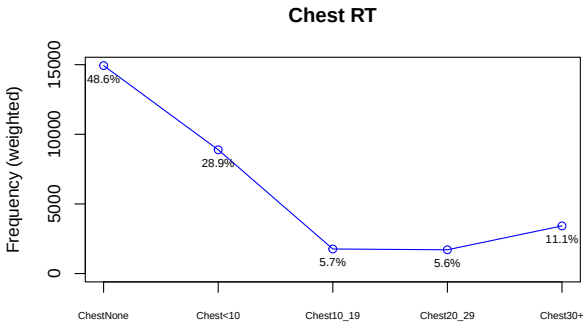

Diagnosis
Frequency (weighted)
0
2000
6000
30.3%
3.3%
1.2%
10.6%
4%
2.8%
11.2%
7.2%
7.9%
7%
6.6%
2.8%
4.6%
ALL
AML
OtherLeukemia
Astrocytoma
Medulloblastoma
Other CNS
HL
NHL
Kidney
NBL
STS
Ewings
Osteosarcoma

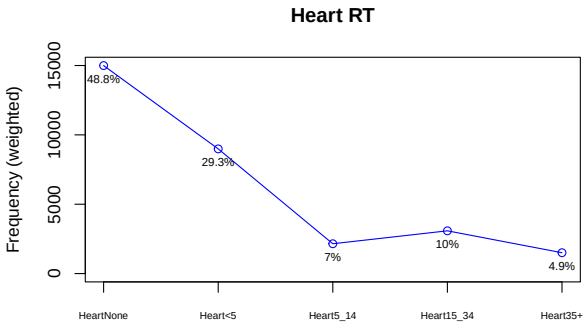

Anthracycline Dose
Frequency (weighted)
0
5000
10000
15000
53.1%
8.9%
21.1%
11%
5.9%
AnthNone
Anth<100
Anth100_249
Anth250_399
Anth400+

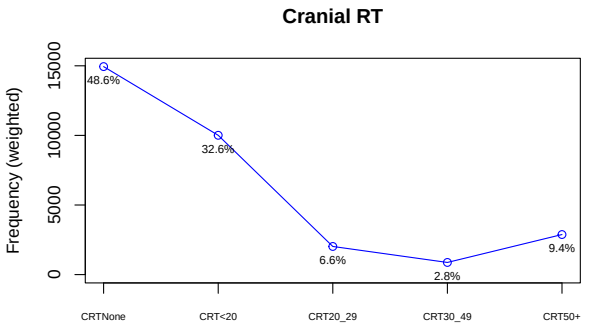

Alkylating Agent Dose
Frequency (weighted)
0
5000
10000
15000
48%
16.3%
12.3%
8.7%
14.7%
AlkNone
Alk<4000
Alk4000_7999
Alk8000_11999
Alk12000+

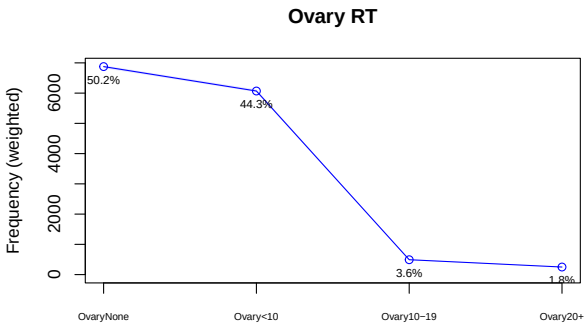

Cisplatin
Frequency (weighted)
0
10000
20000
91.4%
4.2%
4.4%
CispNone
Cisp<400
Cisp400+

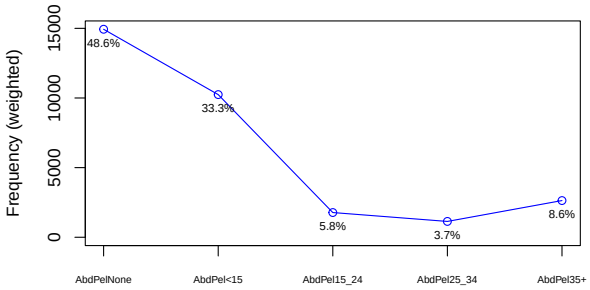

Platinum
Frequency (weighted)
0
10000
20000
89.7%
4%
6.3%
PlatNone
Plat<400
Plat400+

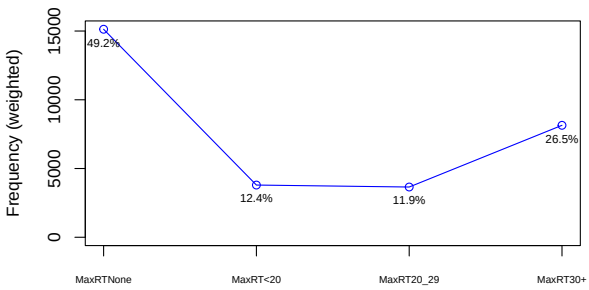

Chest RT
Frequency (weighted)
0
5000
10000
15000
48.6%
28.9%
5.7%
5.6%
11.1%
ChestNone
Chest<10
Chest10_19
Chest20_29
Chest30+

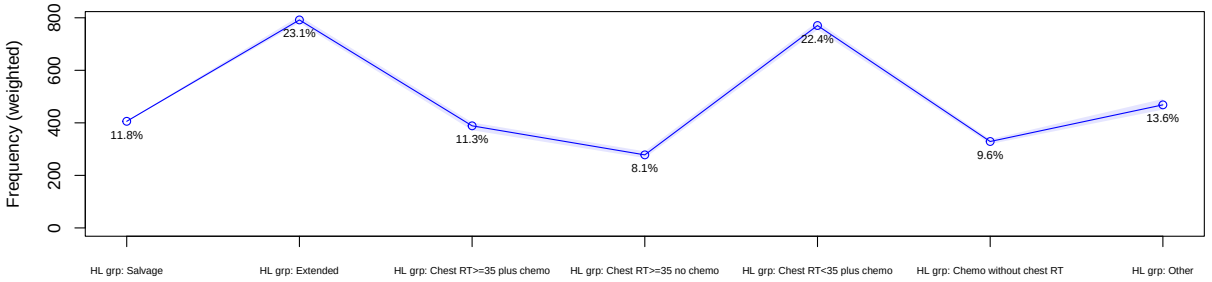

Heart RT
Frequency (weighted)
0
5000
10000
15000
48.8%
29.3%
7%
10%
4.9%
HeartNone
Heart<5
Heart5_14
Heart15_34
Heart35+

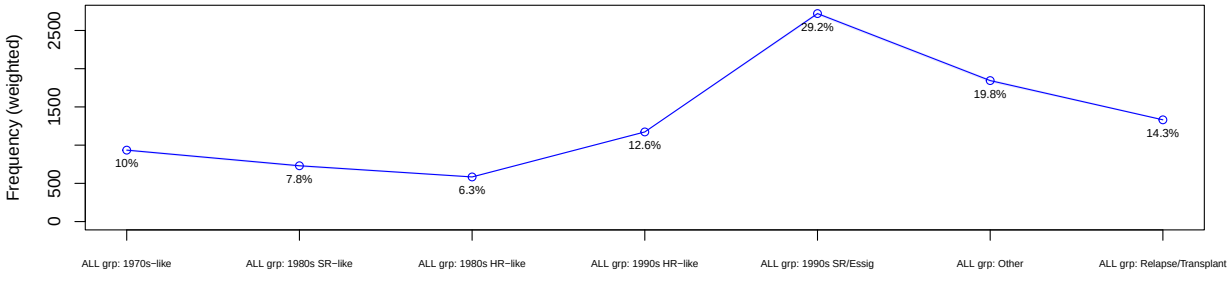

Cranial RT
Frequency (weighted)
0
5000
10000
15000
48.6%
32.6%
6.6%
2.8%
9.4%
CRTNone
CRT<20
CRT20_29
CRT30_49
CRT50+


Ovary RT
Frequency (weighted)
0
2000
4000
6000
50.2%
44.3%
3.6%
1.8%
OvaryNone
Ovary<10
Ovary10−19
Ovary20+


Abdominal/Pelvic RT
Frequency (weighted)
0
5000
10000
15000
48.6%
33.3%
5.8%
3.7%
8.6%
AbdPelNone
AbdPel<15
AbdPel15_24
AbdPel25_34
AbdPel35+


Max RT
Frequency (weighted)
0
5000
10000
15000
49.2%
12.4%
11.9%
26.5%
MaxRTNone
MaxRT<20
MaxRT20_29
MaxRT30+


HL Treatment
Frequency (weighted)
0
200
400
600
800
11.8%
23.1%
11.3%
8.1%
22.4%
9.6%
13.6%
HL grp: Salvage
HL grp: Extended
HL grp: Chest RT>=35 plus chemo
HL grp: Chest RT>=35 no chemo
HL grp: Chest RT<35 plus chemo
HL grp: Chemo without chest RT
HL grp: Other


ALL Treatment
Frequency (weighted)
0
500
1500
2500
10%
7.8%
6.3%
12.6%
29.2%
19.8%
14.3%
ALL grp: 1970s−like
ALL grp: 1980s SR−like
ALL grp: 1980s HR−like
ALL grp: 1990s HR−like
ALL grp: 1990s SR/Essig
ALL grp: Other
ALL grp: Relapse/Transplant

3 Model Inputs

The COMPASS model included risks for 8 index CHCs (i-CHCs), i-CHC mortality, late recurrence incidence and mortality, other causes of excess mortality (other malignancies, infections, external, all other causes), and background mortality. All parameters, except for age-related i-CHC risks and background mortality, were based on the CCSS and generalized linear statistical models using Poisson distributions. These statistical models were used to inform the prior probability distributions (priors) for the parameters in the COMPASS simulation model.

3.1 i-CHC Incidence

The model included 4 i-Cancers (breast, colorectal, glial tumors, sarcomas) and 4 i-CVDs (congestive heart failure, coronary artery disease/myocardial infarction CAD/MI, valvular disease, stroke) for a total of 8 i-CHCs. For priors on treatment-related risks, we used statistical models to predict incidence rates for each i-CHC before age 50. We assumed that rates remained constant based on the age coefficient beyond age 50.

For some risks, models were stratified by diagnosis or group of diagnoses (Supplemental Table 4) as our ability to incorporate diagnosis-specific statistical models for each i-CHC was limited by the rarity of some childhood cancer diagnoses. We balanced the needs for stable statistical models and clinically meaningful treatment exposure-risk relationships using a systematic approach. For i-CHC risks, we started with diagnosis-agnostic models. For example, for breast cancer risk, we used one statistical model for all diagnoses. We incorporated subgroup-specific models to improve calibration to observed data as data allowed. As an example, for stroke, we included 4 models (leukemia, lymphoma, CNS tumors, and all other diagnoses combined) to reflect potential differences in treatment exposures. Similarly, for MI, leaky valves, and CRC we included two models (Hodgkin lymphoma vs. all other diagnoses combined) as the majority of events were observed among HL survivors and could be related to diagnoses-related factors, such as elevated risk associated with older therapies (i.e. mantle RT), older observed attained age given the later diagnosis age of HL, and/or incidental findings routine screening (i.e., early initiation of breast cancer screening (2)).

To account for clustering of risk (either due to causal mechanisms between disease, or residual underlying frailty), we model relative rates of chronic disease incidence, conditional on developing other chronic diseases. I-CHC-specific relative rates are applied, and we allowed all i-CHCs to impact each other to explore temporal and structural uncertainty. RRs were fit via calibration with a floor of 1.0 enforced when sampling. Samples were drawn from the joint distribution of the regression coefficients.

We also assumed 1) survivors who have a recurrence of their original cancer diagnosis may have higher i-CHC and excess mortality risks due to treatment exposures not captured in the CCSS surveys or greater disease severity; 2) survivors diagnosed with cancer before age 5 may face higher mortality risks from other malignancies due to non-treatment-related factors (i.e. cancer predisposition syndromes).

In addition to treatment-related risks, survivors also faced age-related risks for the i-CHCs (except glial tumors and sarcomas which were assumed to be negligible). Age-related risks were based on national databases (SEER 2000-2016, NHLBI 1970-2003) (3, 4) and published studies (5). We sampled incidence rates by age group from the reported estimates using Beta distributions with uniform priors. We then interpolated the sampled rates using natural cubic splines with knots set at the midpoint of each age group. We enforced (weakly) monotonically increasing incidence by age for all conditions except female breast cancer. We assumed that treatment- and age-related risks were independent.

Cubic splines were calculated as:

$$f(x) = \beta_0 \cdot x + \sum_{j=1}^{n-2} \beta_j \cdot g(x, j)$$

where β is the set of coefficients, n is the number of knots,

$$g(x,j) = h(x,k_j) - h(x,k_{n-1})\frac{k_n - k_j}{k_n - k_{n-1}} + h(x,k_n)\frac{k_{n-1} - k_j}{k_n - k_{n-1}}$$

where k is the set of knots,

$$h(x,\kappa) = \max\left(\left(\frac{x-\kappa}{\delta}\right)^3, 0\right)$$

and $\delta = (k_n - k_1)^{\frac{2}{3}}$.

3.2 General Population Incidence

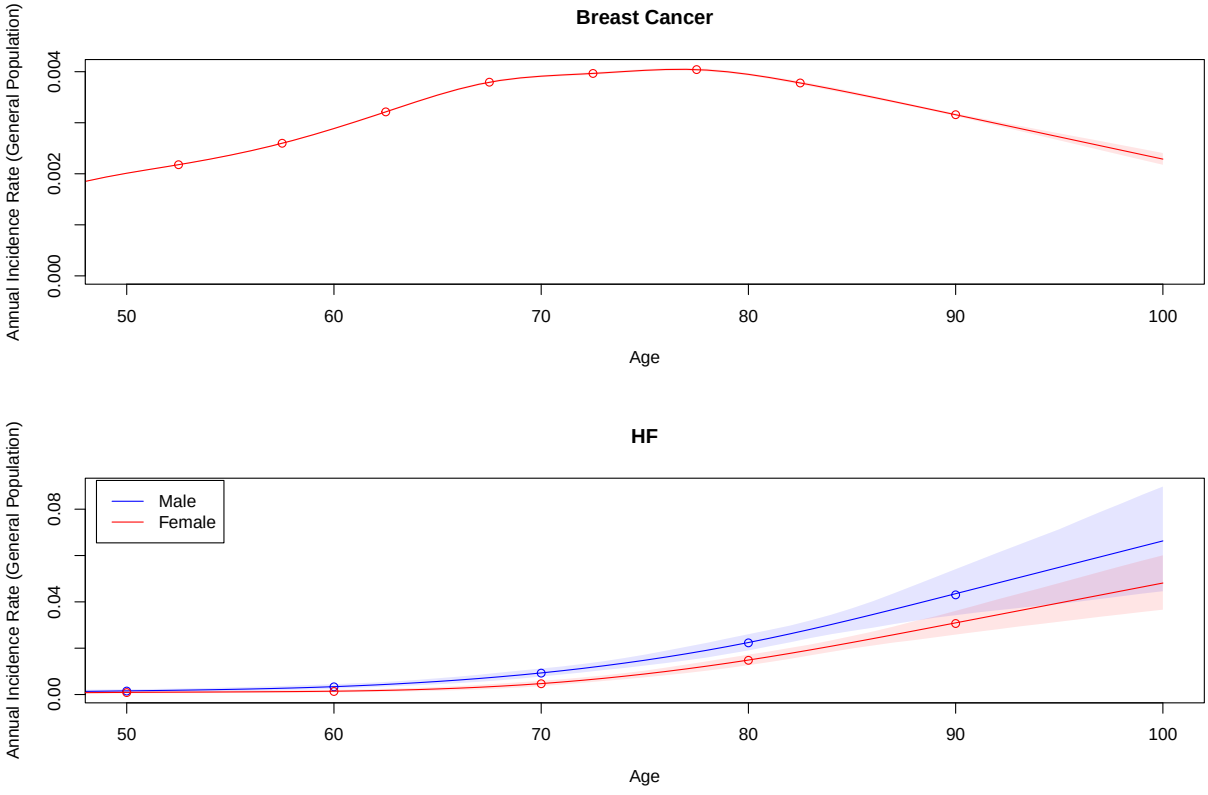
Estimates of chronic conditions in the general population were used to inform projected incidence rates at older ages. We obtained estimates of general population incidence by age group for the following conditions (we assumed negligible risks for glial tumors and sarcomas):

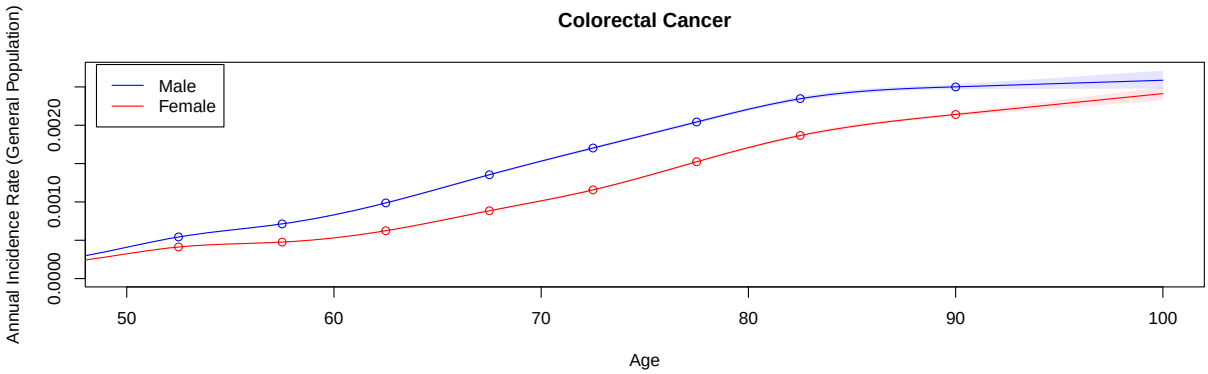
Condition	Sex	Source
Breast Cancer	F	SEER 2000-2016
HF	M,F	NHLBI 1980-2003
Colorectal Cancer	M,F	SEER 2000-2016
CAD/MI	M,F	NHLBI 1980-2003
Stroke	M,F	NHLBI 1980-2003
Valvular Disease	Both	Nkomo et al. 2006

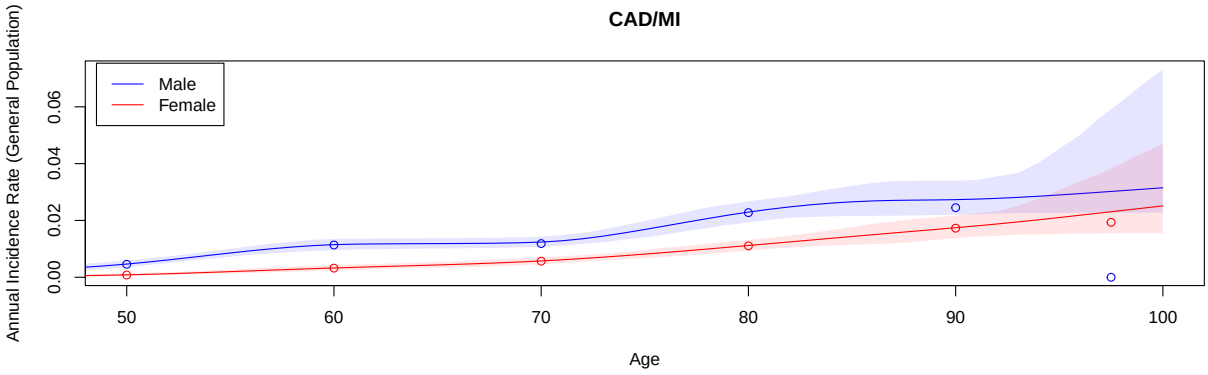
We sampled incidence rates by age group from the reported estimates using Beta distributions with uniform priors. We then interpolated the sampled rates using natural cubic splines with knots set at the midpoint of each age group. We enforced (weakly) monotonically increasing incidence by age for all conditions except female breast cancer.

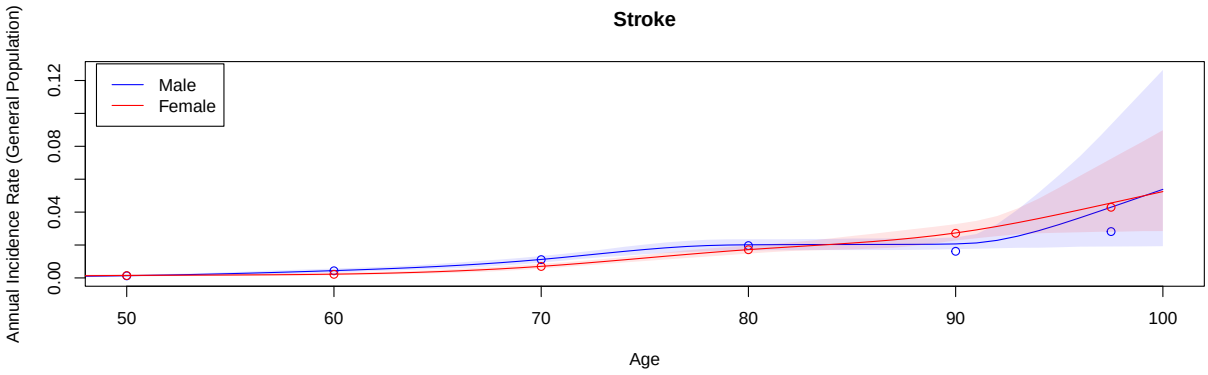
We used regression models to predict exccess (additive) incidence rates for each chronic condition for childhood cancer survivors. These (individual-level, predicted) excess incidence rates were added to the general population incidence rates to model excess risk of each chronic condition. This approach allows us to capture individual-level heterogeneity in chronic disease risk from the CCSS data at younger ages while also accounting for age-related incidence trends which are not yet able to be observed in the CCSS due to censoring.

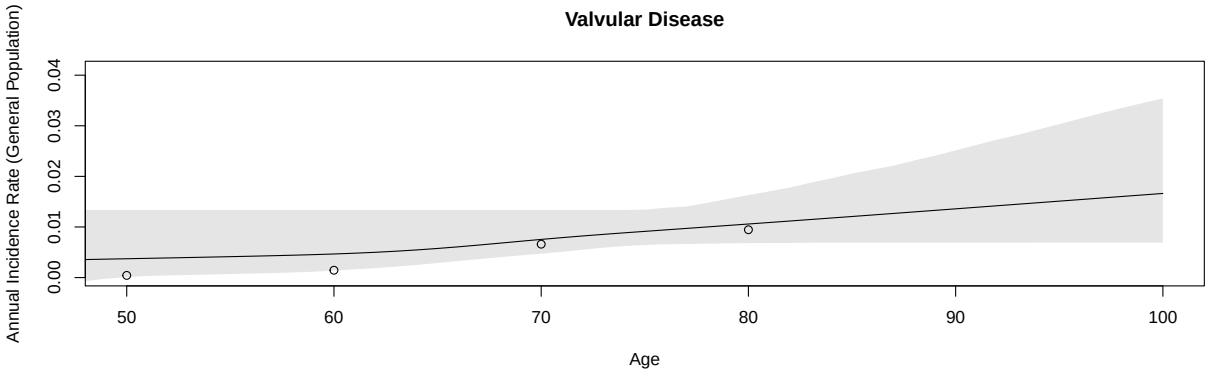
Here we plot the general population incidence priors (mean and 95% UI):




Colorectal Cancer
Male
Female
Annual Incidence Rate (General Population)
0.0000
0.0010
0.0020
50
60
70
80
90
100
Age


CAD/MI
Male
Female
Annual Incidence Rate (General Population)
0.00
0.02
0.04
0.06
50
60
70
80
90
100
Age


Stroke
Male
Female
Annual Incidence Rate (General Population)
0.00
0.04
0.08
0.12
50
60
70
80
90
100
Age


Valvular Disease
Annual Incidence Rate (General Population)
0.00
0.01
0.02
0.03
0.04
50
60
70
80
90
100
Age

References:

National Heart, Lung, and Blood Institute, National Institutes of Health. Incidence and Prevalence: 2006 Chart Book on Cardiovascular and Lung Diseases. Bethesda, United States: National Institutes of Health (NIH), 2006.

Nkomo VT, Gardin JM, Skelton TN, Gottdiener JS, Scott CG, Enriquez-Sarano M. Burden of valvular heart diseases: a population-based study. Lancet 2006; 368(9540): 1005-11.

Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 18 Regs Research Data + Hurricane Katrina Impacted Louisiana Cases, Nov 2018 Sub (2000-2016) - Linked To County Attributes - Total U.S., 1969-2017 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, released April 2019, based on the November 2018 submission.

3.3 i-CHC mortality

Statistical models using CCSS data were fit to predict total mortality rates for each i-CHC based on CCSS data.

3.4 Late recurrence incidence and mortality

Statistical models using CCSS data were fit to predict incidence and mortality from recurrence were based on CCSS data. The following diagnoses were combined to provide stable estimates: AML and other leukemia, medulloblastoma, Primitive Neuro-Ectodermal Tumors (PNET) and other CNS tumors, Wilms' tumor and neuroblastoma, osteosarcoma and other bone tumors.

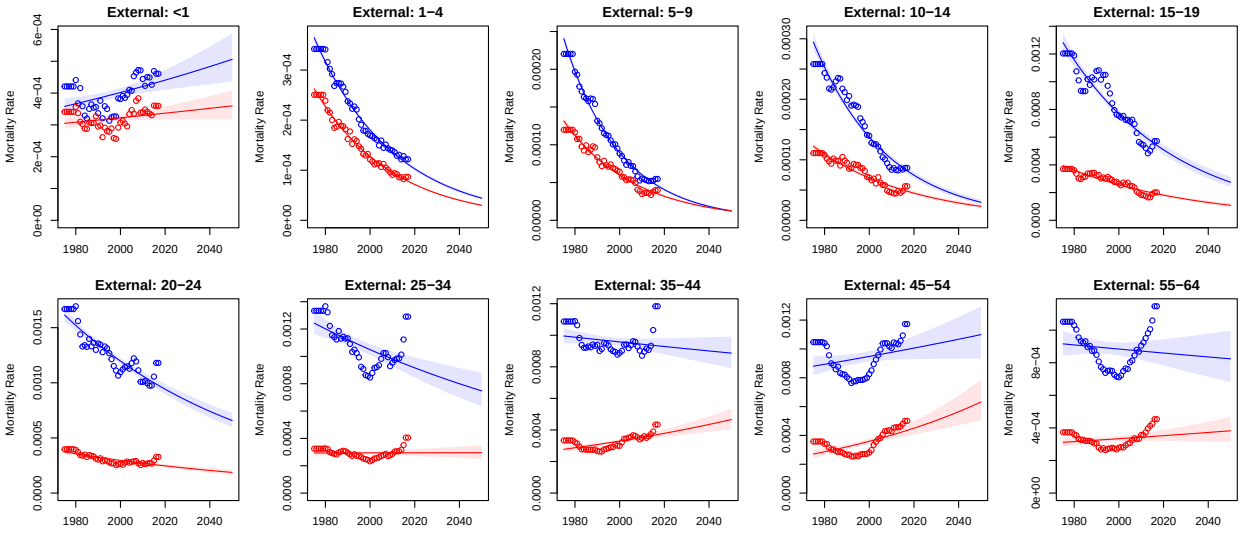
3.5 Excess mortality from other causes

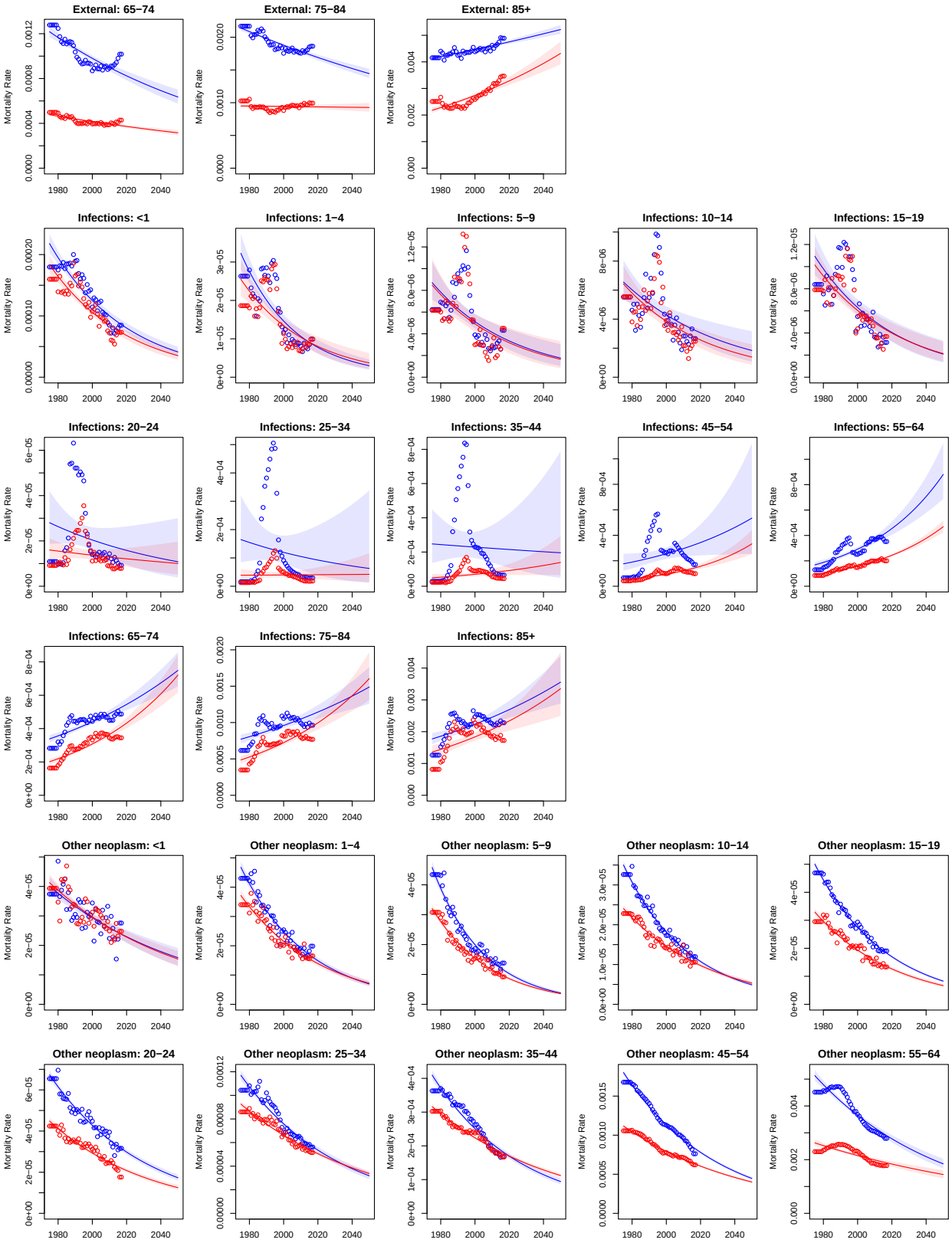
To reflect excess mortality risks from causes other than the 8 i-CHCs, statistical models using CCSS data were fit to predict excess mortality rates other secondary neoplasm (SNs), infections, external causes, and all other causes. For external causes, only the statistical model for survivors of CNS tumors had statistically significant coefficients and was included in the calibration.

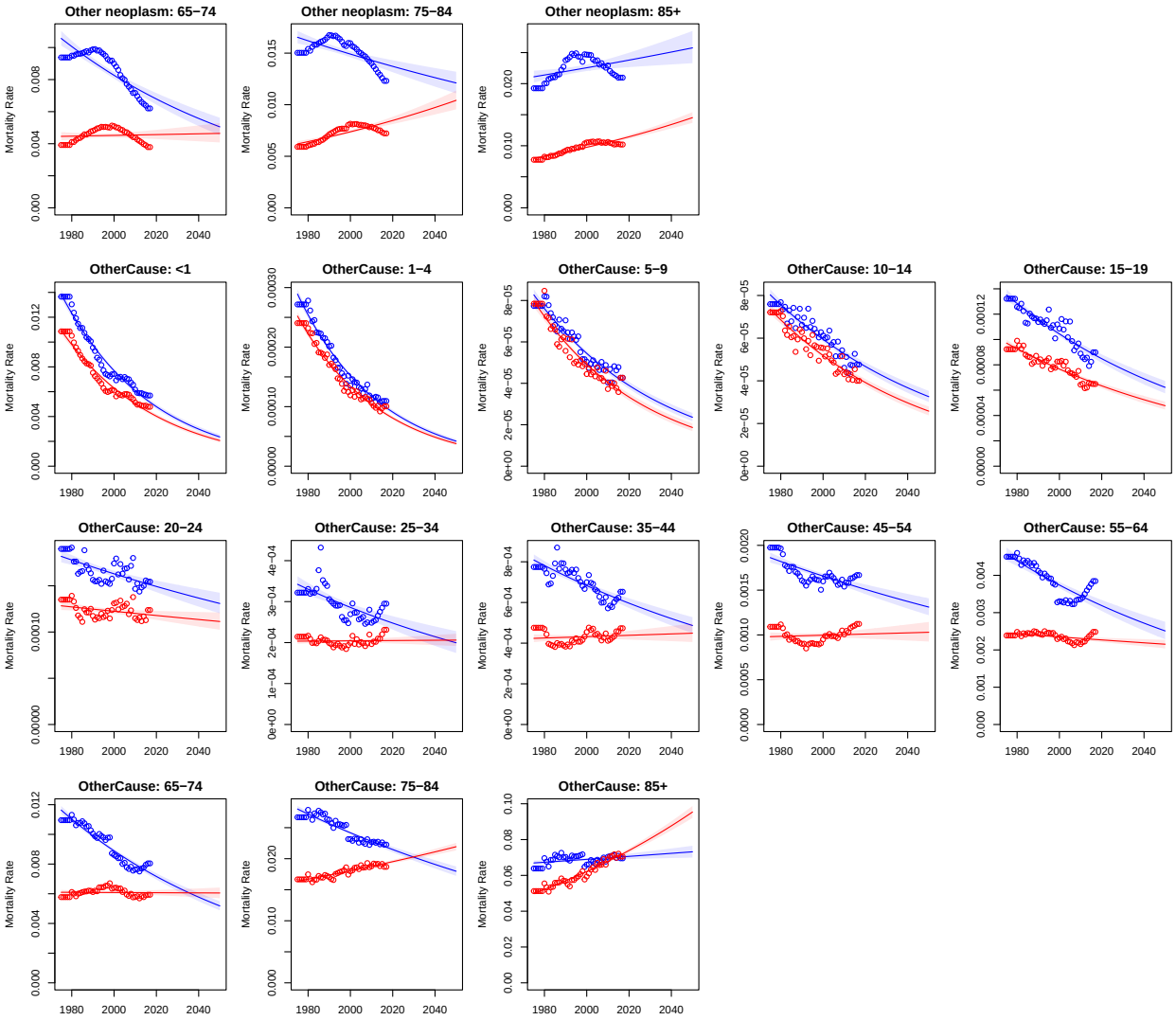
3.6 Background Mortality

To account for background mortality we used cause-specific mortality rates estimated by the Centers for Disease Control and Prevention (CDC) by age group, sex, and calendar year. We fit logistic regression models by cause, age group, and sex: $\mu(t)^{c,a,s} = 1/\left[1 + \exp(-(\beta_0^{c,a,s} + \beta_1^{c,a,s} * t))\right]$ to smooth reported rates by year and make projections of mortality rates for future years. We used the regression model coefficients as priors when calibrating the model. Estimated mortality rates were interpolated linearly between the midpoint of age groups, assuming rates remained constant at 2014 rates for later years. We simulated each individual until they died (from any cause) or until age 100.

Here we plot the reported rates and estimated regression models. Blue = Males, Red = Females




External: 65−74
External: 75−84
External: 85+
Infections: <1
Infections: 1−4
Infections: 5−9
Infections: 10−14
Infections: 15−19
Infections: 20−24
Infections: 25−34
Infections: 35−44
Infections: 45−54
Infections: 55−64
Infections: 65−74
Infections: 75−84
Infections: 85+
Other neoplasm: <1
Other neoplasm: 1−4
Other neoplasm: 5−9
Other neoplasm: 10−14
Other neoplasm: 15−19
Other neoplasm: 20−24
Other neoplasm: 25−34
Other neoplasm: 35−44
Other neoplasm: 45−54
Other neoplasm: 55−64
Mortality Rate
1980
2000
2020
2040

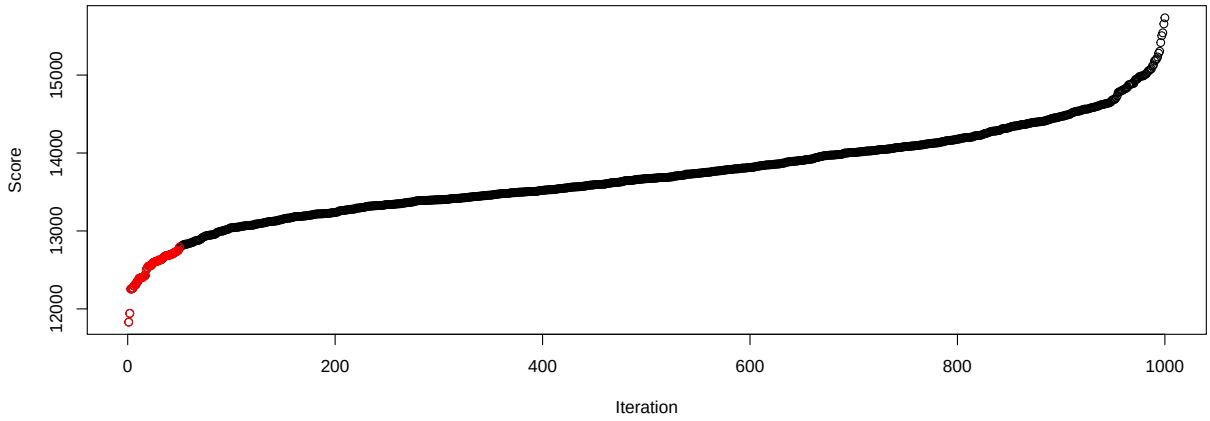

Other neoplasm: 65−74
Other neoplasm: 75−84
Other neoplasm: 85+
OtherCause: <1
OtherCause: 1−4
OtherCause: 5−9
OtherCause: 10−14
OtherCause: 15−19
OtherCause: 20−24
OtherCause: 25−34
OtherCause: 35−44
OtherCause: 45−54
OtherCause: 55−64
OtherCause: 65−74
OtherCause: 75−84
OtherCause: 85+
Mortality Rate
1980
2000
2020
2040

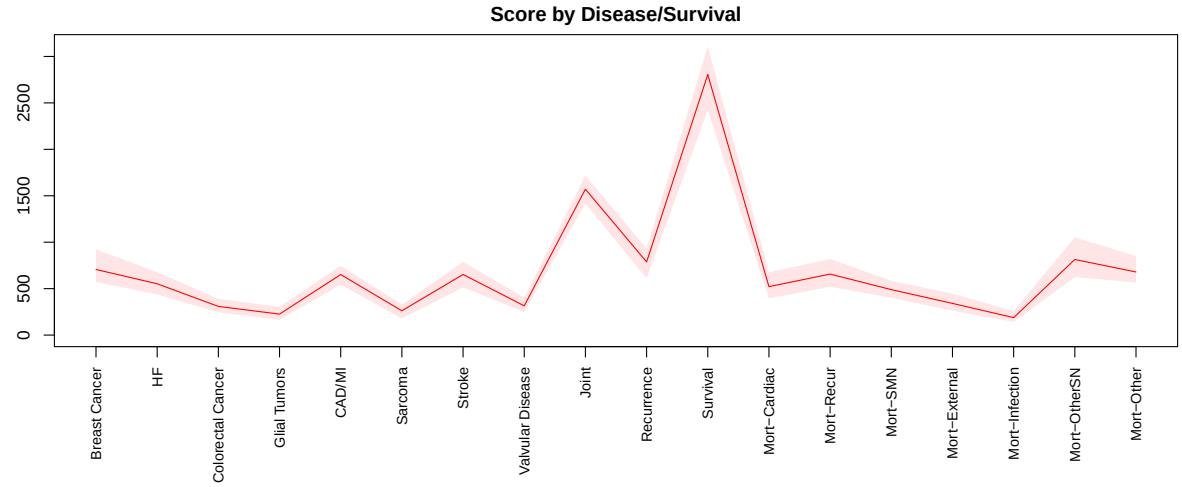
4 Model Calibration

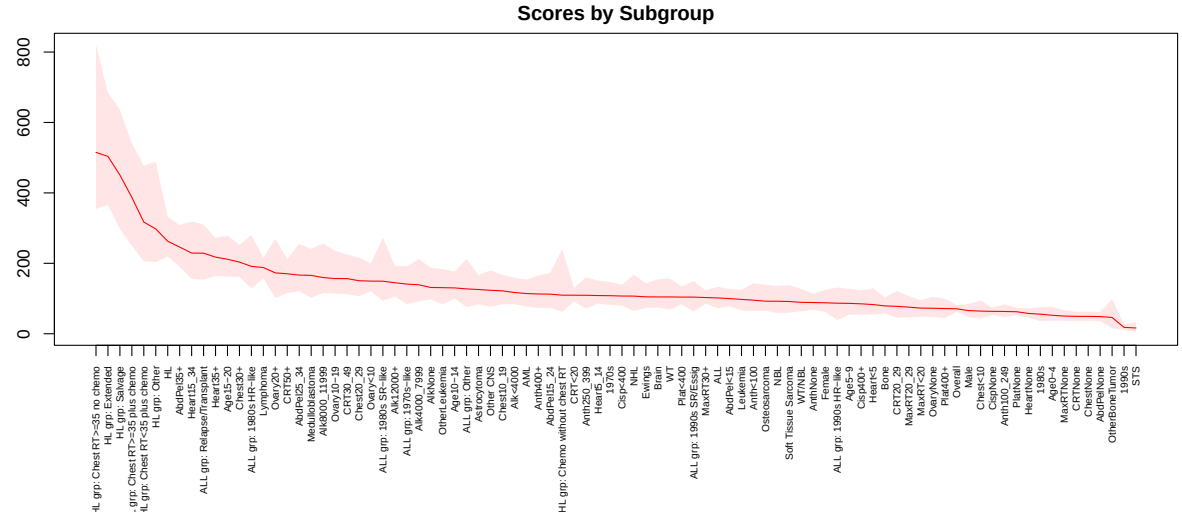
We calibrated cumulative incidence (years since diagnosis) for each subgroup and joint cumulative incidence for selected pairs of conditions. We employed a Bayesian framework using the statistical models described above as the priors (i.e., sampling from the joint normal distributions of model coefficients). For better stability we removed estimates based on fewer than 10 people still at risk. We also calibrated to survival (all-cause mortality) for each subgroup by time since childhood cancer diagnosis. The calibration include a total of 79,360 targets (23,481 i-CHC incidence, 27,804 joint i-CHC incidence, 4723 overall survival and 23,352 mortality targets) for the overall cohort and subgroups by sex, treatment era (1970s, 1980s, 1990s), diagnosis, diagnosis subgroups, age at diagnosis, cumulative chemotherapy agent (anthracyclines, alkylators, platinums, cisplatins), radiation type/dose (chest, cranial, heart, ovarian, pelvic/abdominal, max RT) and ALL and HL treatment exposure subgroups (6, 7).

Targets were scored as the squared difference between the reported estimate and model prediction (weighted by the inverse of the 95% confidence intervals). We selected the best 50 good-fitting parameter sets.

4.1 Calibration Scores





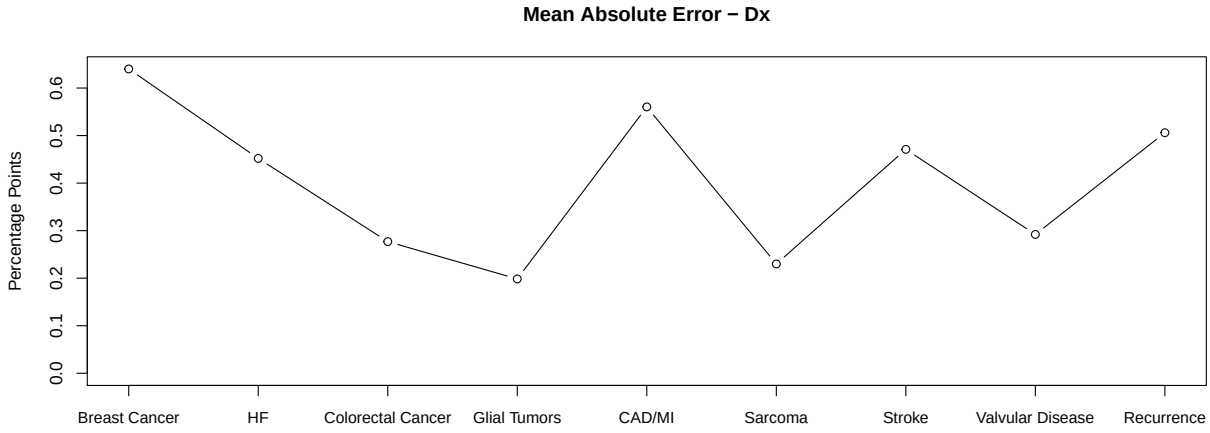


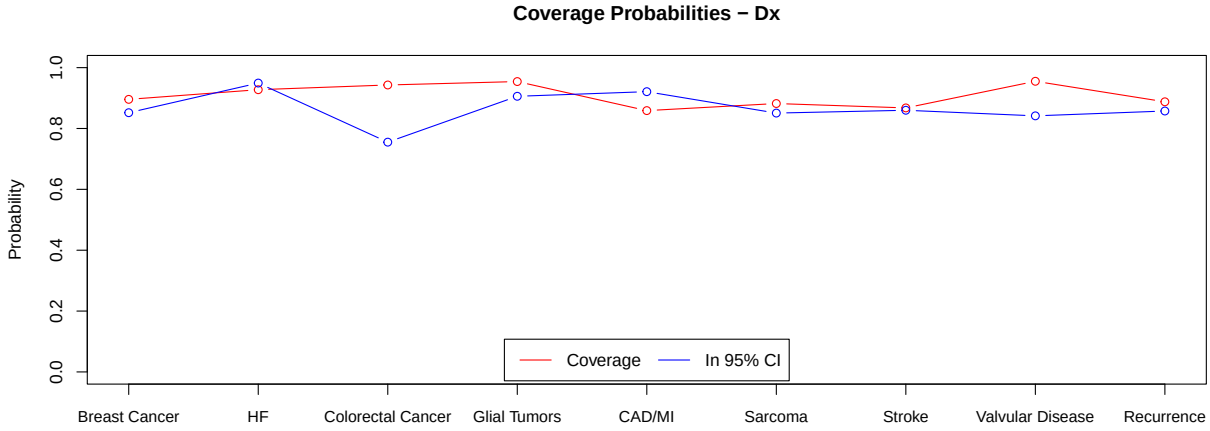
4.2 Summary Indicators

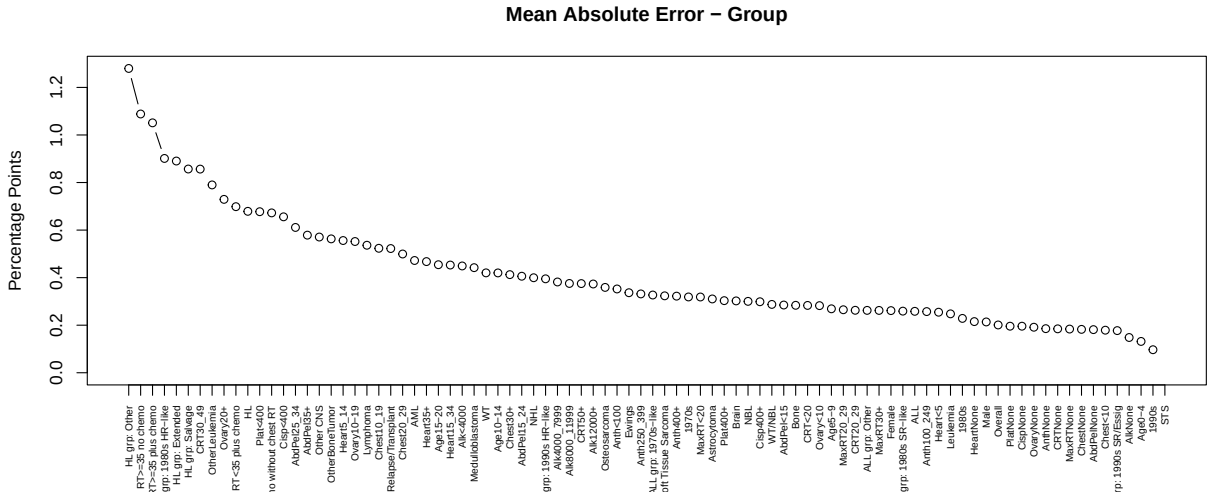
Summary indicators of calibration fit among the 50 calibrated parameter sets included the percentage that 1) contained the reported point and 2) for which the prediction intervals overlapped with the 95% CIs of the CCSS empirical data. For the first indicator (i.e. coverage probability), results for the training set were 88-94%. For the second indicator, results were 86-91%, except for joint incidence targets (51%), which was likely due to small numbers of events.

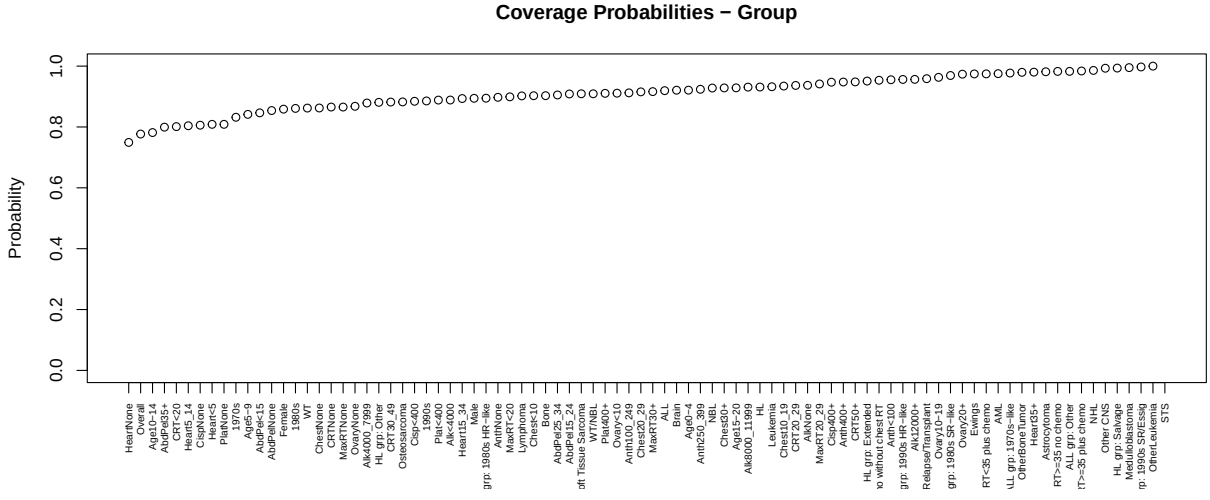
4.2.1 Incidence

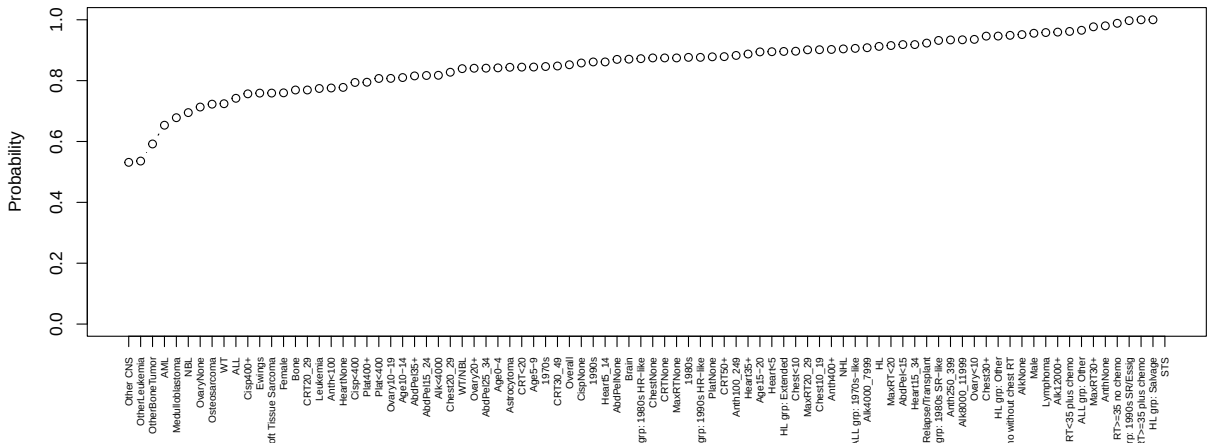
[1] "Overall Incidence" [1] "Mean Absolute Error: 0.406" [1] "Coverage %: 90.7" [1] "In CI %: 86.6"





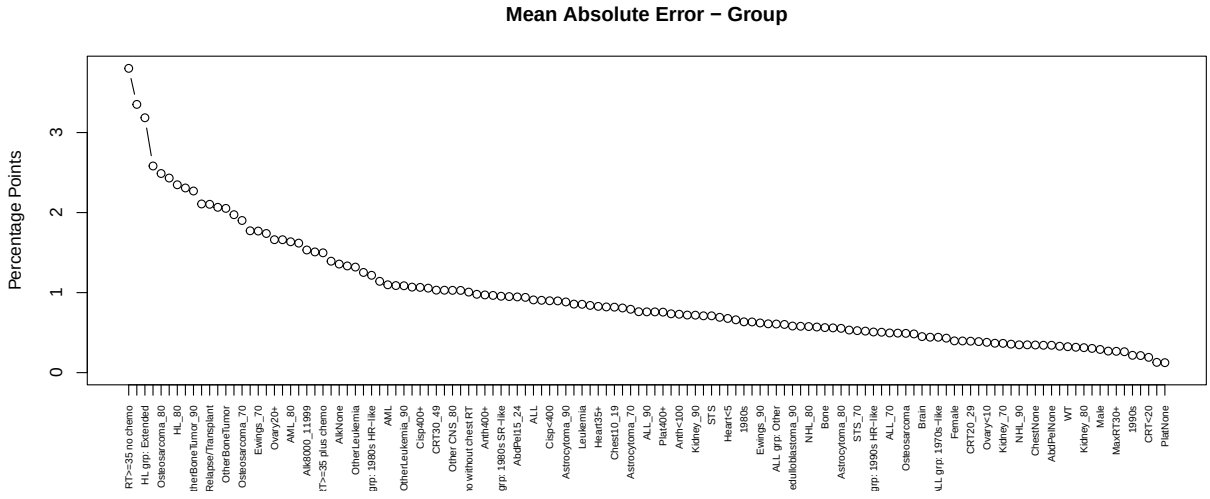

Mean Absolute Error − Group
Percentage Points
0.0
0.2
0.4
0.6
0.8
1.0
1.2

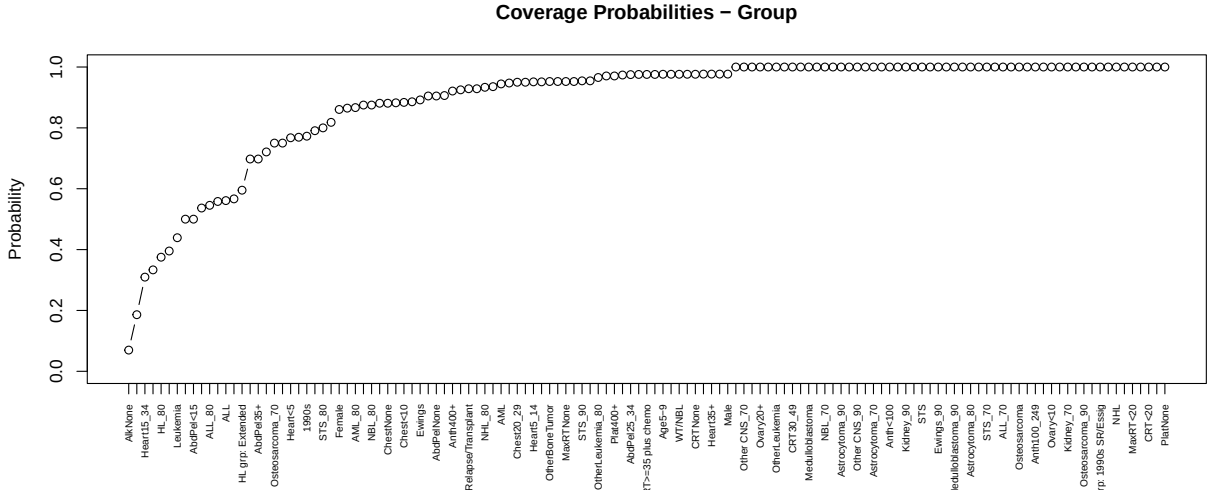

Coverage Probabilities − Group
Probability
0.0
0.2
0.4
0.6
0.8
1.0

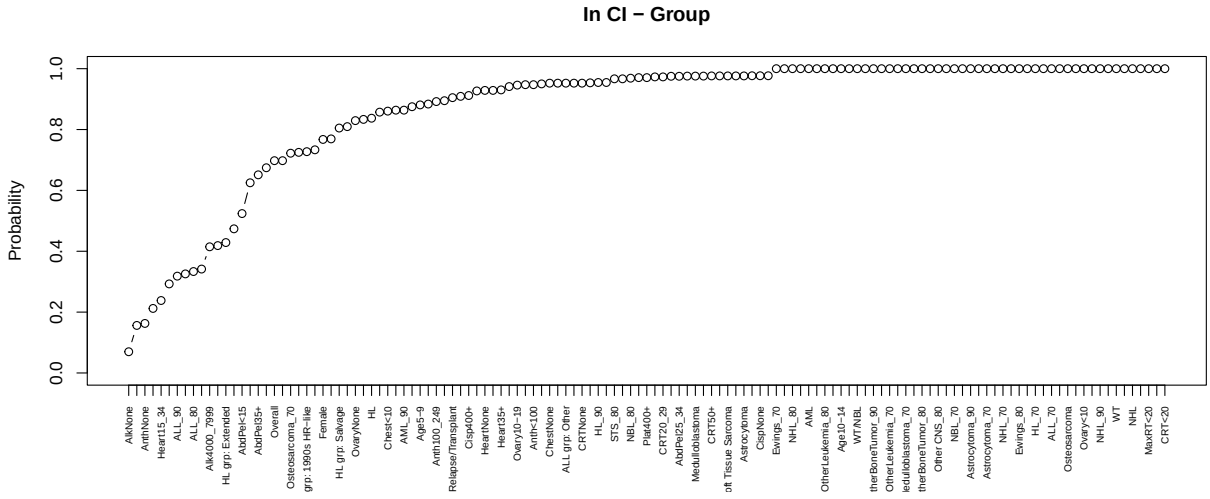

ln CI − Group
Probability
0.0
0.2
0.4
0.6
0.8
1.0

4.2.2 Survival

[1] "Overall Survival" [1] "Mean Absolute Error: 0.95" [1] "Coverage %: 88.4" [1] "In CI %: 86.1"

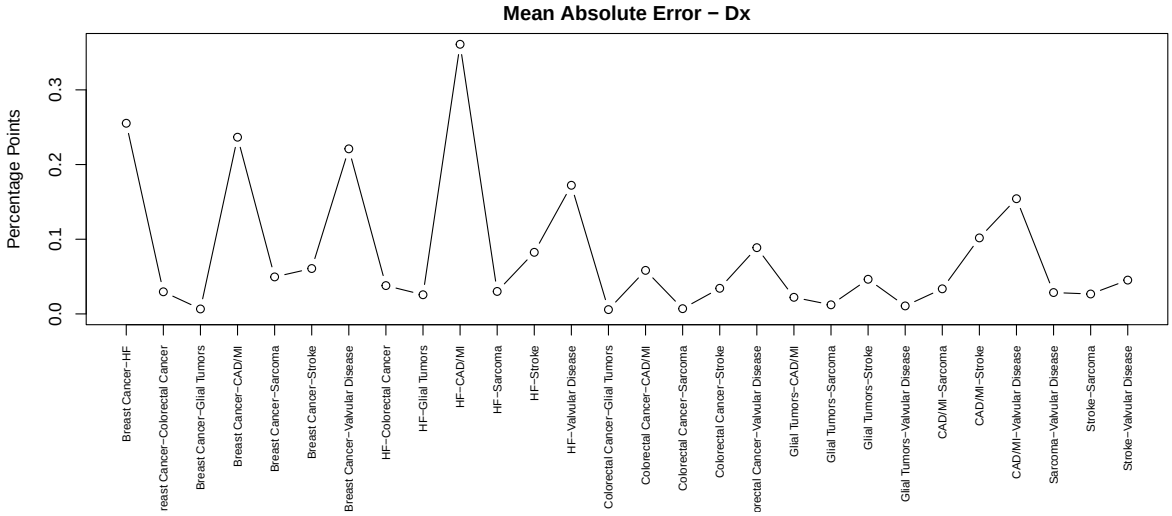


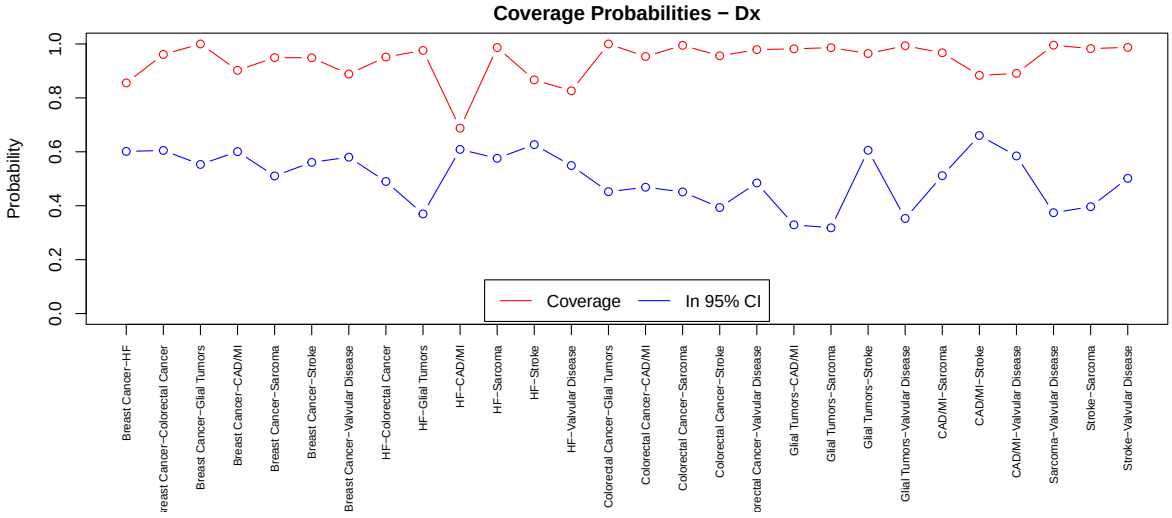


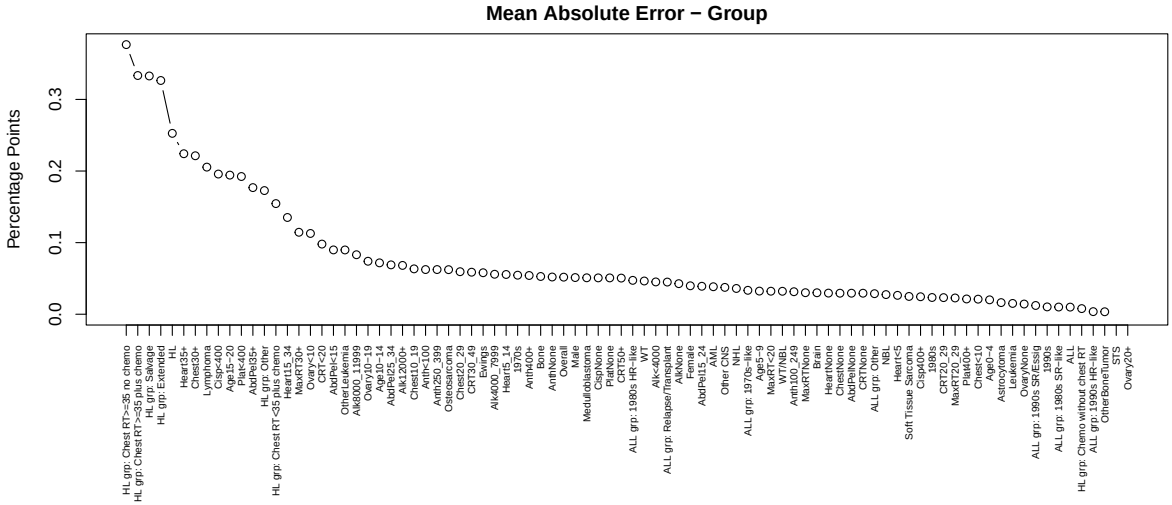


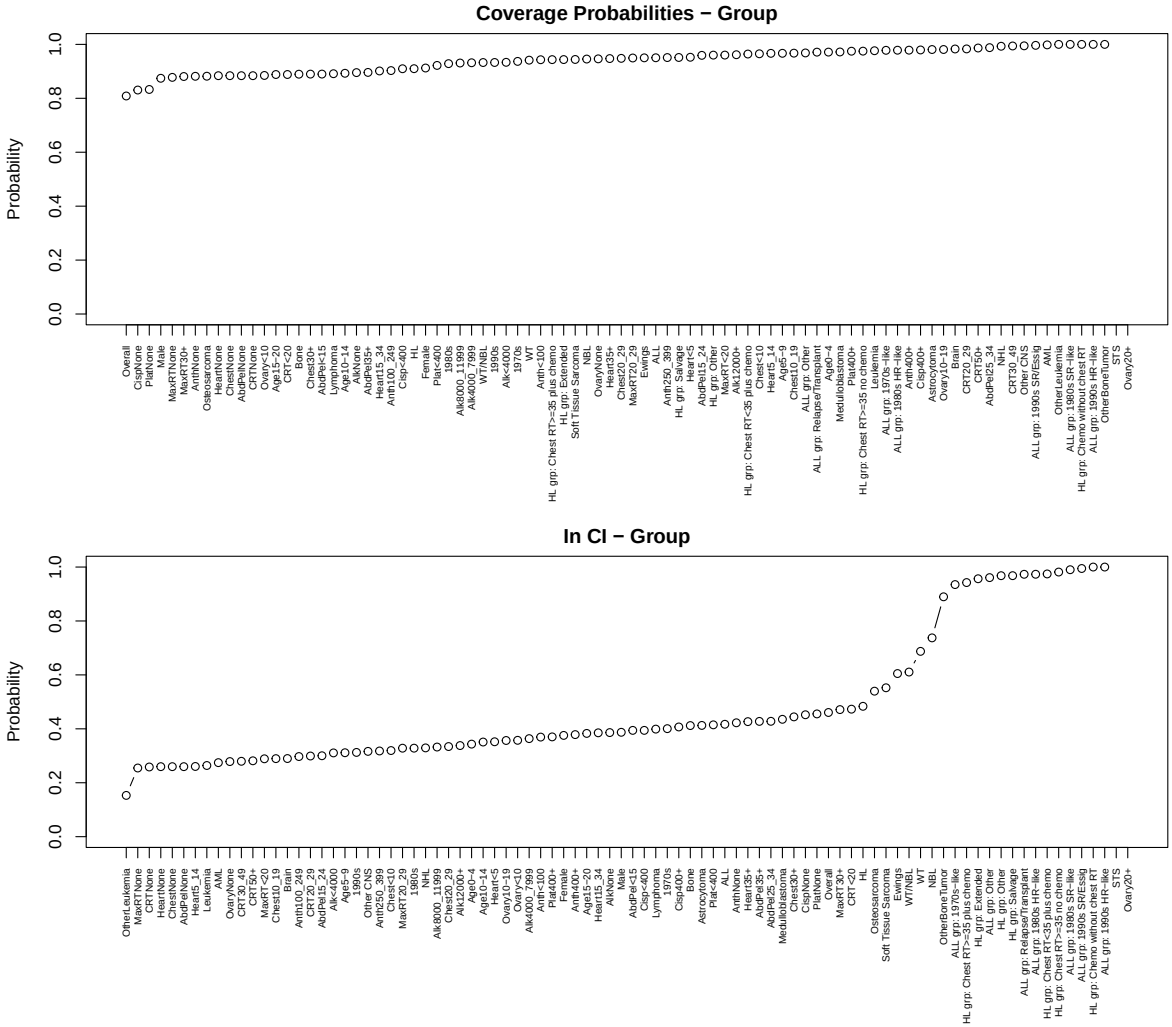
4.2.3 Joint Incidence

[1] “Overall Joint Incidence” [1] “Mean Absolute Error: 0.084” [1] “Coverage %: 93.6” [1] “In CI %: 50.6”



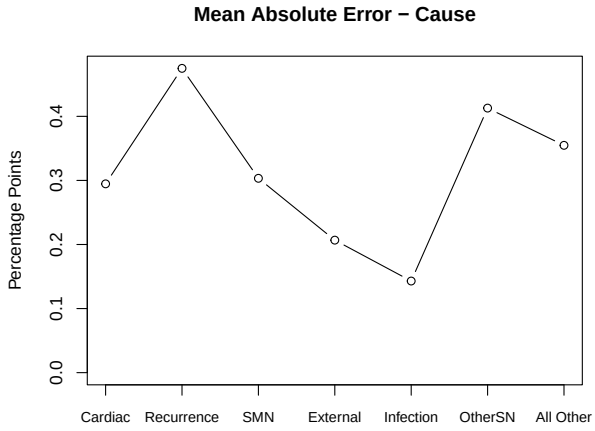


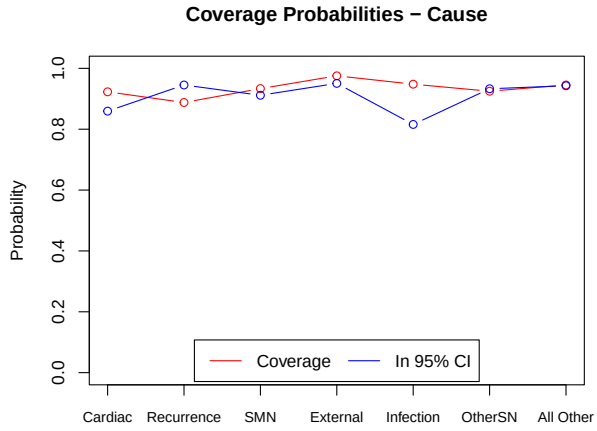


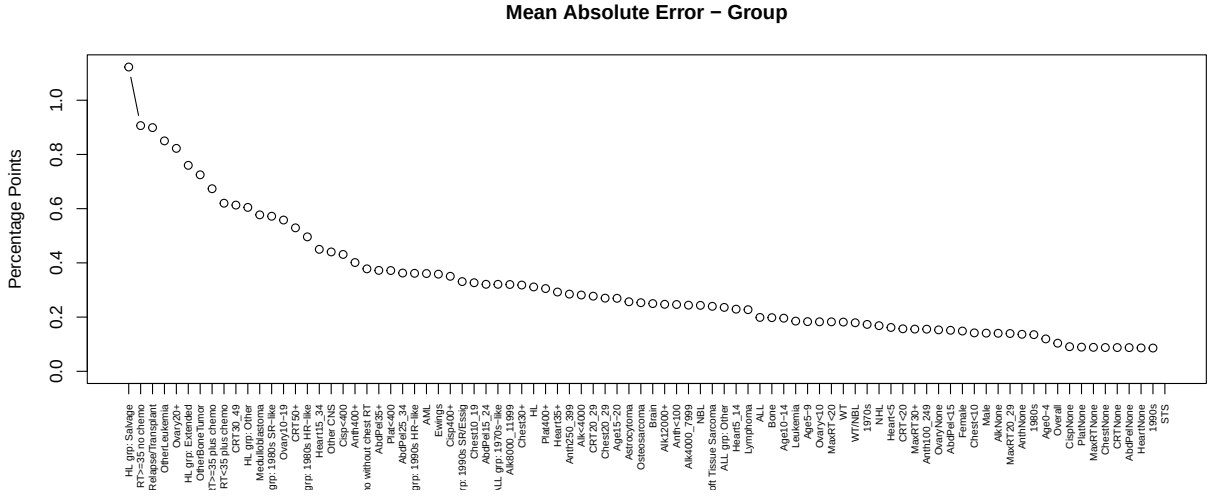

Coverage Probabilities − Group
Probability
0.0
0.2
0.4
0.6
0.8
1.0
Overall
CispNone
PlatNone
AnthNone
MaxRTNone
MaxRT30+
AnthNone
Osteosarcoma
HeartNone
ChestNone
AbdPelNone
CRTNone
Ovary<10
Age15−20
CRT<20
Bone
Chest30+
AbdPel<15
Lymphoma
Age10−14
Alk<400
AbdPel35+
Heart15_34
Anth100_249
Cisp<400
HL
Female
Plat<400
1980s
Alk8000_11999
Alk4000_7999
White
1990s
Alk<4000
1970s
WT
Anth<400
HL grp: Chest RT>=35 plus chemo
HL grp: Extended
Soft Tissue Sarcoma
NBL
OvaryNone
Heart35+
Chest20_29
MaxRT20_29
Ewings
ALL
Anth250_399
HL grp: Stage 3
Heart5
AbdPel15_24
HL grp: Other
MaxRT<20
Alk12000+
HL grp: Chest RT<35 plus chemo
Chest<10
Heart5_14
Age5−9
Chest10_19
ALL grp: Other
ALL grp: Relapse/Transplant
Age0−4
Medulloblastoma
Plat400+
HL grp: Chest RT>=35 no chemo
Anth400+
ALL grp: 1970s−like
ALL grp: 1980s HR−like
Anth400+
Cisp400+
Astrocytoma
Ovary10−19
Brain
CRT20_29
CRT50+
AbdPel25_34
AML
CRT30_49
Other CNS
ALL grp: 1990s SR/Essig
AML
OtherLeukemia
ALL grp: 1990s SR−like
HL grp: Chemo without chest RT
ALL grp: 1990s HR−like
OtherBoneTumor
STS
Ovary20+
In CI − Group
Probability
0.0
0.2
0.4
0.6
0.8
1.0
OtherLeukemia
MaxRTNone
CRTNone
HeartNone
ChestNone
AbdPelNone
Heart5_14
Leukemia
AML
OvaryNone
CRT30_49
CRT50+
MaxRT<20
Chest10_19
Brain
Anth100_249
CRT20_29
AbdPel15_24
Alk<4000
Age5−9
Heart5
Other CNS
Anth250_399
Chest<10
MaxRT20_29
1980s
NBL
Alk8000_11999
Chest20_29
Alk12000+
Age0−4
Anth<400
Heart35+
Ovary10−19
Ovary<10
Alk4000_7999
Anth<100
Plat400+
Female
Anth400+
Age15−20
Heart15_34
AlkNone
Male
AbdPel<15
Cisp<400
Lymphoma
1970s
CispNone
Bone
Astrocytoma
Plat<400
ALL
AnthNone
HeartNone
AbdPel35+
AbdPel25_34
Medulloblastoma
Chest30+
CispNone
PlatNone
Overall
MaxRT30+
CRT<20
HL
Osteosarcoma
Soft Tissue Sarcoma
Ewings
WT/NBL
WT
NBL
OtherBoneTumor
ALL grp: 1970s−like
HL grp: Chest RT>=35 plus chemo
HL grp: Extended
ALL grp: Other
HL grp: Other
HL grp: Stage 3
ALL grp: Relapse/Transplant
ALL grp: 1980s HR−like
HL grp: Chest RT<35 plus chemo
HL grp: Chest RT>=35 no chemo
ALL grp: 1980s SR−like
ALL grp: 1990s SR/Essig
HL grp: Chemo without chest RT
ALL grp: 1990s HR−like
STS
Ovary20+

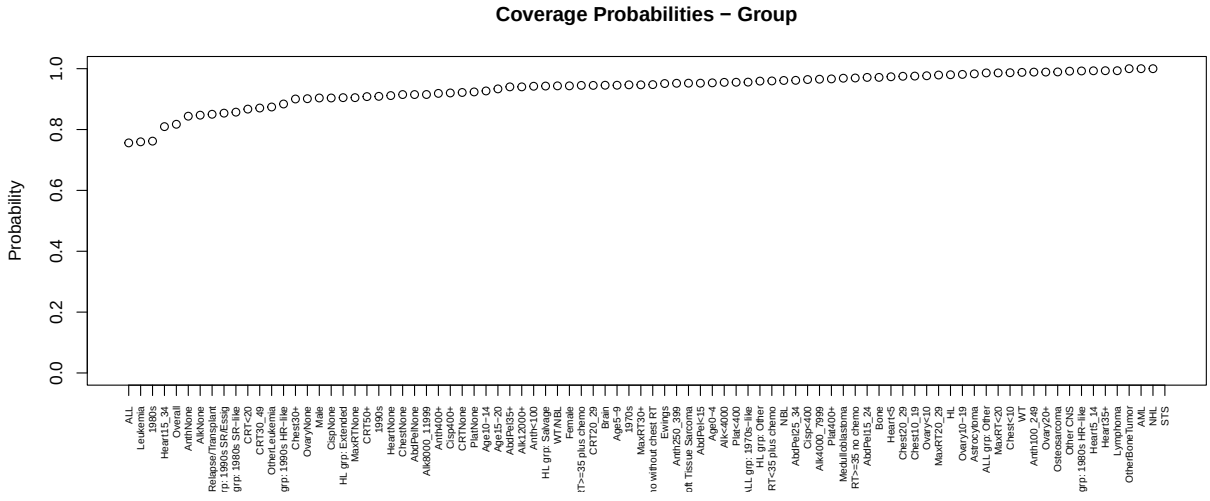
4.2.4 Cumulative Mortality

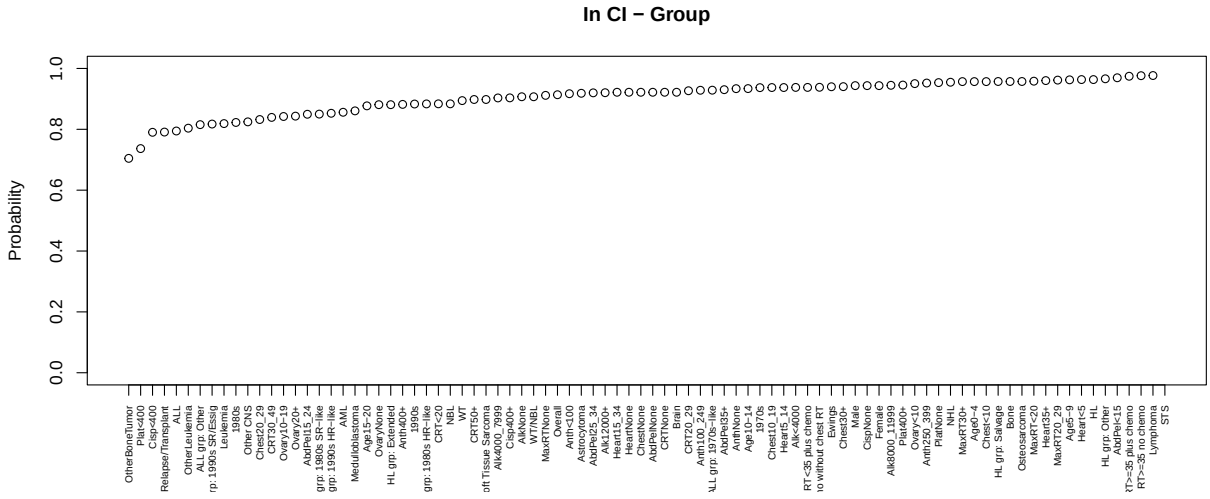
[1] “Overall Cum. Mortality” [1] “Mean Absolute Error: 0.313” [1] “Coverage %: 93.4” [1] “In CI %: 90.8”









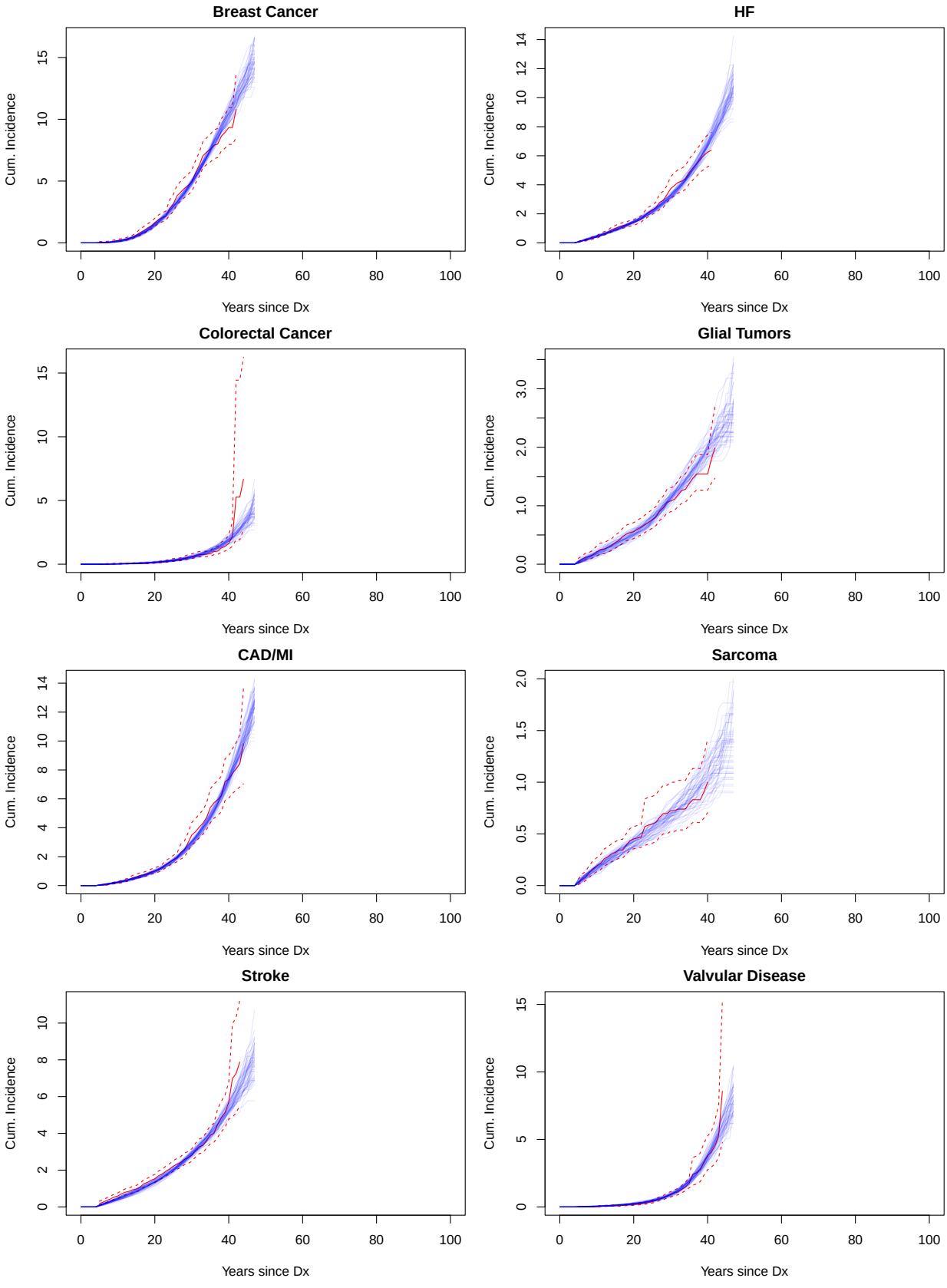

In CI − Group
Probability
0.0
0.2
0.4
0.6
0.8
1.0
OtherBoneTumor
Plat<400
Cisp<400
Relapse/Transplant
ALL
OtherLeukemia
ALLgrp: Other
rp: 1990s SR/Essig
Leukemia
1980s
Other CNS
Chest20_29
CRT50_69
Ovary10−19
Ovary20+
AbdPelt15_24
grp: 1980s SR−like
grp: 1990s HR−like
AML
Medulloblastoma
Age15−20
OvaryNone
HL grp: Extended
Anth400+
1990s
grp: 1980s HR−like
CRT<50
NBL
WT
CRT50+
oft Tissue Sarcoma
Alk4000_7999
Cisp400+
AlkNone
WT/NBL
MaxRTNone
Overall
Anth<100
Astrocytoma
Age5_14
Alk1200+
Heart15_34
HeartNone
ChestNone
AbdPelNone
CRTNone
Bone
CRT20_29
Anth100_249
ALL grp: 1970s−like
AbdPel35+
AnthNone
Age10_14
1970s
Chest10_19
Heart5_14
Alk<4000
RT<35 plus chemo
no without chest RT
Hodgkins
Chest30+
Male
CispNone
Female
Alk8000_11999
Plat400+
Ovary<10
Anth250_399
PlatNone
NHL
MaxRT30+
Age0−4
Chest<10
HL grp: Salvage
Bone
Osteosarcoma
MaxRT<20
Heart35+
MaxRT20_29
 Age5−9
Heart<5
HL
HL grp: Other
AbdPel<15
RT>=35 plus chemo
RT>=35 no chemo
Lymphoma
STS

4.3 Calibration Targets

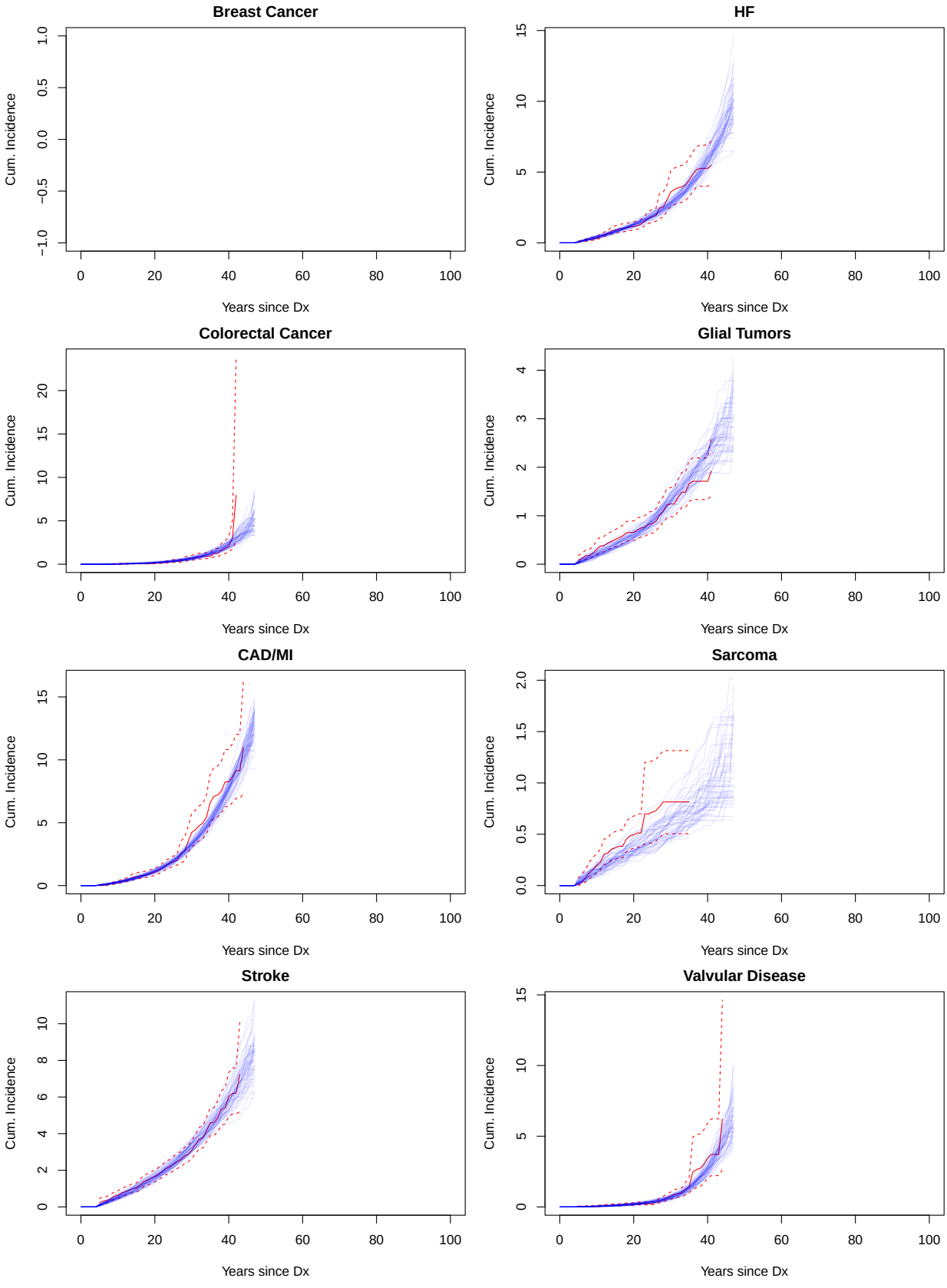
4.3.1 Cumulative Incidence

Here we plot cumulative incidence for each disease by subgroup.

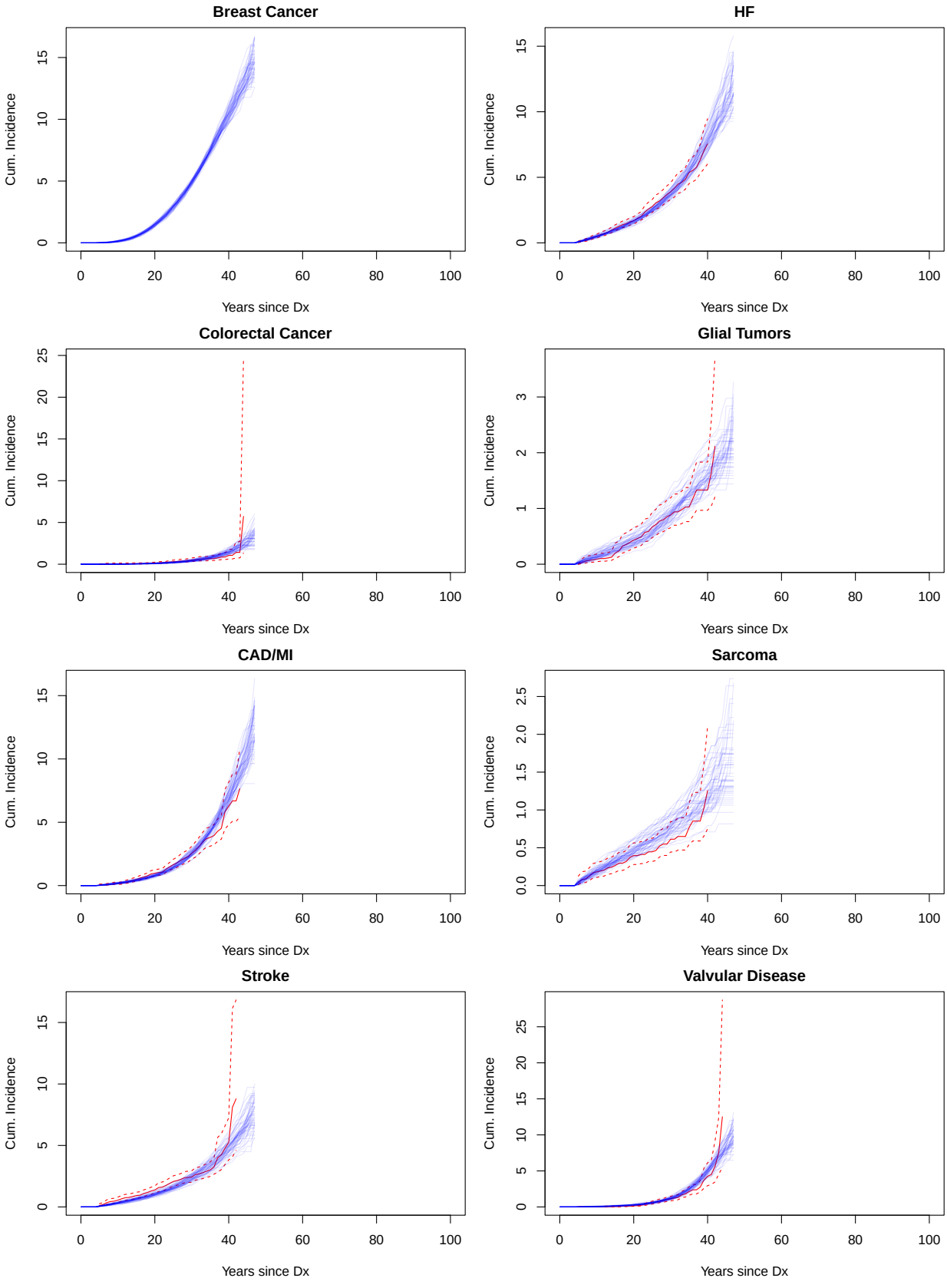
4.3.1.1 Overall



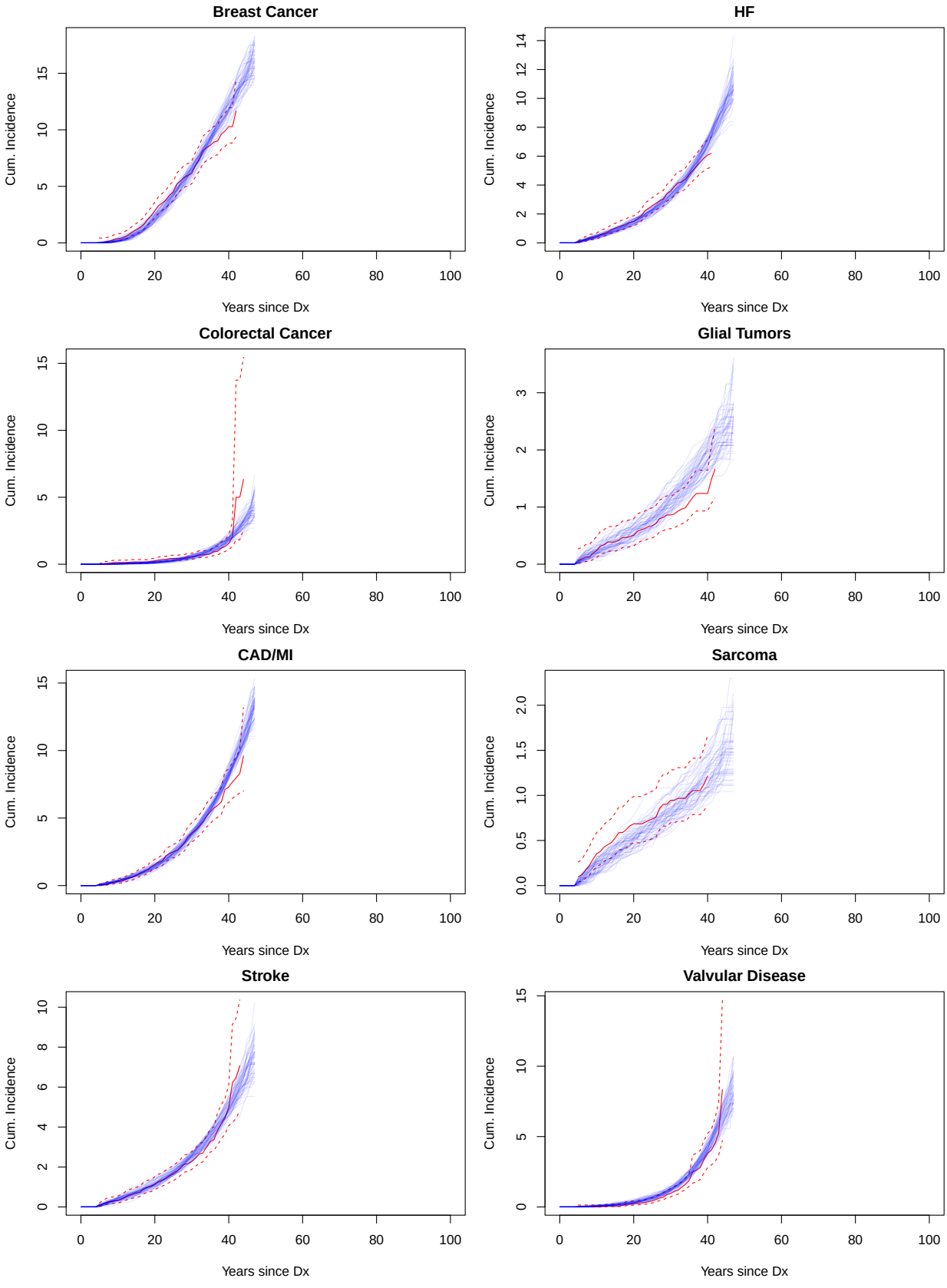
4.3.1.2 Male


Breast Cancer
Cum. Incidence
−1.0
−0.5
0.0
0.5
1.0
0
20
40
60
80
100
Years since Dx
HF
Cum. Incidence
0
5
10
15
0
20
40
60
80
100
Years since Dx
Colorectal Cancer
Cum. Incidence
0
5
10
15
20
0
20
40
60
80
100
Years since Dx
Glial Tumors
Cum. Incidence
0
1
2
3
4
0
20
40
60
80
100
Years since Dx
CAD/MI
Cum. Incidence
0
5
10
15
0
20
40
60
80
100
Years since Dx
Sarcoma
Cum. Incidence
0.0
0.5
1.0
1.5
2.0
0
20
40
60
80
100
Years since Dx
Stroke
Cum. Incidence
0
2
4
6
8
10
0
20
40
60
80
100
Years since Dx
Valvular Disease
Cum. Incidence
0
5
10
15
0
20
40
60
80
100
Years since Dx

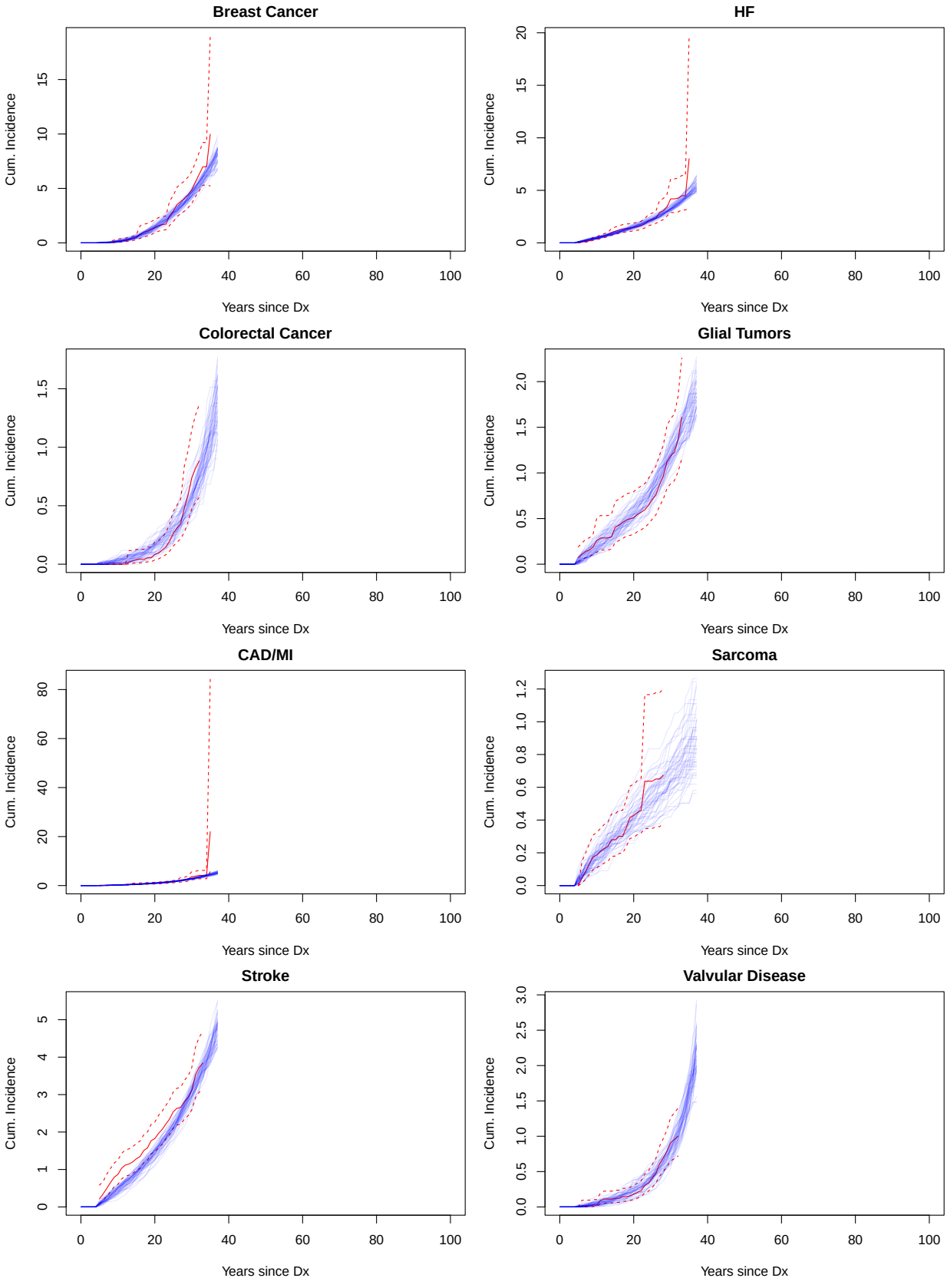
4.3.1.3 Female


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

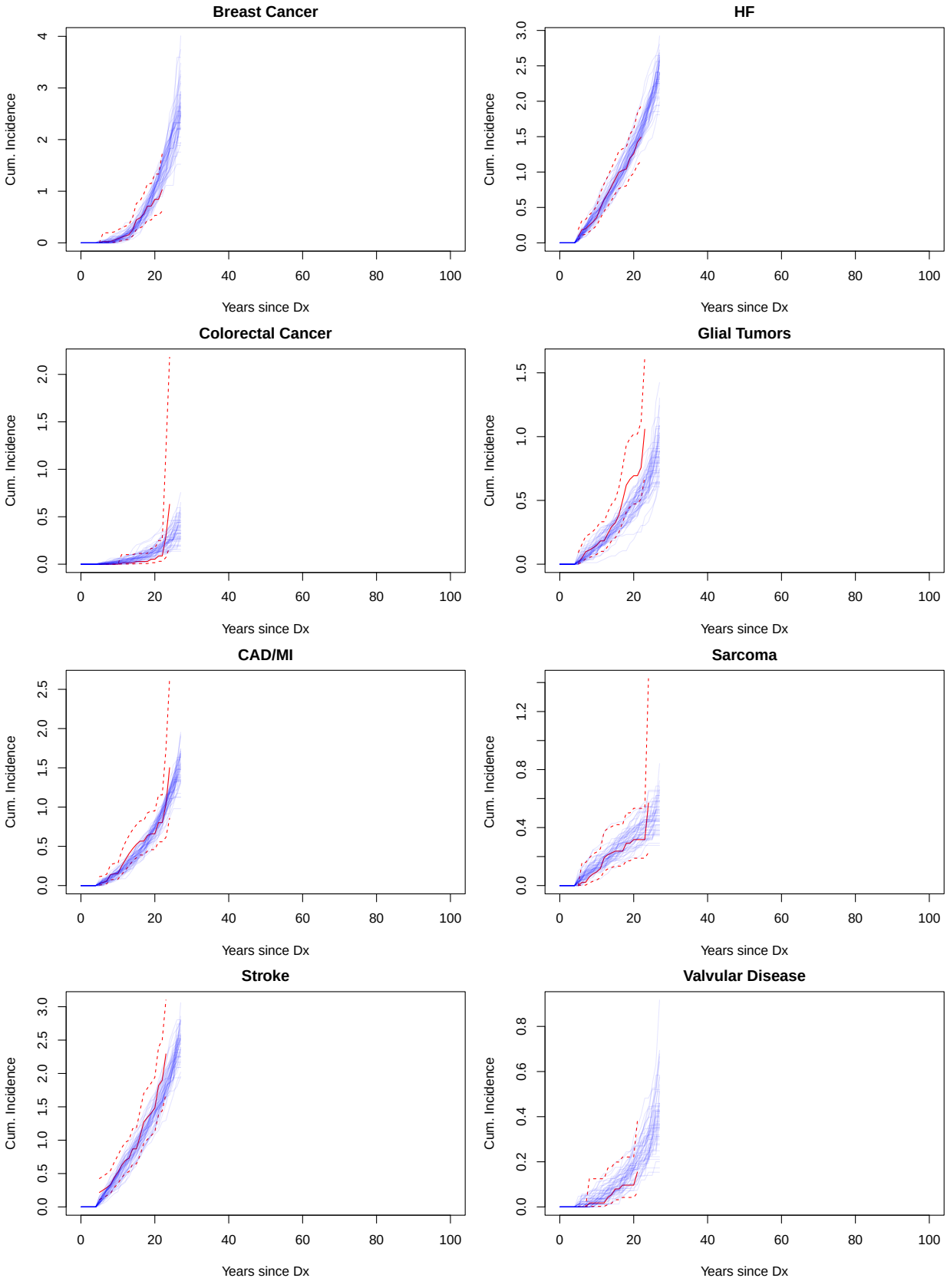
4.3.1.4 1970s


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

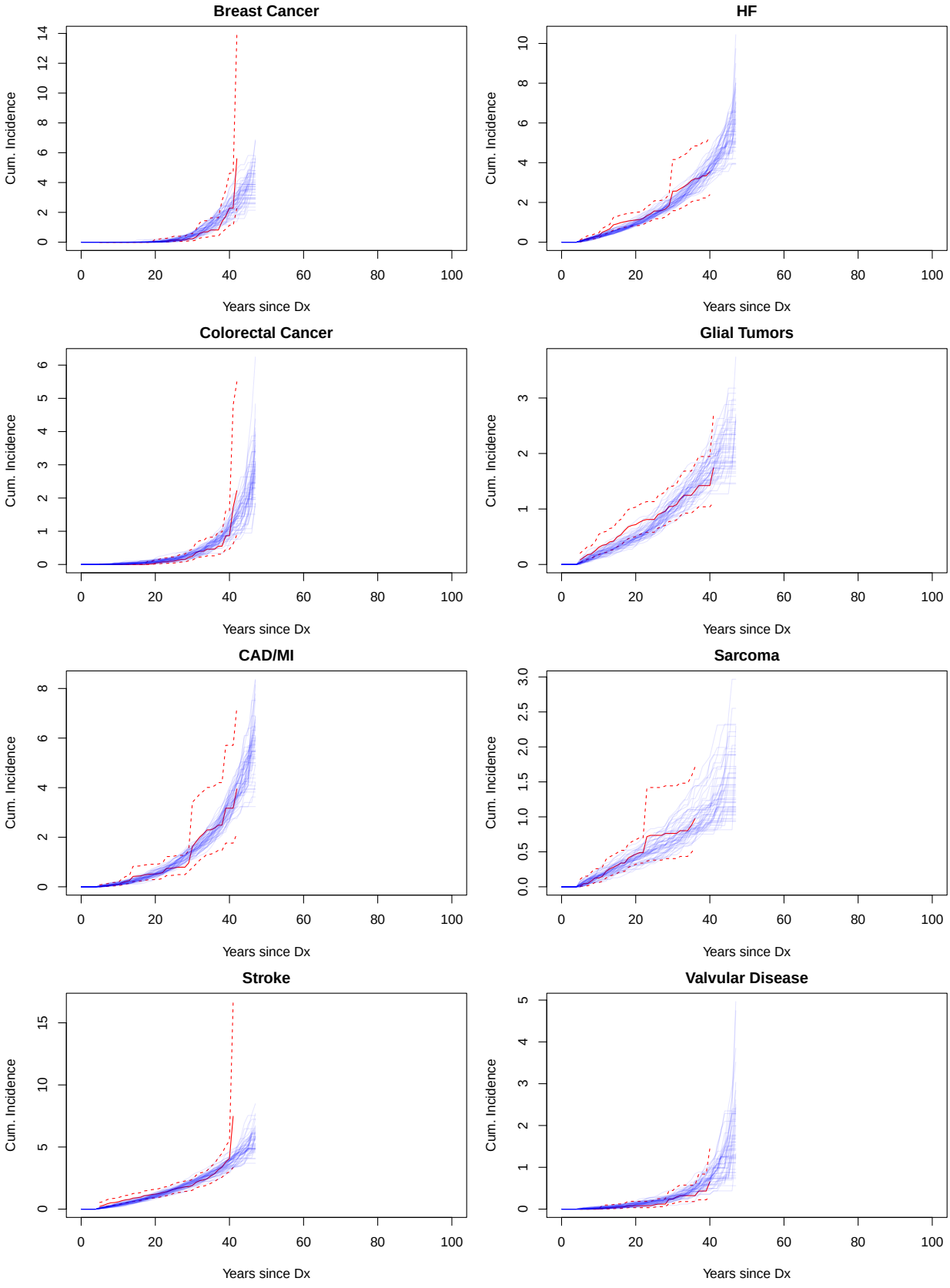
4.3.1.5 1980s


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

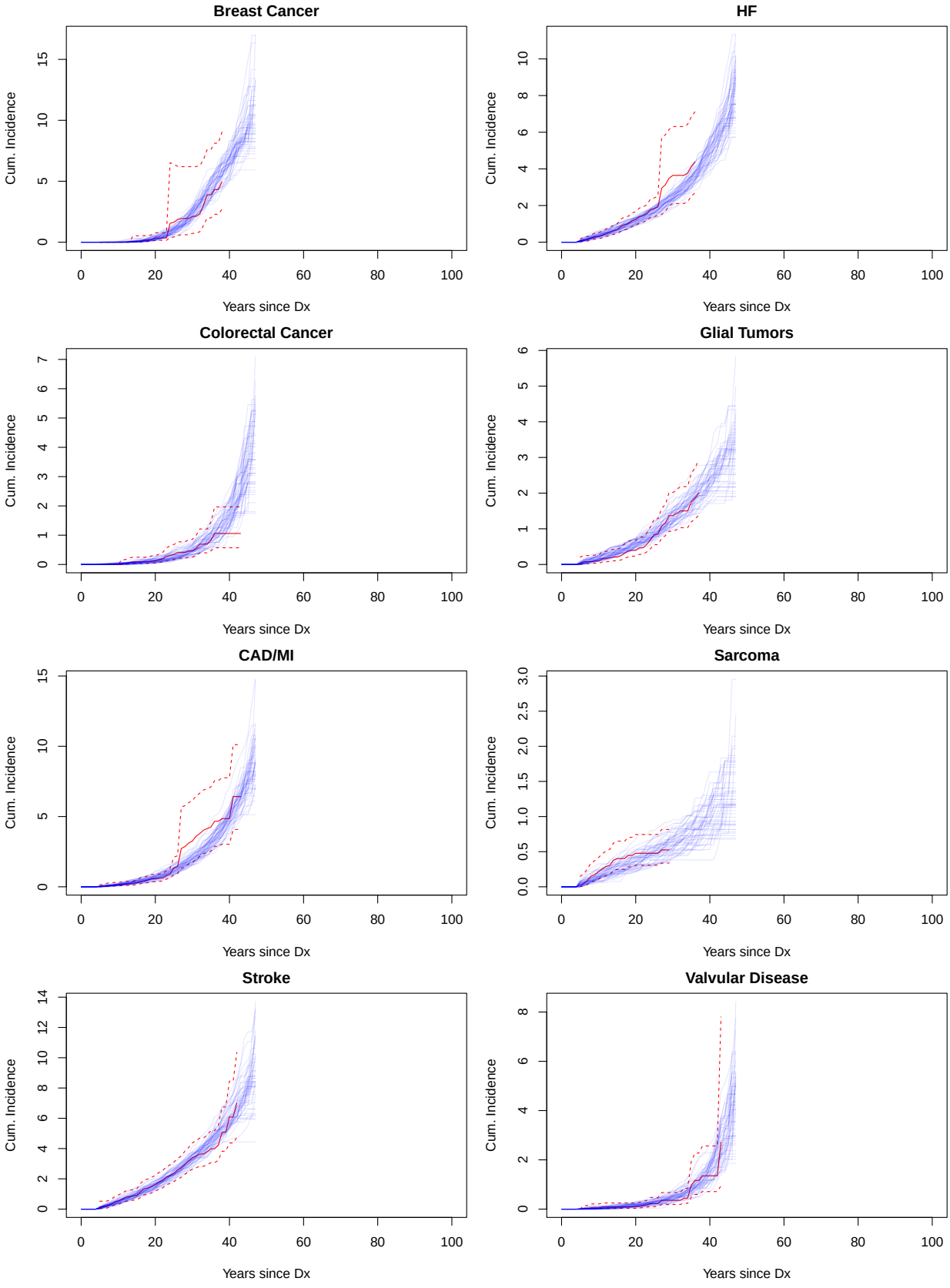
4.3.1.6 1990s


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

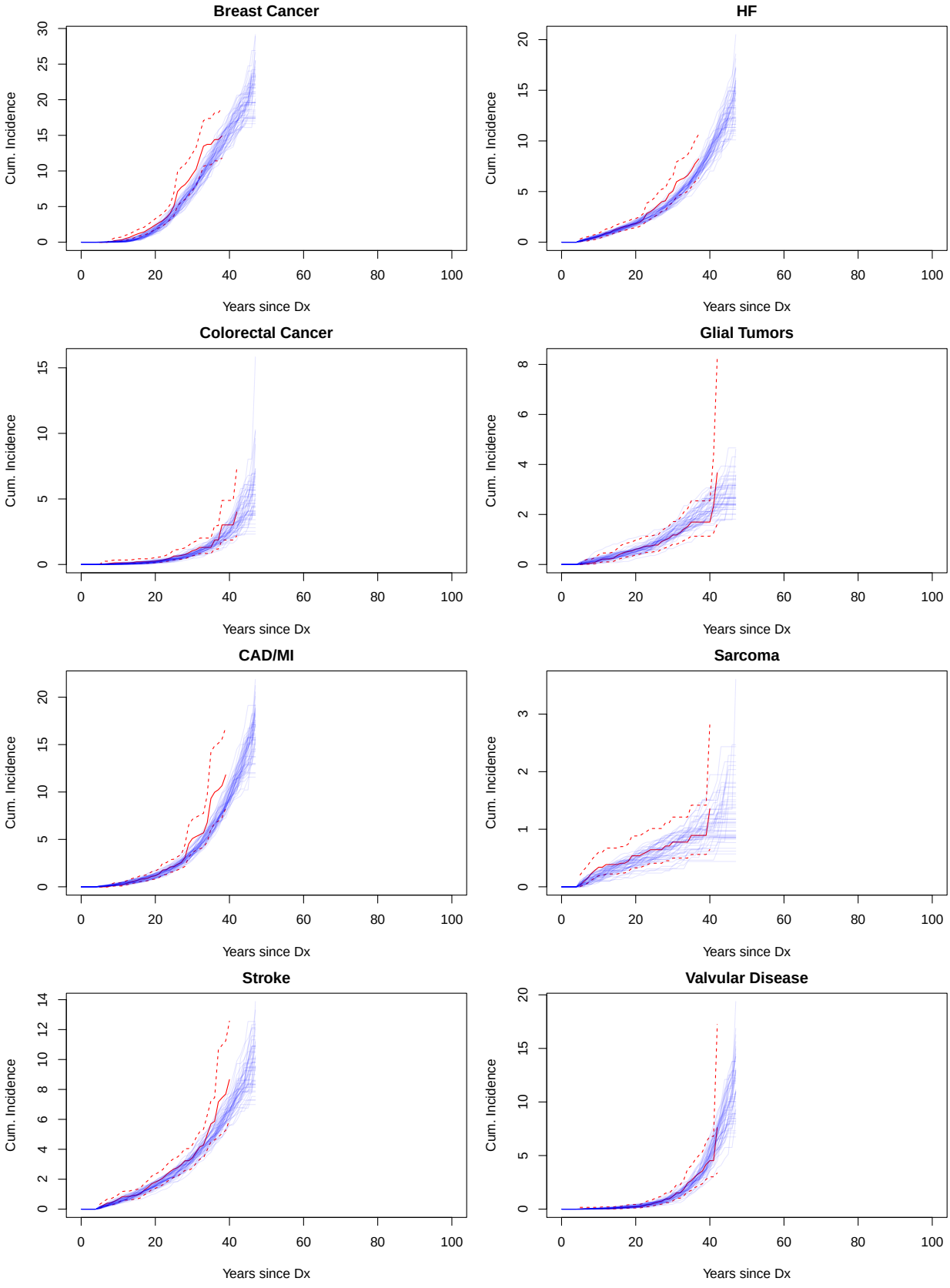
4.3.1.7 Age0-4


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

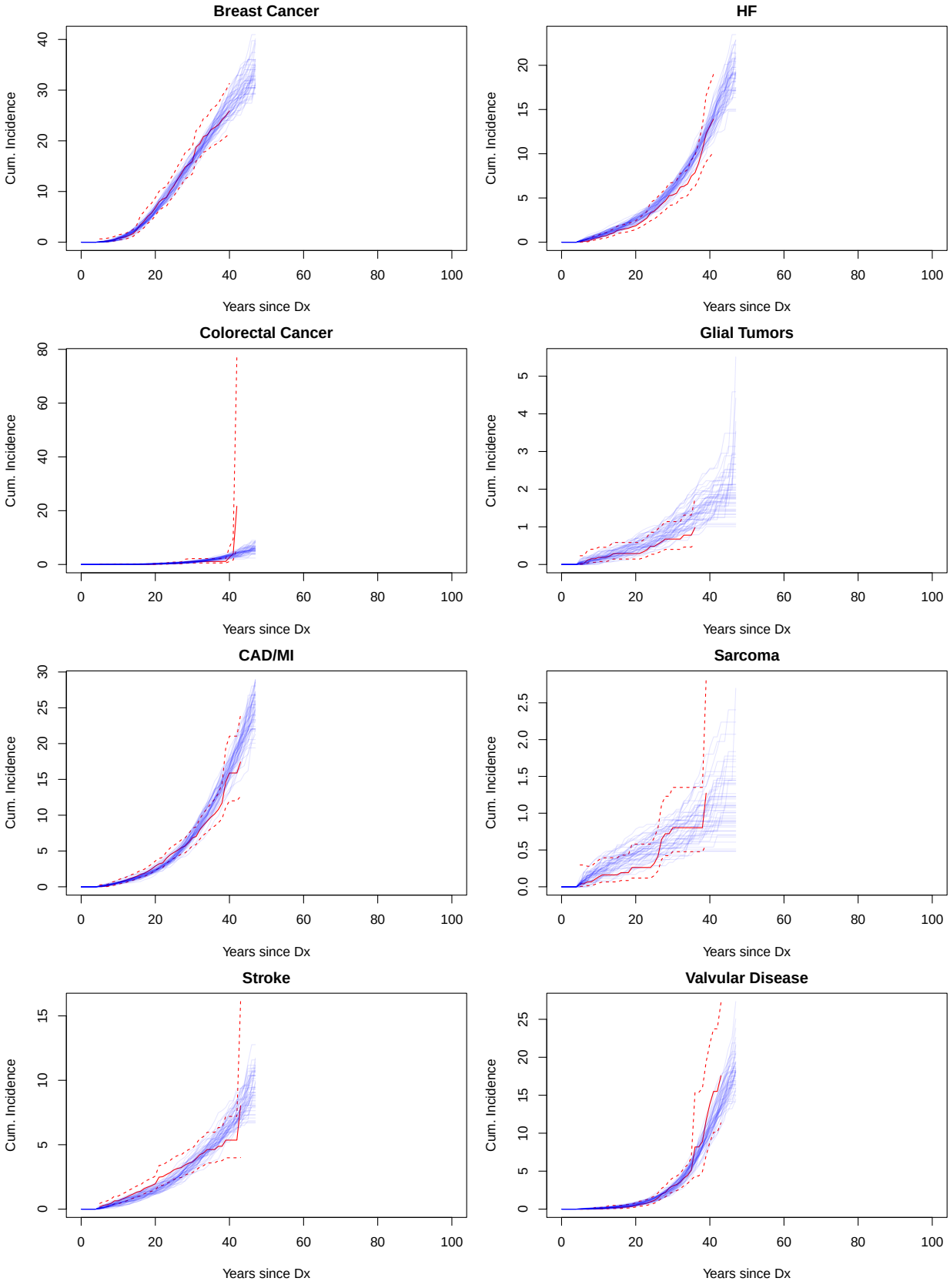
4.3.1.8 Age5-9


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

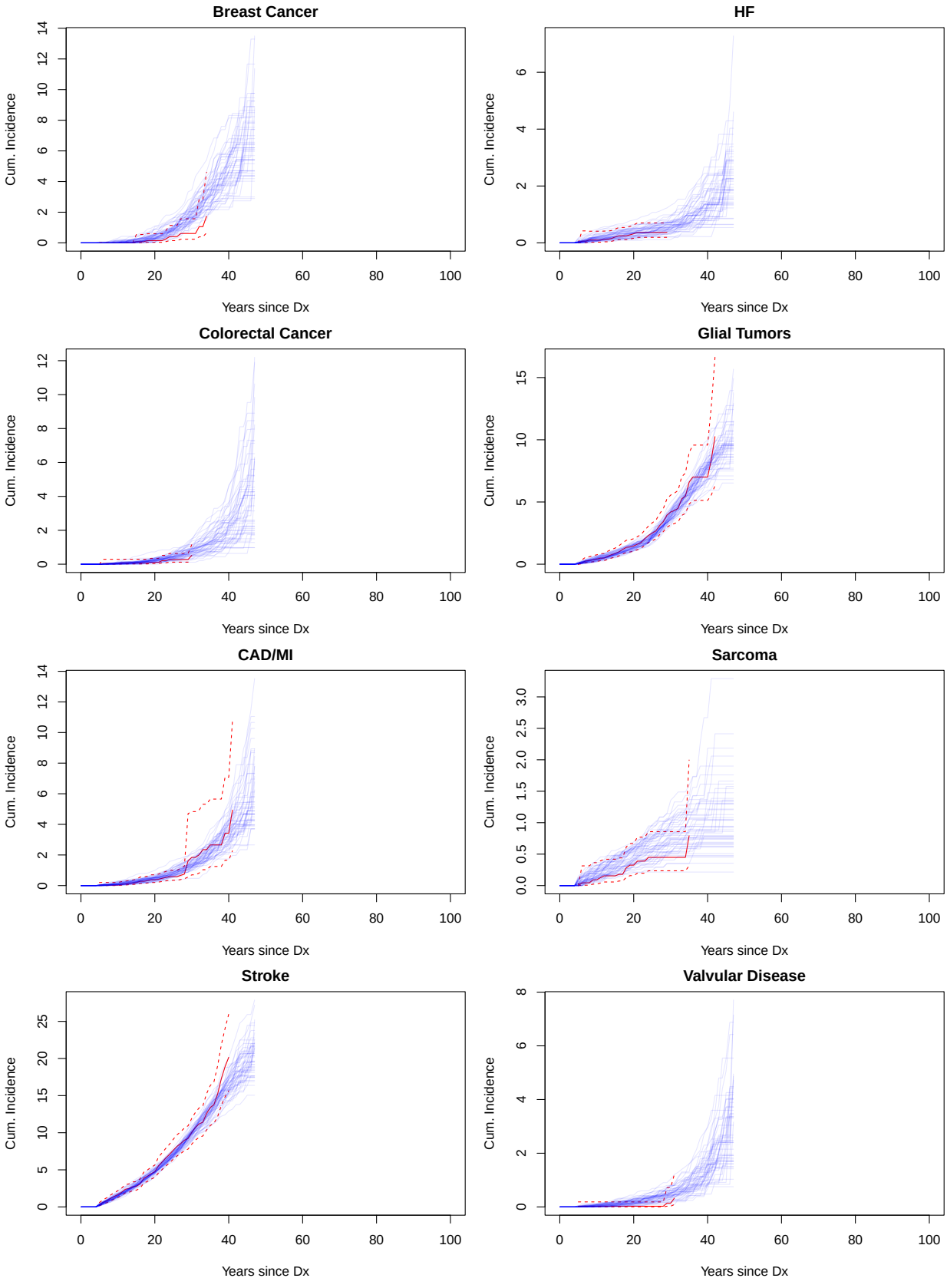
4.3.1.9 Age10-14



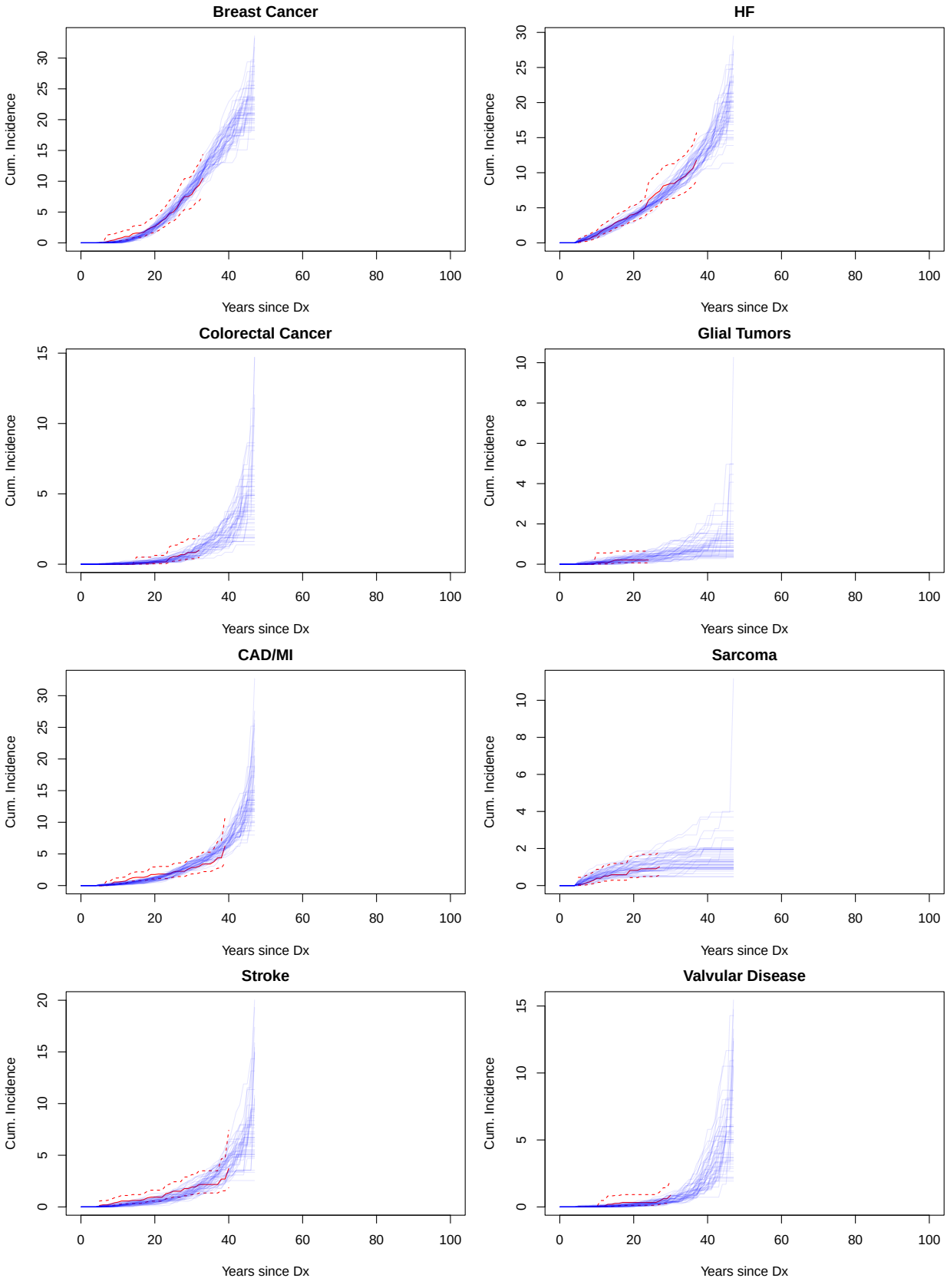
4.3.1.10 Age15-20



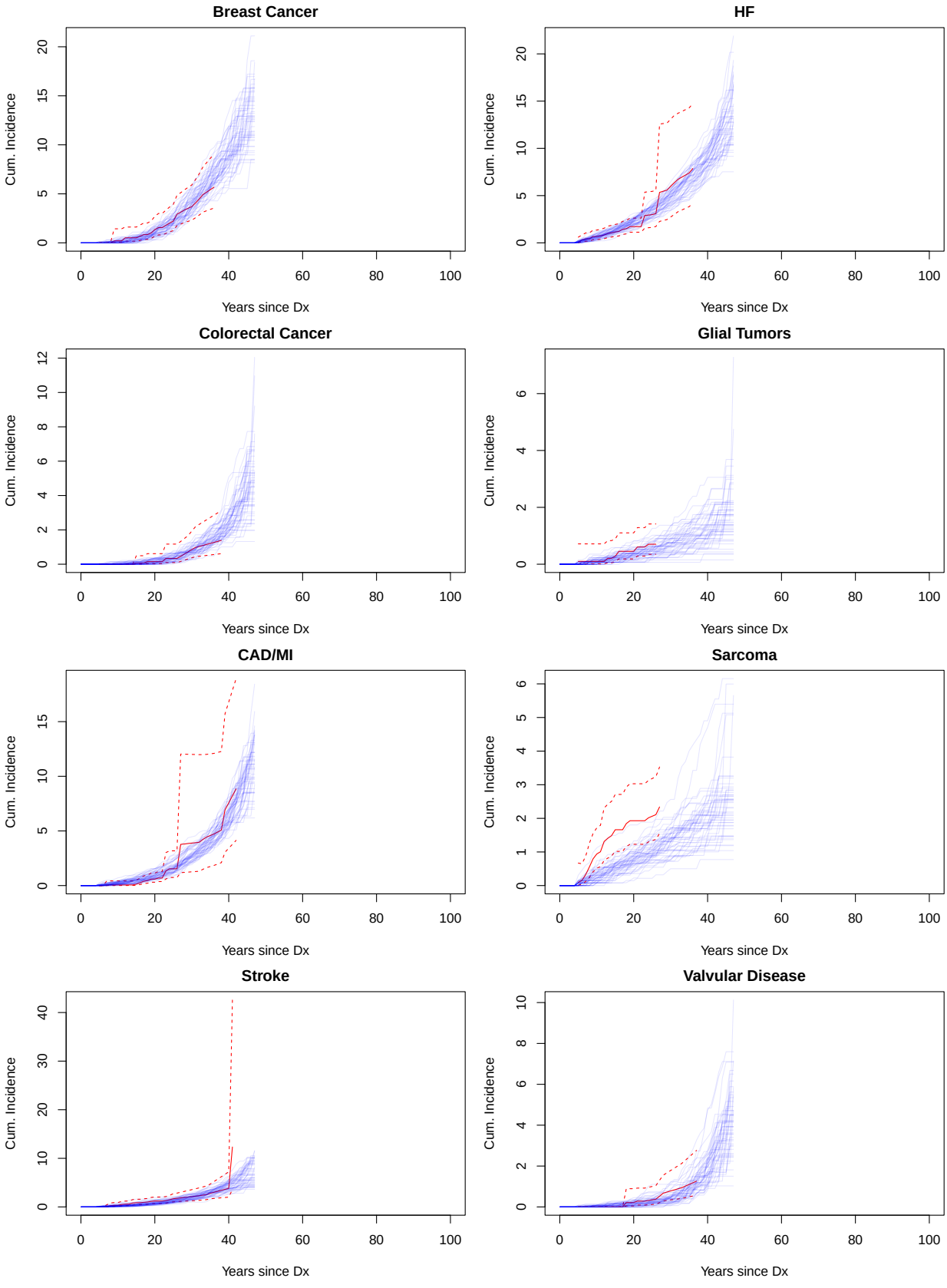
4.3.1.11 Brain


Breast Cancer
Cum. Incidence
Years since Dx
HF
Cum. Incidence
Years since Dx
Colorectal Cancer
Cum. Incidence
Years since Dx
Glial Tumors
Cum. Incidence
Years since Dx
CAD/MI
Cum. Incidence
Years since Dx
Sarcoma
Cum. Incidence
Years since Dx
Stroke
Cum. Incidence
Years since Dx
Valvular Disease
Cum. Incidence
Years since Dx

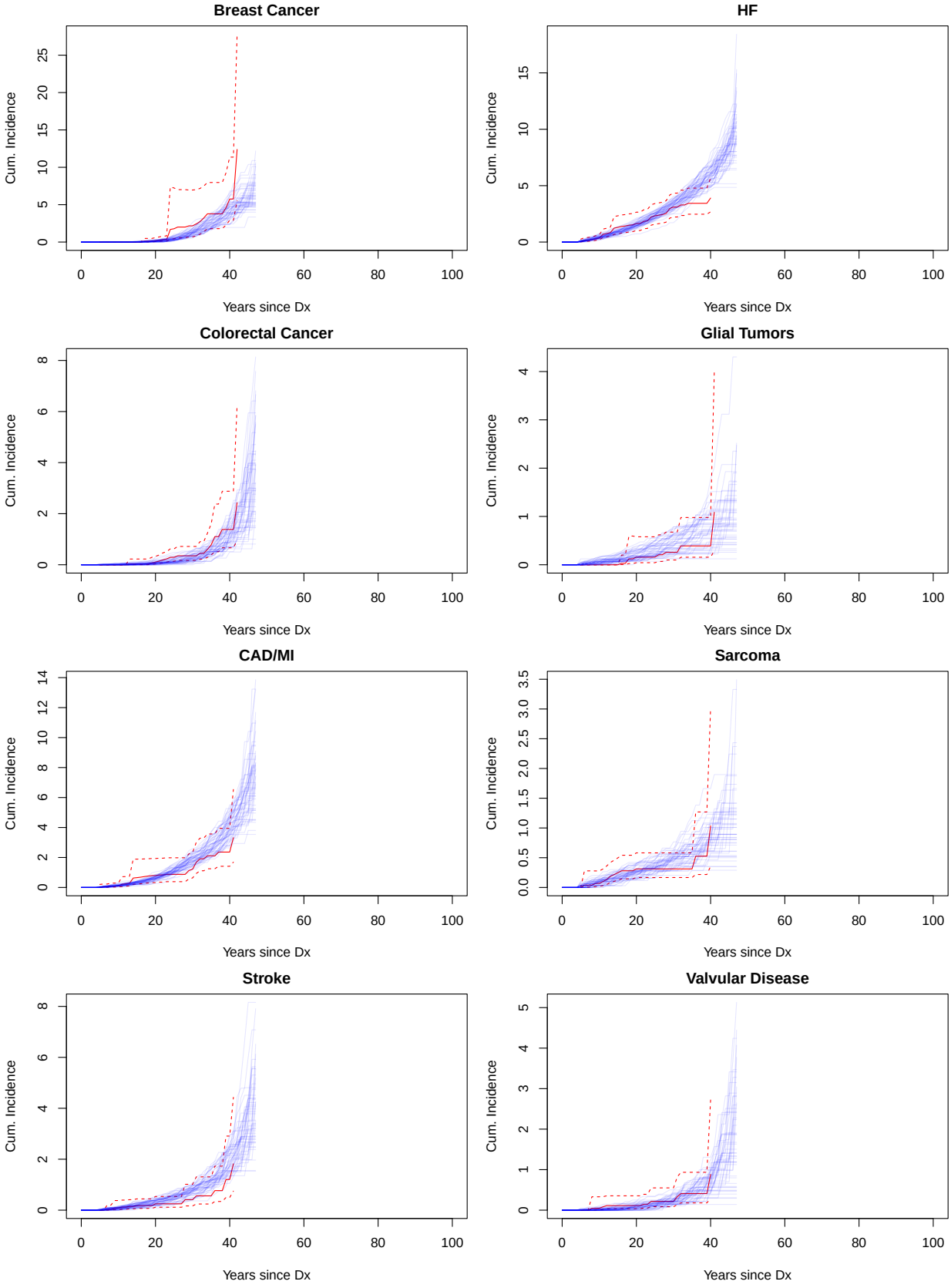
4.3.1.12 Bone


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

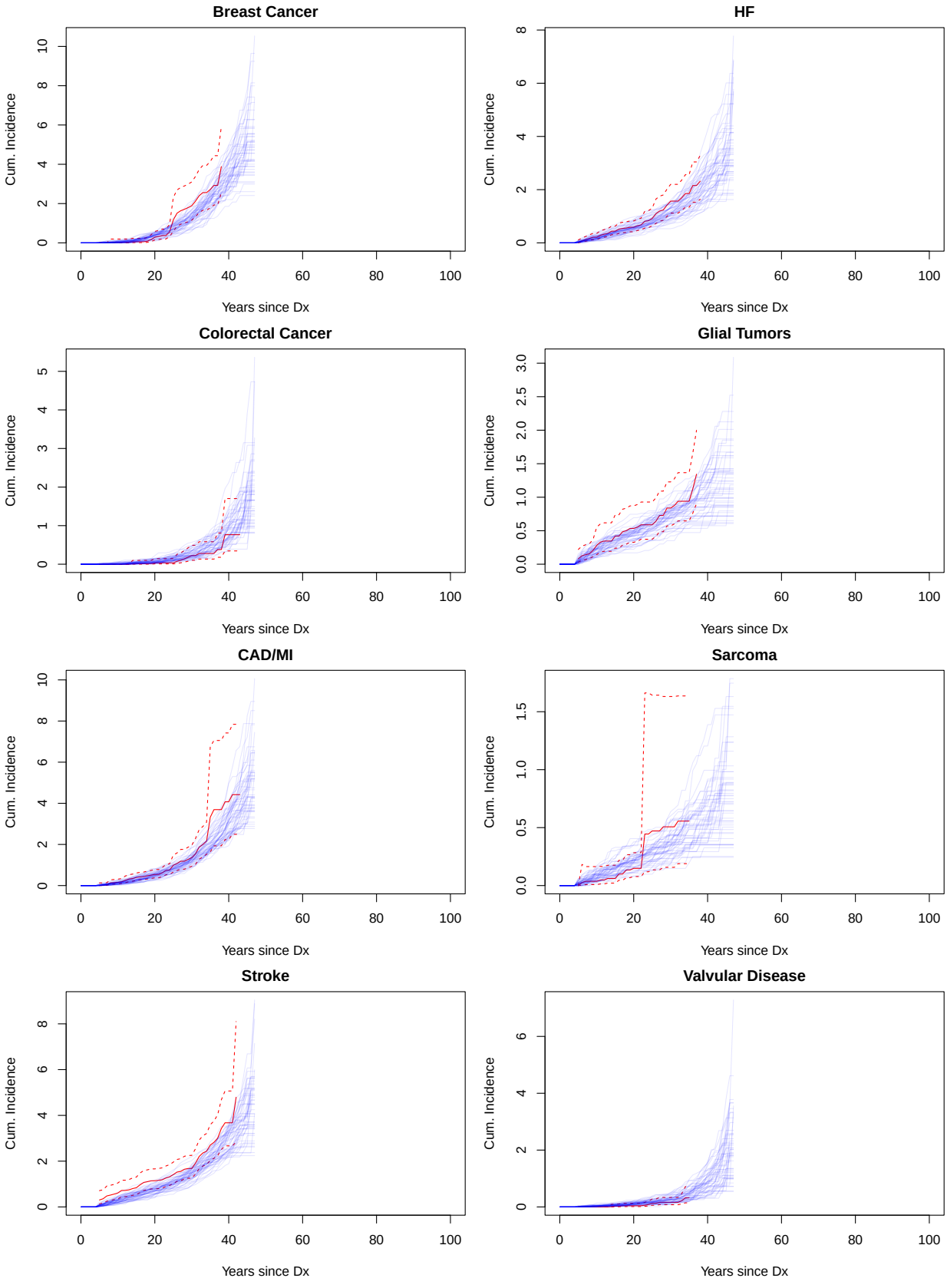
4.3.1.13 Soft Tissue Sarcoma



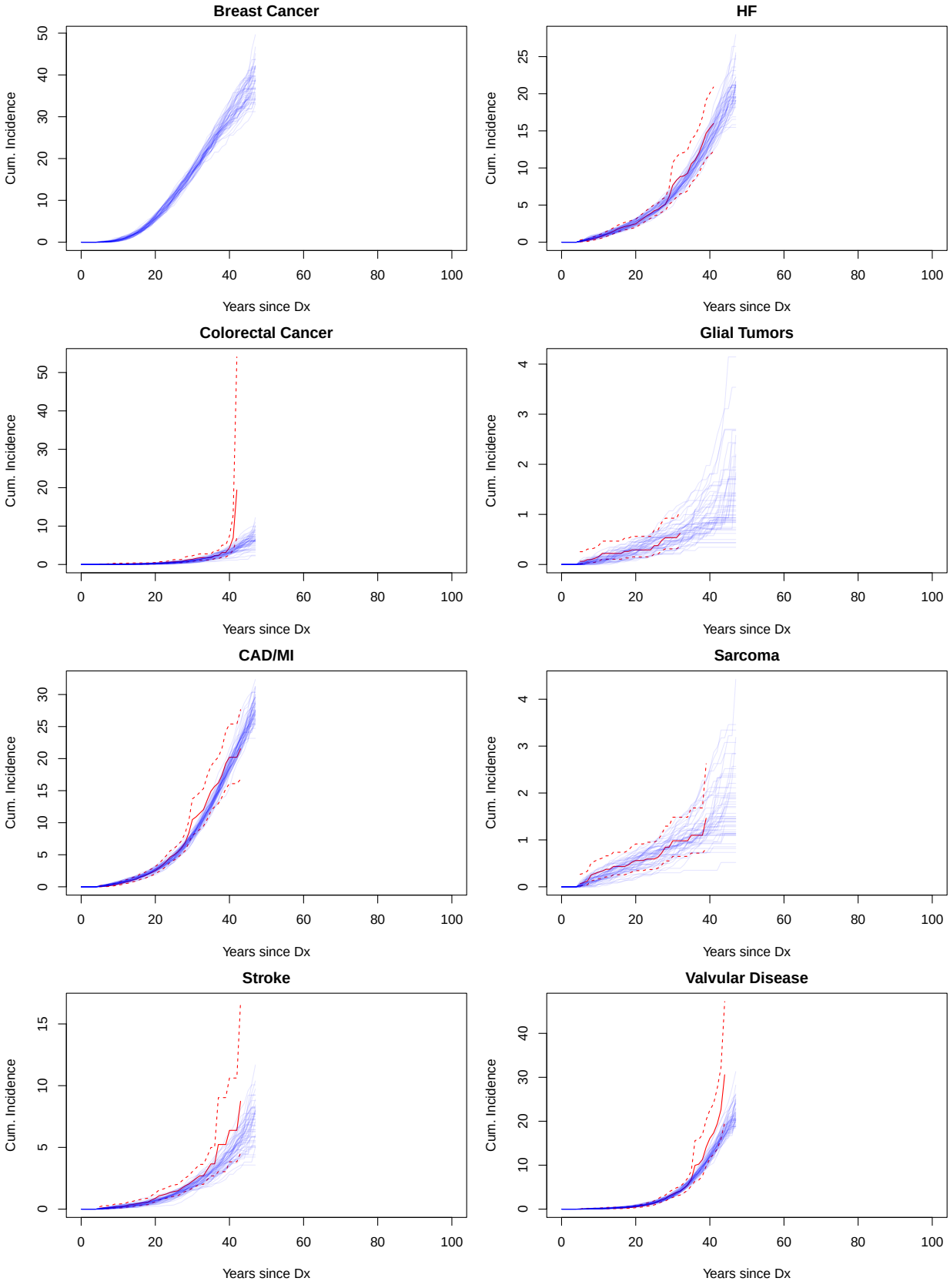
4.3.1.14 WT/NBL


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

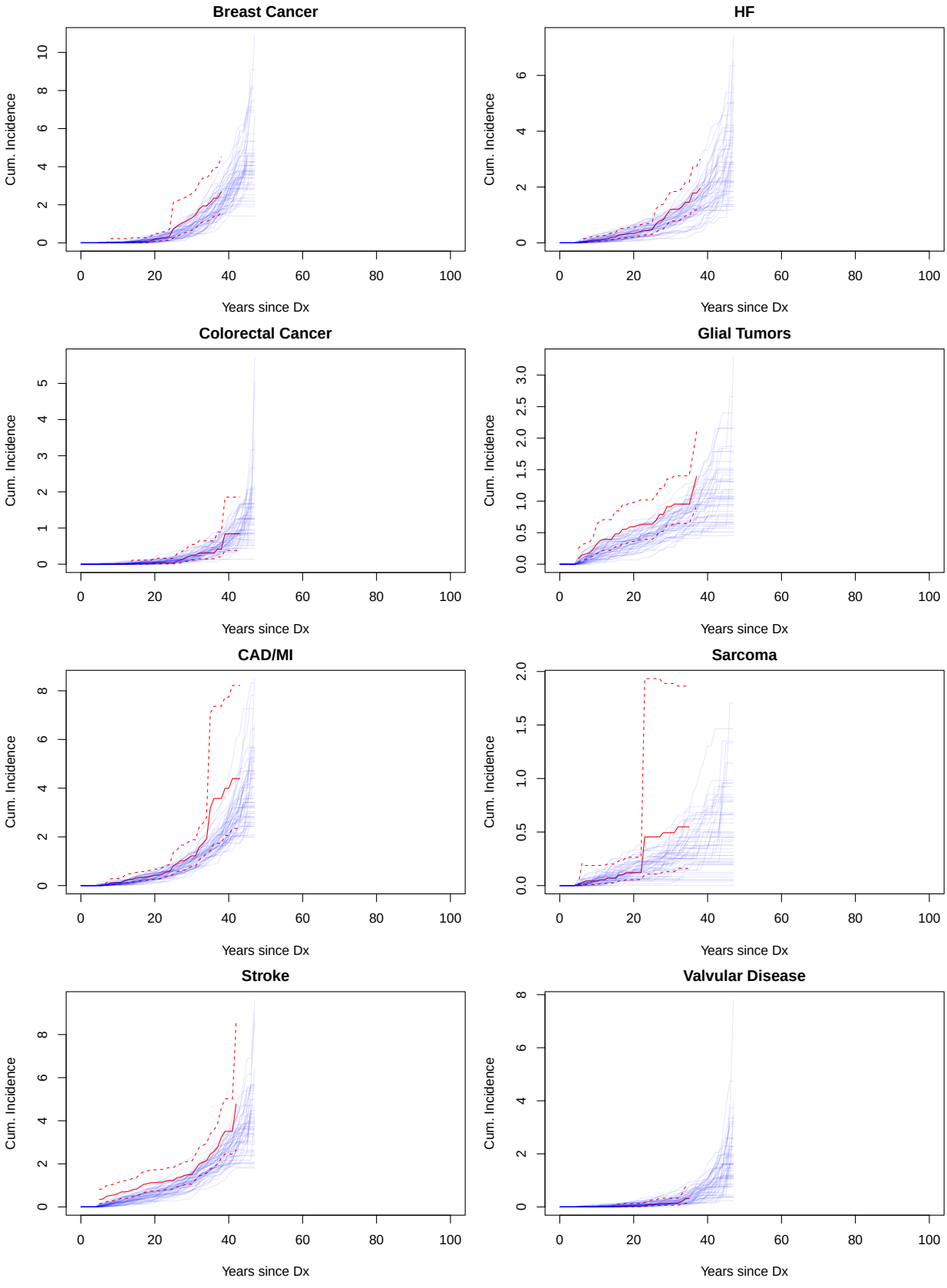
4.3.1.15 Leukemia



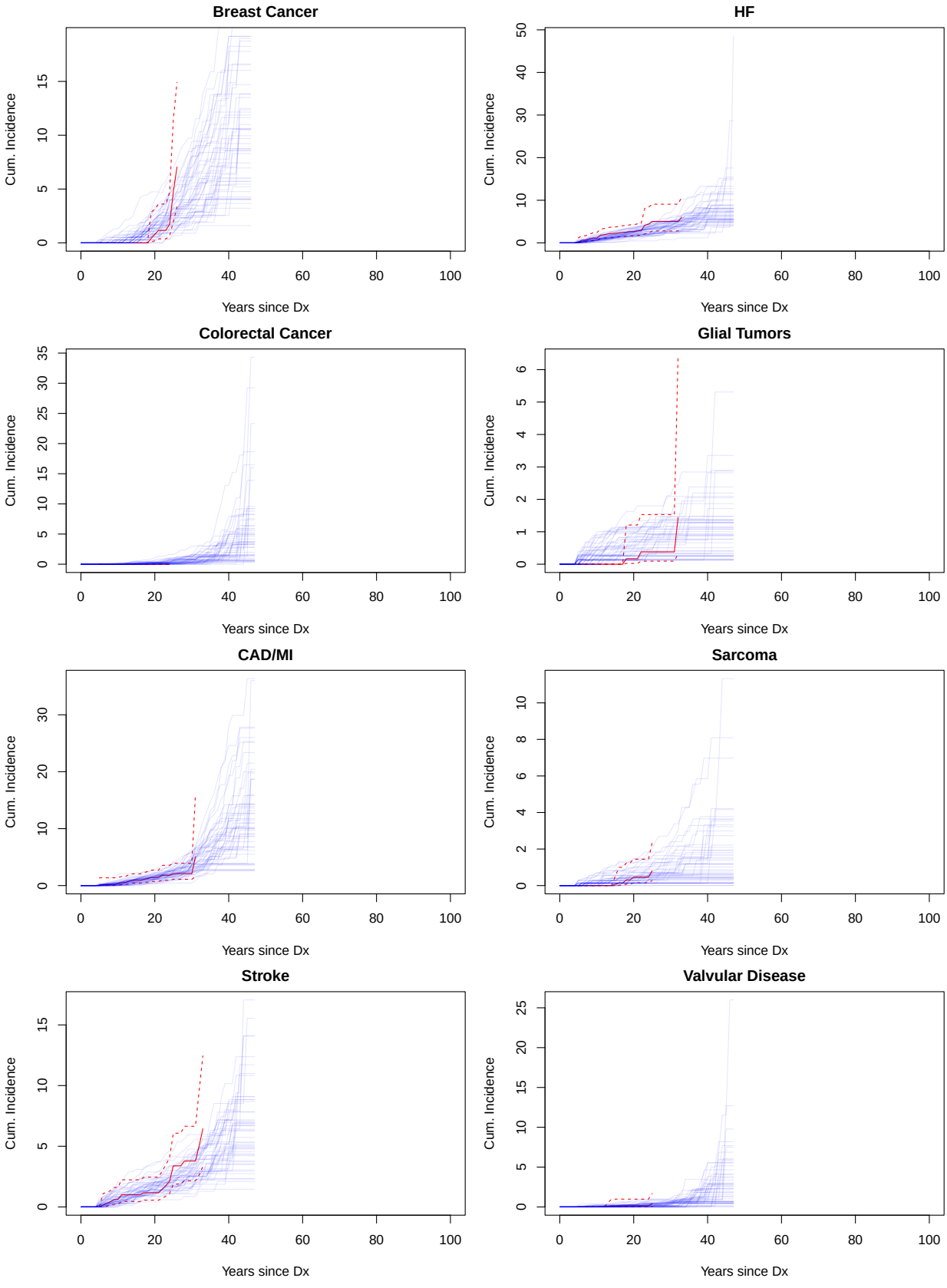
4.3.1.16 Lymphoma



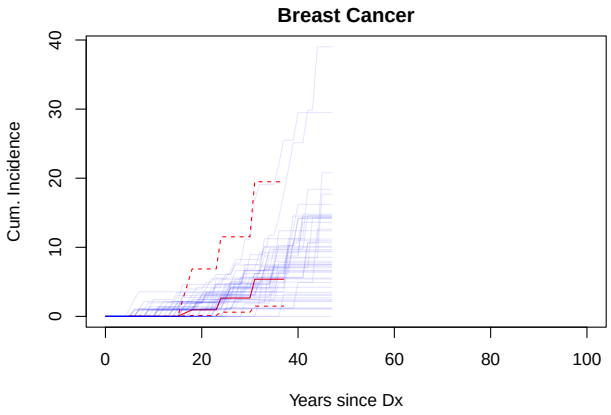
4.3.1.17 ALL

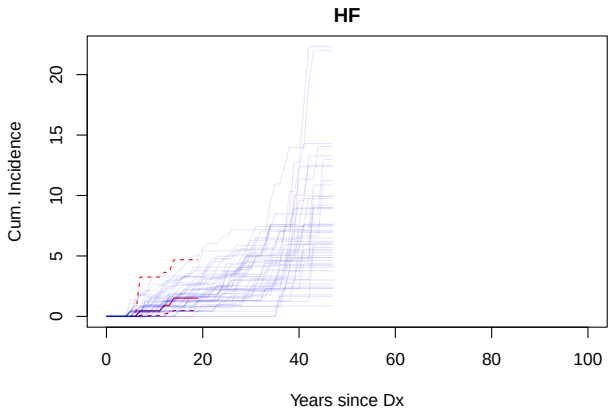

Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

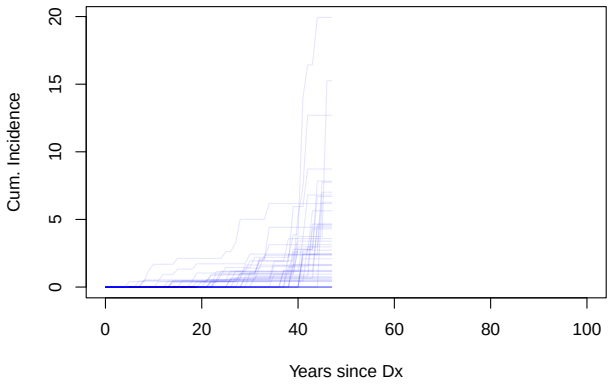
4.3.1.18 AML

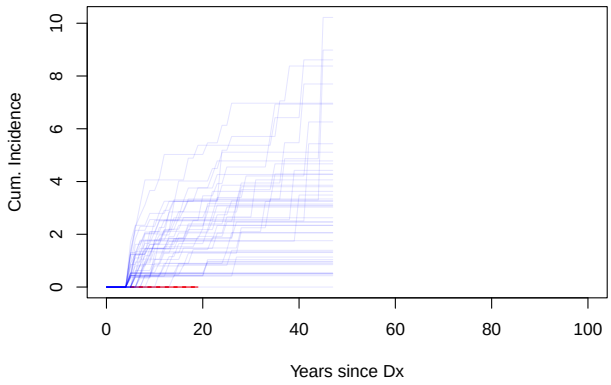

Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

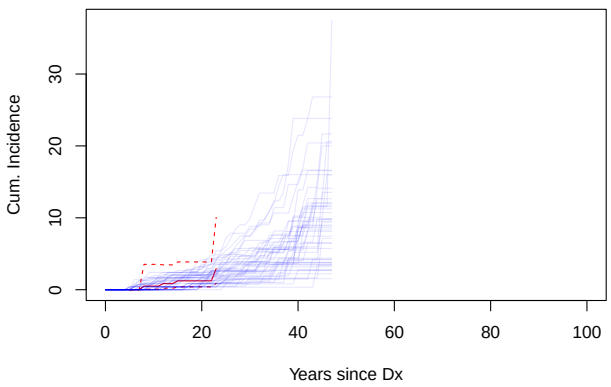
4.3.1.19 OtherLeukemia

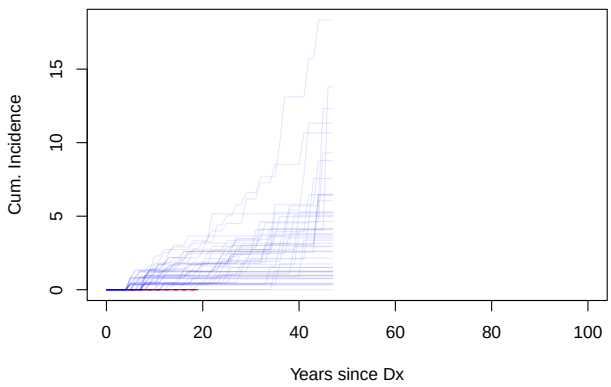


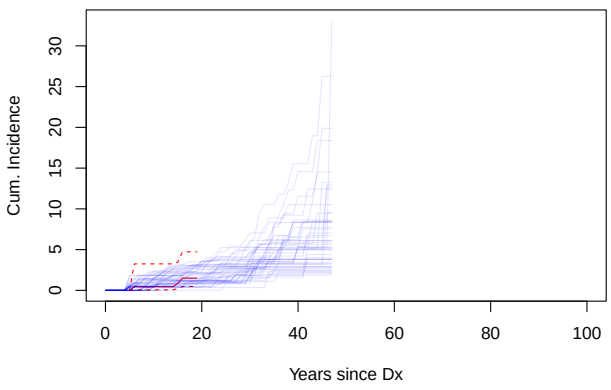


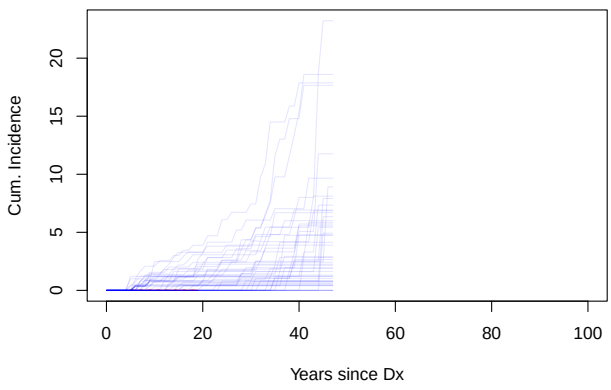




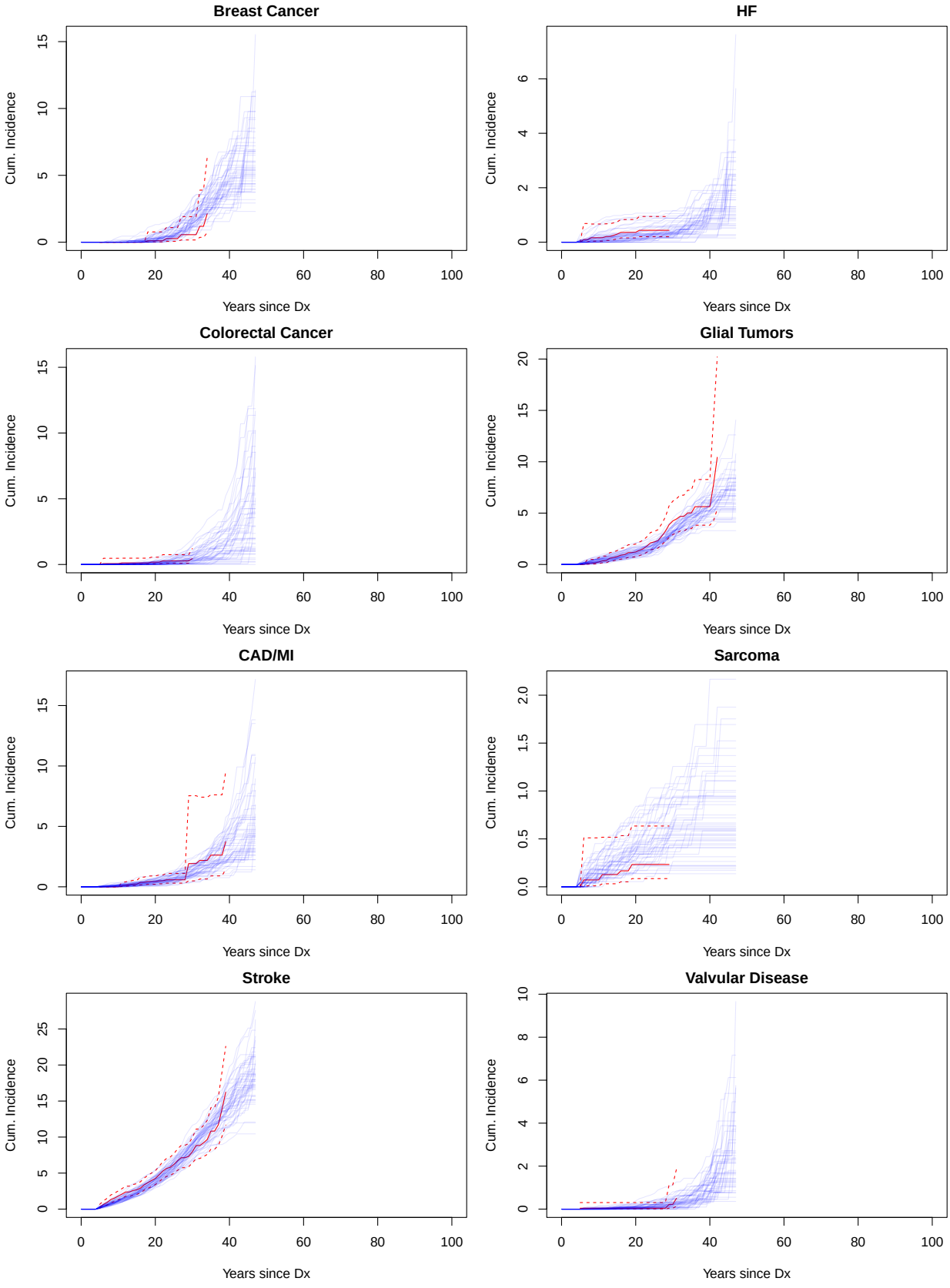




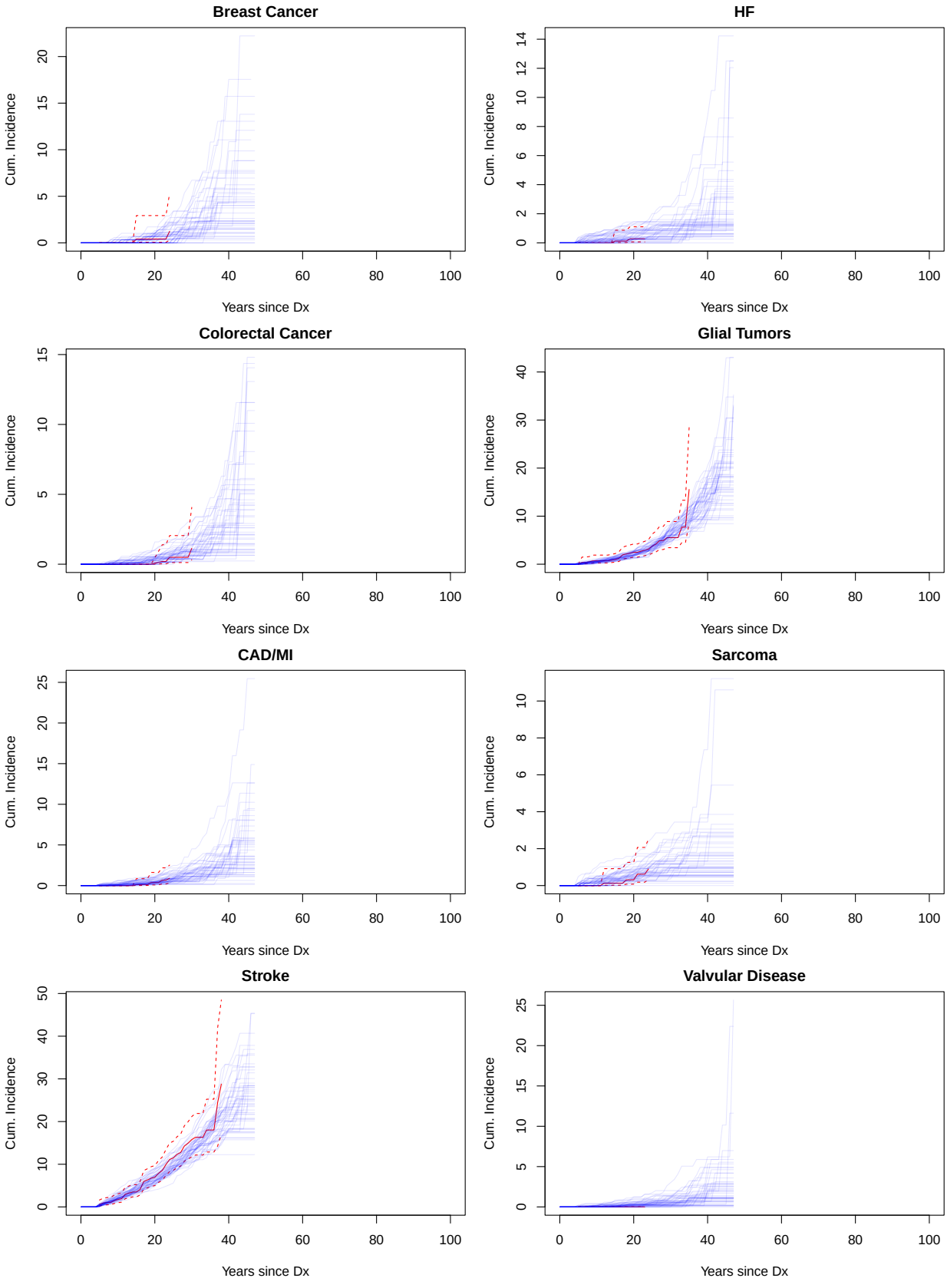




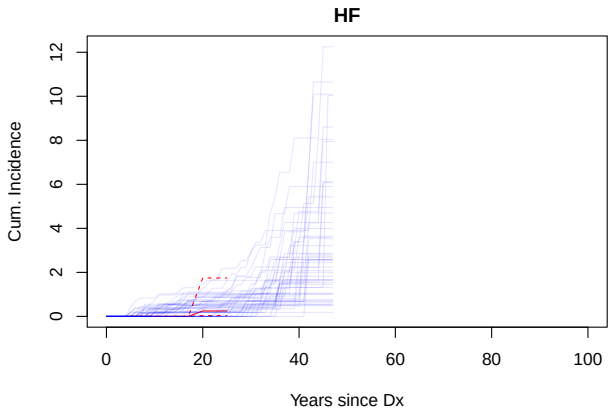
4.3.1.20 Astrocytoma

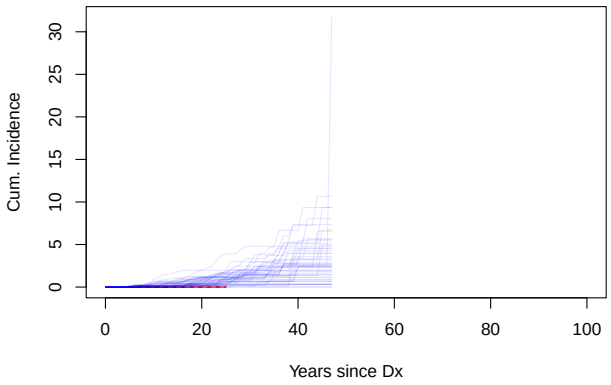


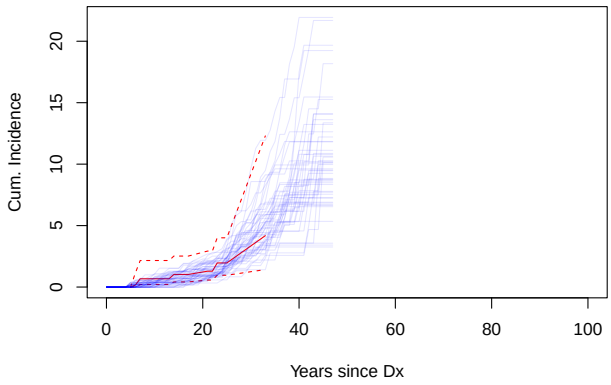
4.3.1.21 Medulloblastoma

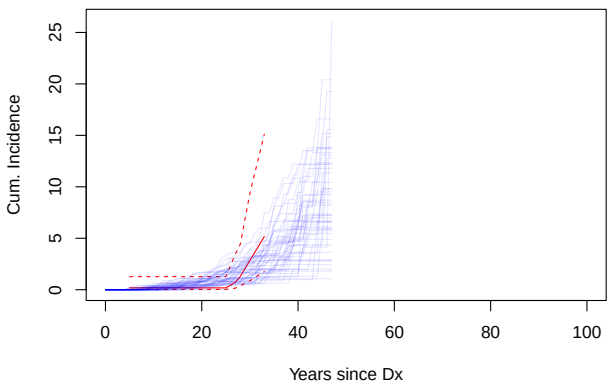


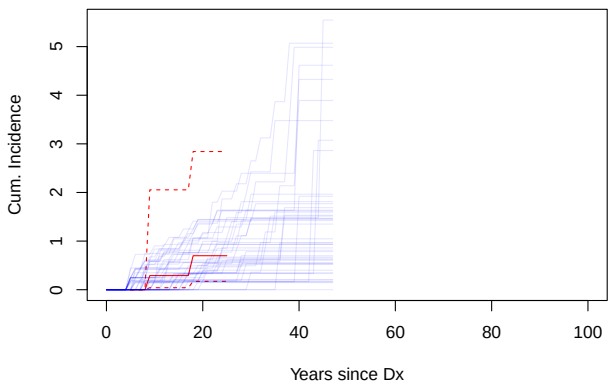
4.3.1.22 Other CNS

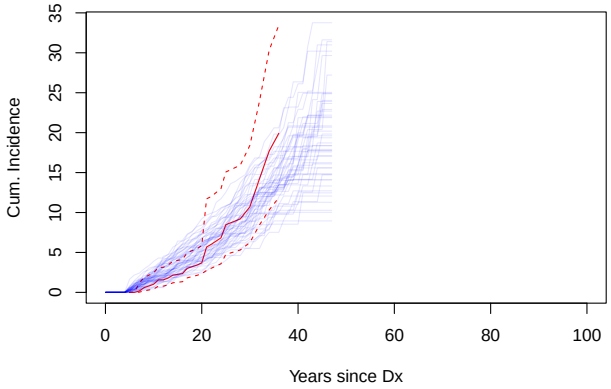


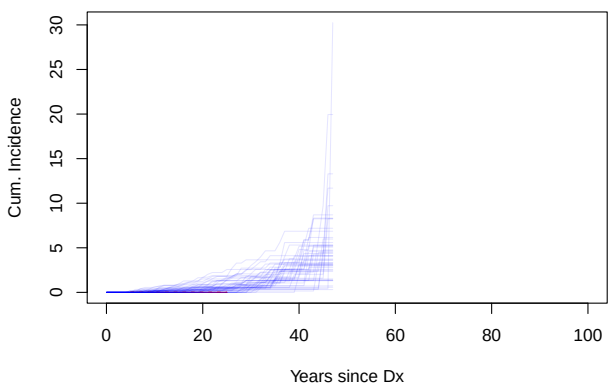




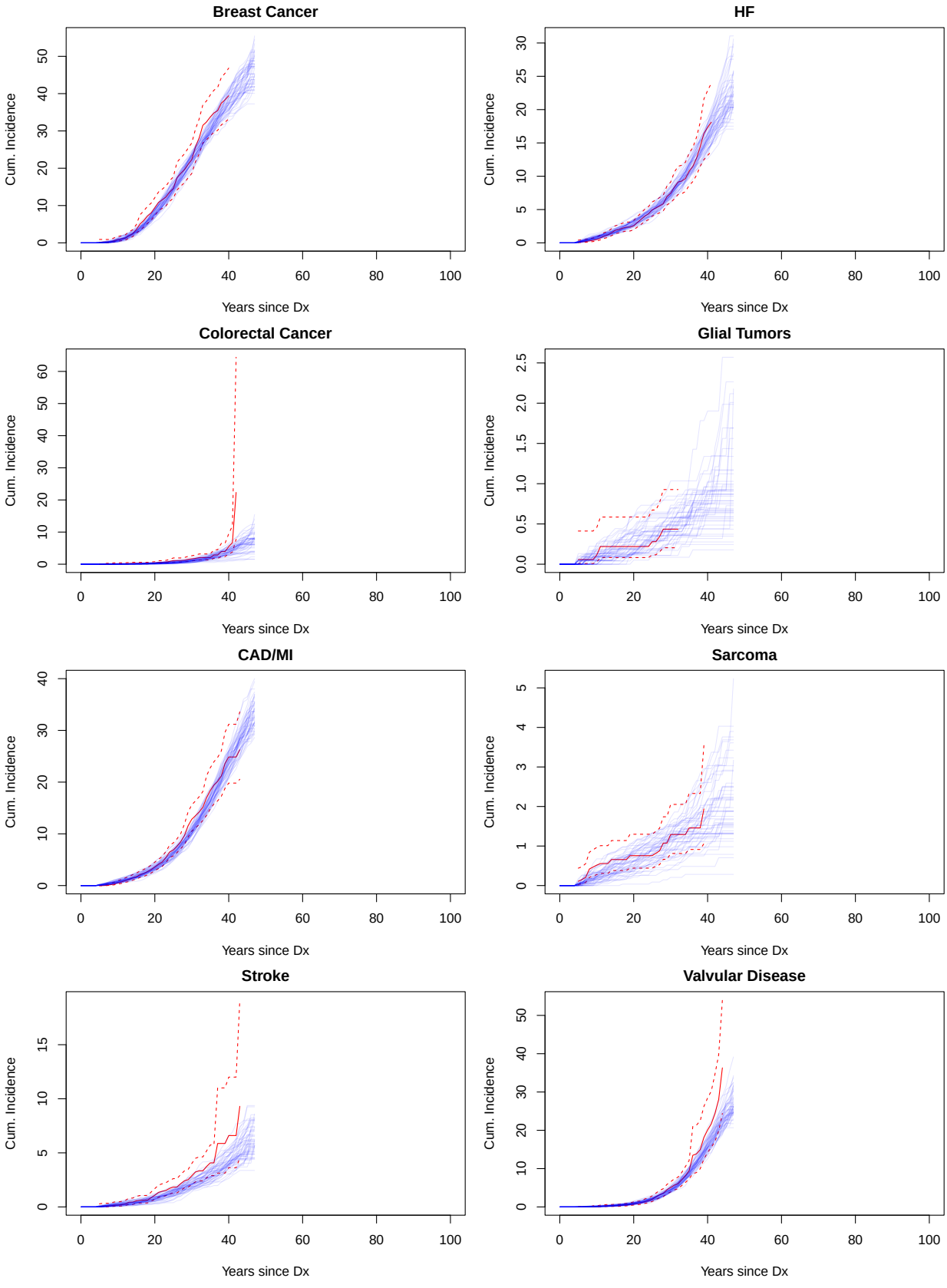




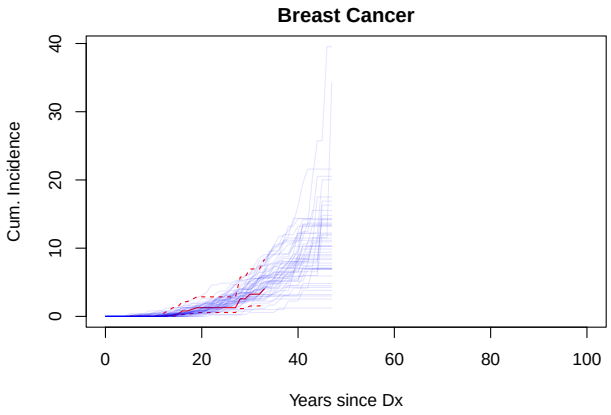


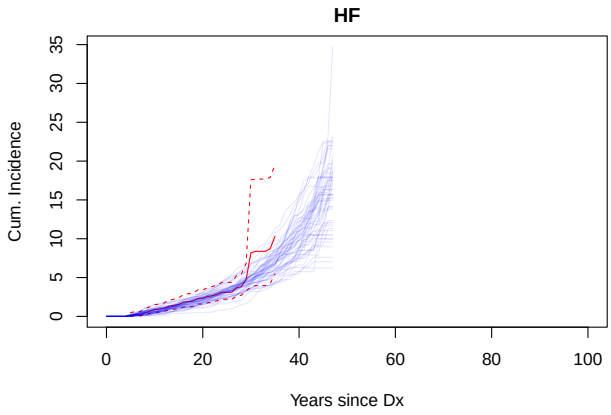


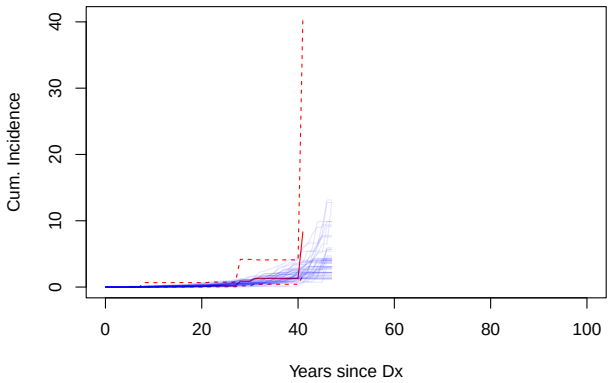
4.3.1.23 HL

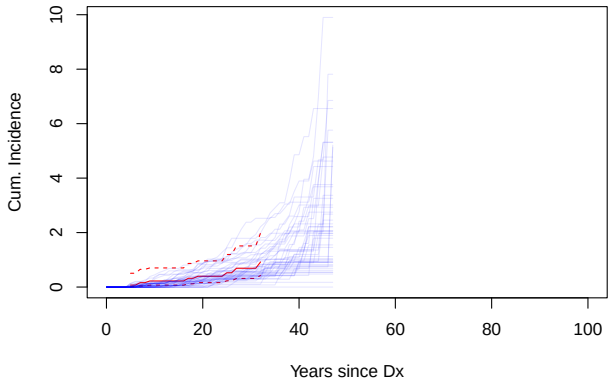

Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

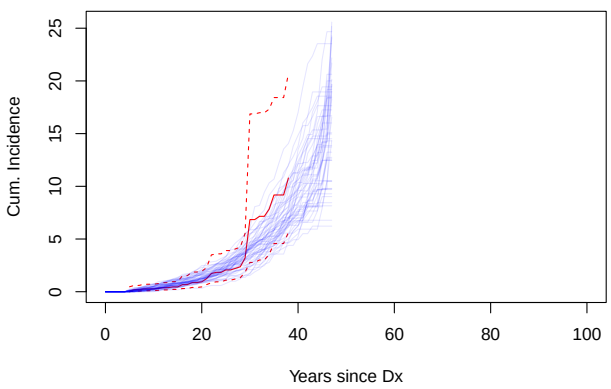
4.3.1.24 NHL

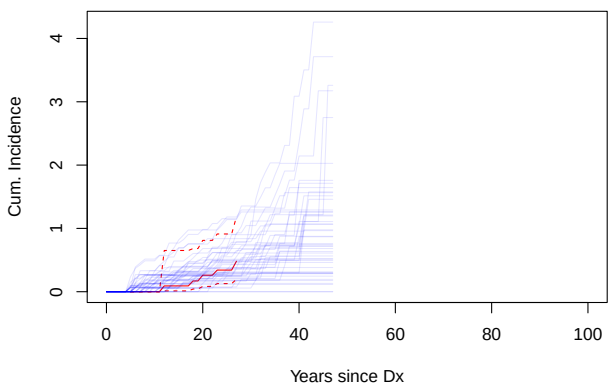

Breast Cancer
Cum. Incidence
0
10
20
30
40
0
20
40
60
80
100
Years since Dx

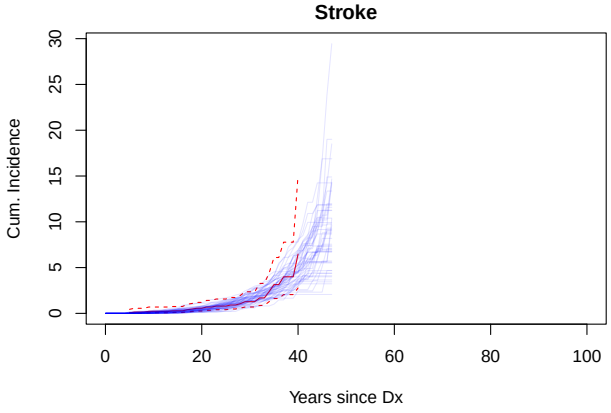

HF
Cum. Incidence
0
5
10
15
20
25
30
35
0
20
40
60
80
100
Years since Dx

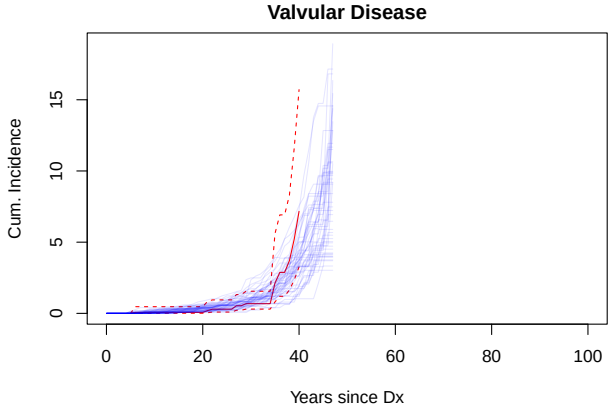

Colorectal Cancer
Cum. Incidence
0
10
20
30
40
0
20
40
60
80
100
Years since Dx


Glial Tumors
Cum. Incidence
0
2
4
6
8
10
0
20
40
60
80
100
Years since Dx

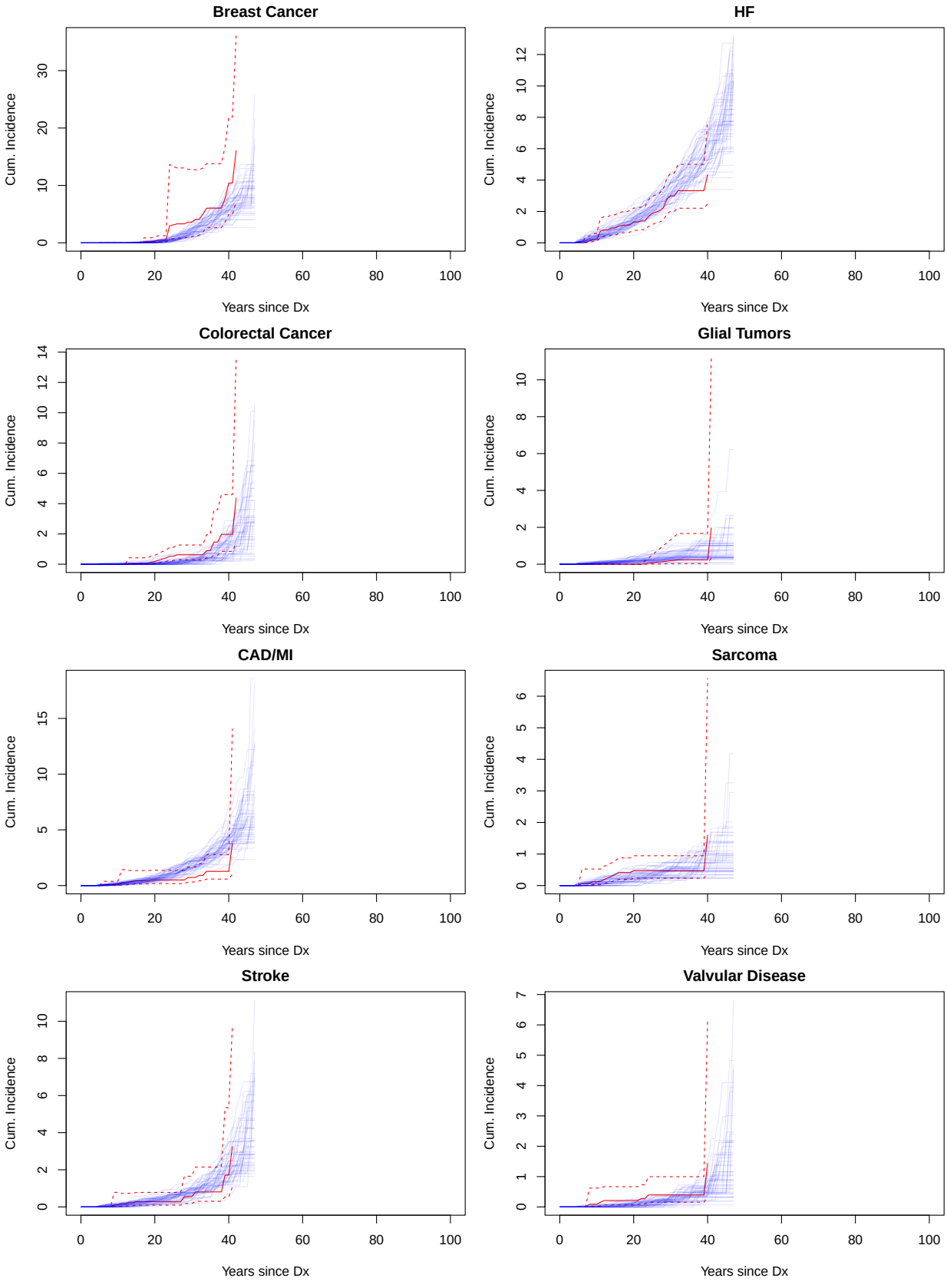

CAD/MI
Cum. Incidence
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx


Sarcoma
Cum. Incidence
0
1
2
3
4
0
20
40
60
80
100
Years since Dx

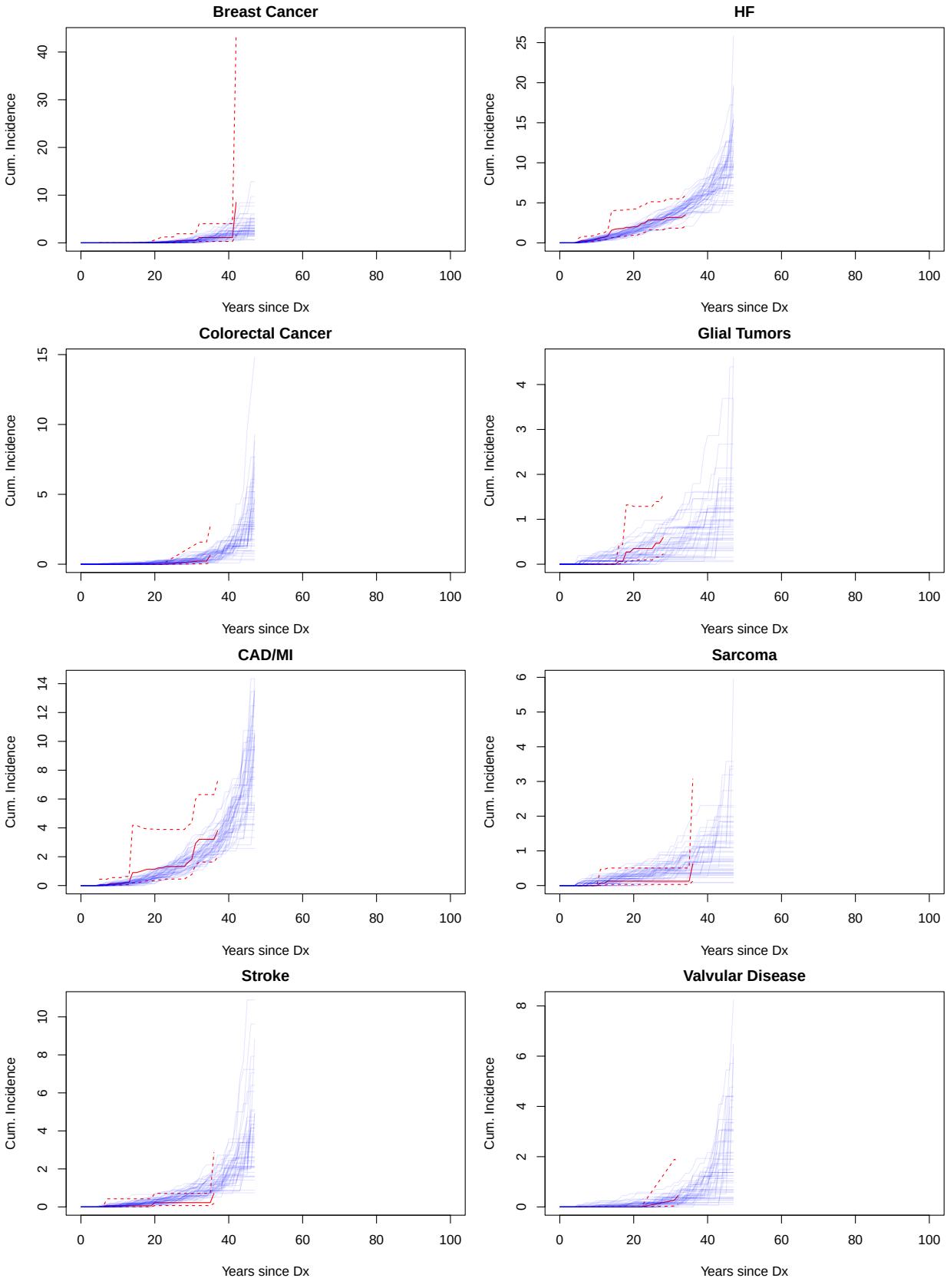

Stroke
Cum. Incidence
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx


Valvular Disease
Cum. Incidence
0
5
10
15
0
20
40
60
80
100
Years since Dx

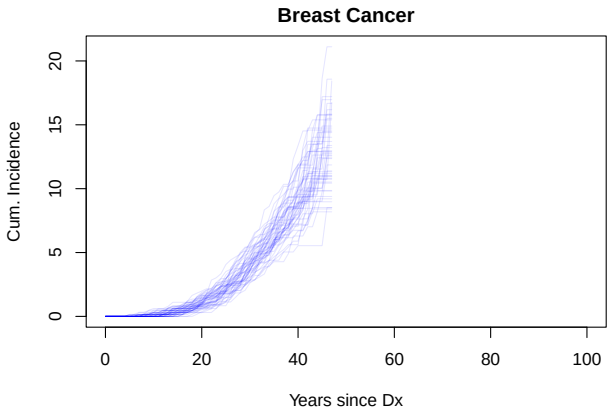
4.3.1.25 WT

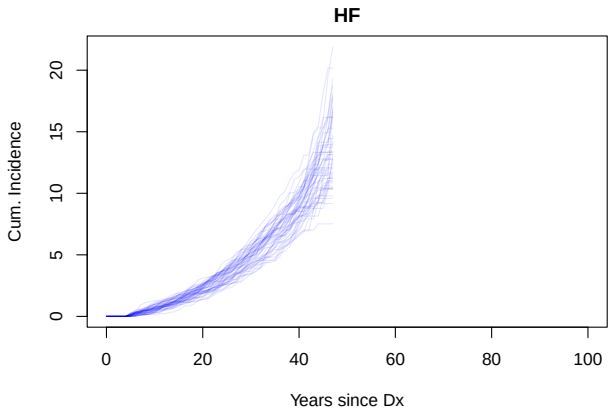

Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

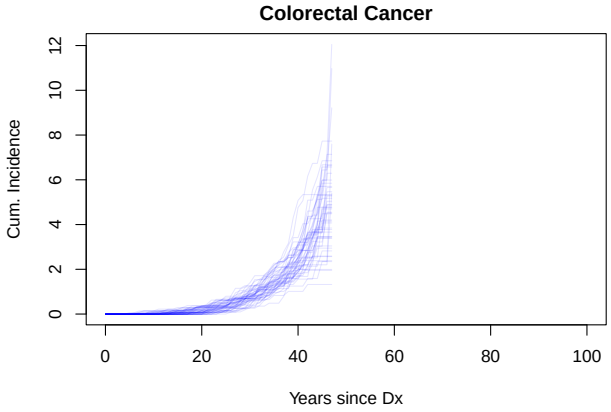
4.3.1.26 NBL

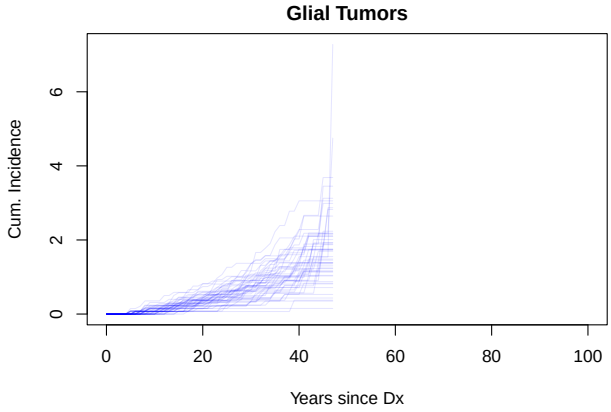

Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

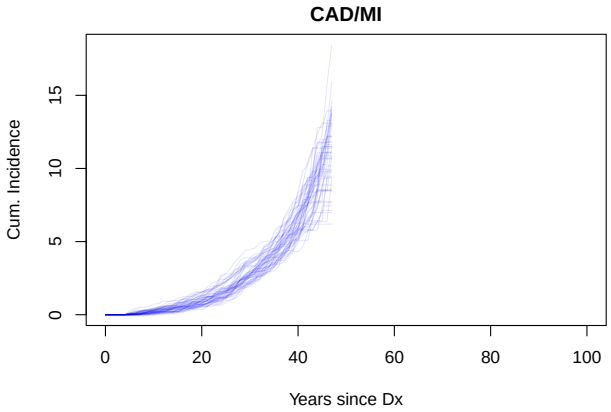
4.3.1.27 STS


Breast Cancer
Cum. Incidence
0
5
10
15
20
0
20
40
60
80
100
Years since Dx

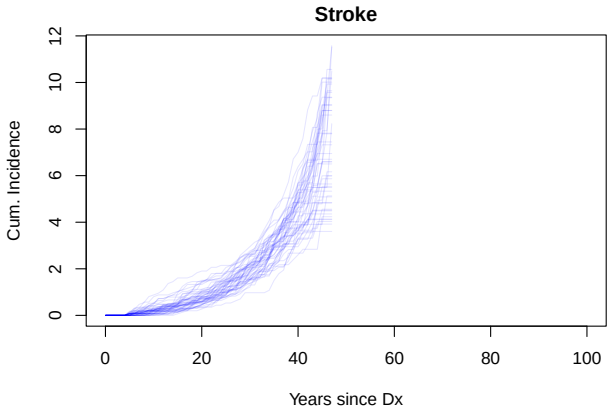

HF
Cum. Incidence
0
5
10
15
20
0
20
40
60
80
100
Years since Dx

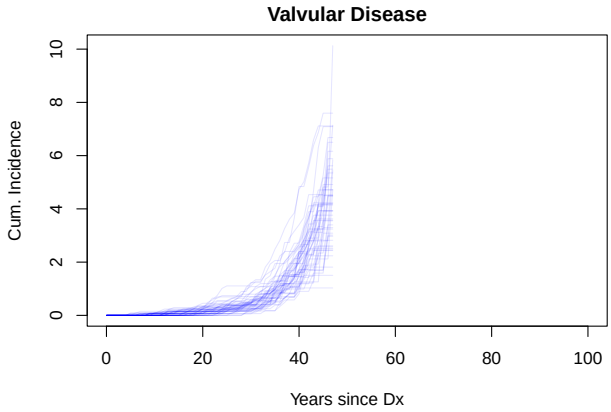

Colorectal Cancer
Cum. Incidence
0
2
4
6
8
10
12
0
20
40
60
80
100
Years since Dx


Glial Tumors
Cum. Incidence
0
2
4
6
0
20
40
60
80
100
Years since Dx

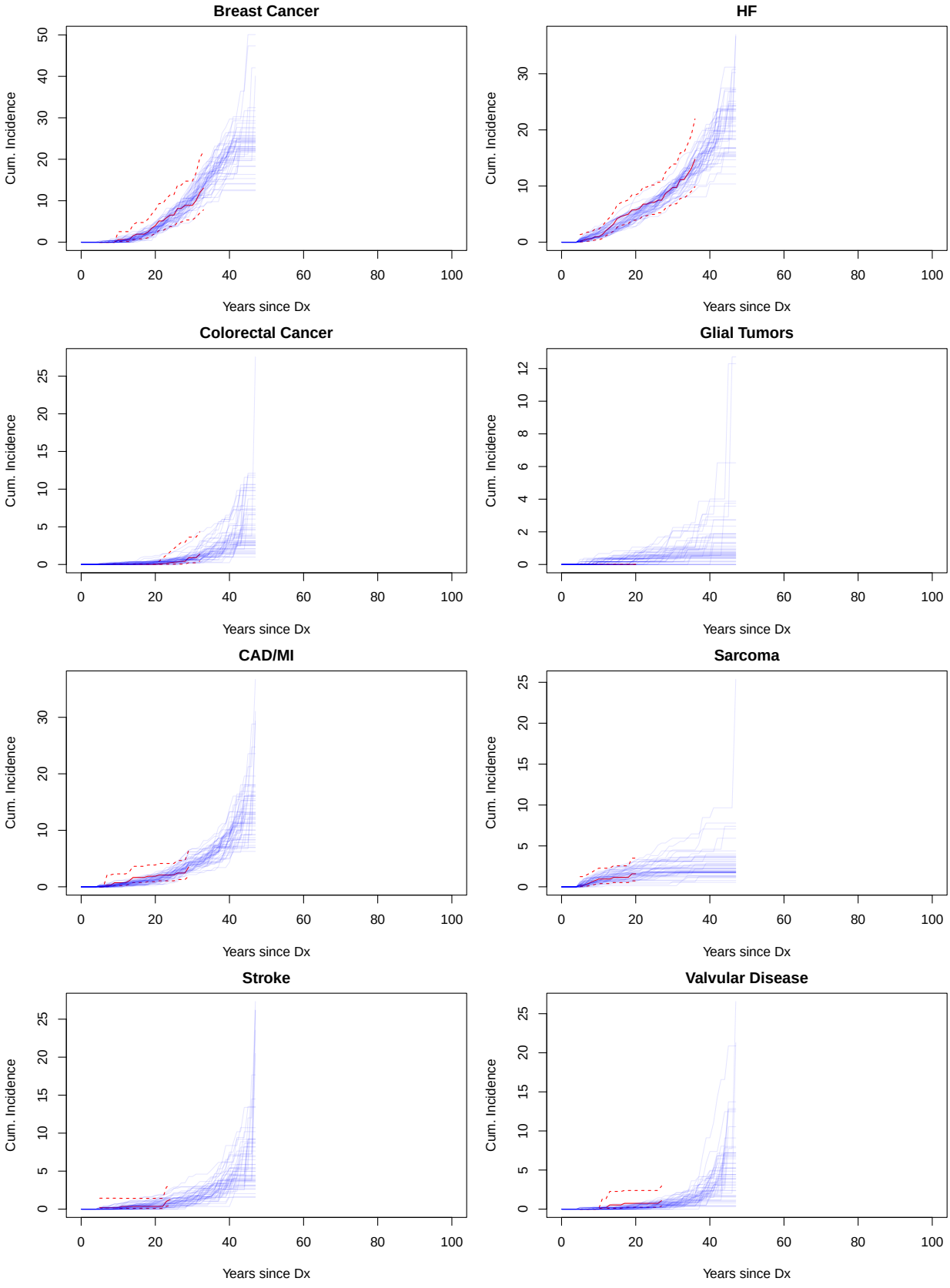

CAD/MI
Cum. Incidence
0
5
10
15
0
20
40
60
80
100
Years since Dx

Sarcoma
Cum. Incidence
0
1
2
3
4
5
6
0
20
40
60
80
100
Years since Dx

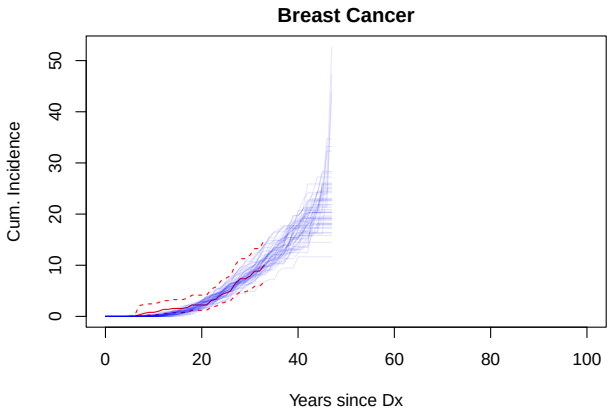

Stroke
Cum. Incidence
0
2
4
6
8
10
12
0
20
40
60
80
100
Years since Dx

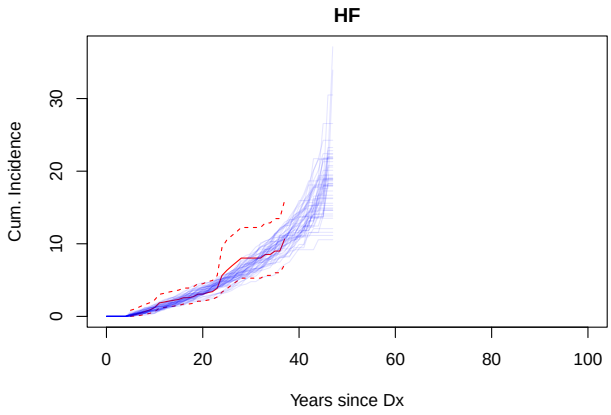

Valvular Disease
Cum. Incidence
0
2
4
6
8
10
0
20
40
60
80
100
Years since Dx

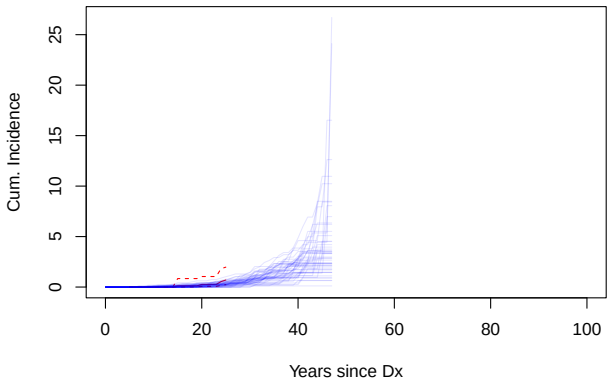
4.3.1.28 Ewings

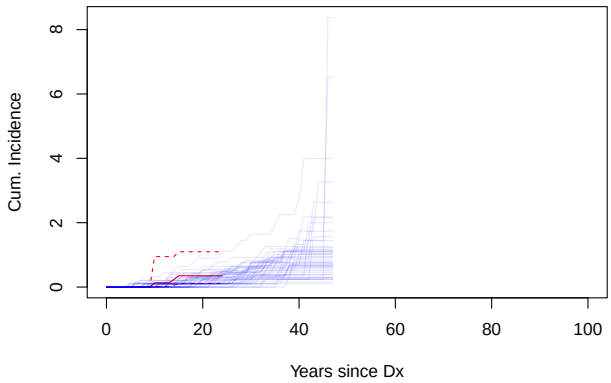


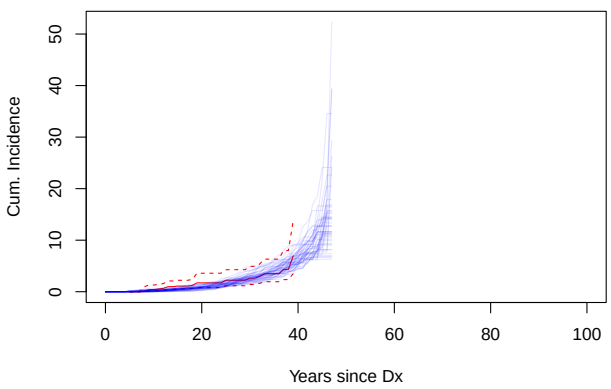
4.3.1.29 Osteosarcoma

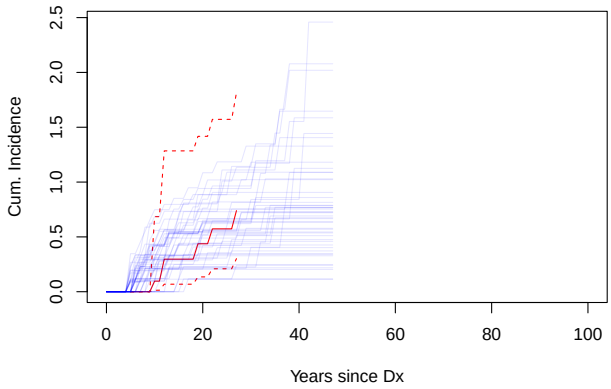


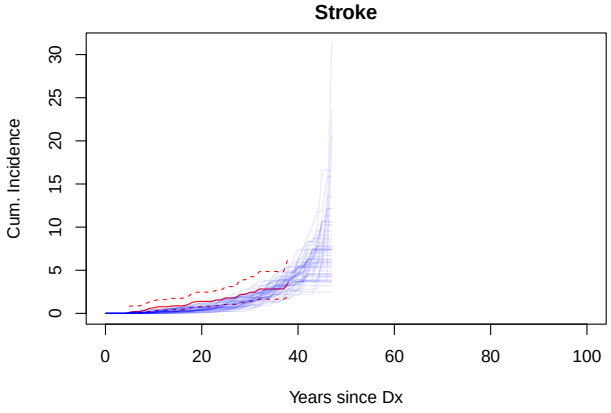


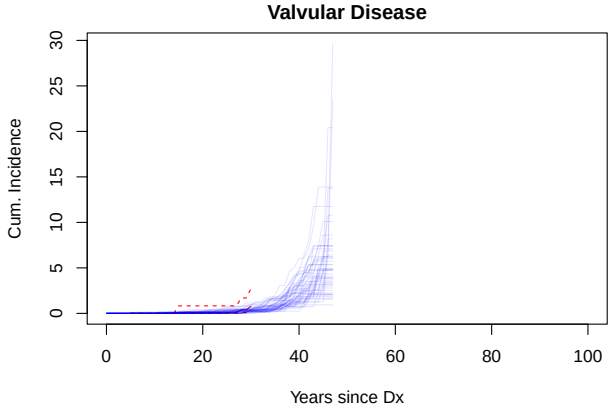




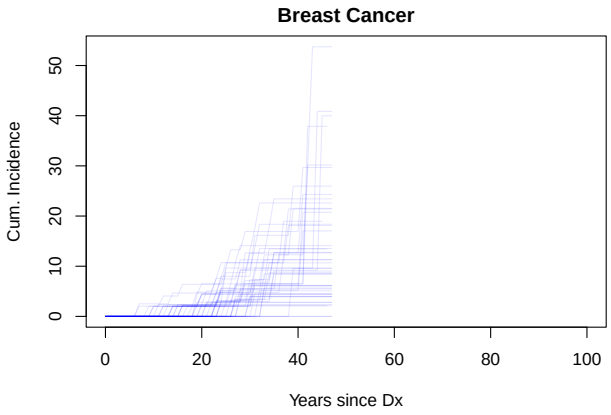


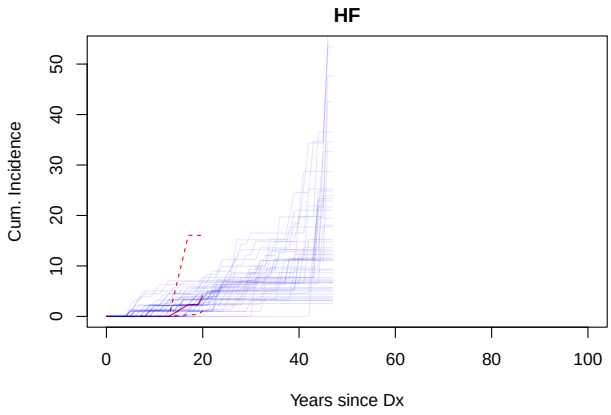


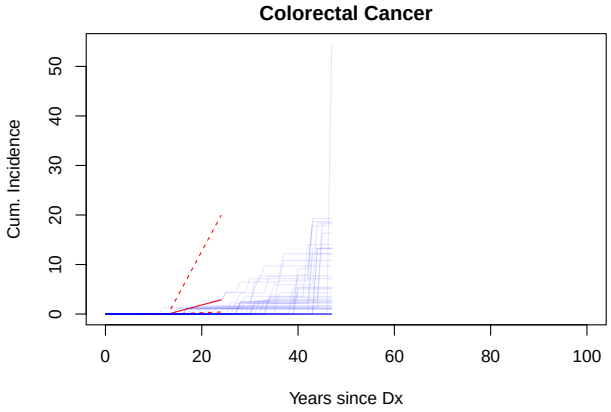


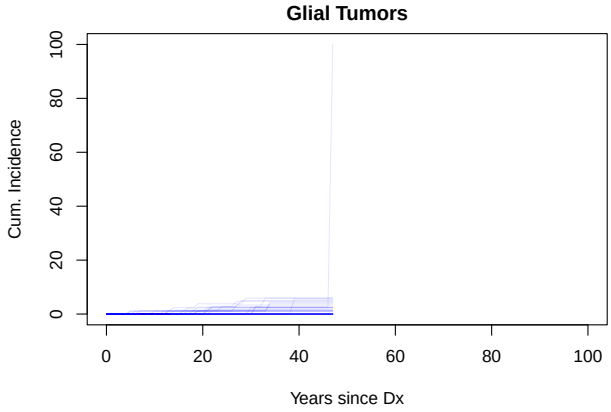


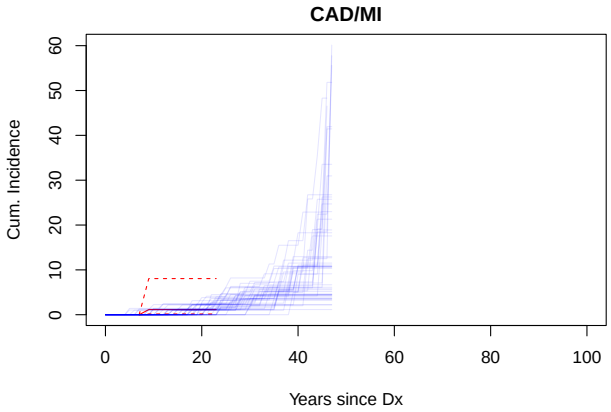
4.3.1.30 OtherBoneTumor

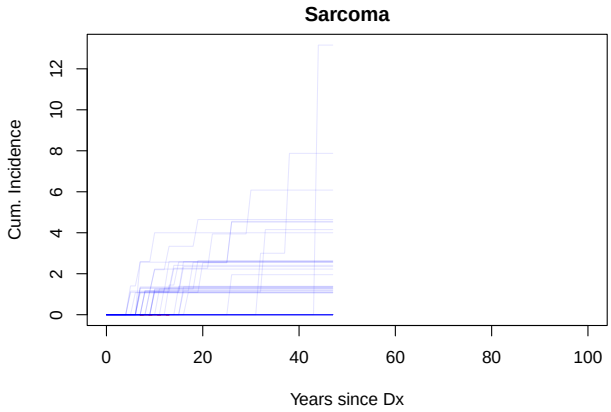


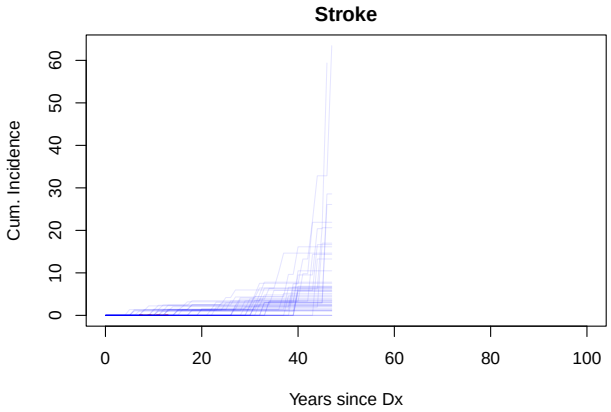


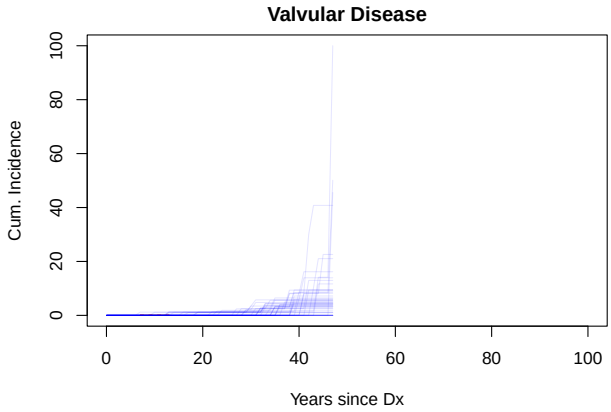




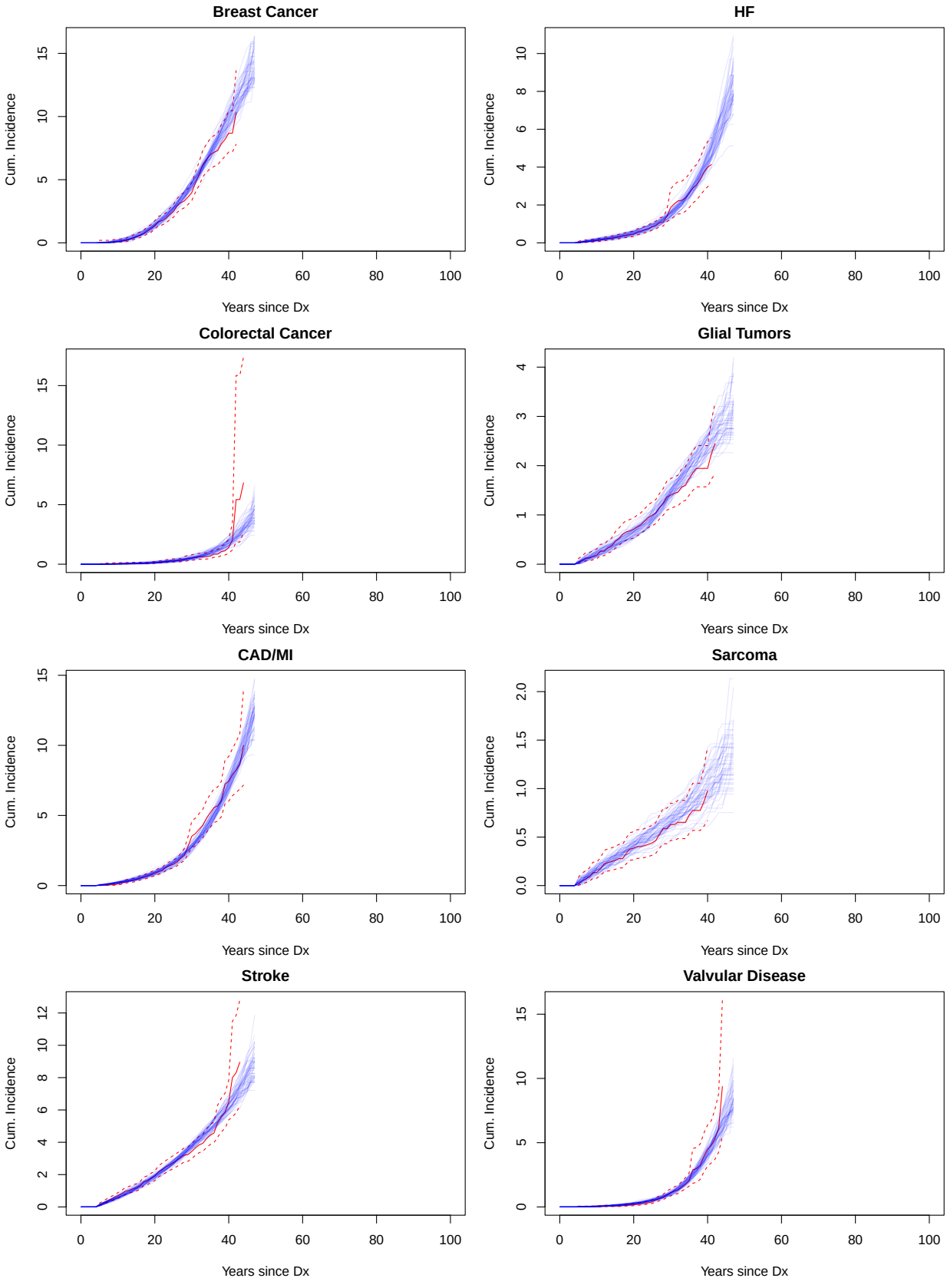




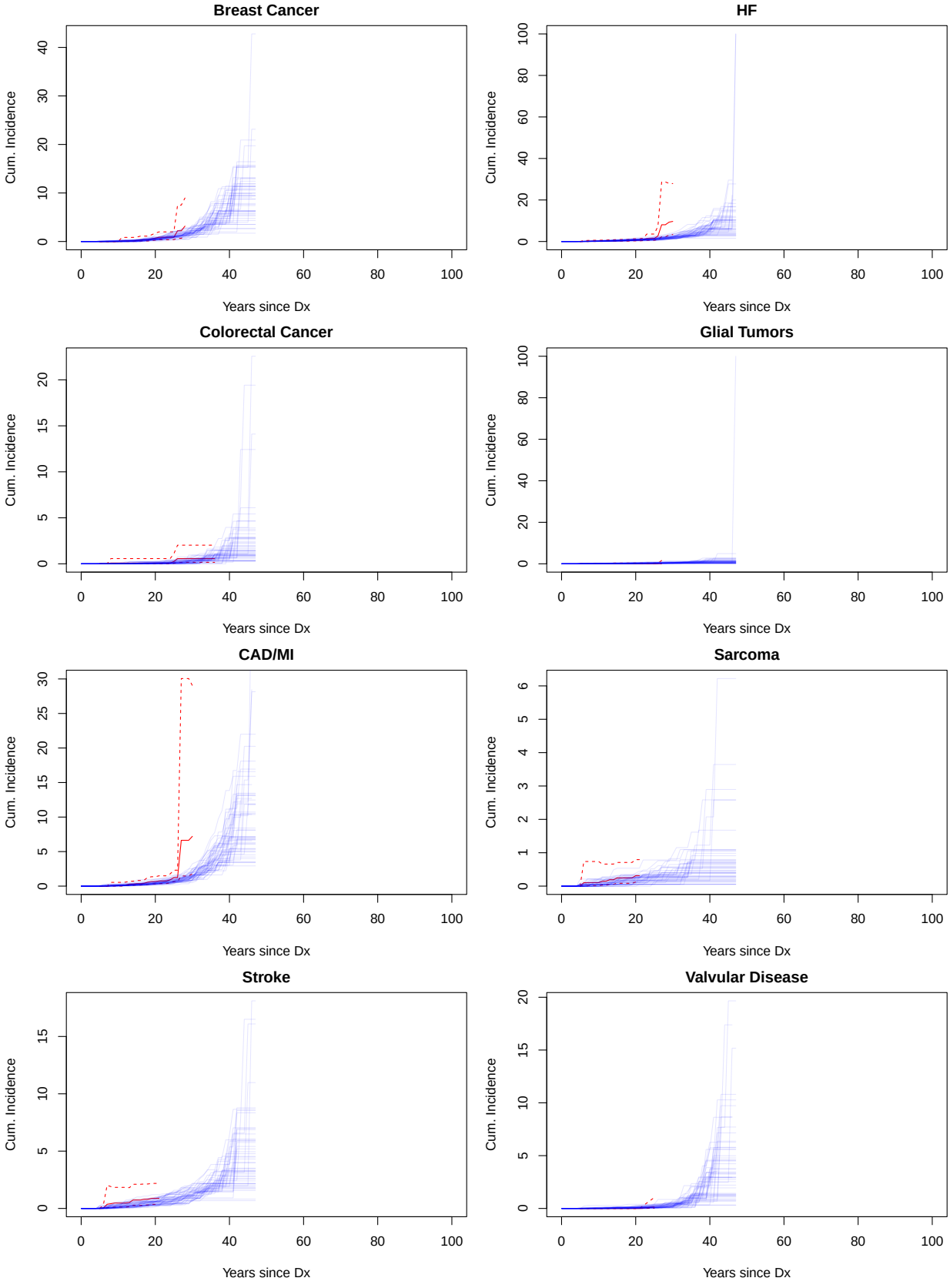




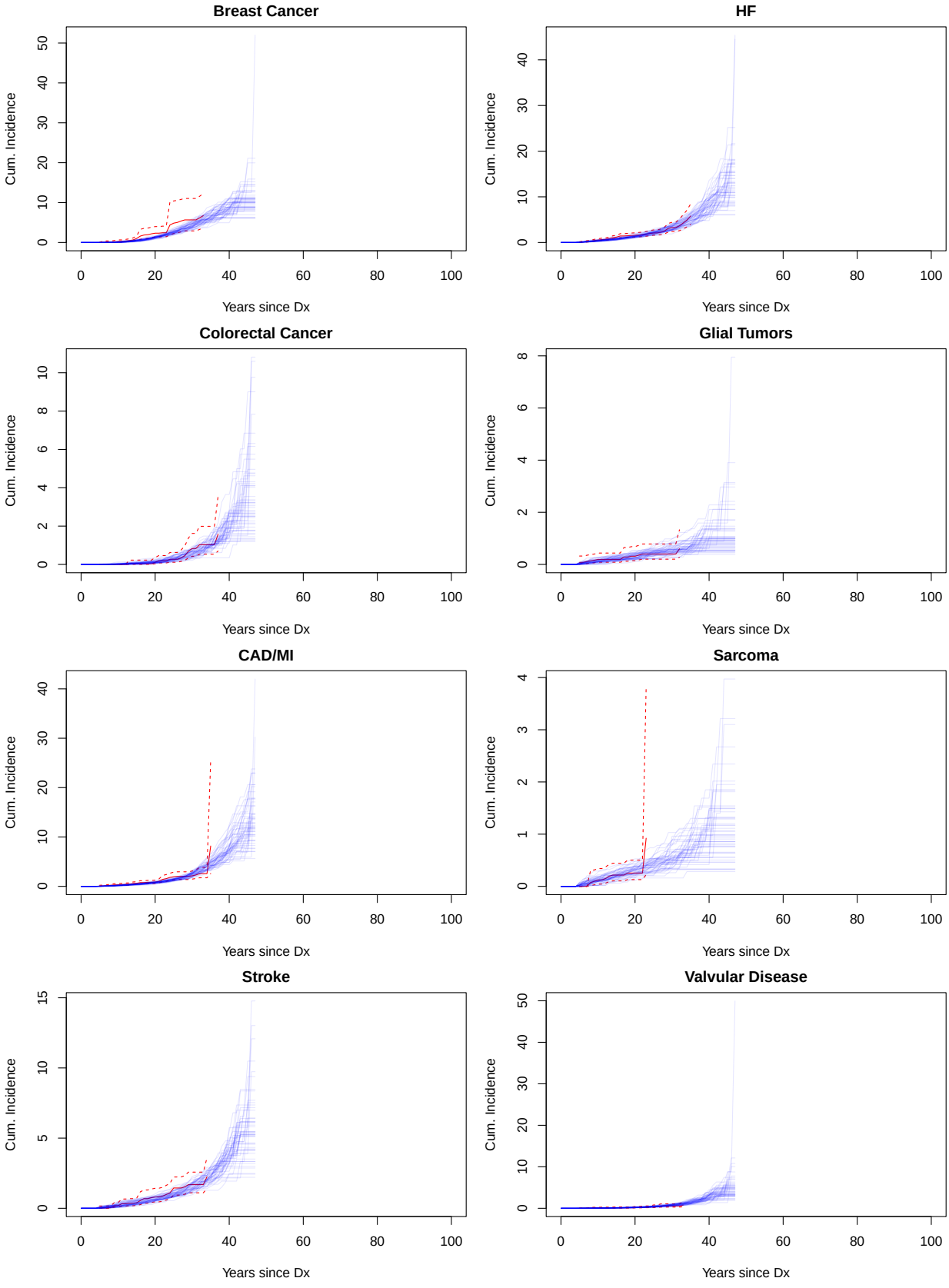
4.3.1.31 AnthNone



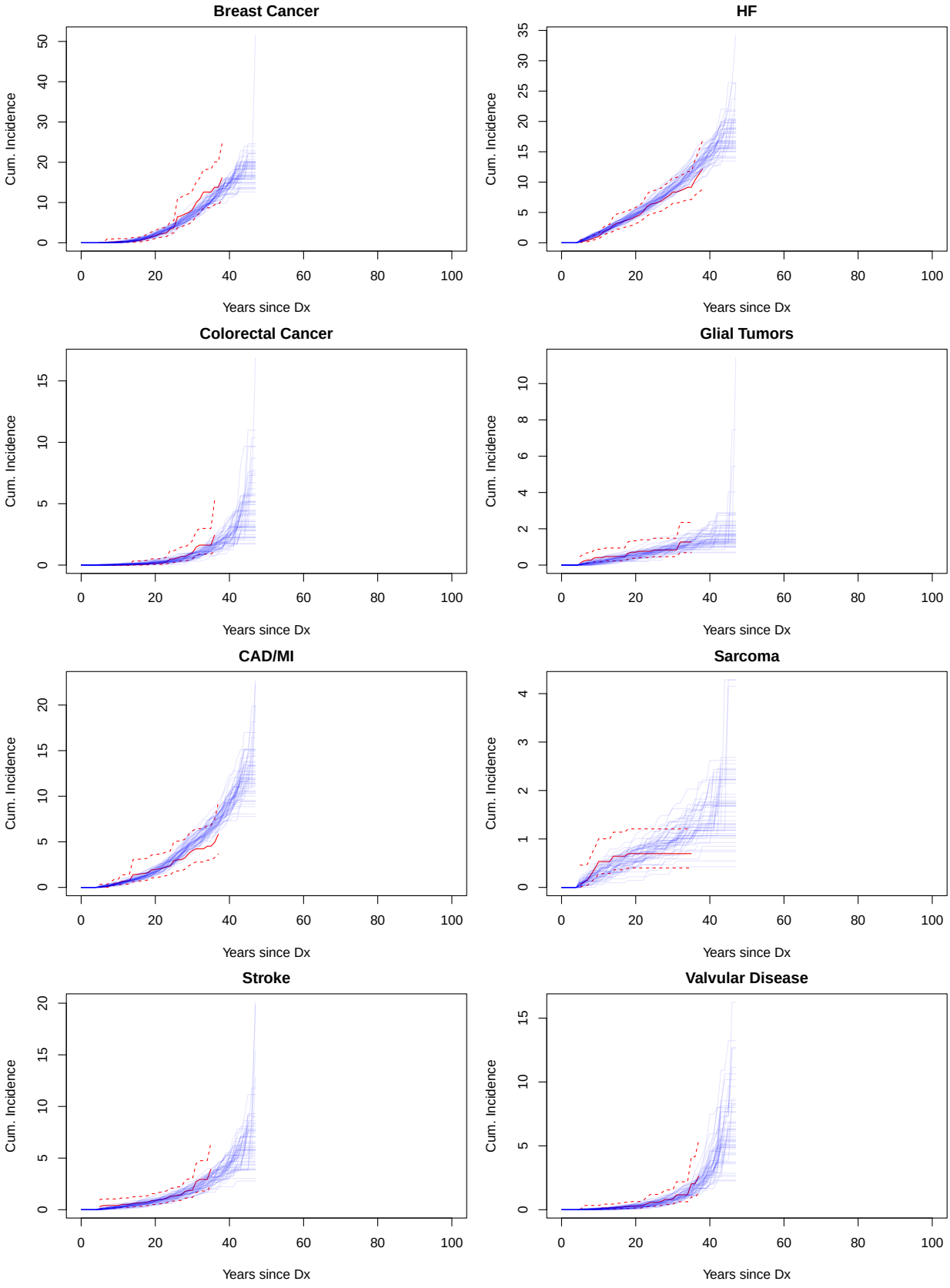
4.3.1.32 Anth<100



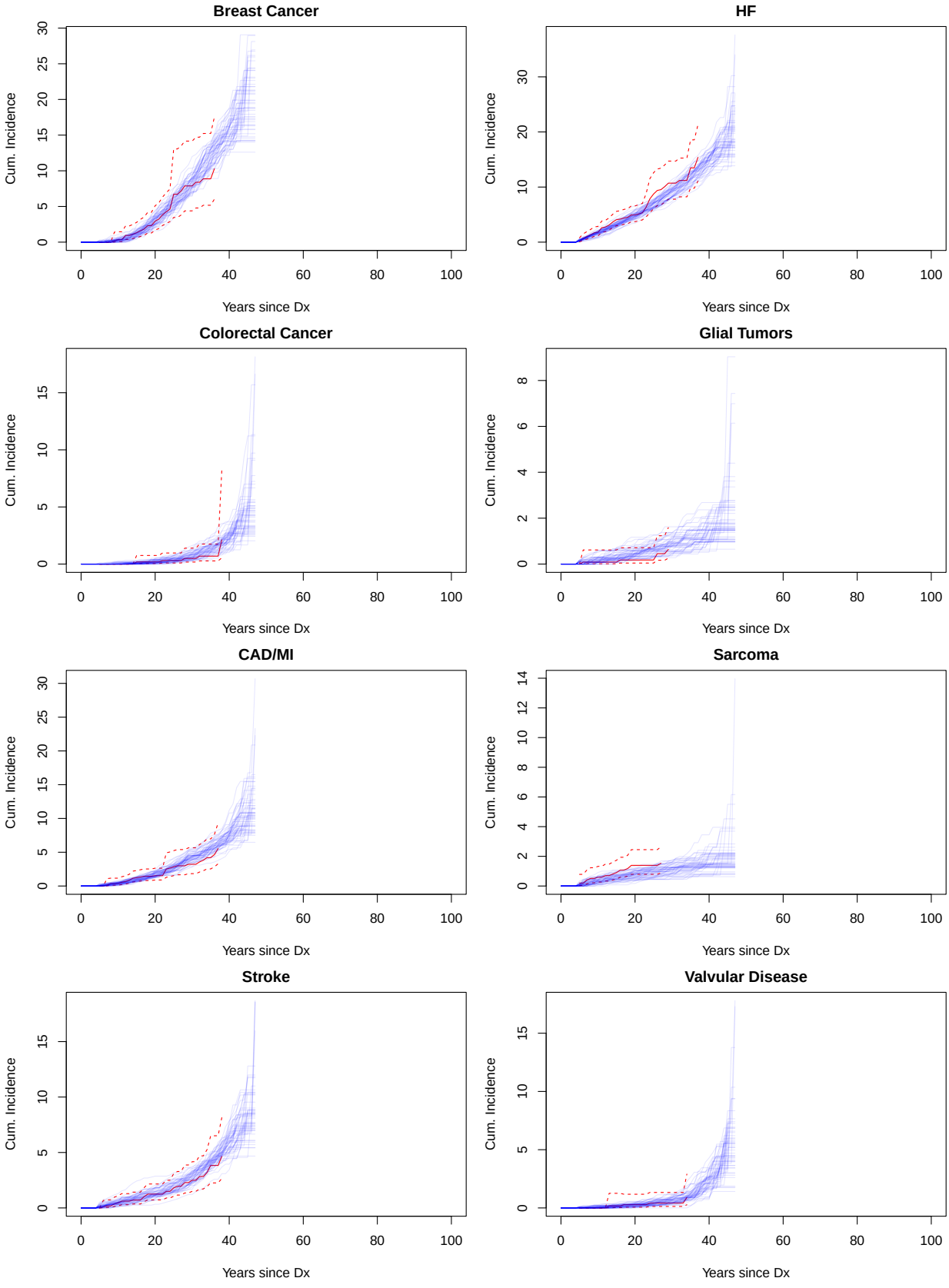
4.3.1.33 Anth100_249



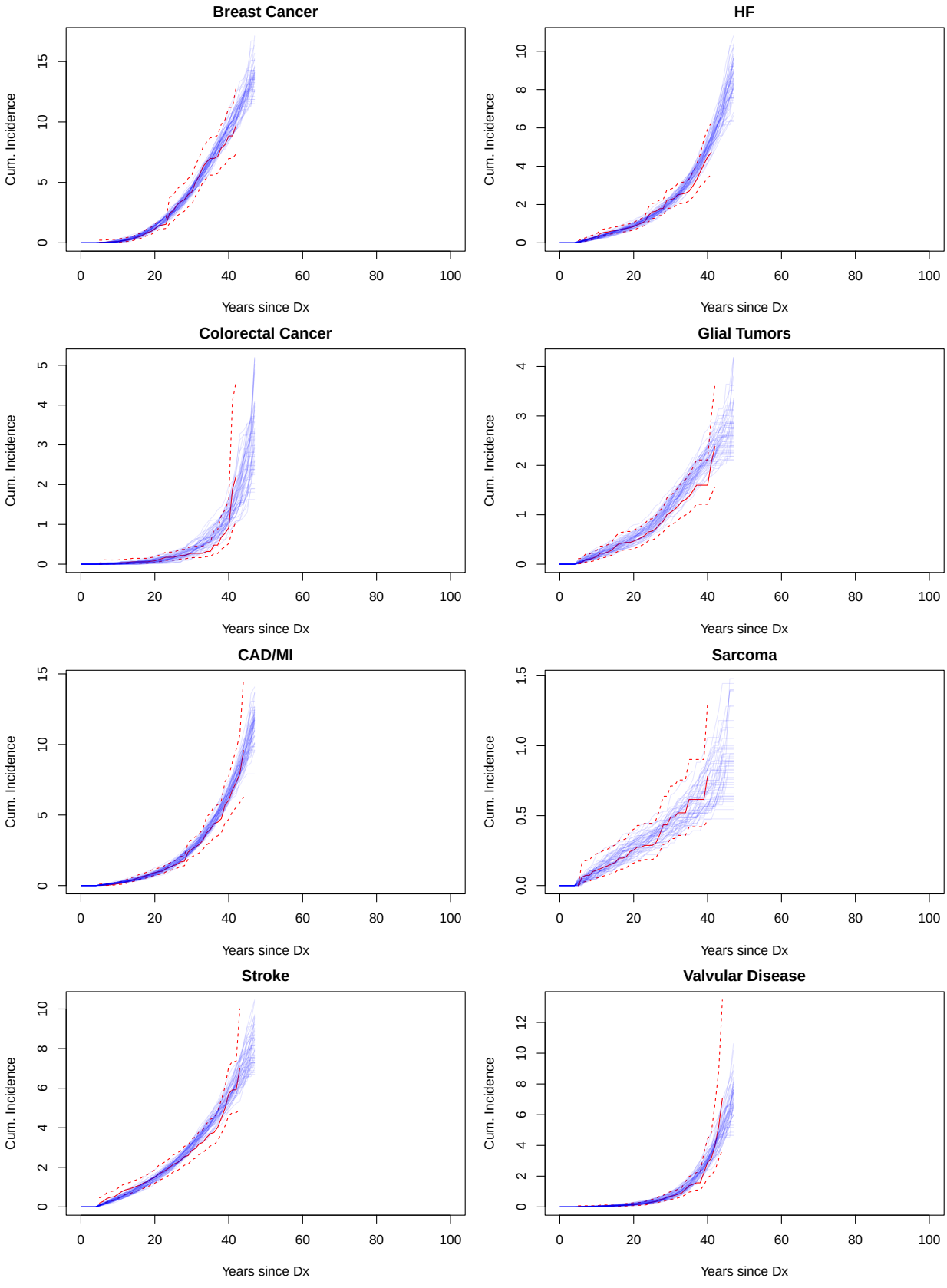
4.3.1.34 Anth250_399



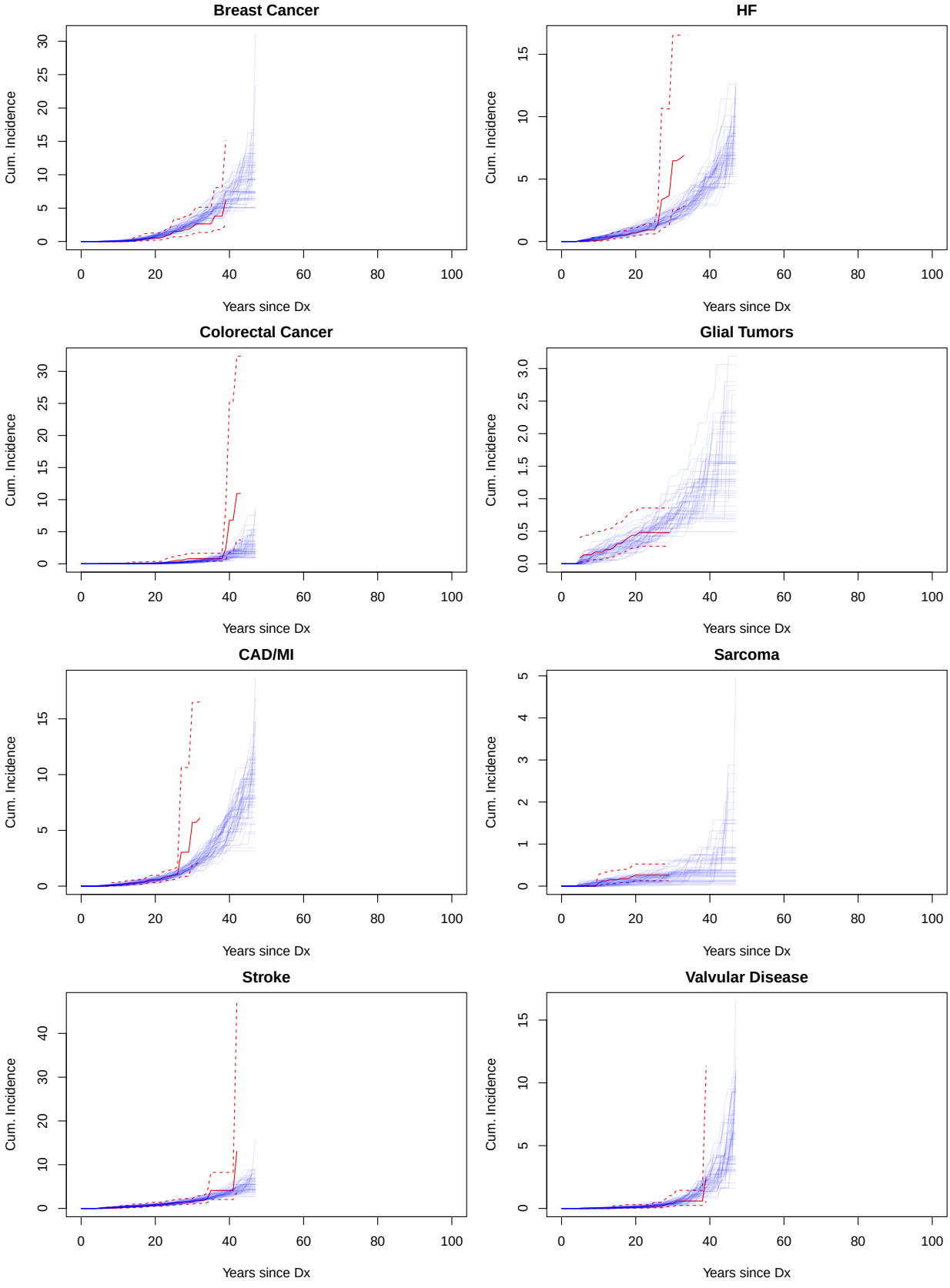
4.3.1.35 Anth400+



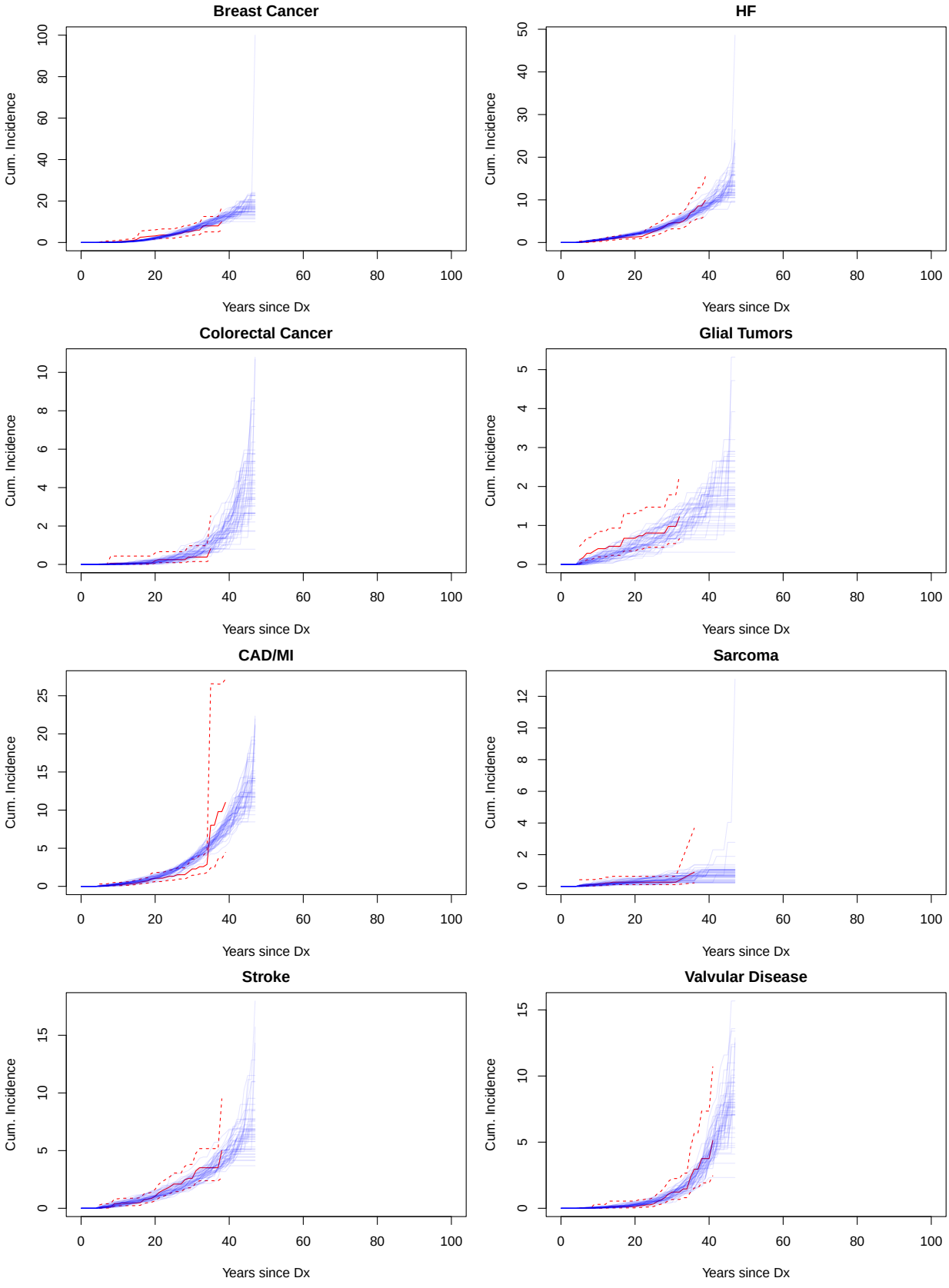
4.3.1.36 AlkNone



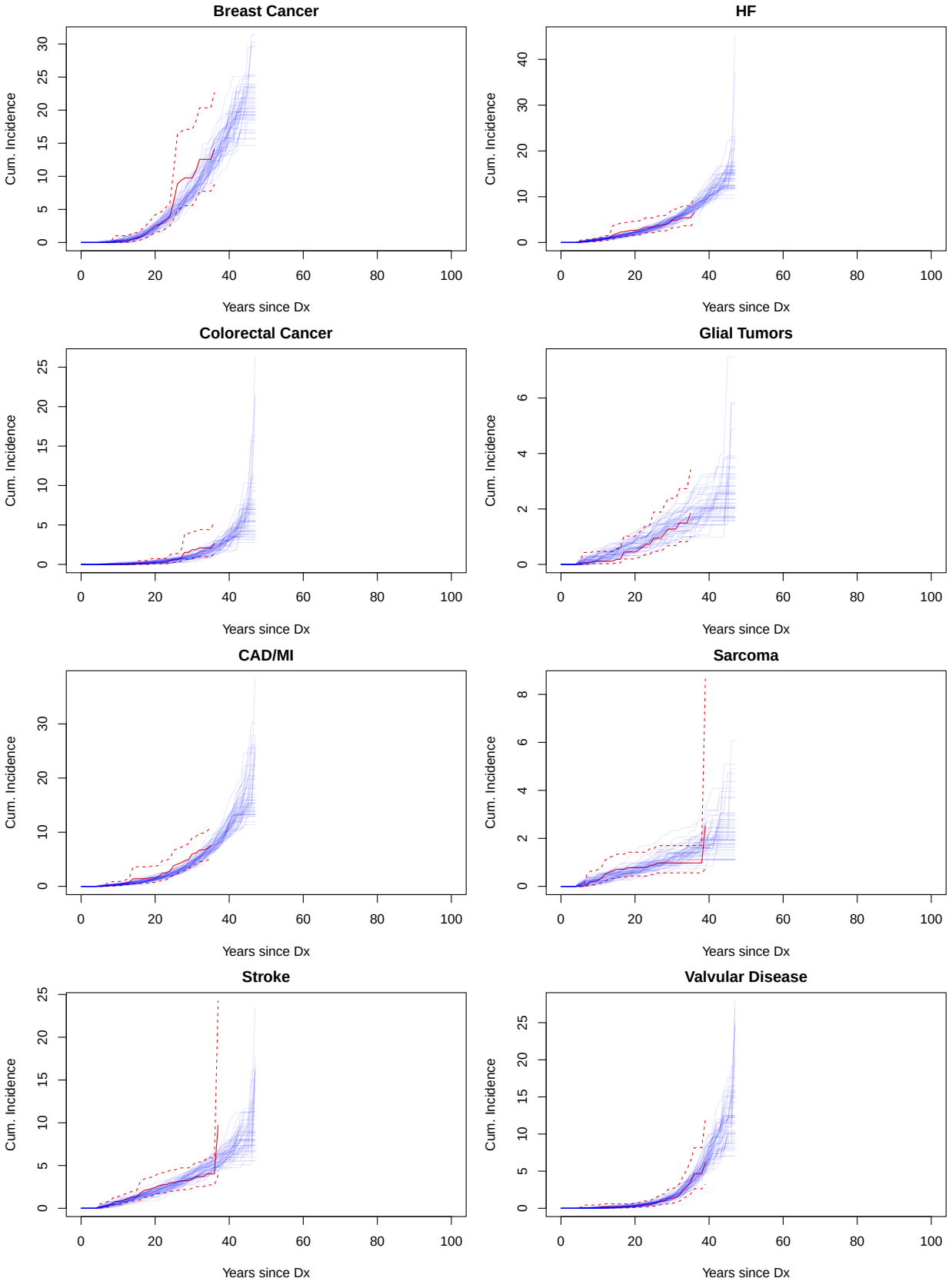
4.3.1.37 Alk<4000



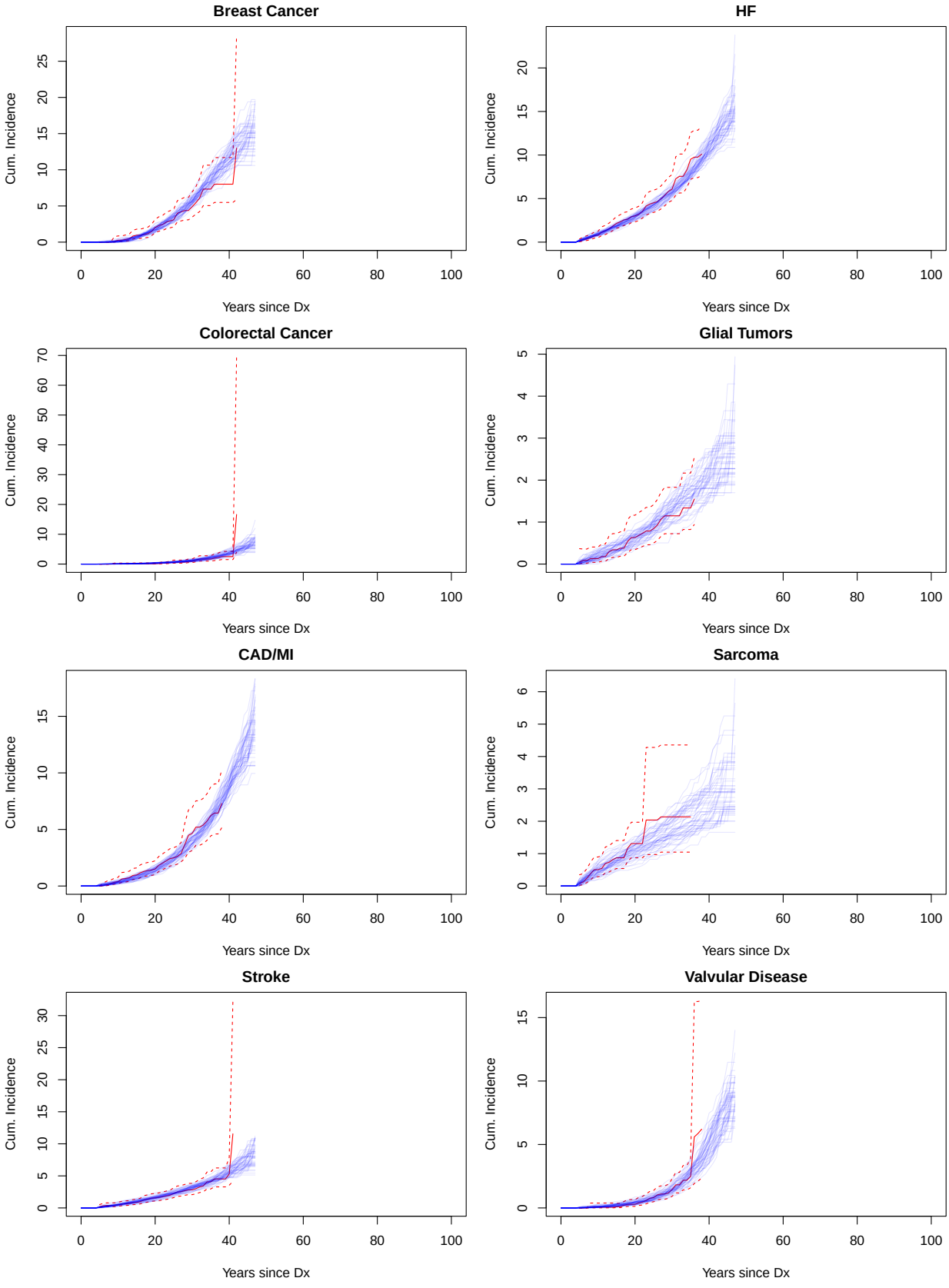
4.3.1.38 Alk4000_7999



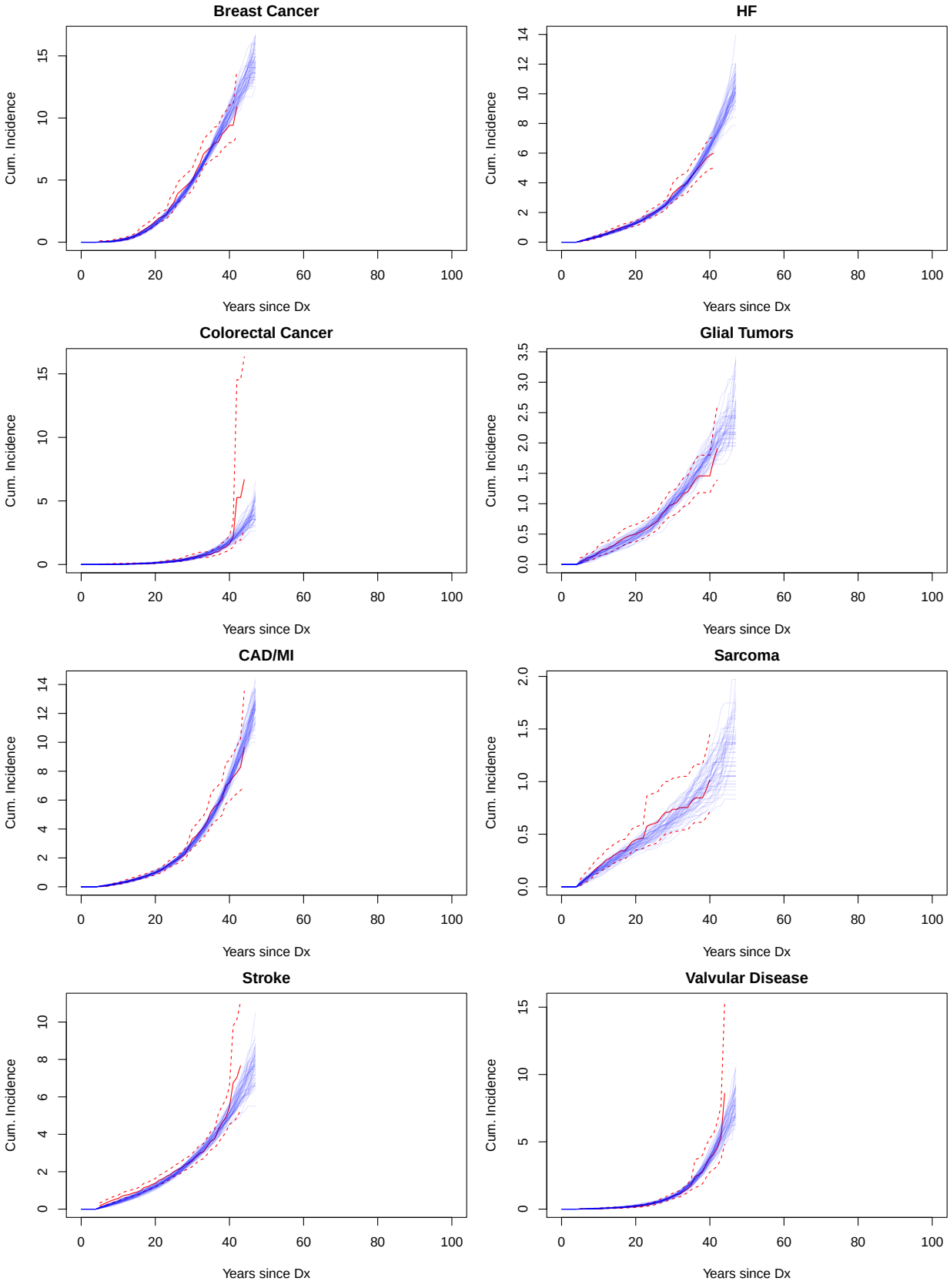
4.3.1.39 Alk8000_11999



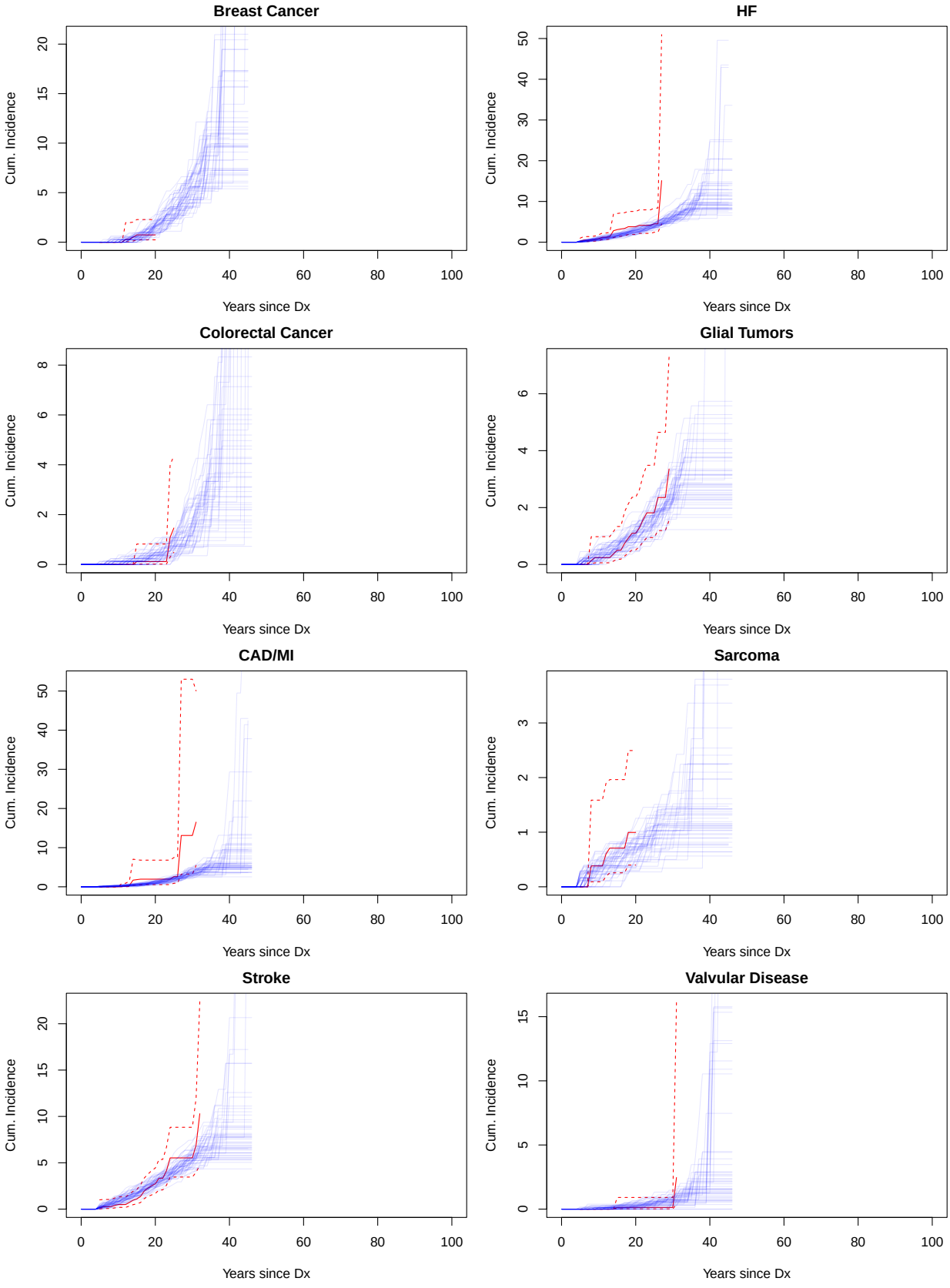
4.3.1.40 Alk12000+



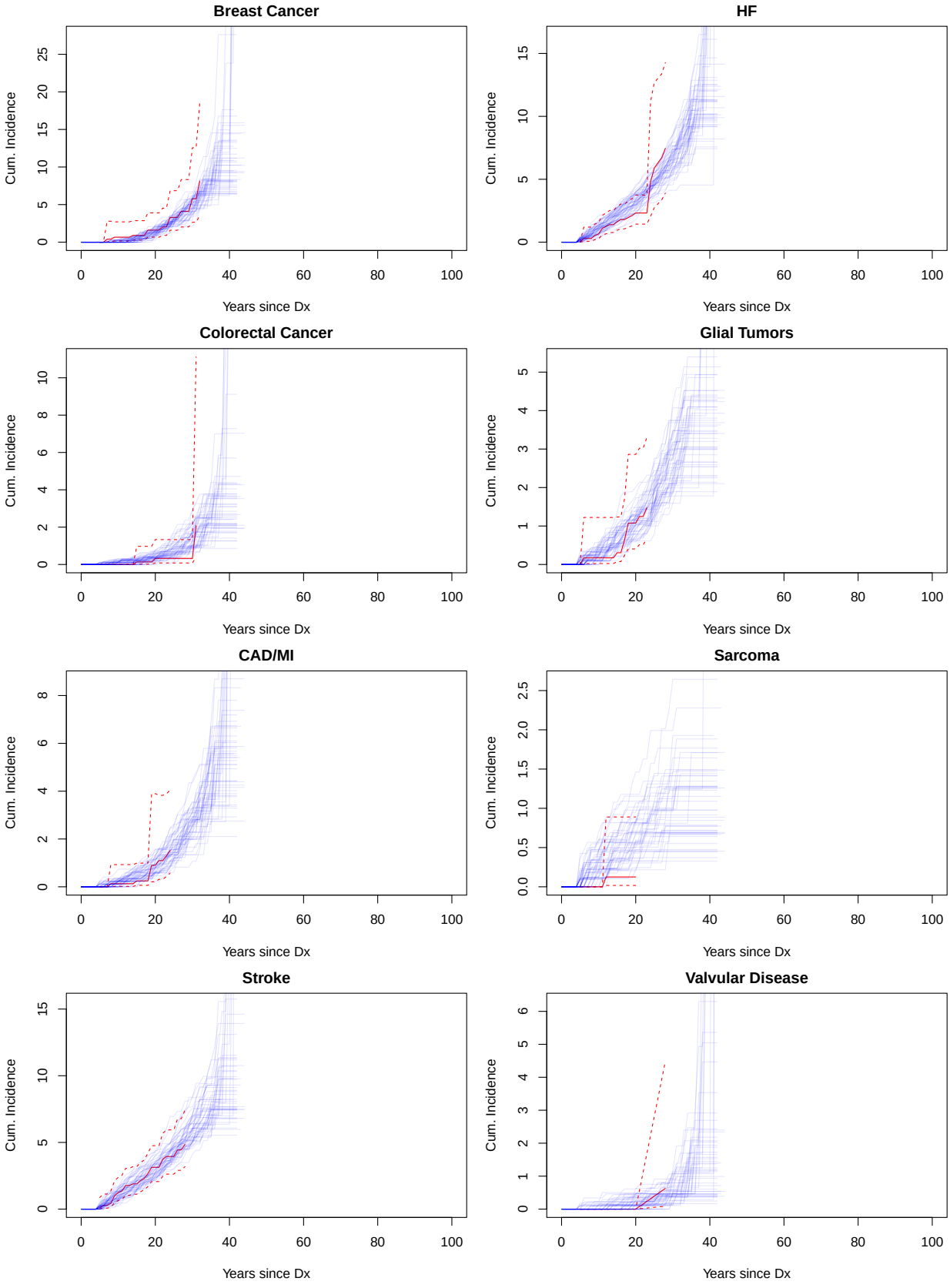
4.3.1.41 CispNone



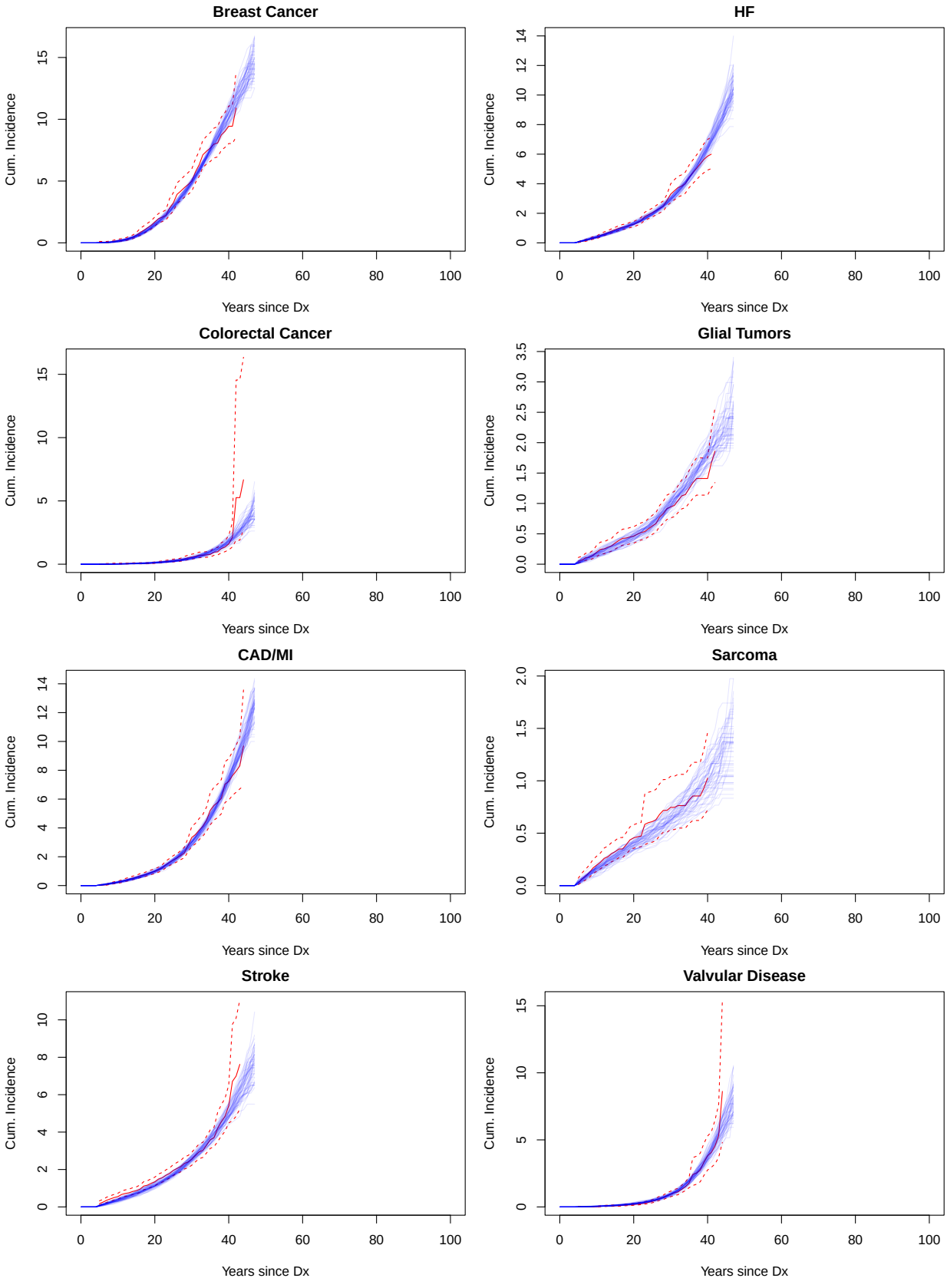
4.3.1.42 Cisp<400



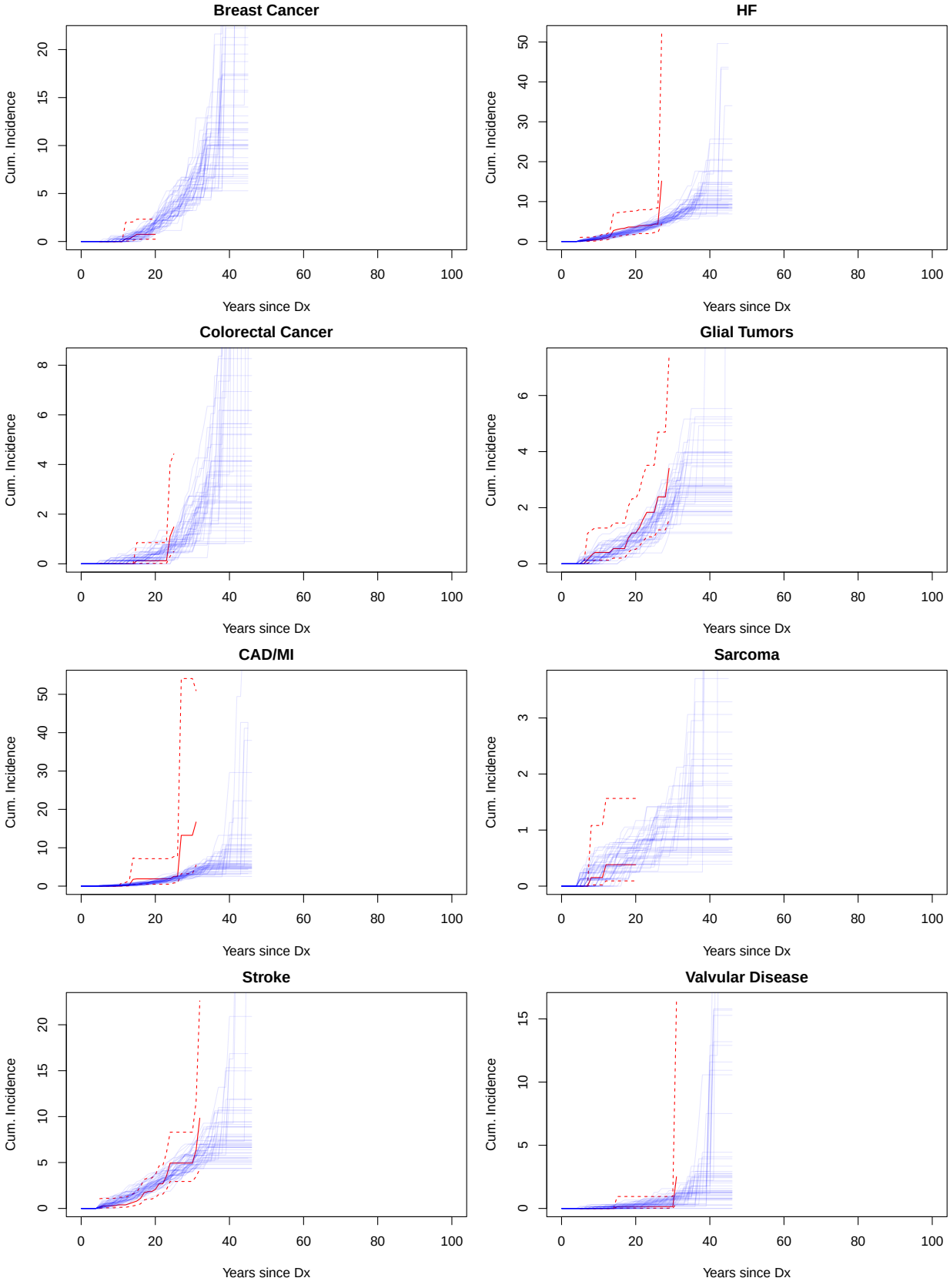
4.3.1.43 Cisp400+



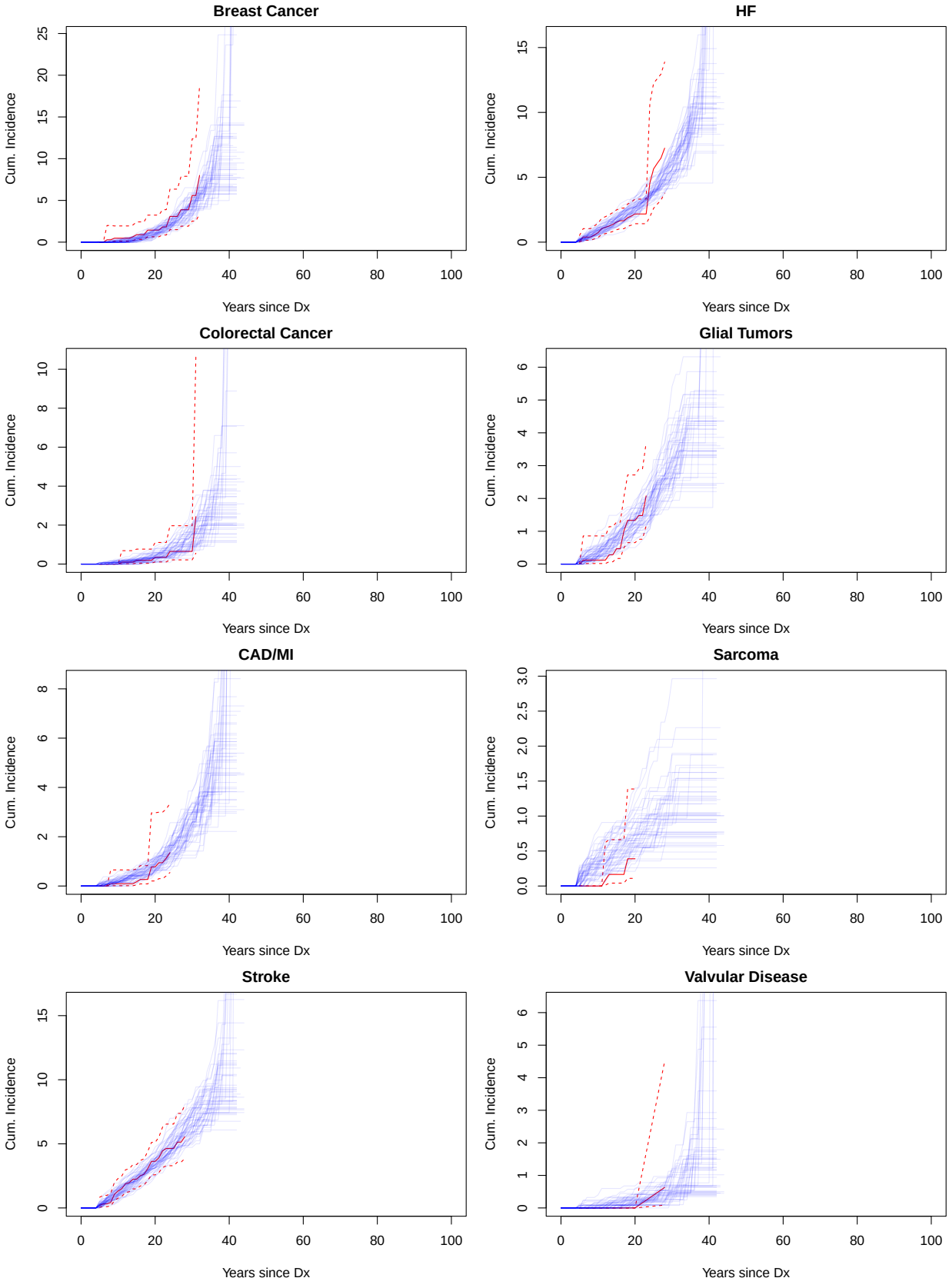
4.3.1.44 PlatNone



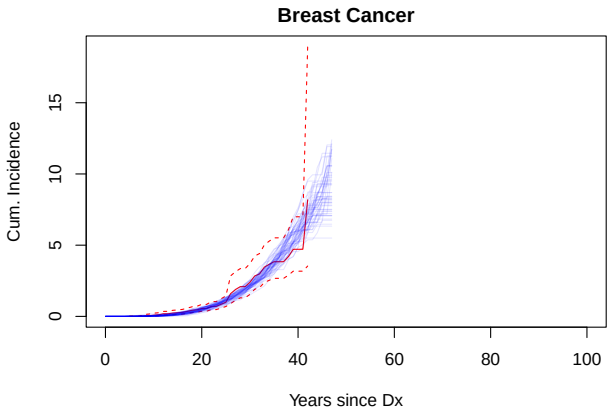
4.3.1.45 Plat<400

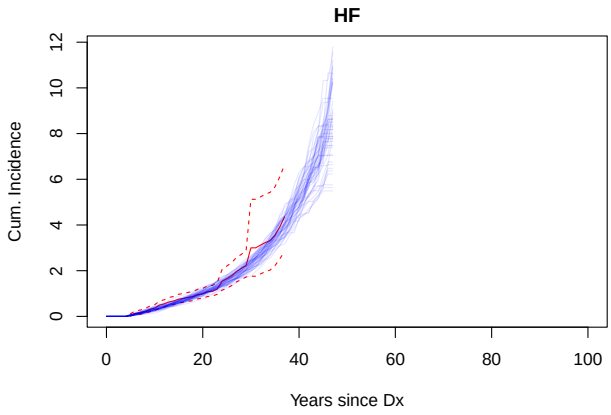


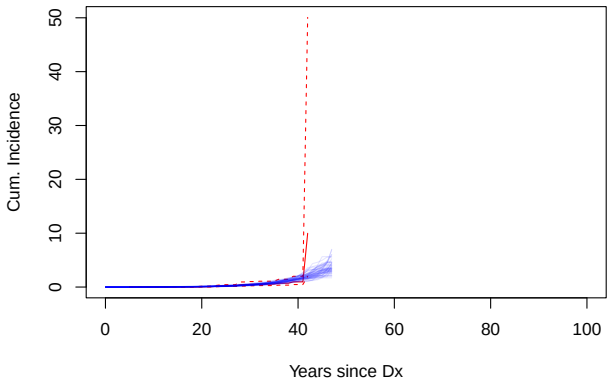
4.3.1.46 Plat400+

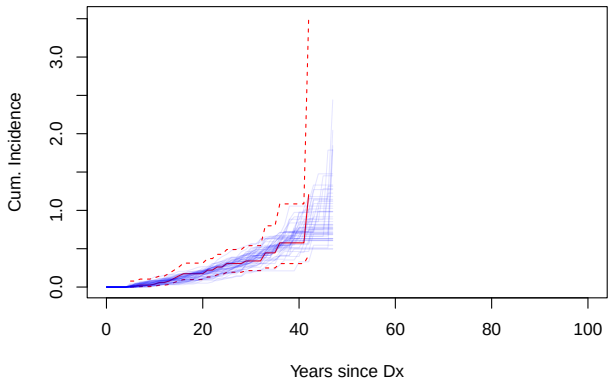


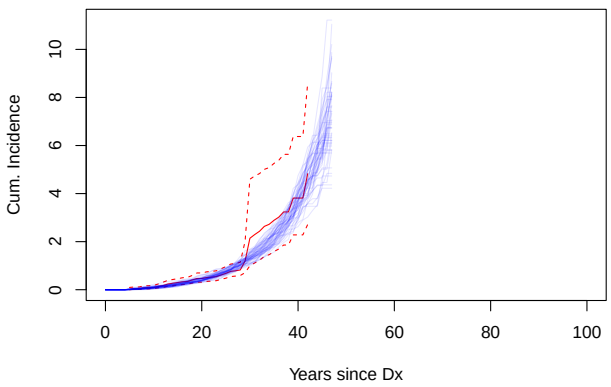
4.3.1.47 ChestNone

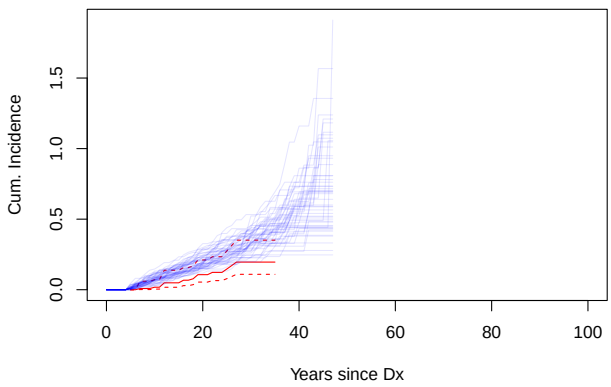


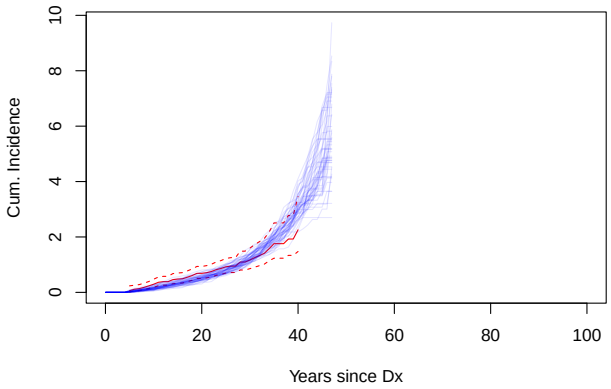


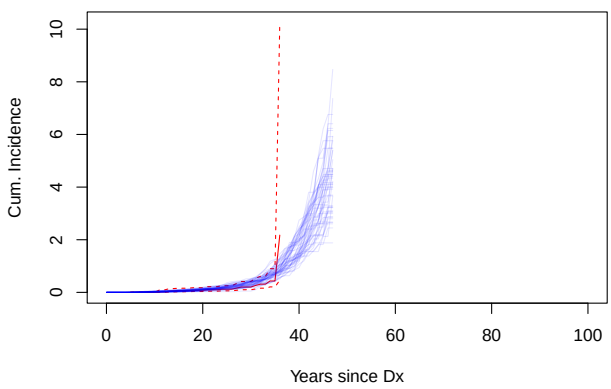




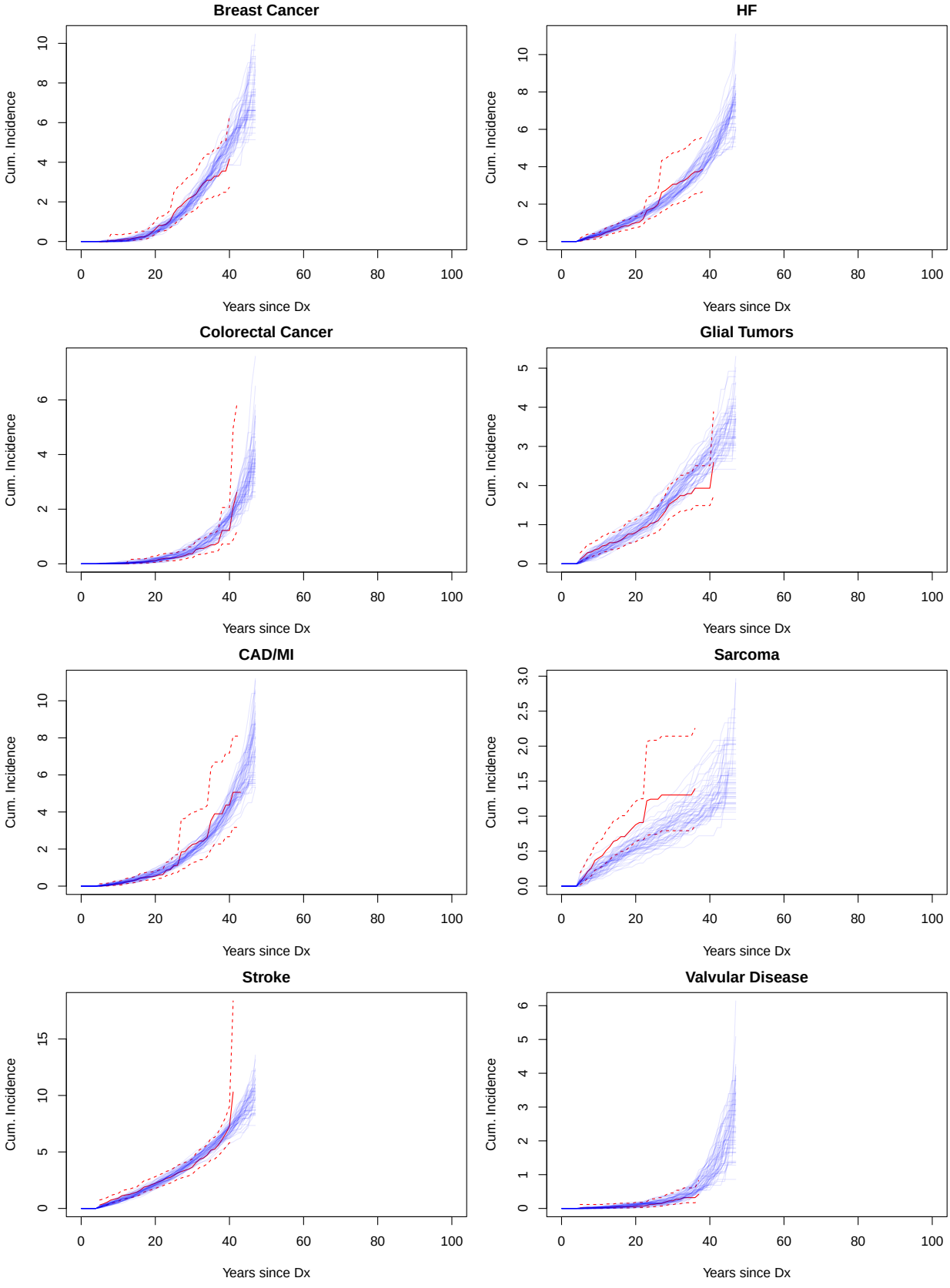




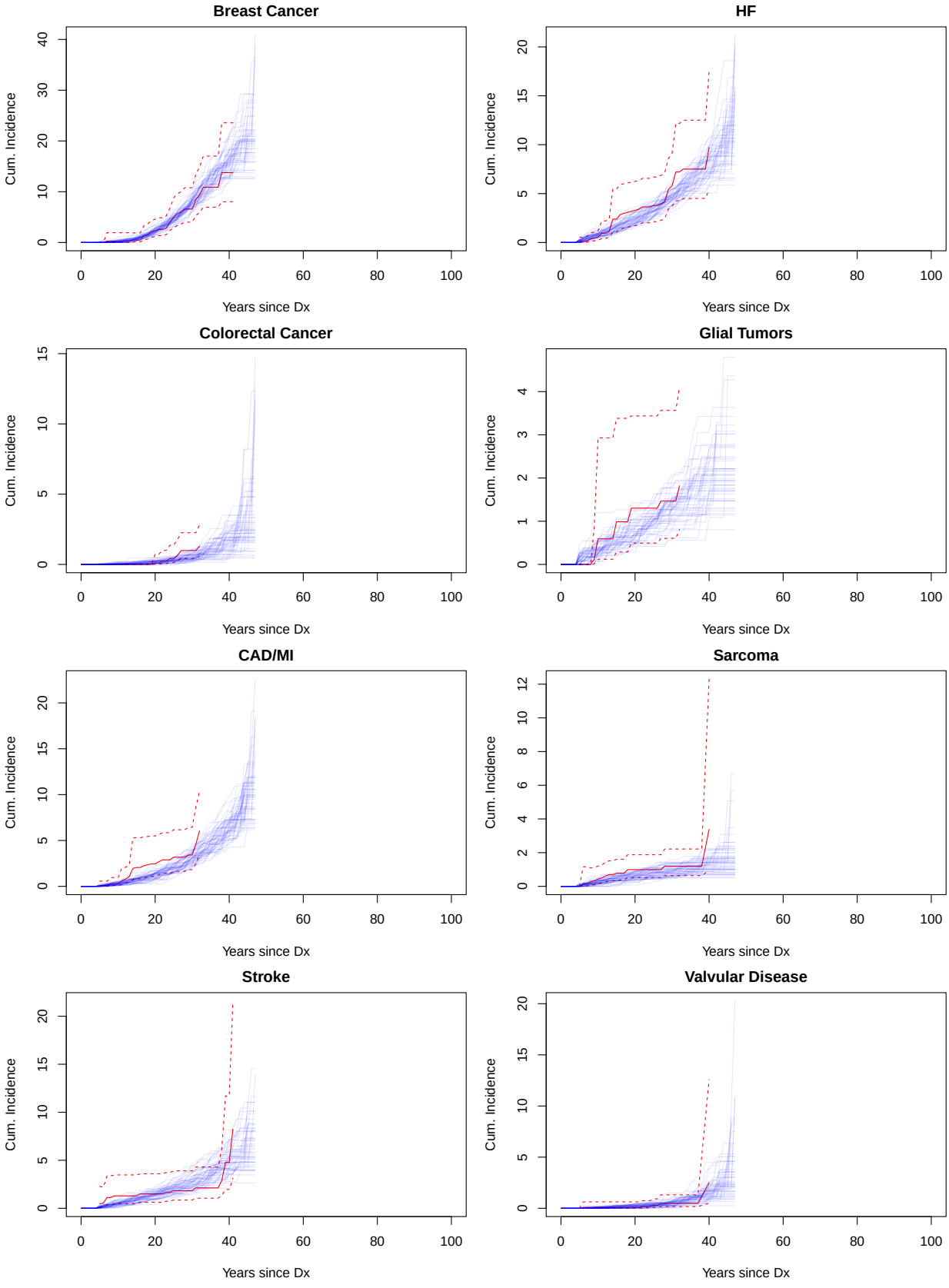




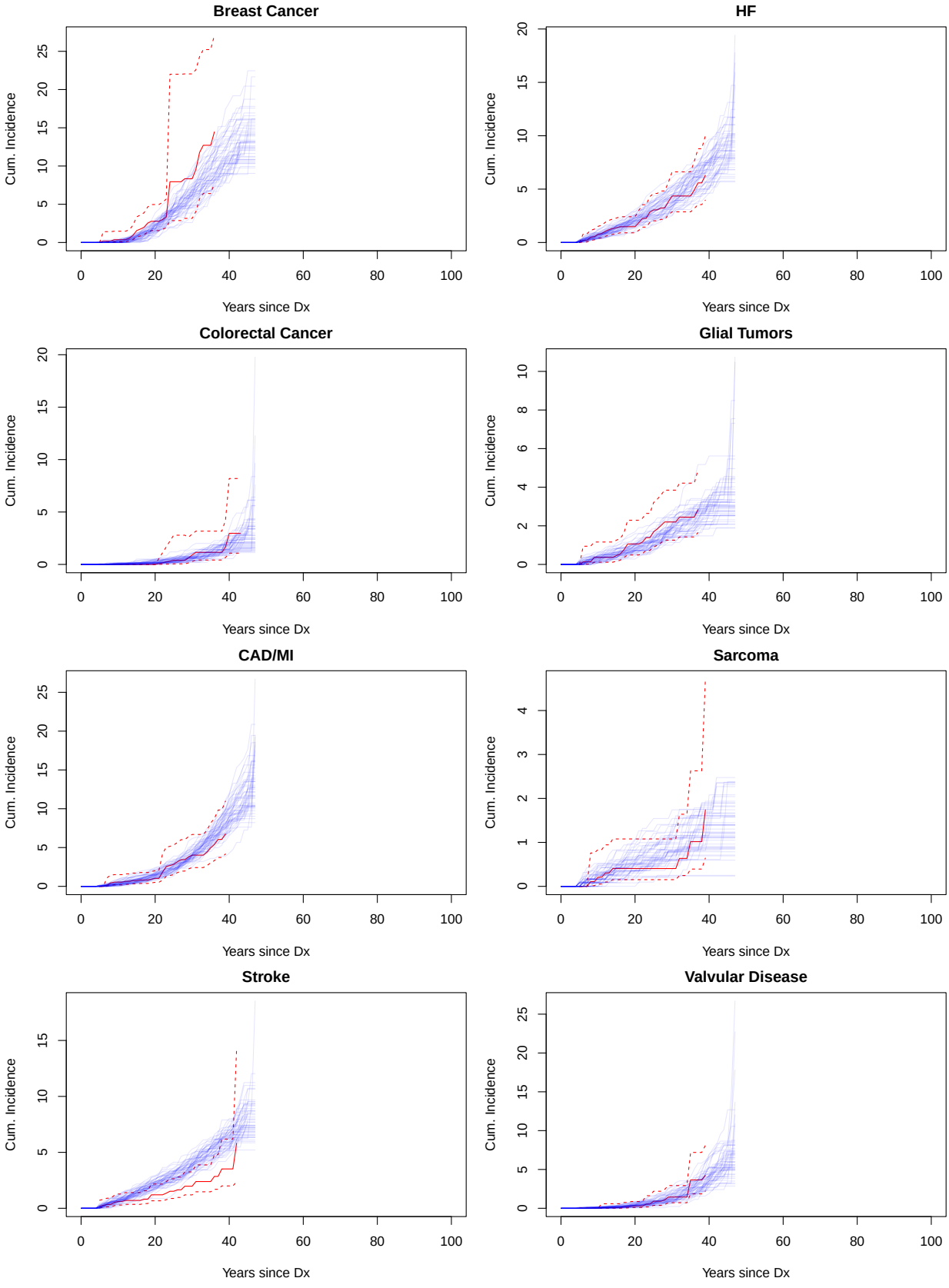
4.3.1.48 Chest<10



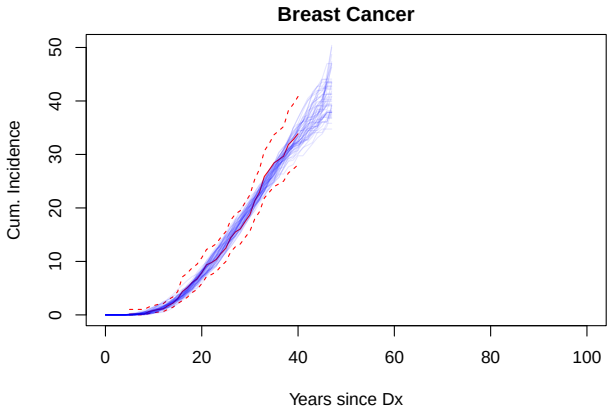
4.3.1.49 Chest10_19

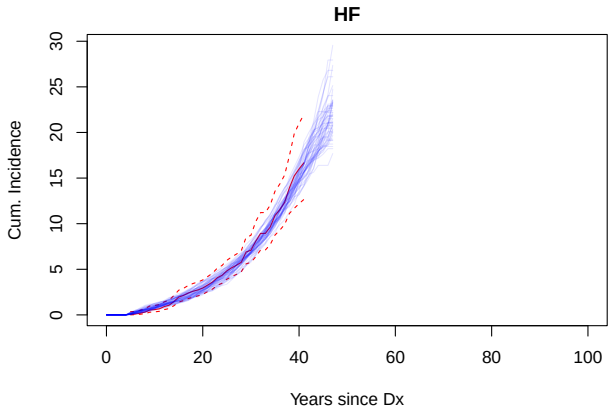


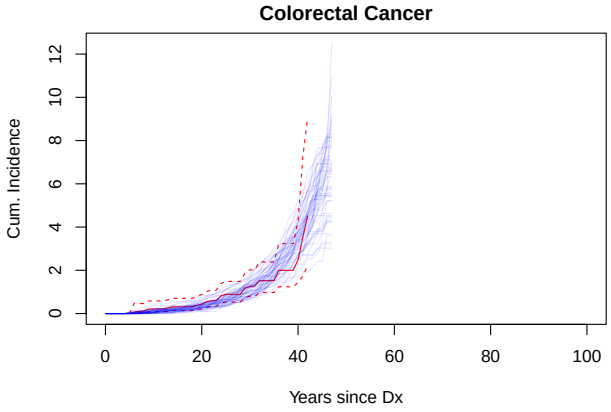
4.3.1.50 Chest20_29

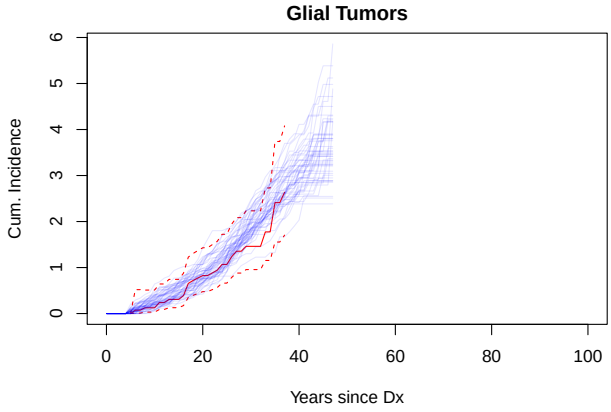


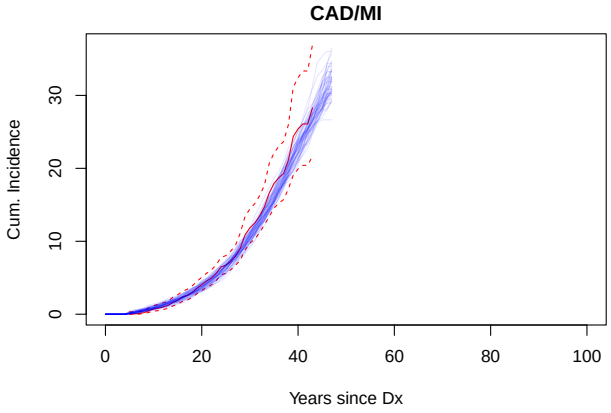
4.3.1.51 Chest30+

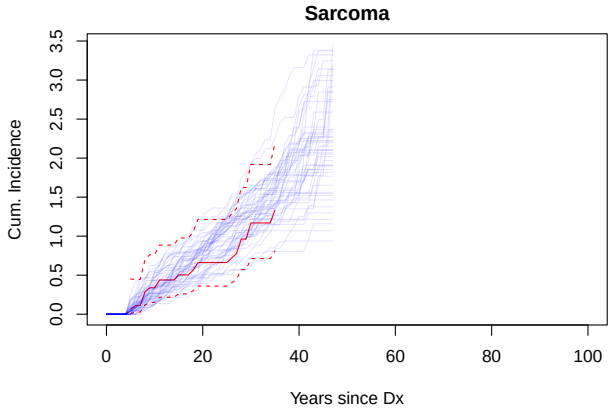


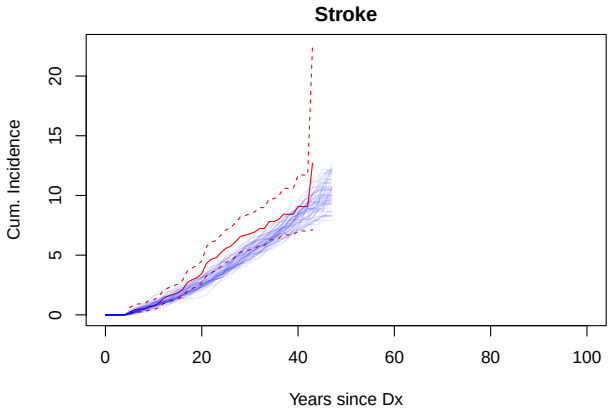


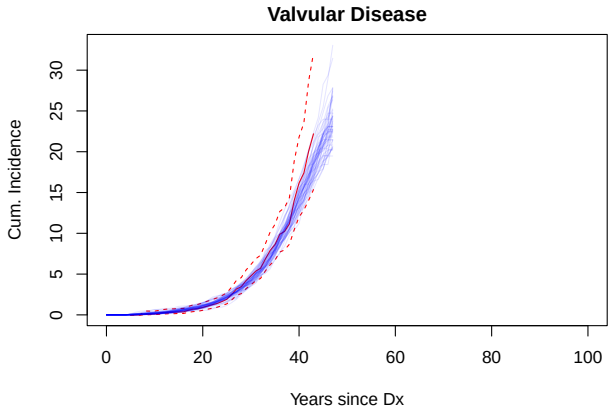




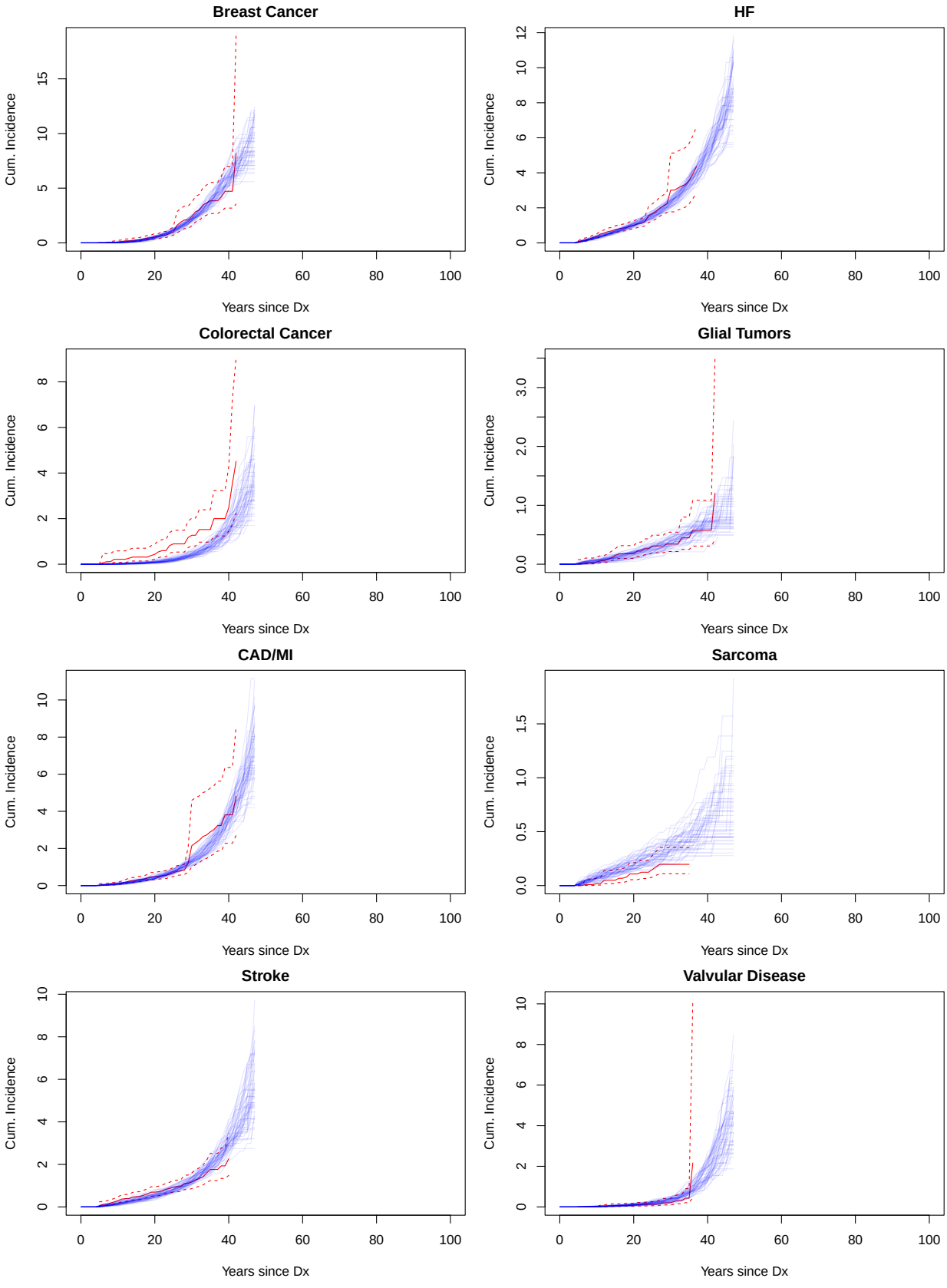




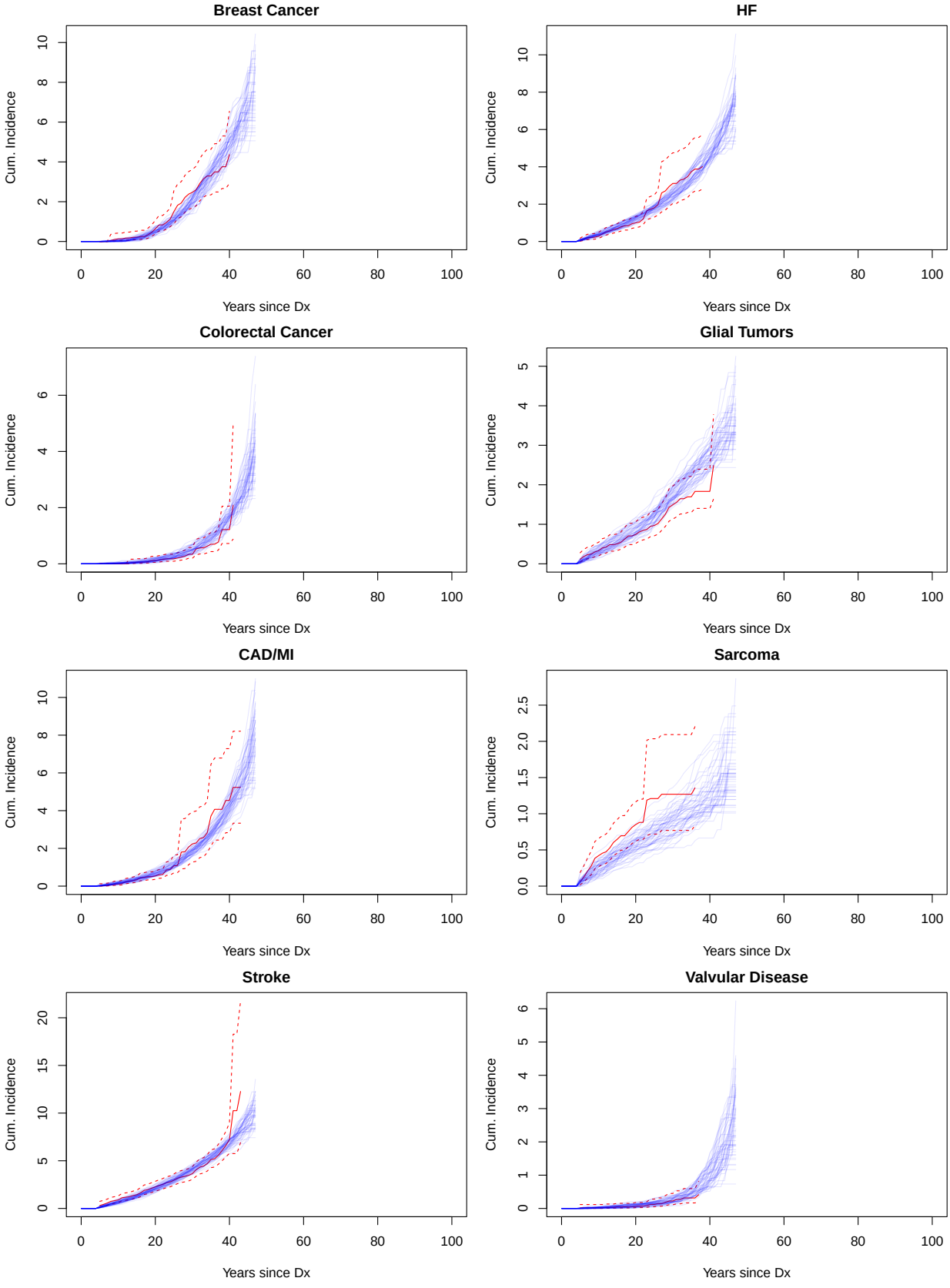




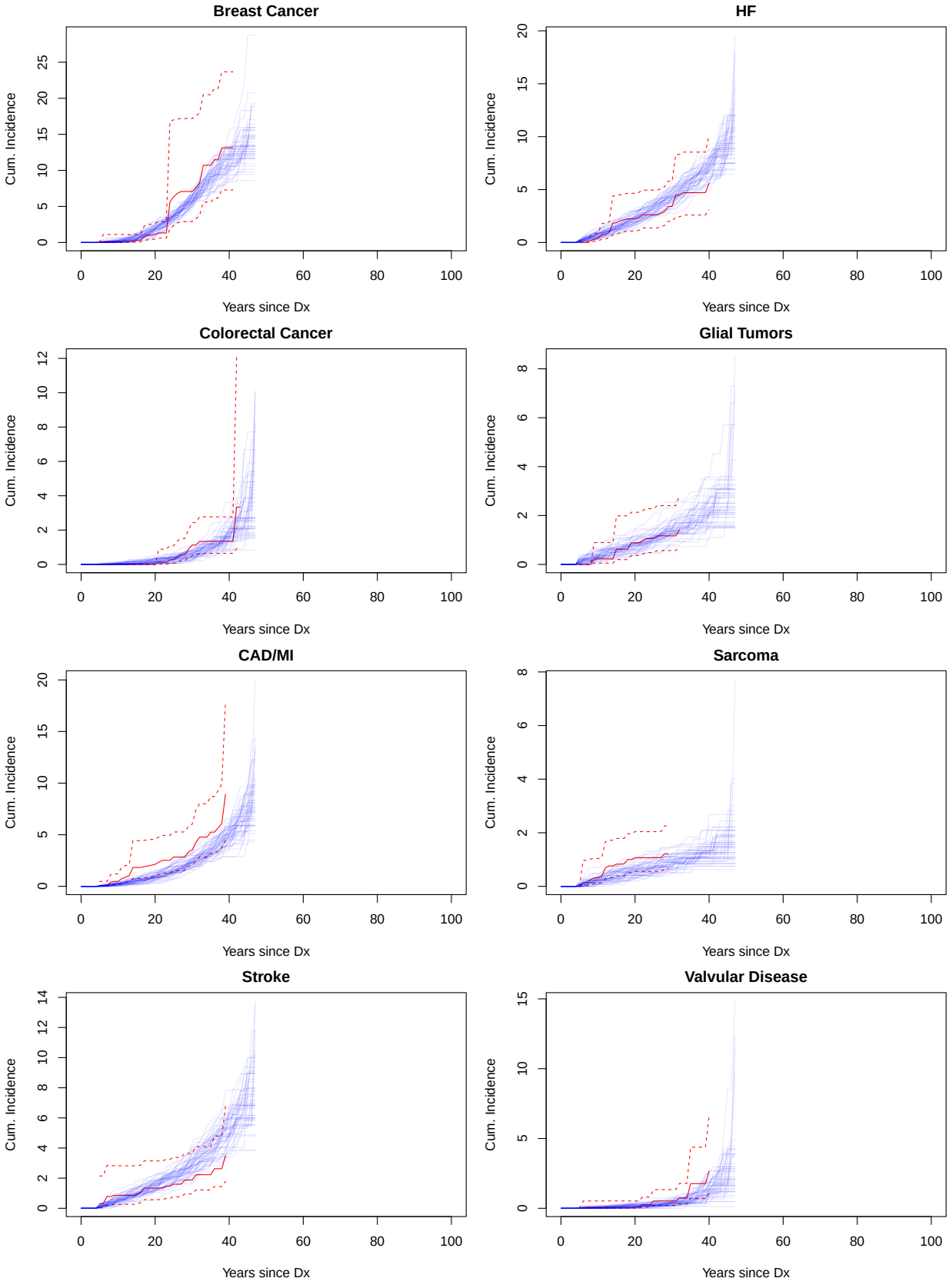
4.3.1.52 HeartNone



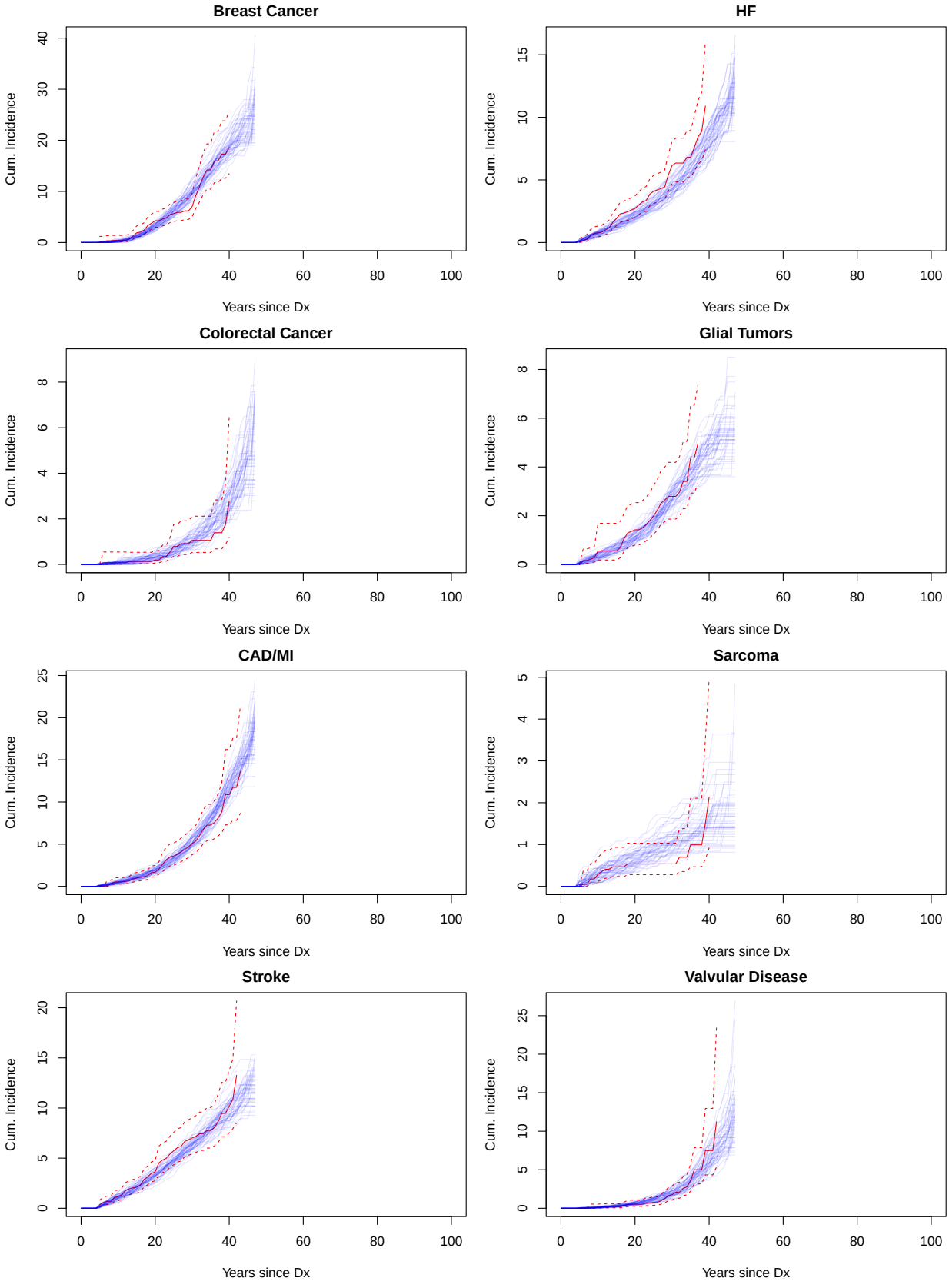
4.3.1.53 Heart<5



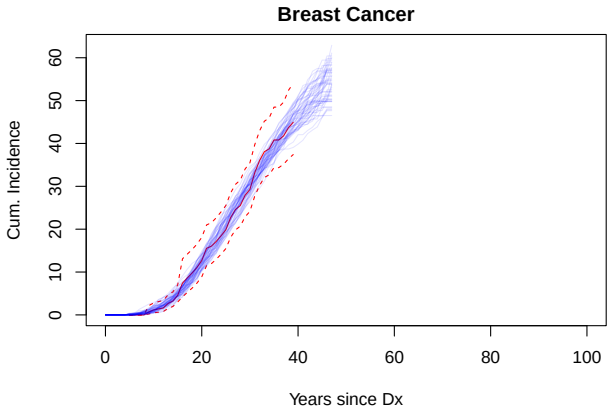
4.3.1.54 Heart5_14

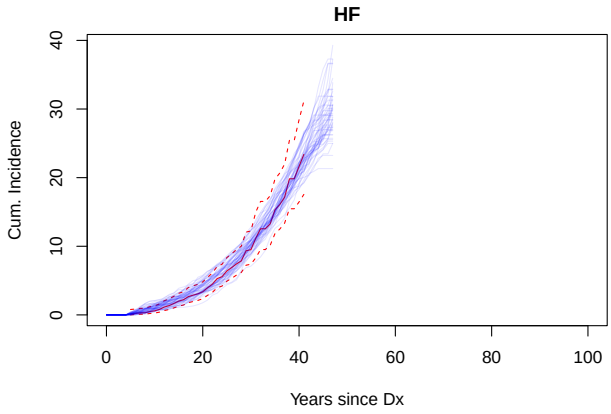


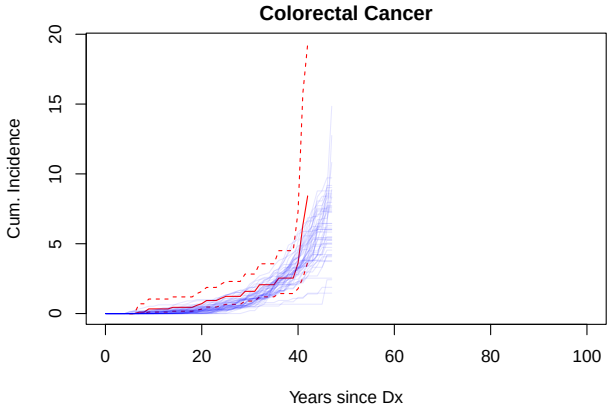
4.3.1.55 Heart15_34

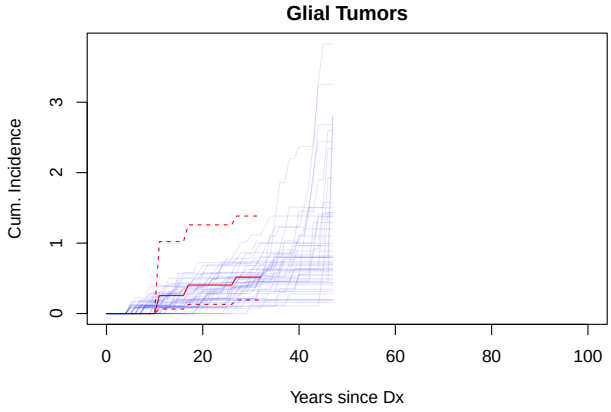


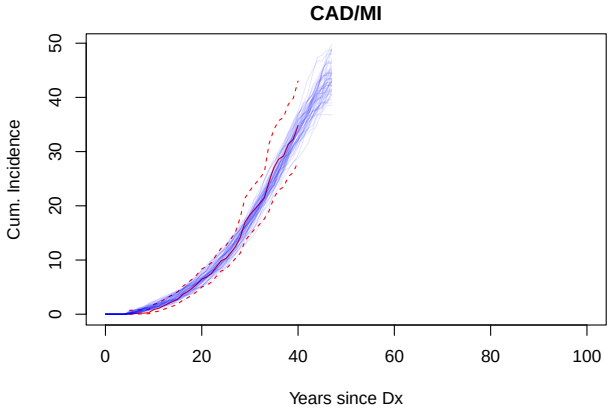
4.3.1.56 Heart35+

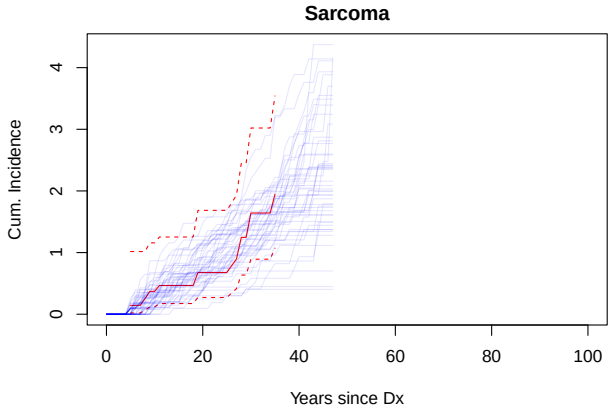


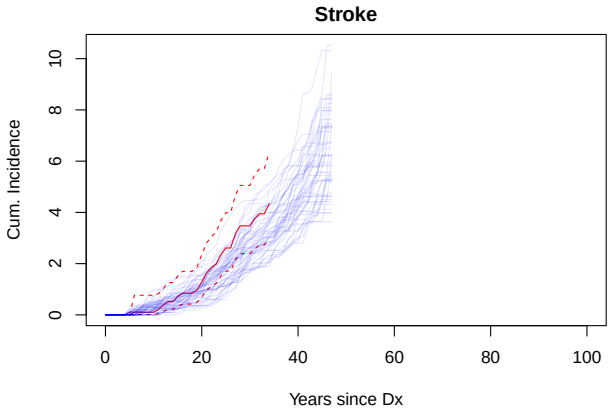


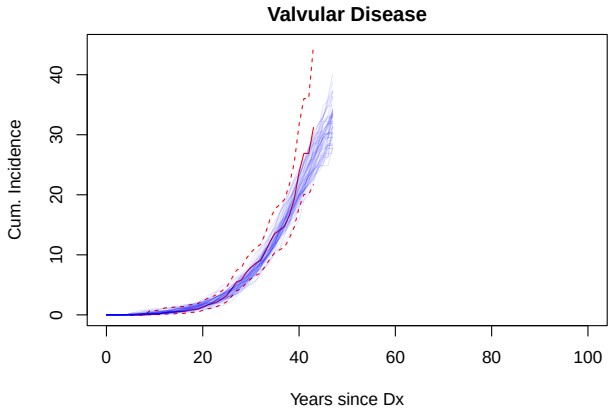




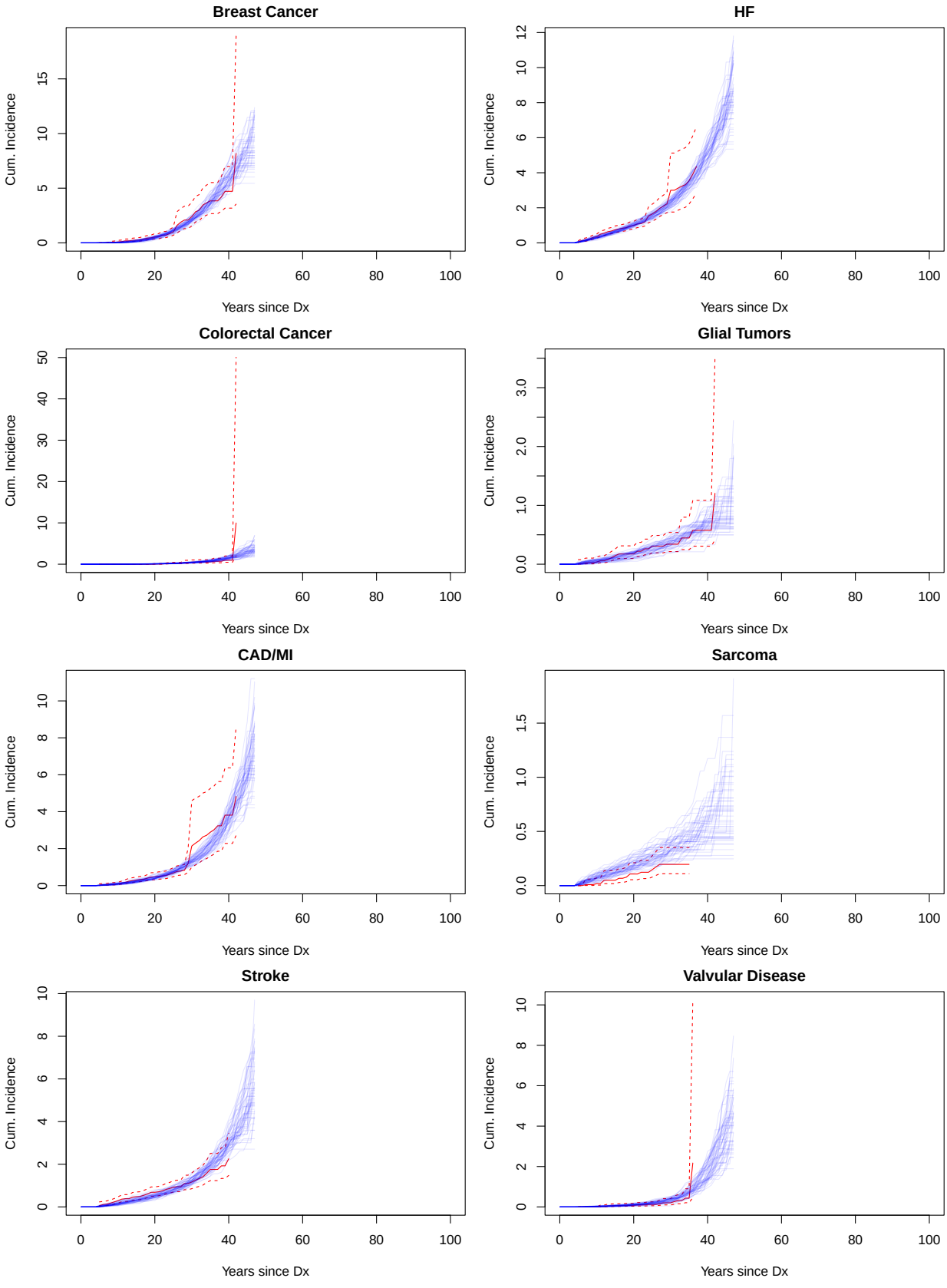




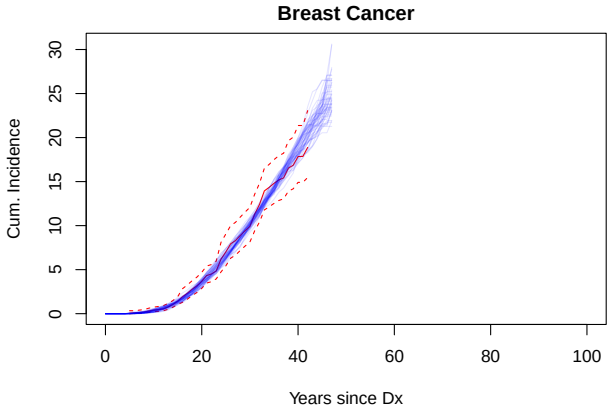


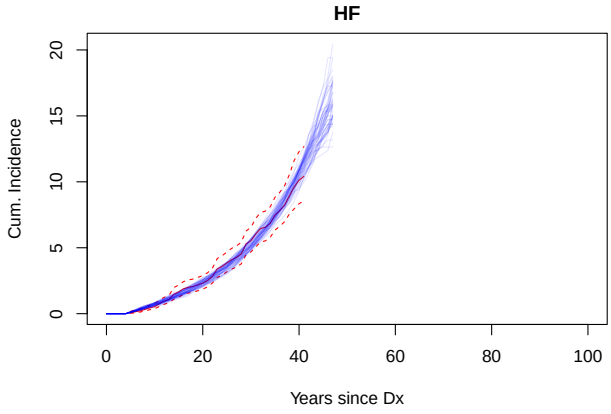


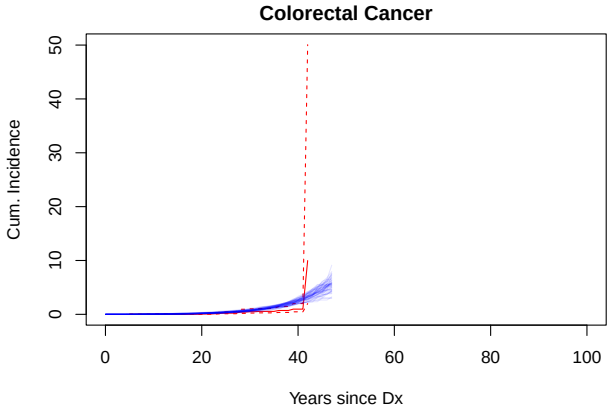
4.3.1.57 CRTNone

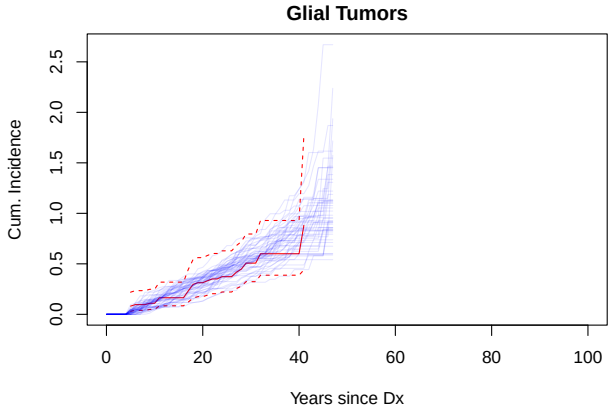


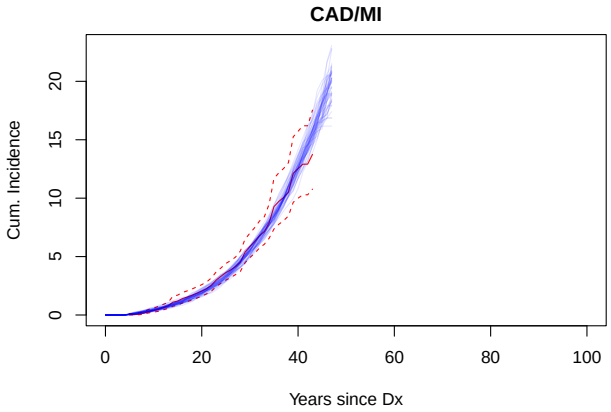
4.3.1.58 CRT<20

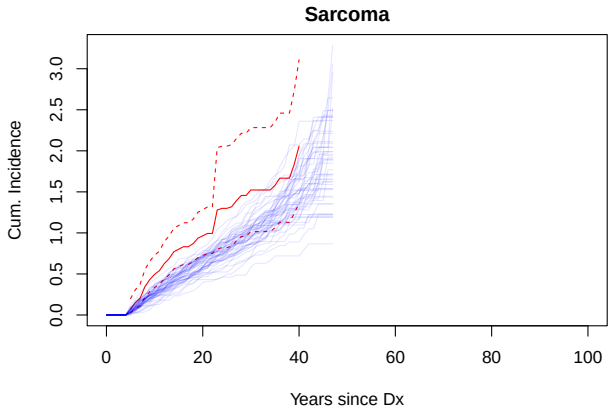

Breast Cancer
Cum. Incidence
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx

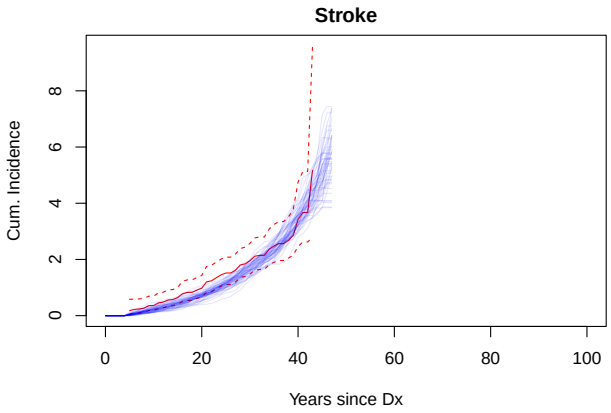

HF
Cum. Incidence
0
5
10
15
20
0
20
40
60
80
100
Years since Dx

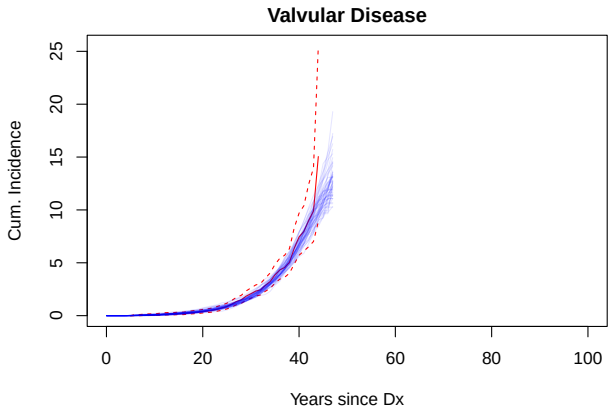

Colorectal Cancer
Cum. Incidence
0
10
20
30
40
50
0
20
40
60
80
100
Years since Dx


Glial Tumors
Cum. Incidence
0.0
0.5
1.0
1.5
2.0
2.5
0
20
40
60
80
100
Years since Dx

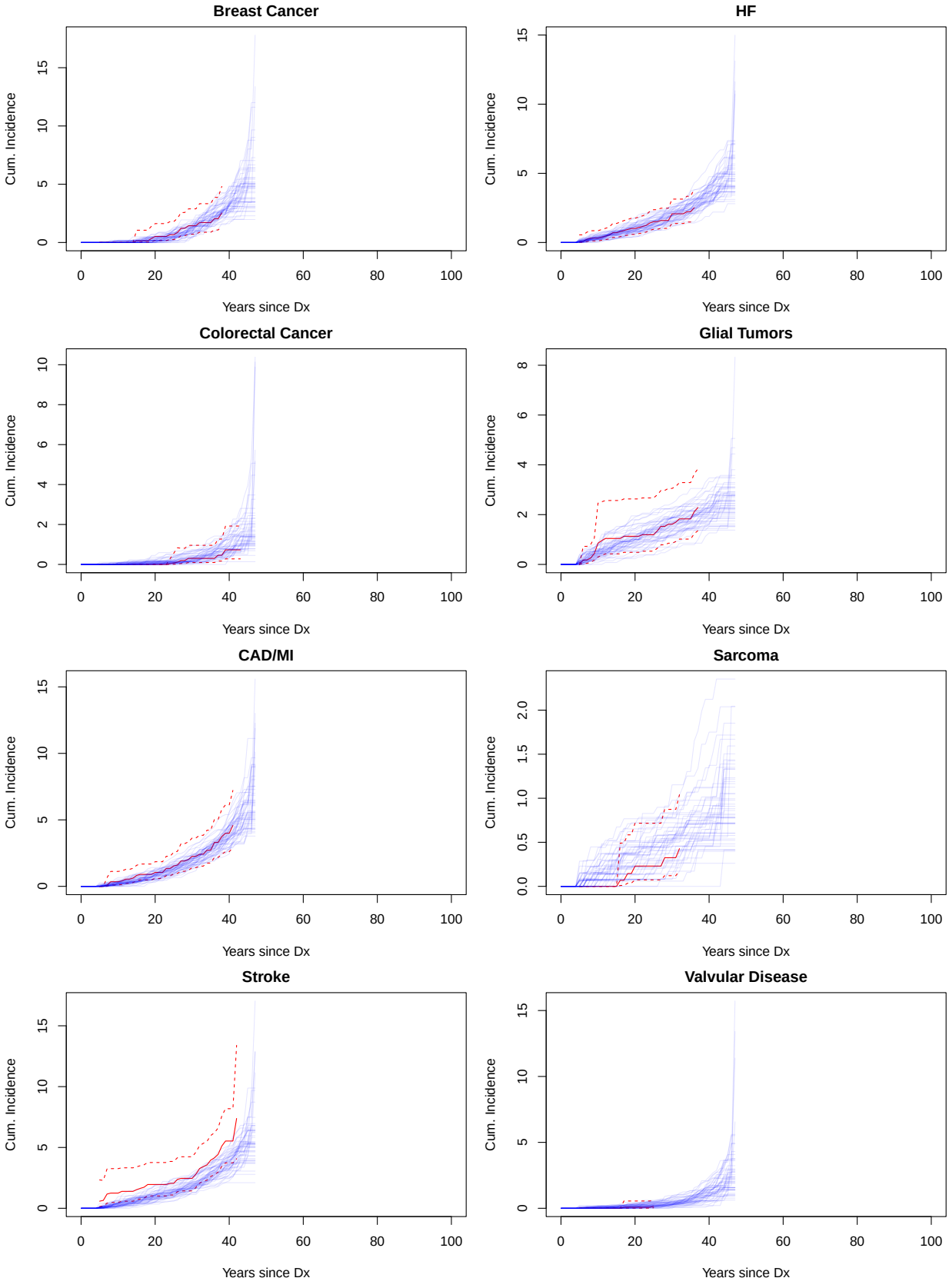

CAD/MI
Cum. Incidence
0
5
10
15
20
0
20
40
60
80
100
Years since Dx


Sarcoma
Cum. Incidence
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0
20
40
60
80
100
Years since Dx

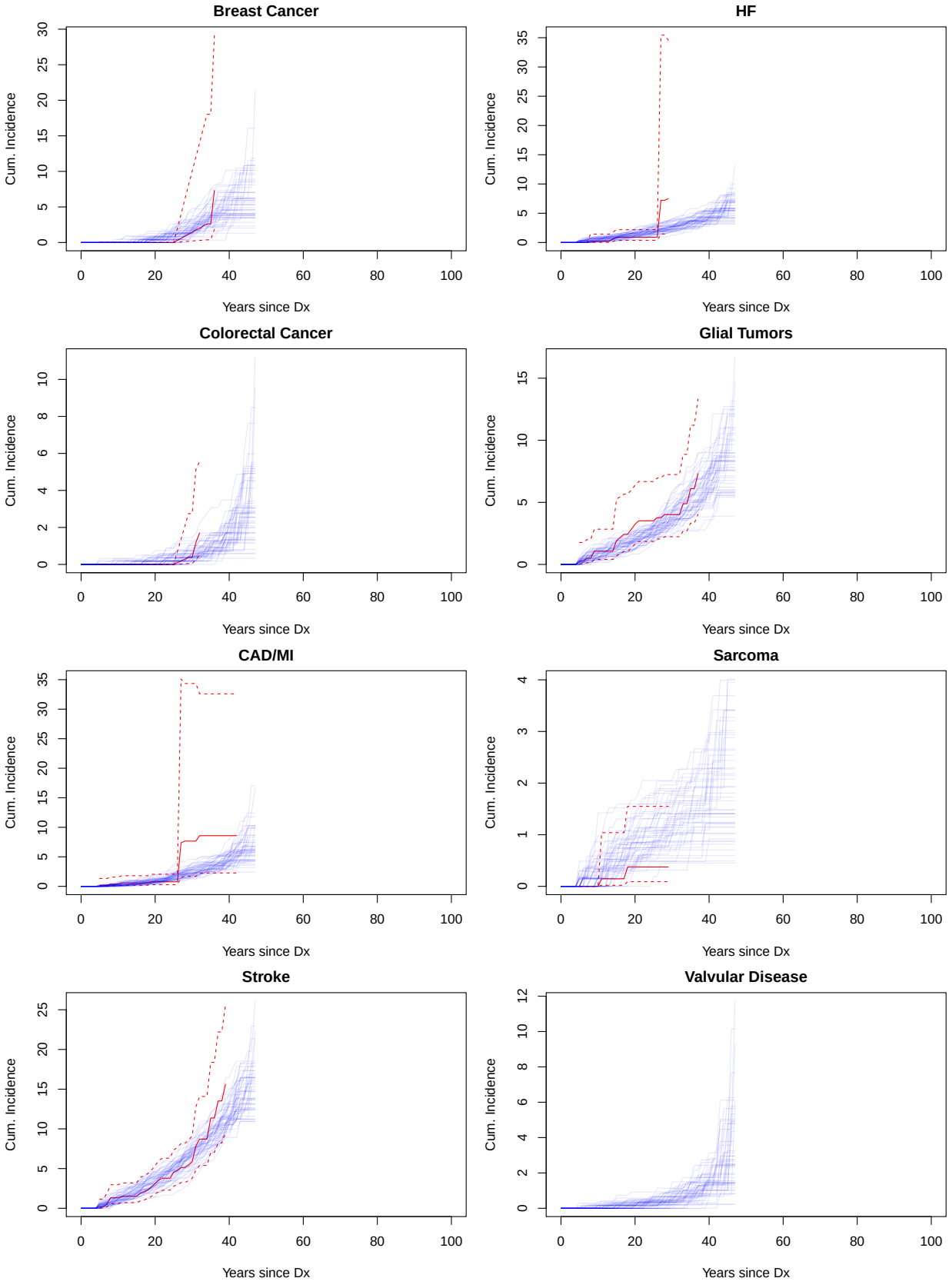

Stroke
Cum. Incidence
0
2
4
6
8
0
20
40
60
80
100
Years since Dx


Valvular Disease
Cum. Incidence
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx

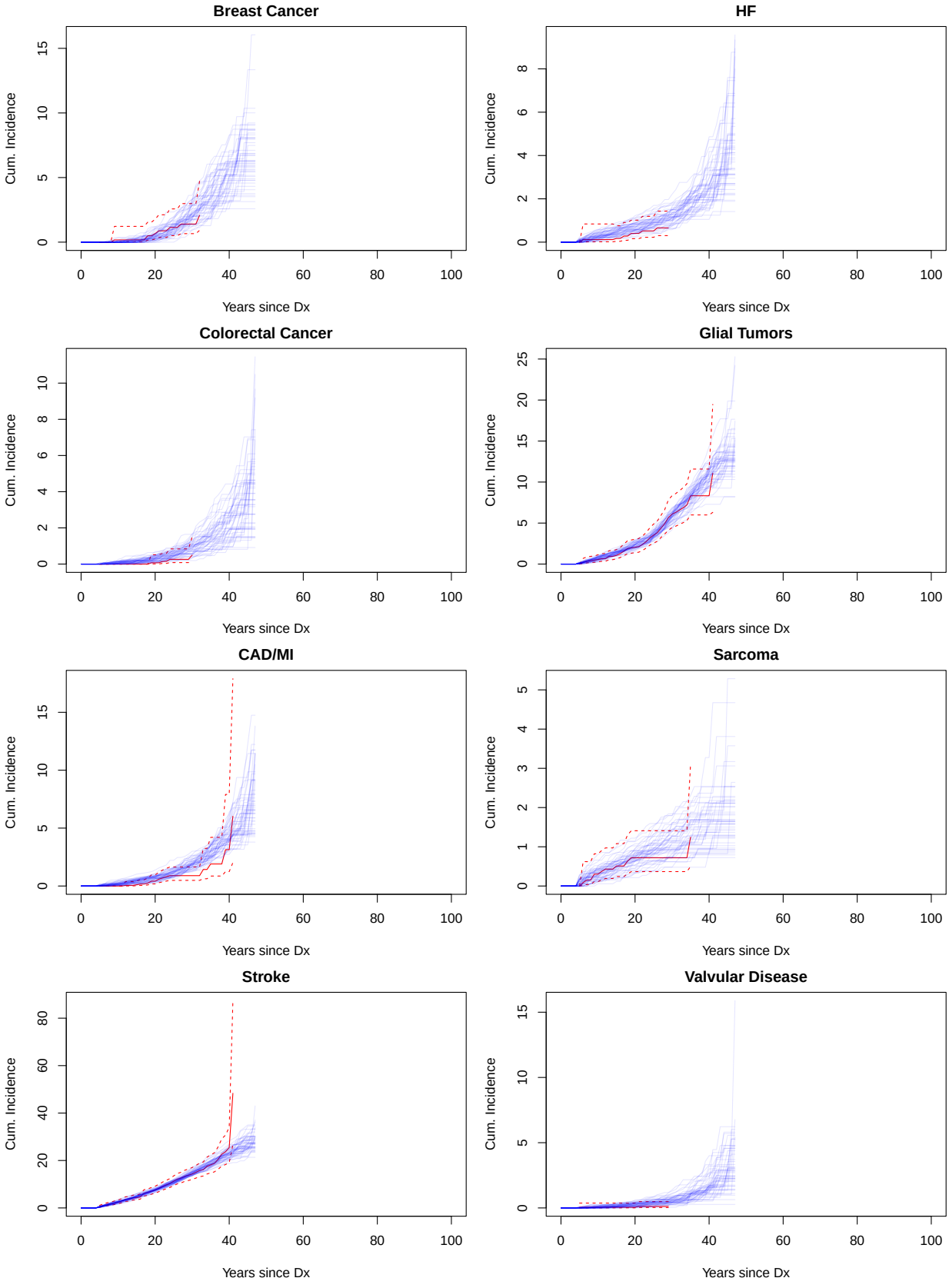
4.3.1.59 CRT20_29



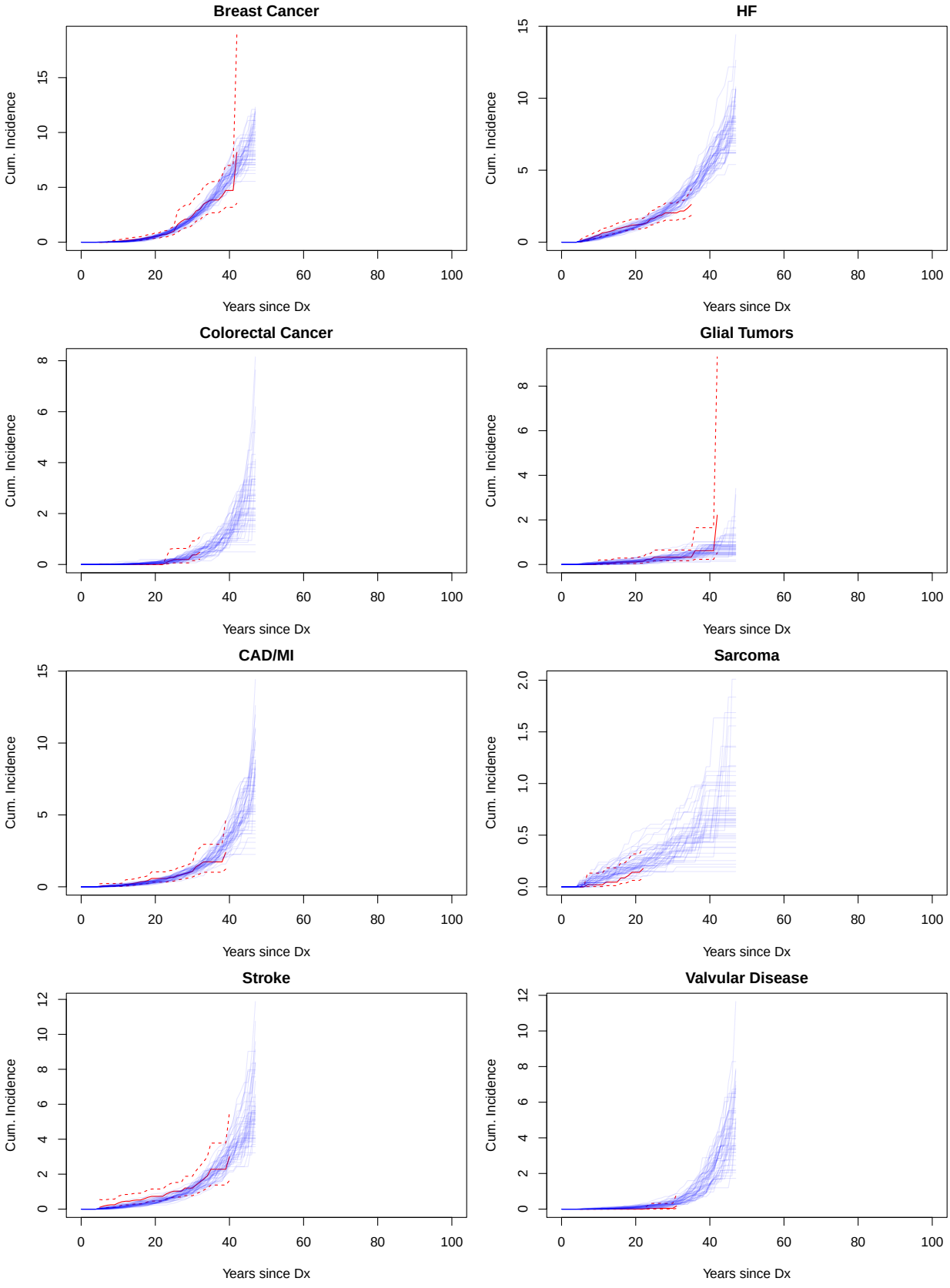
4.3.1.60 CRT30_49



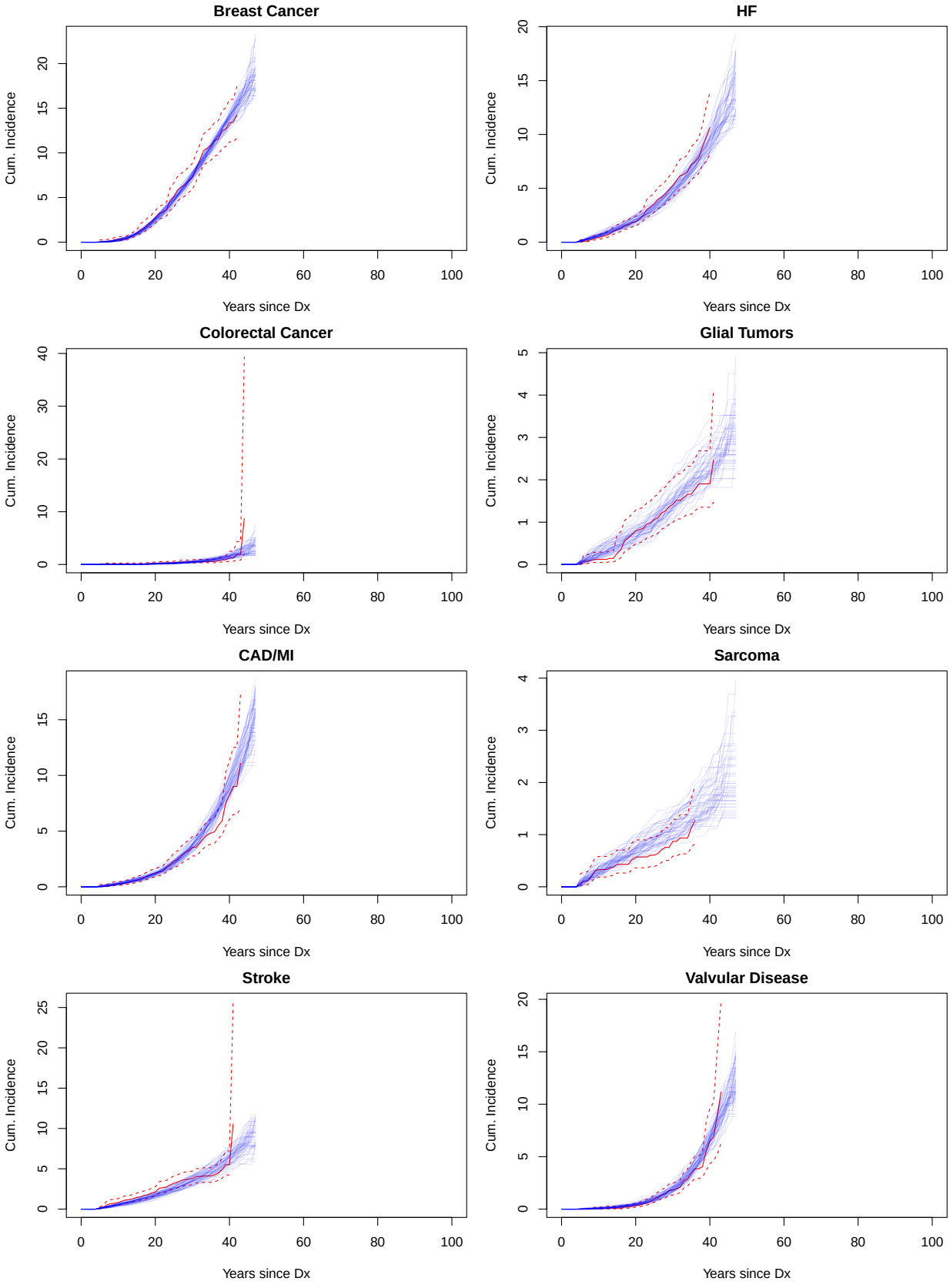
4.3.1.61 CRT50+


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

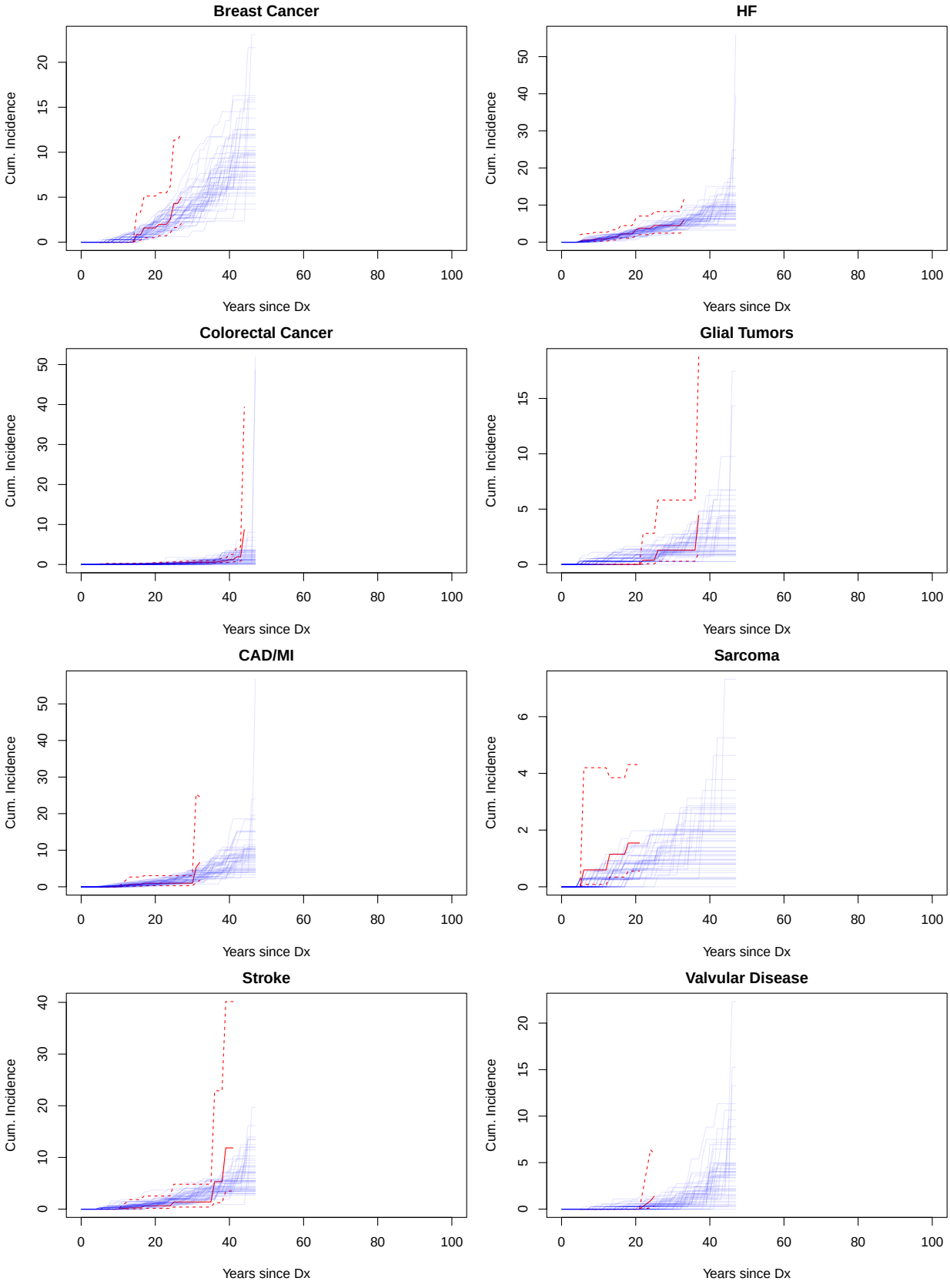
4.3.1.62 OvaryNone



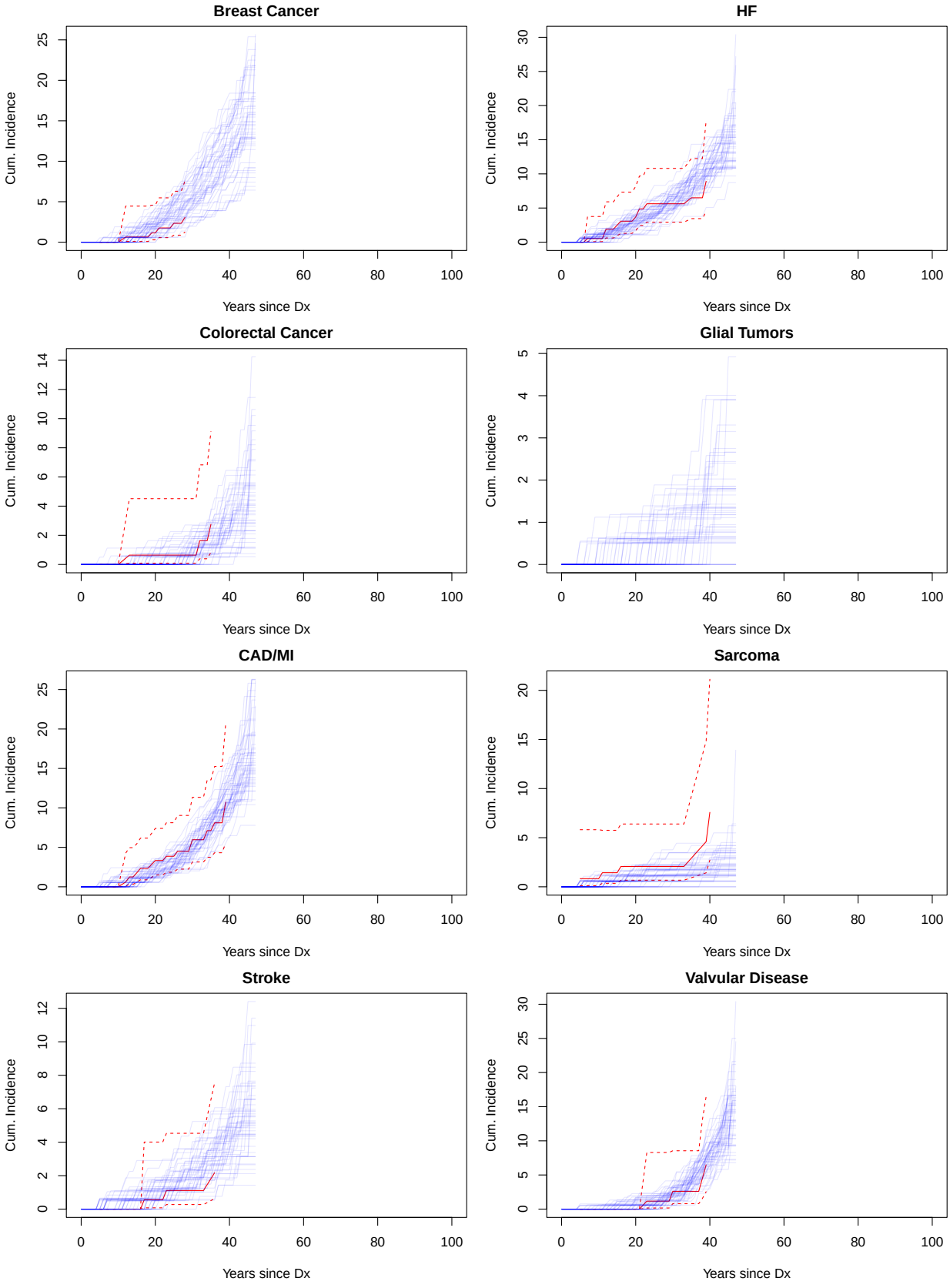
4.3.1.63 Ovary<10



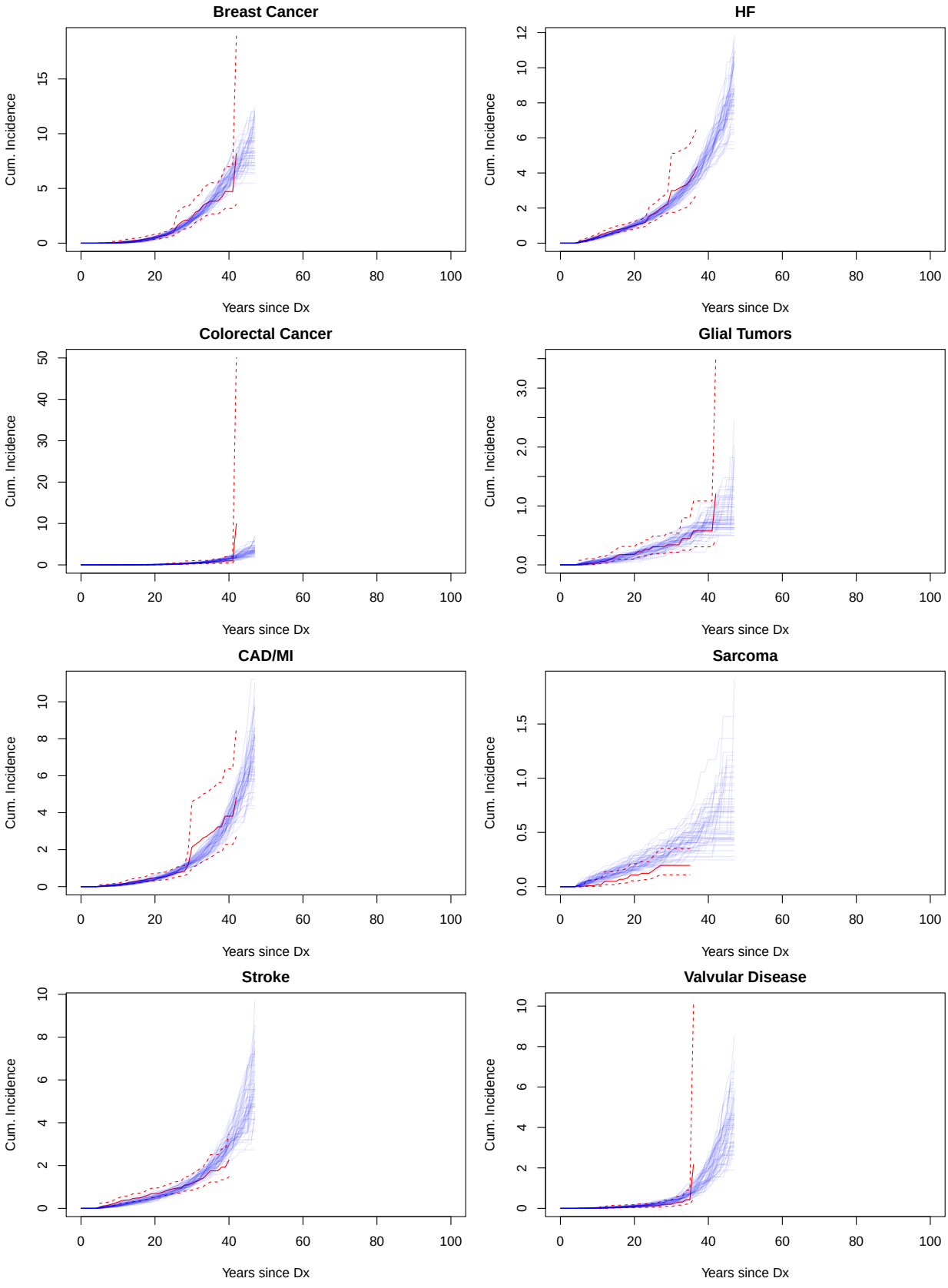
4.3.1.64 Ovary10-19



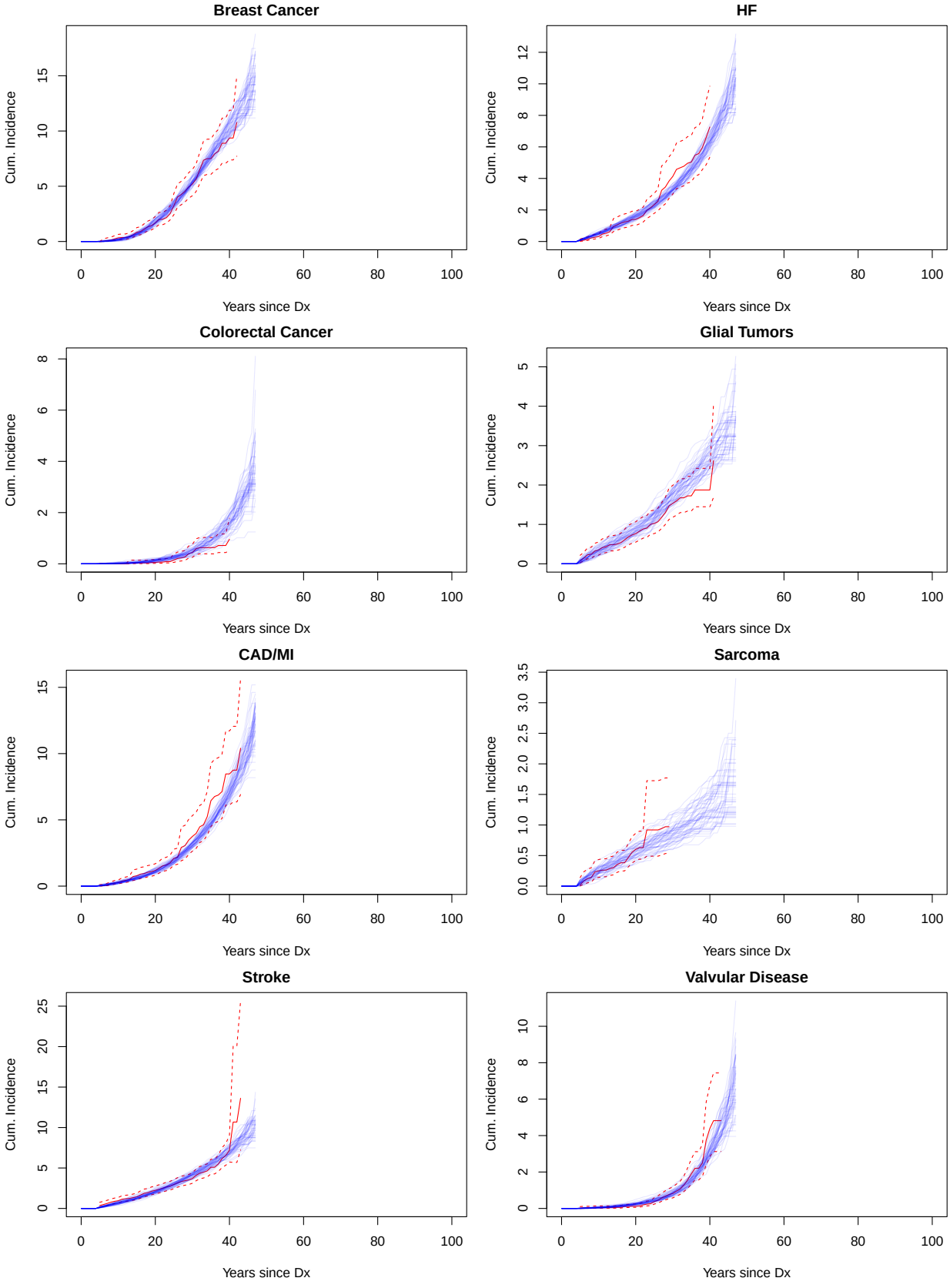
4.3.1.65 Ovary20+



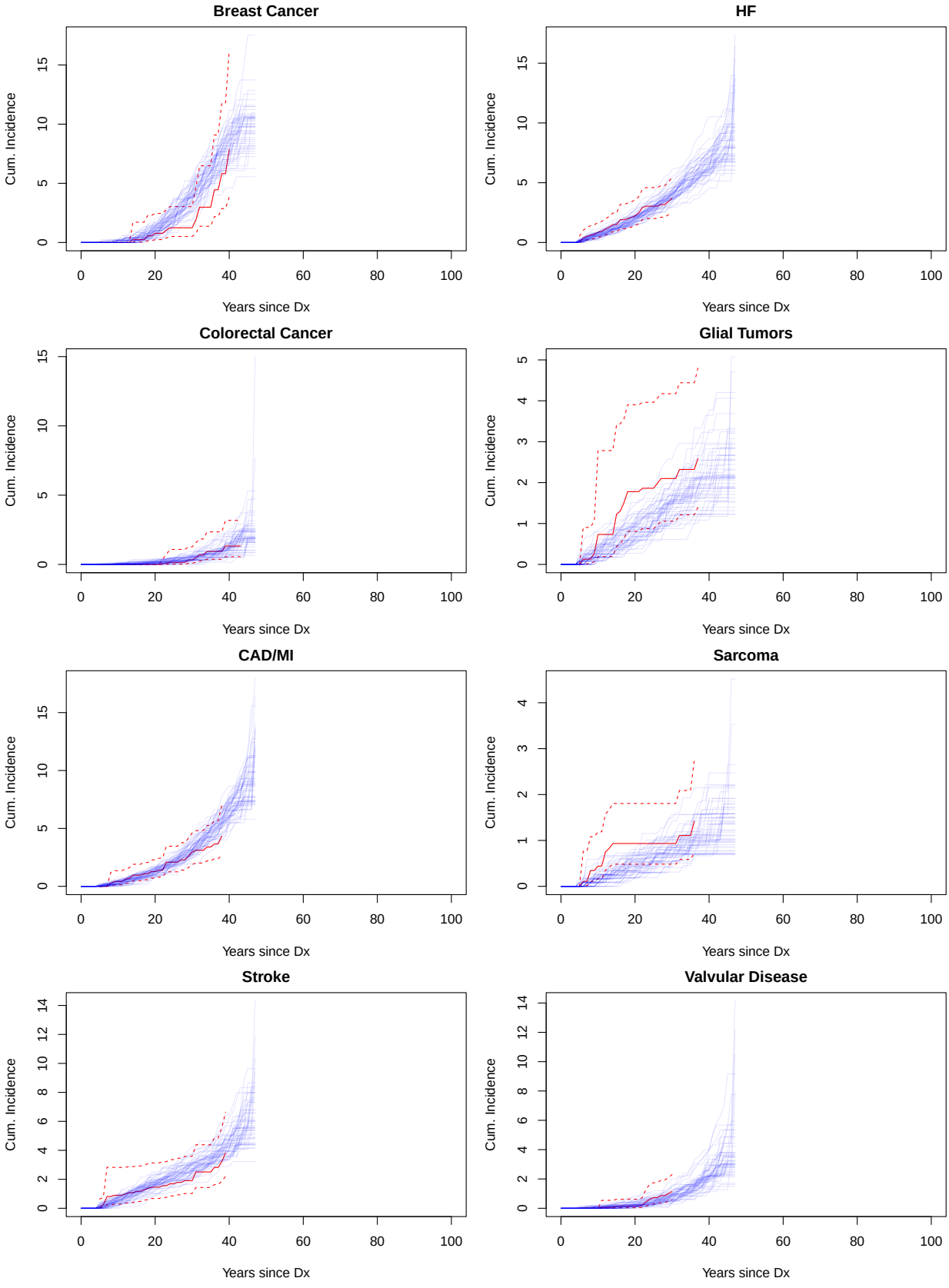
4.3.1.66 AbdPelNone



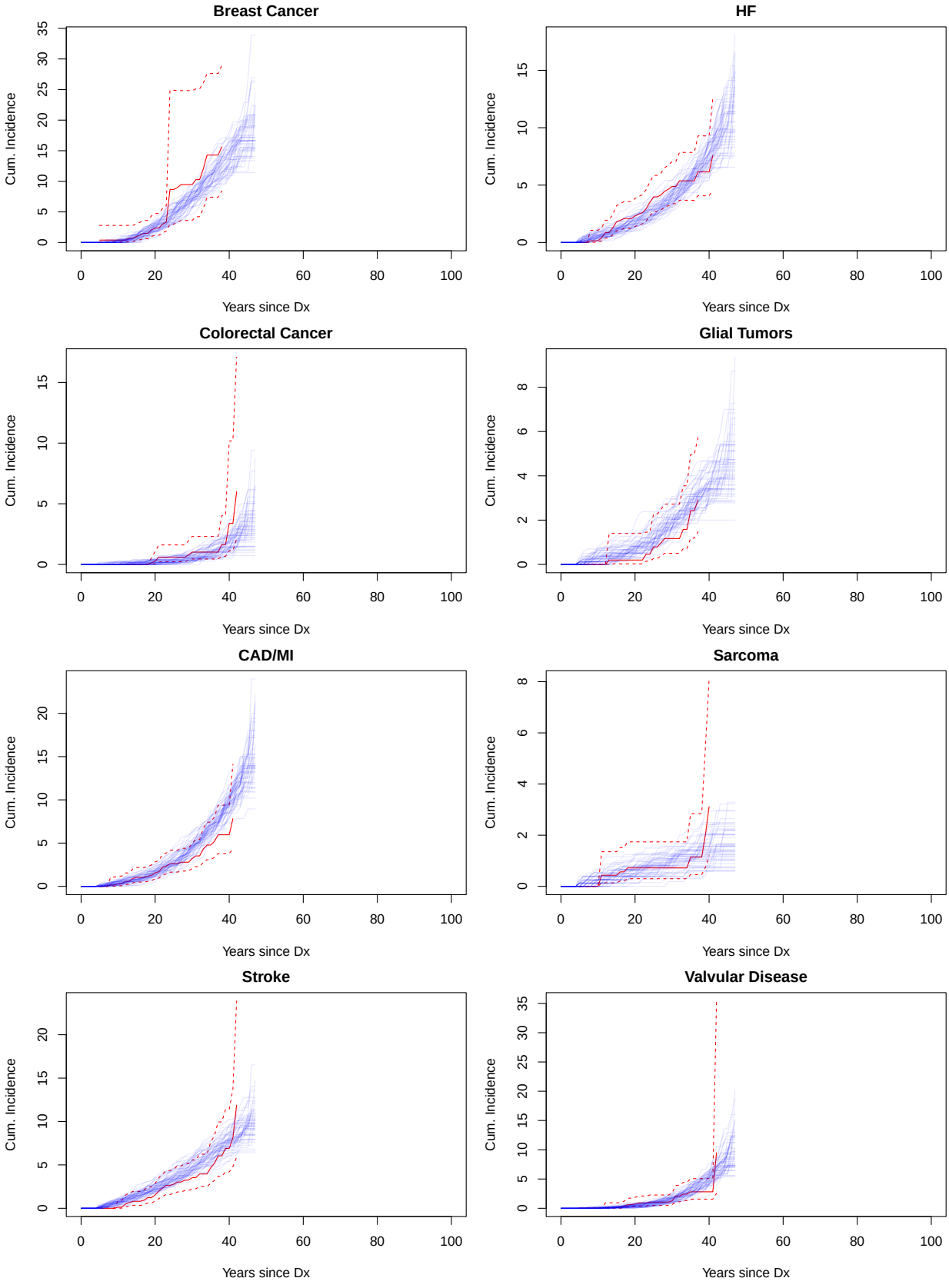
4.3.1.67 AbdPel<15



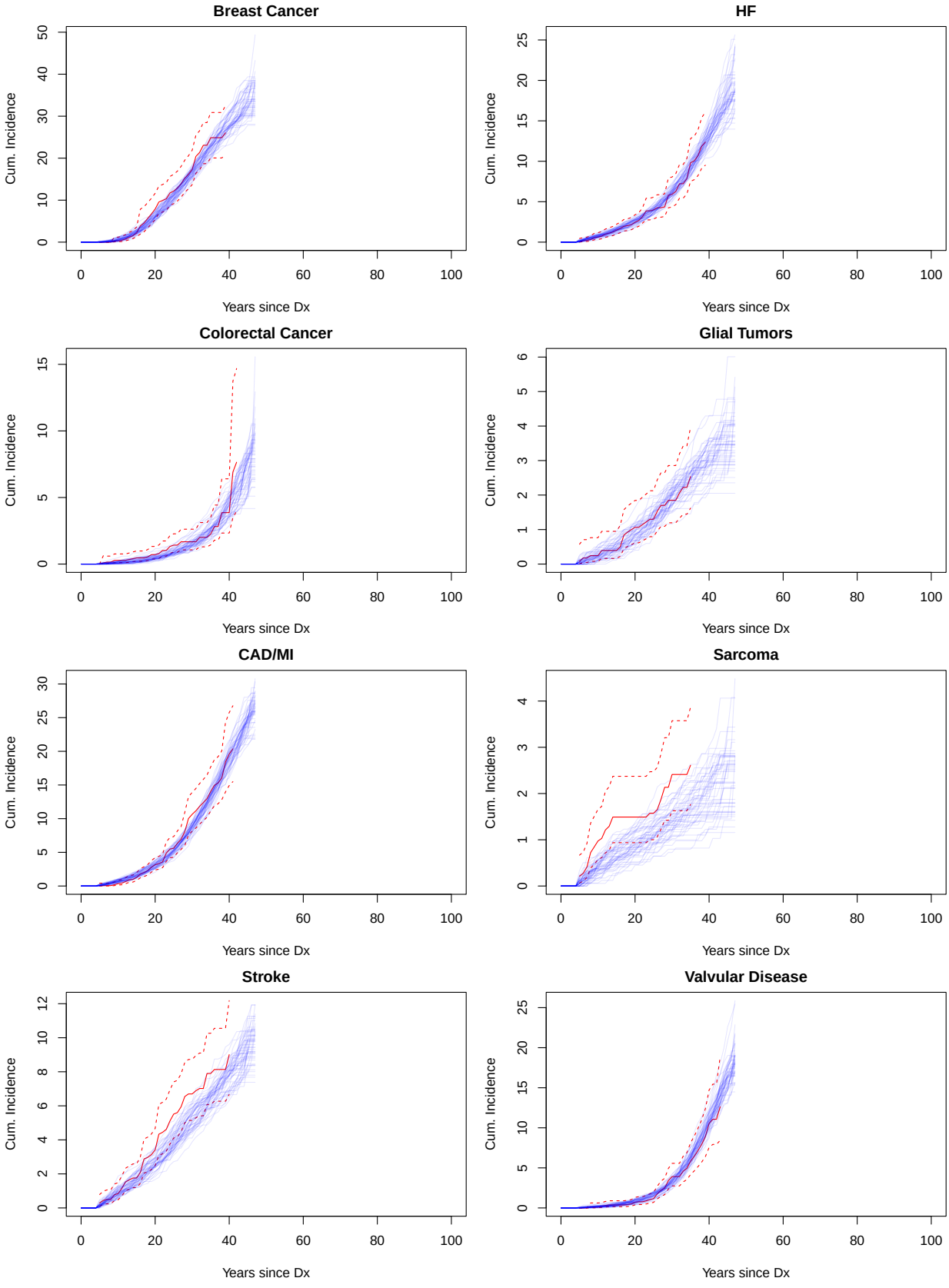
4.3.1.68 AbdPel15_24



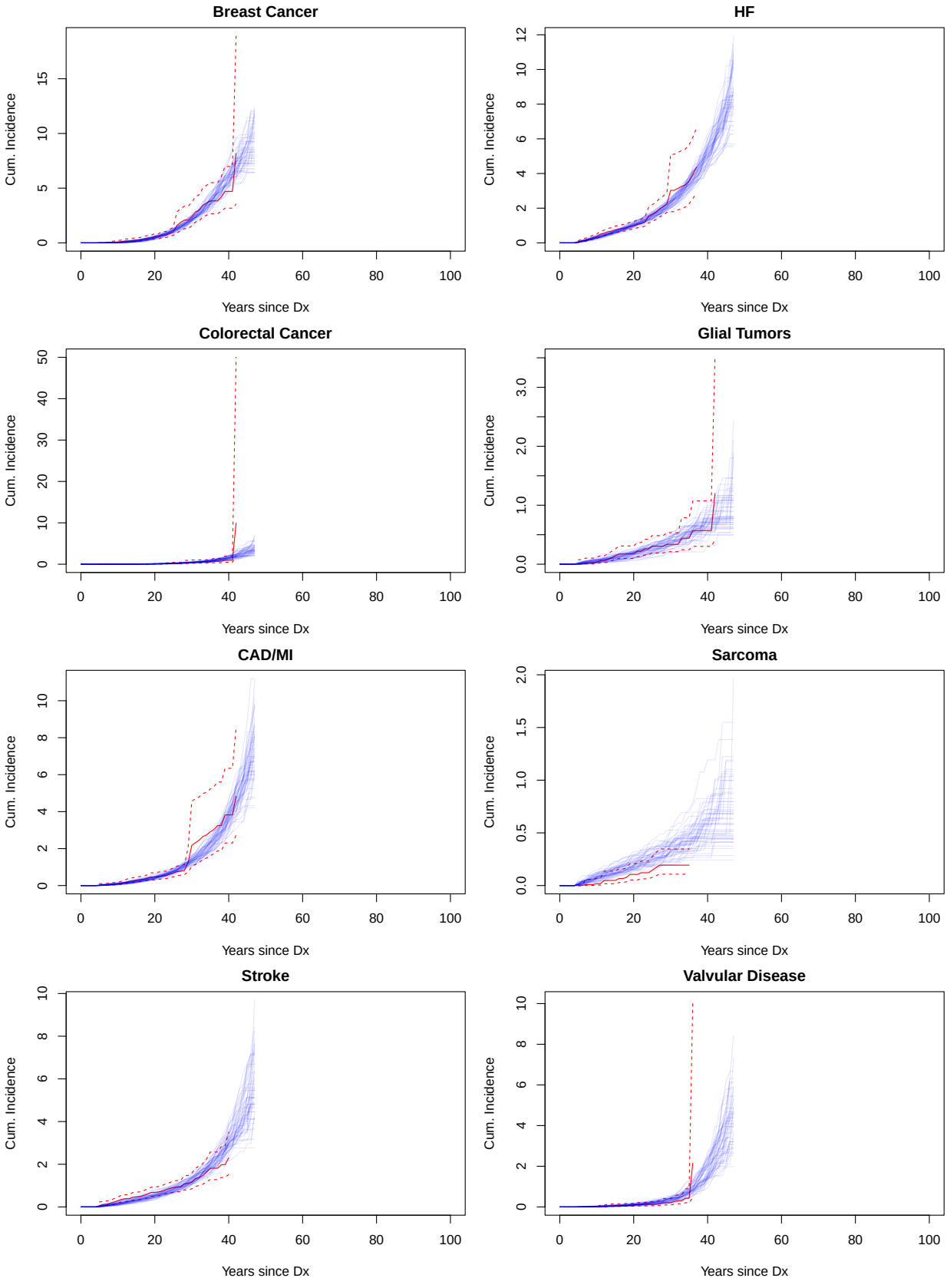
4.3.1.69 AbdPel25_34



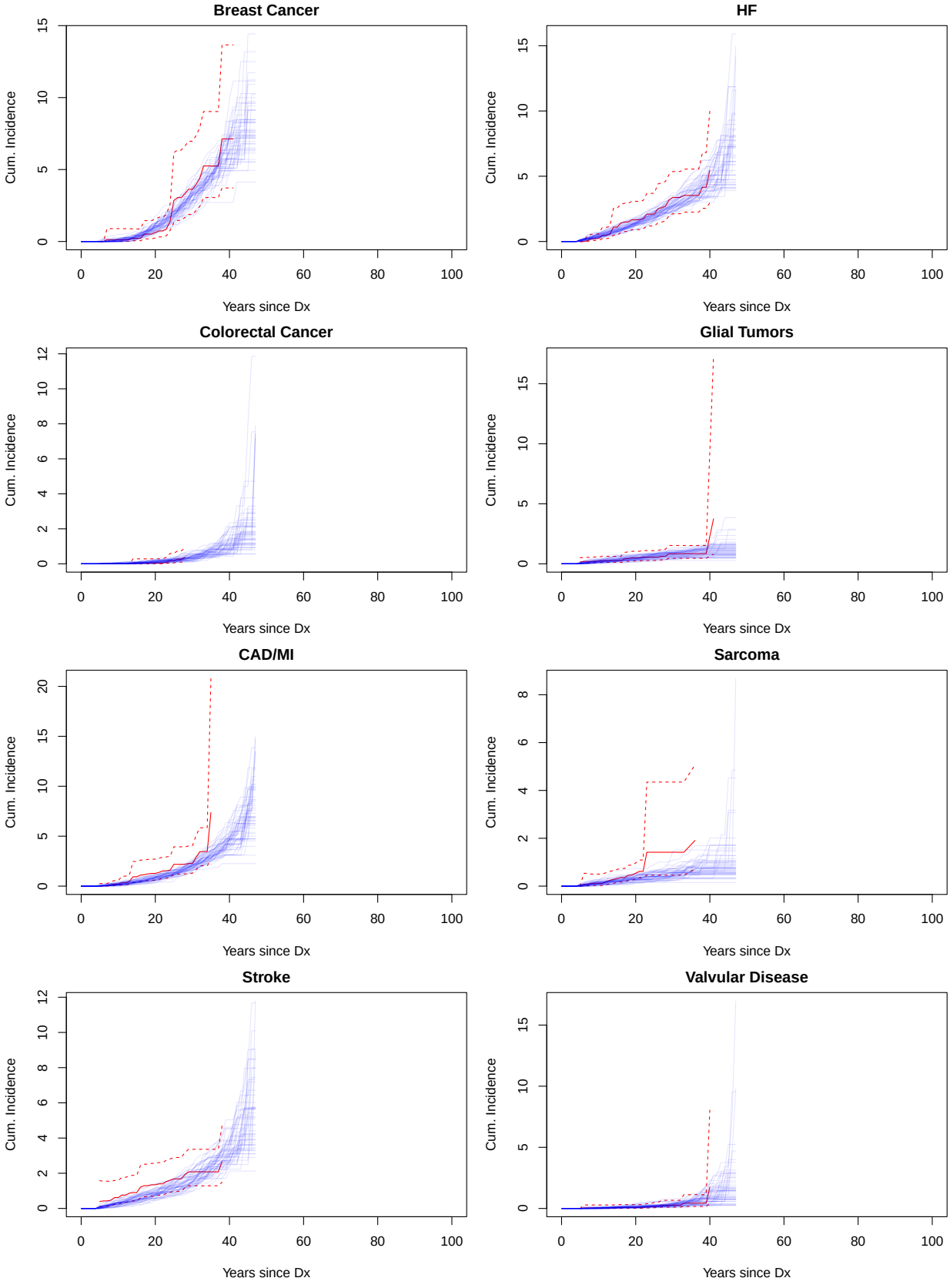
4.3.1.70 AbdPel35+



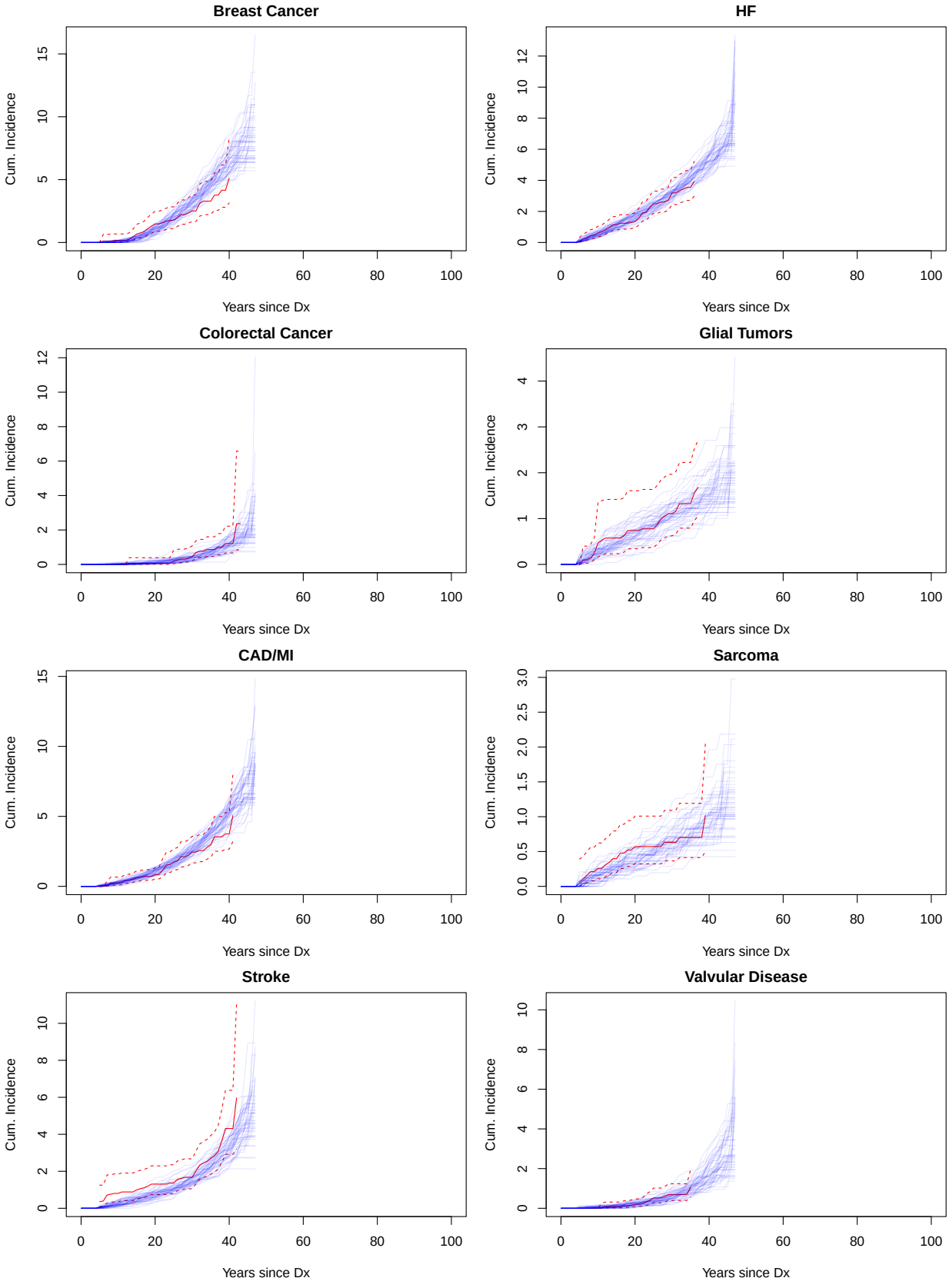
4.3.1.71 MaxRTNone



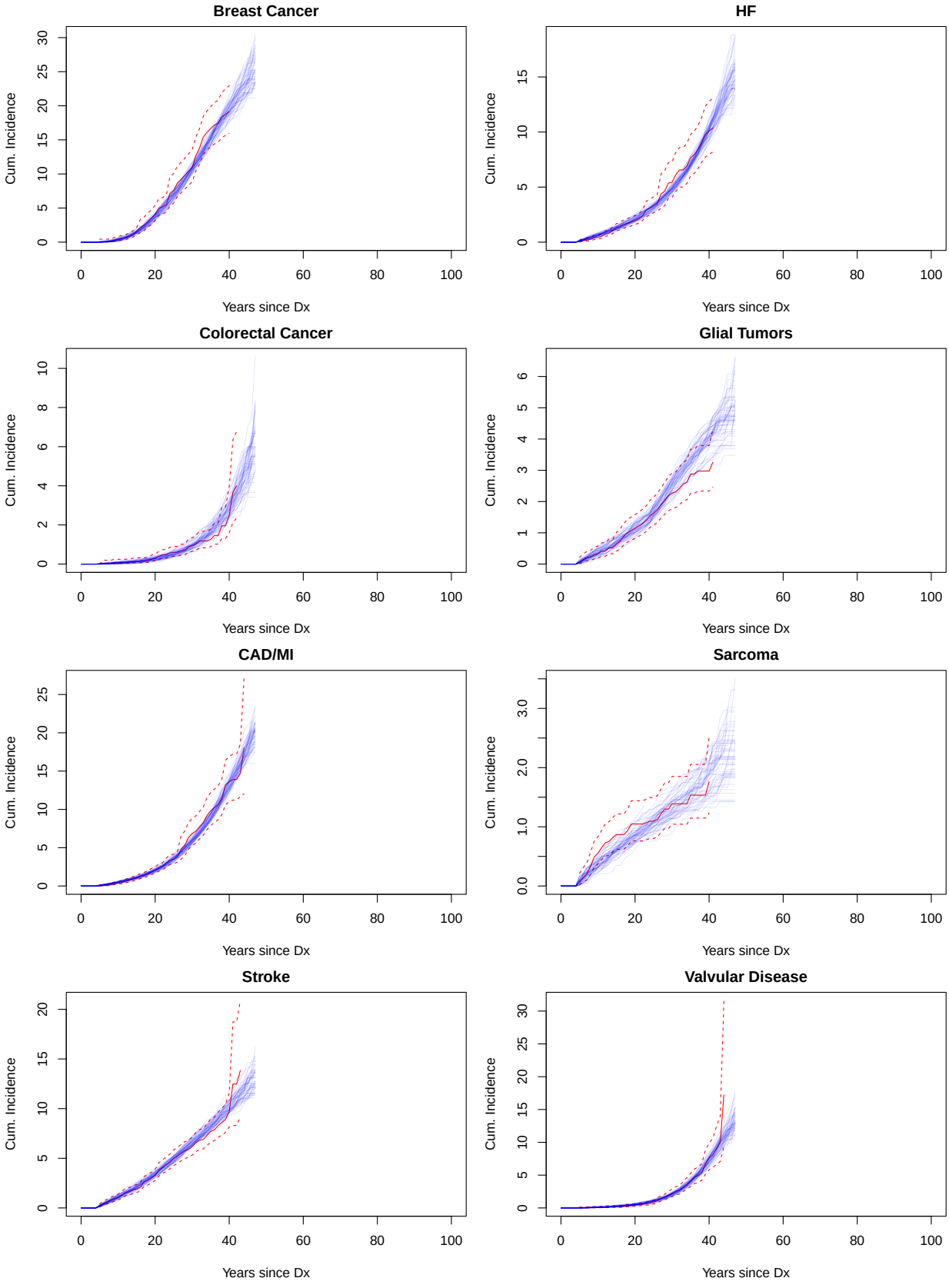
4.3.1.72 MaxRT<20



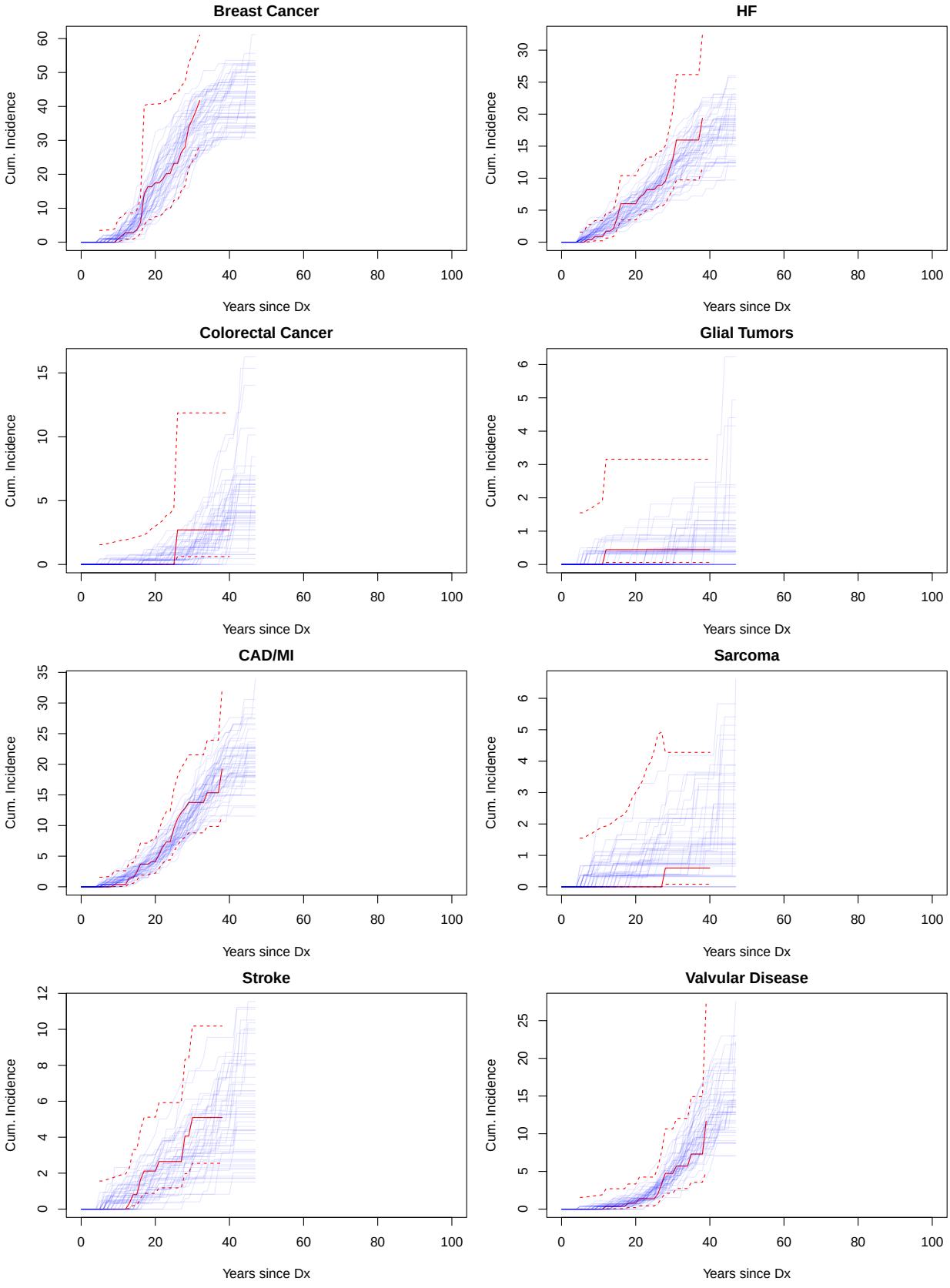
4.3.1.73 MaxRT20_29



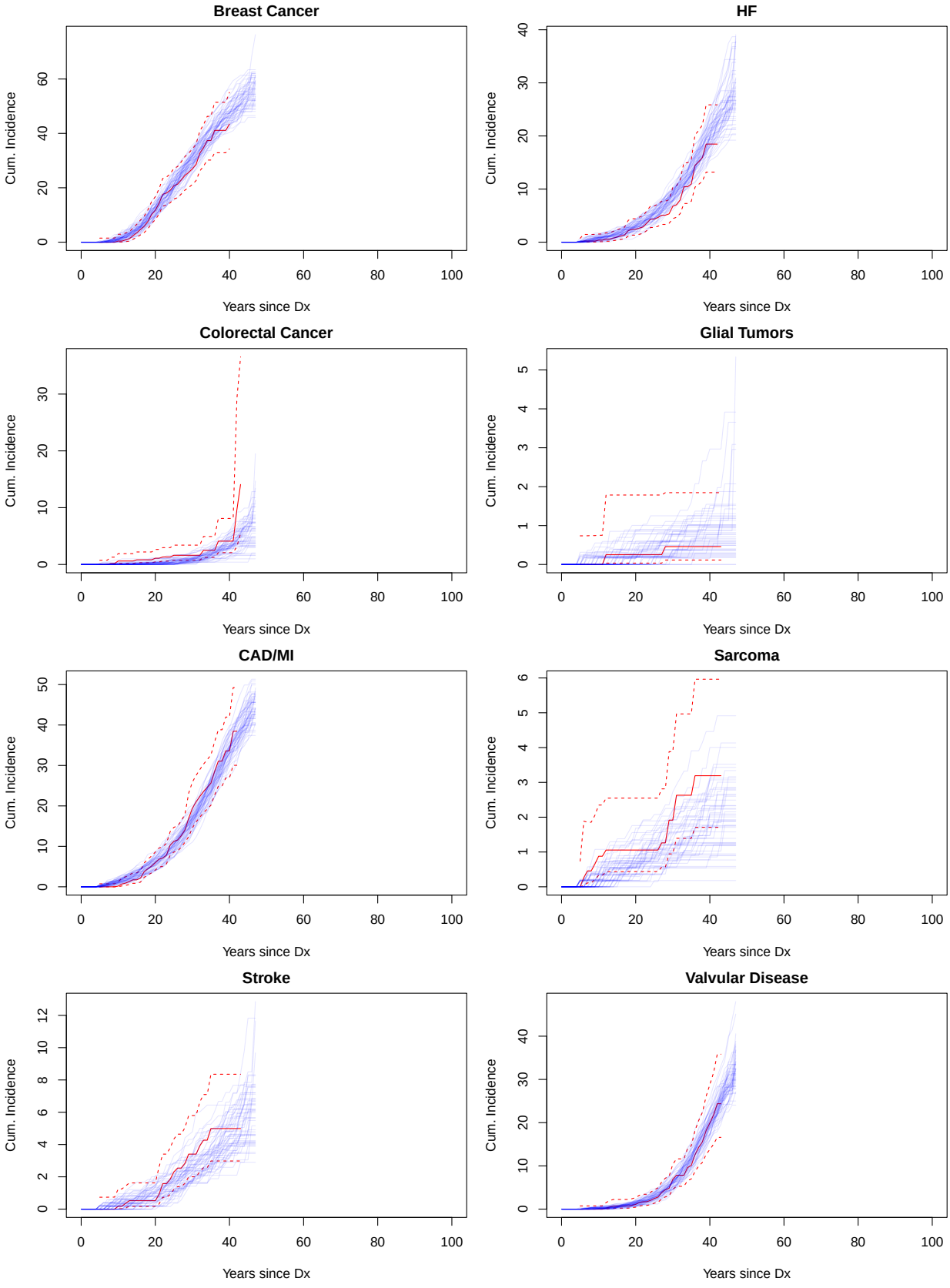
4.3.1.74 MaxRT30+



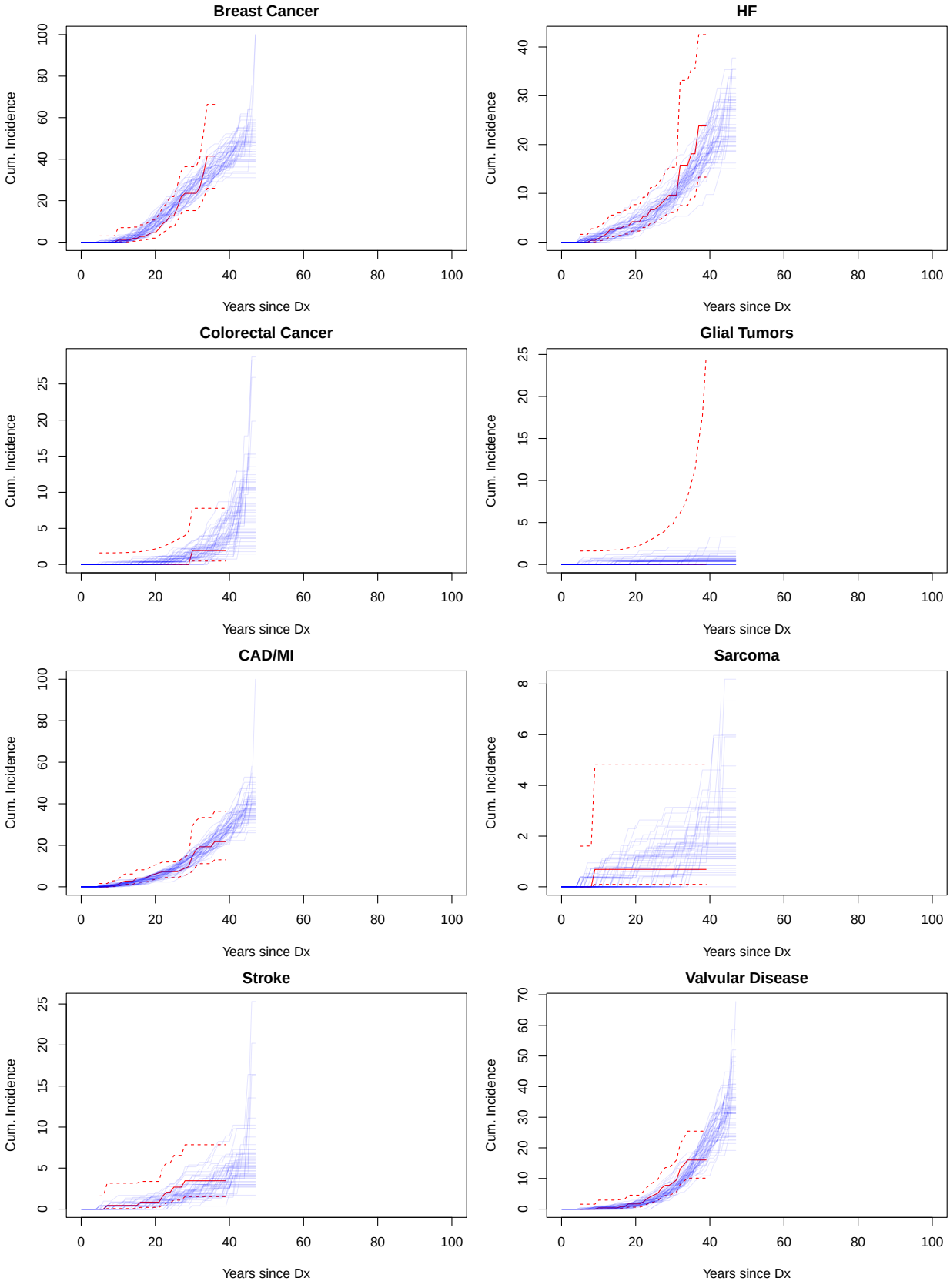
4.3.1.75 HL grp: Salvage



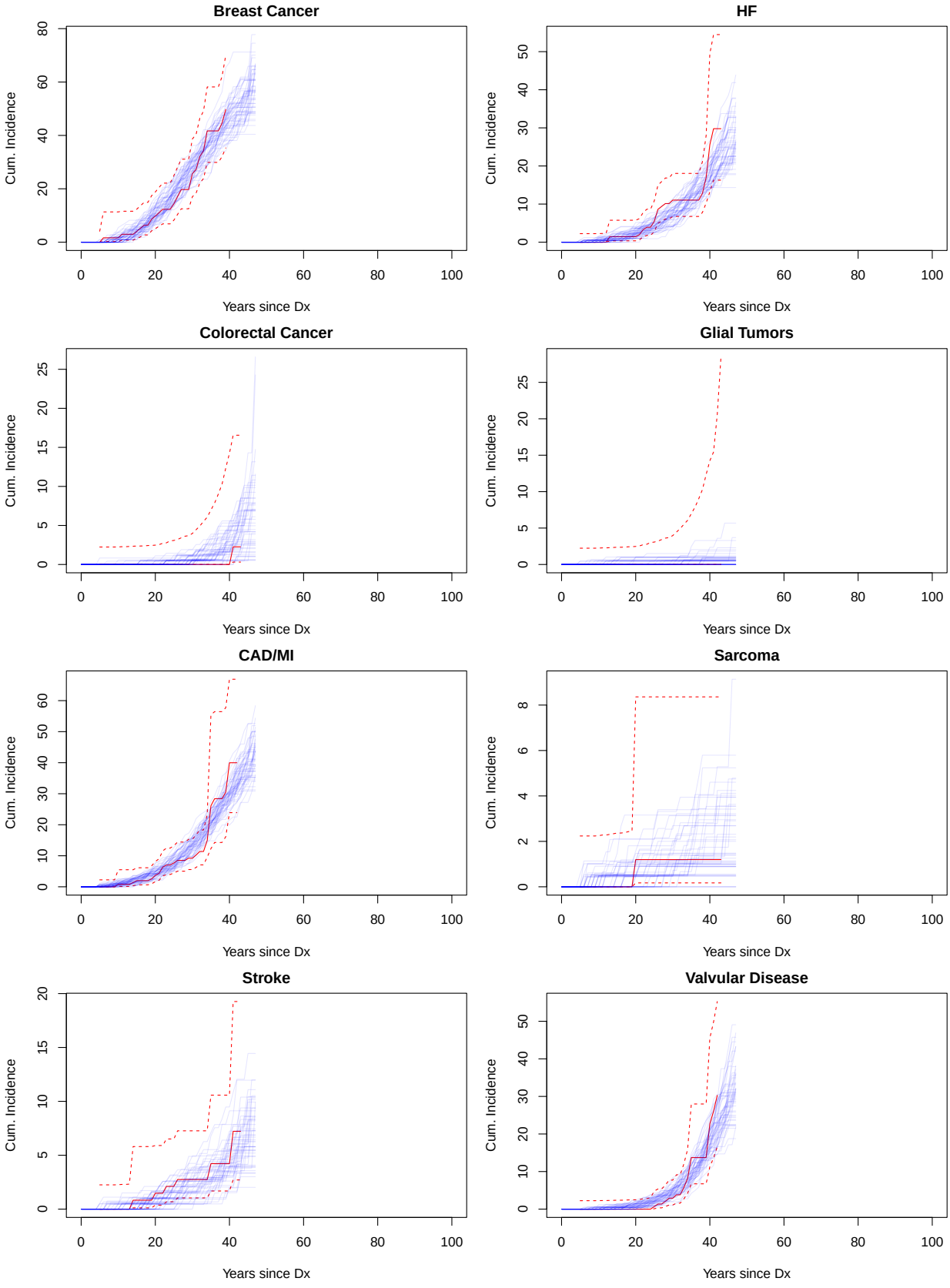
4.3.1.76 HL grp: Extended



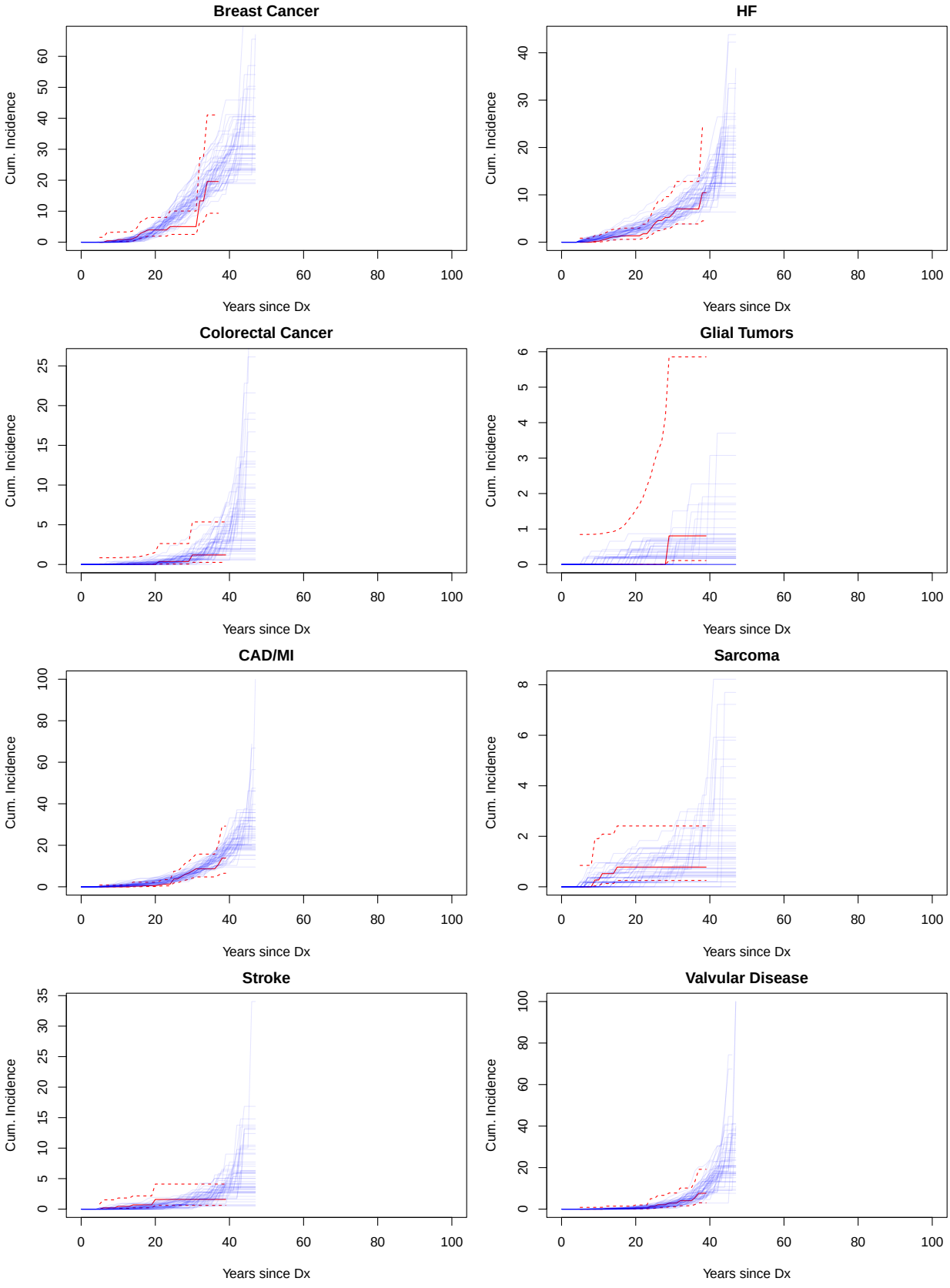
4.3.1.77 HL grp: Chest RT>=35 plus chemo



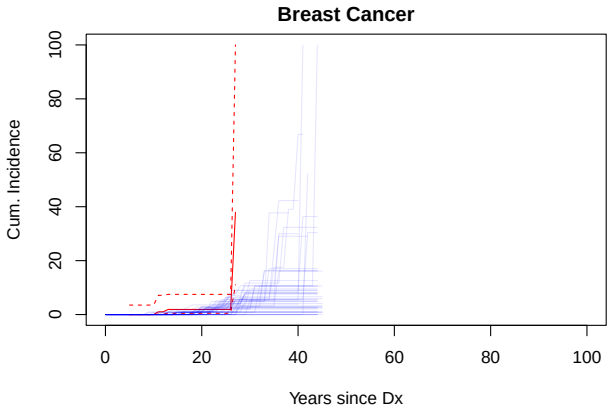
4.3.1.78 HL grp: Chest RT>=35 no chemo

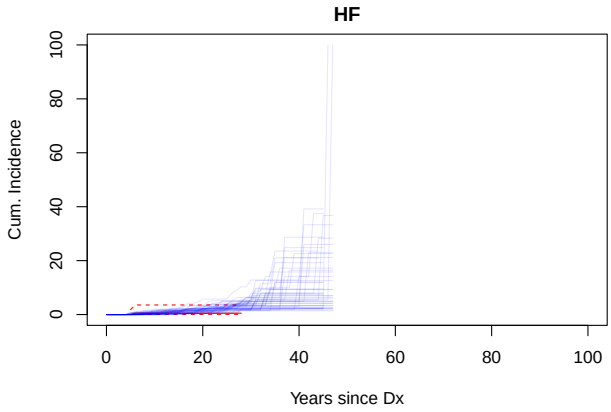


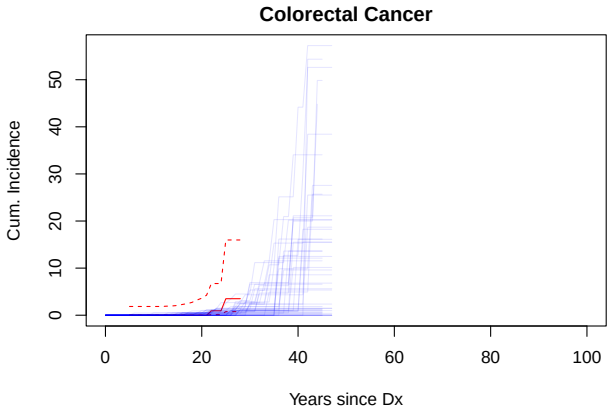
4.3.1.79 HL grp: Chest RT<35 plus chemo

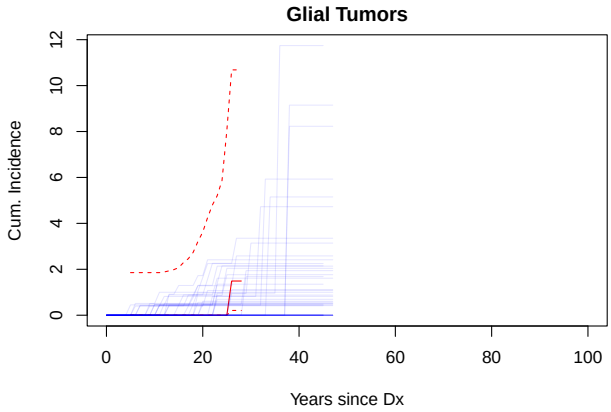


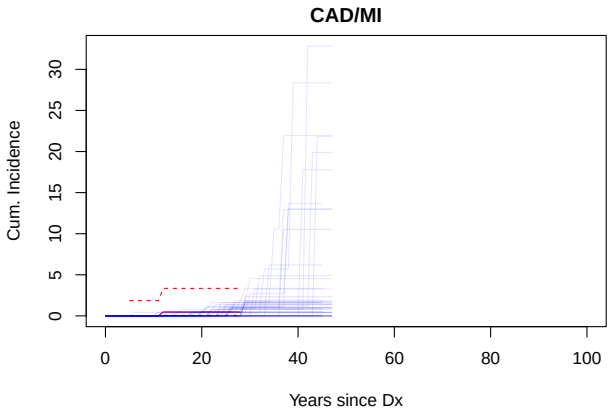
4.3.1.80 HL grp: Chemo without chest RT

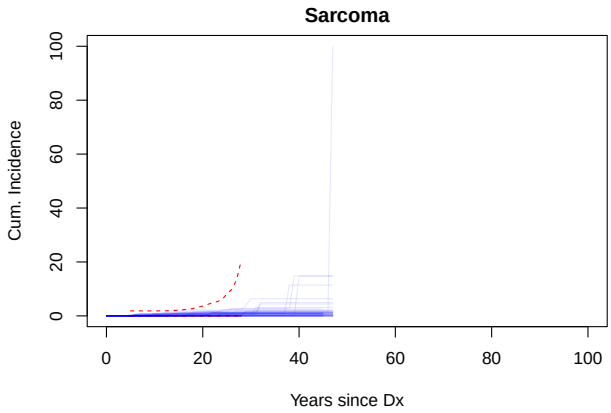


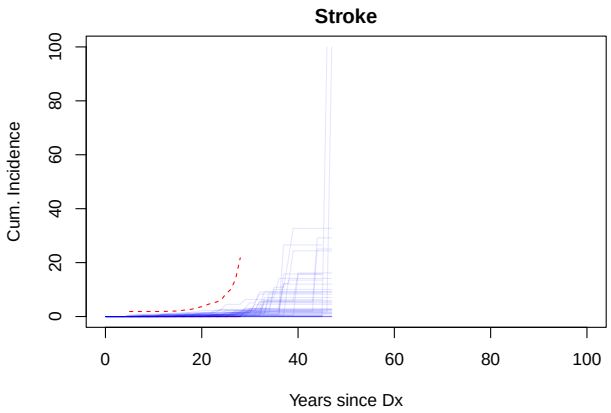


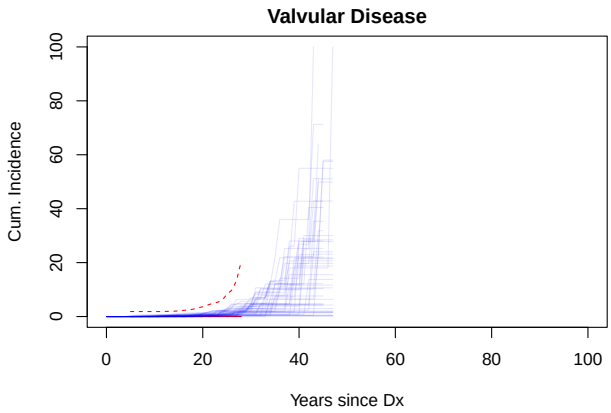




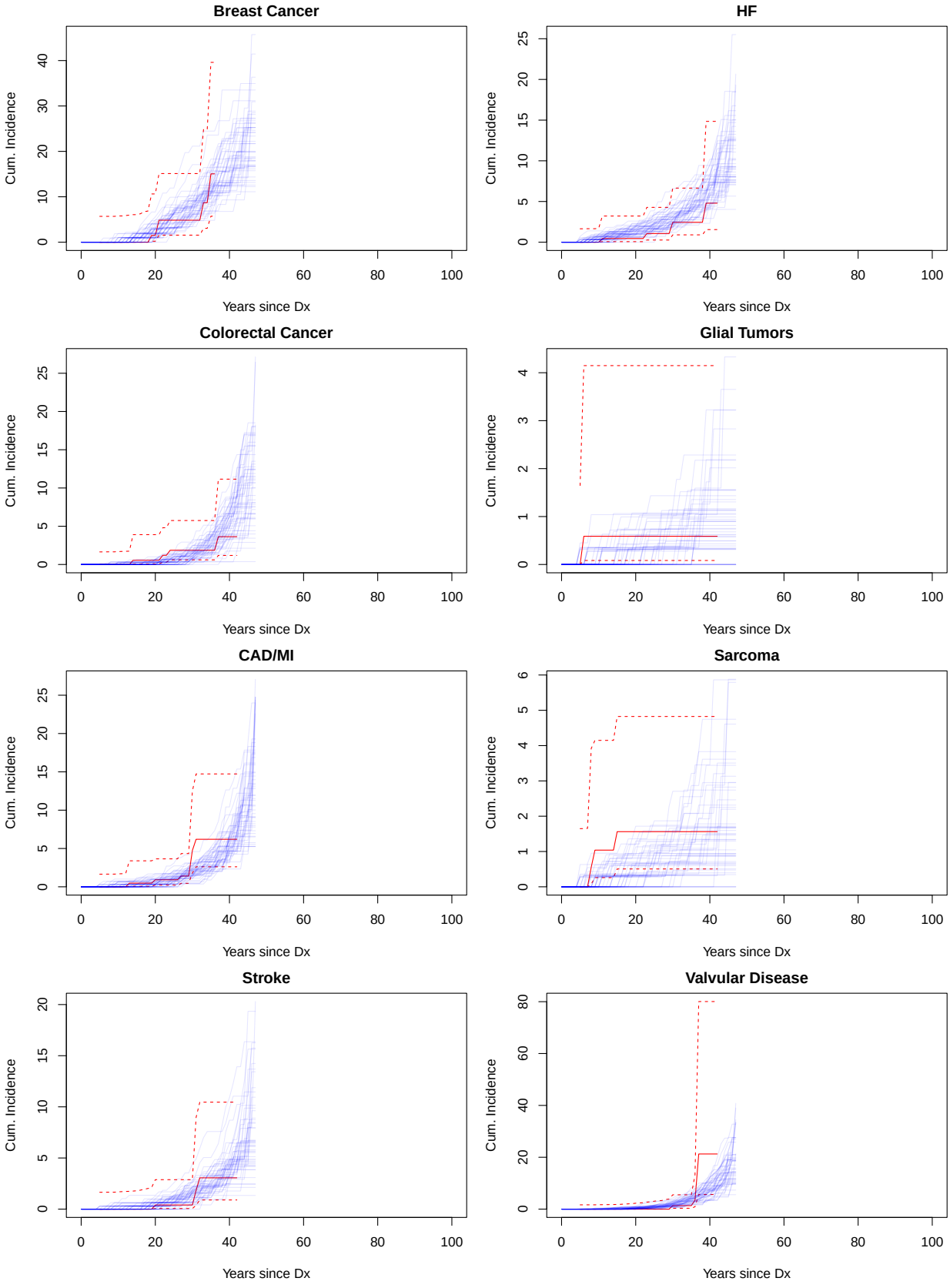




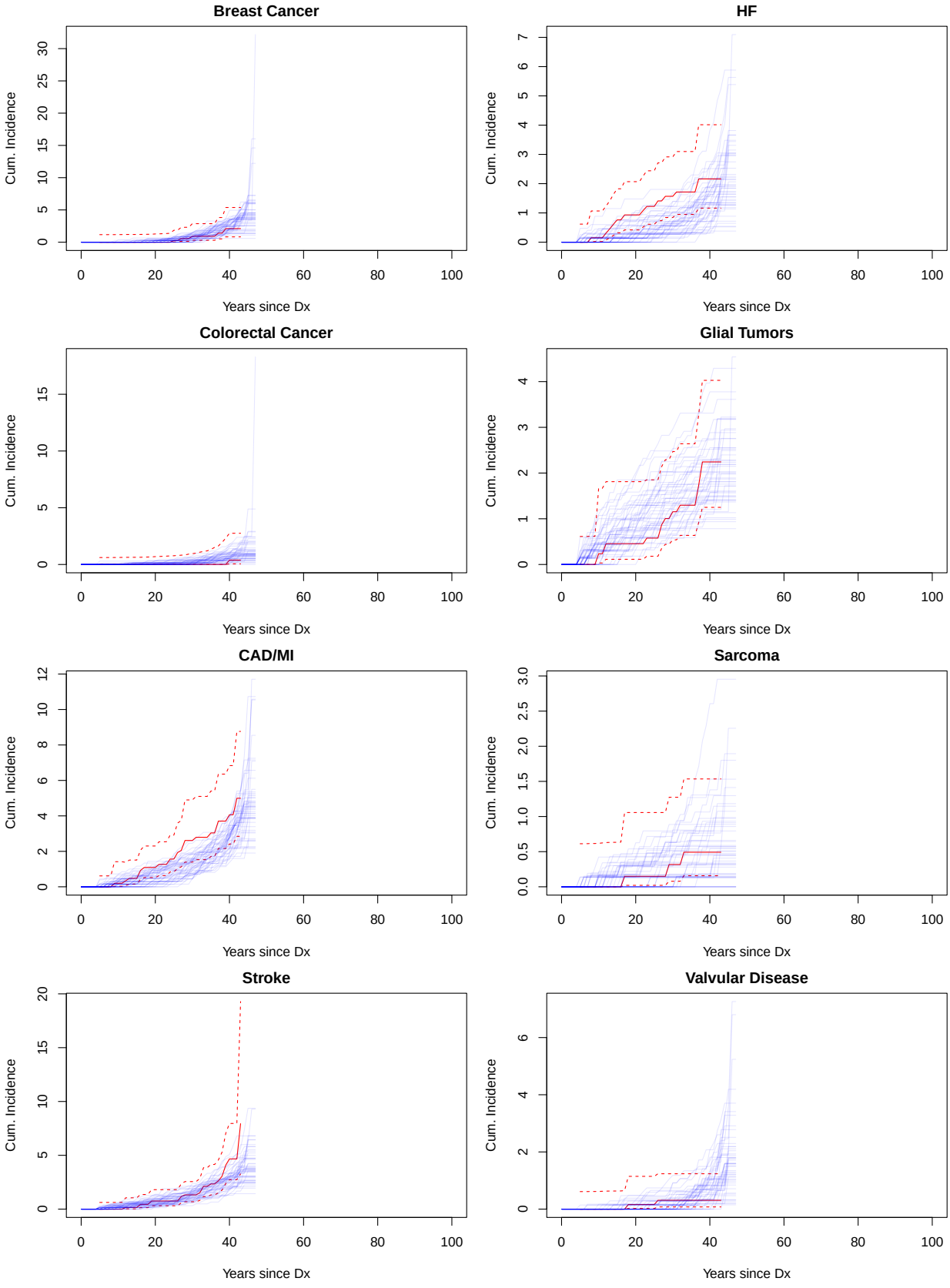




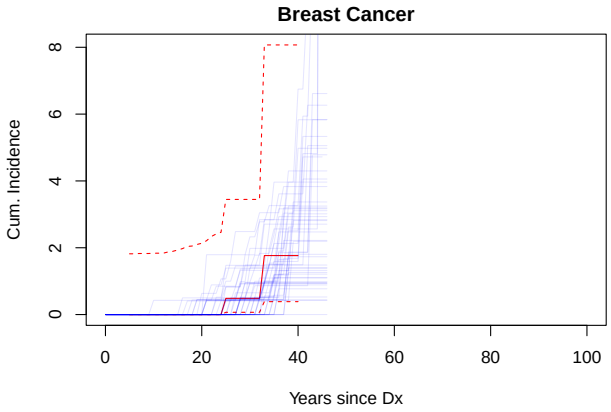
4.3.1.81 HL grp: Other

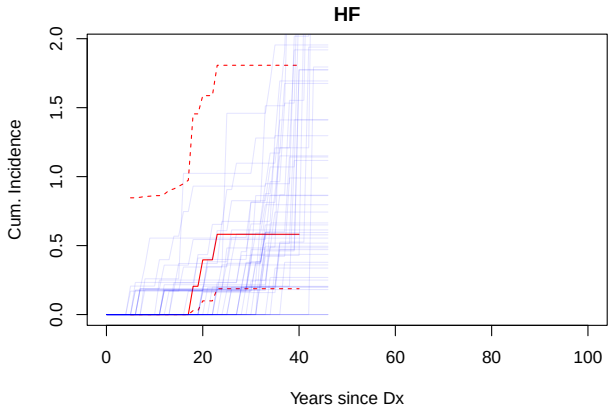


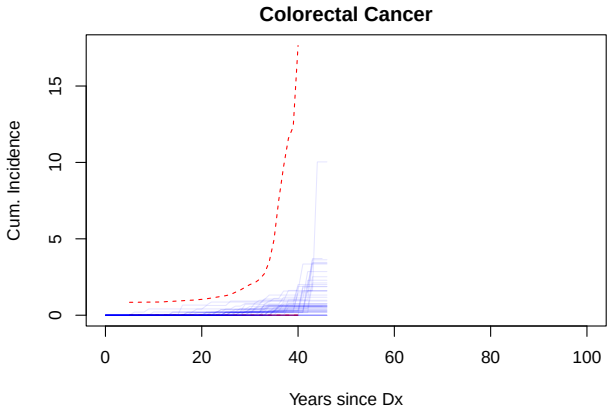
4.3.1.82 ALL grp: 1970s-like

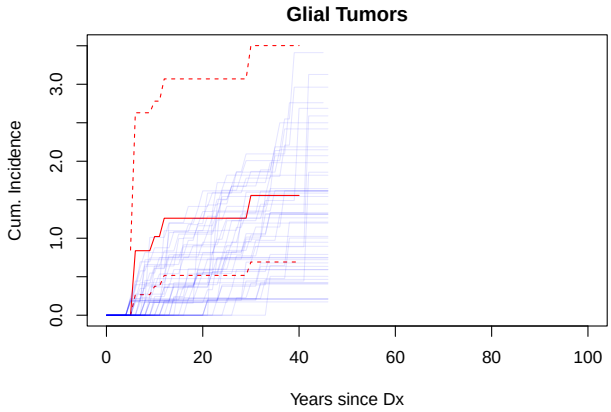


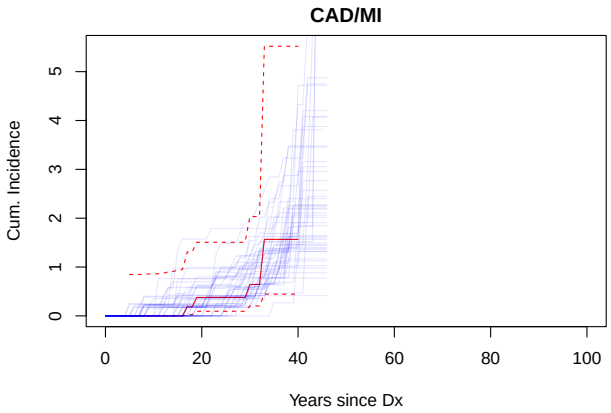
4.3.1.83 ALL grp: 1980s SR-like

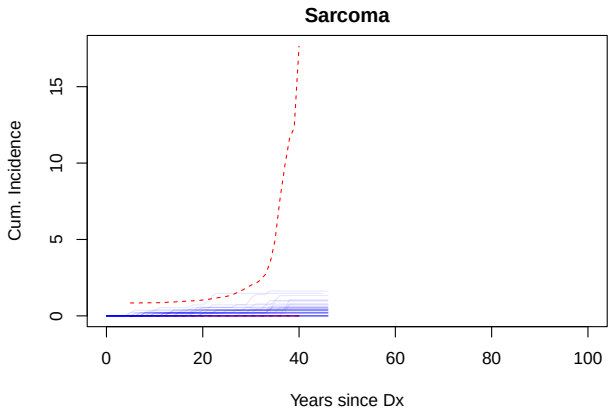


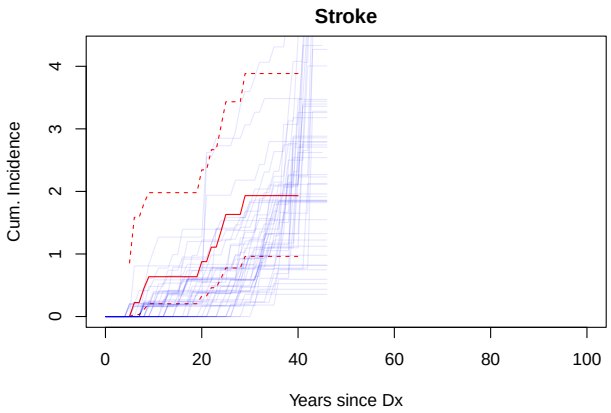


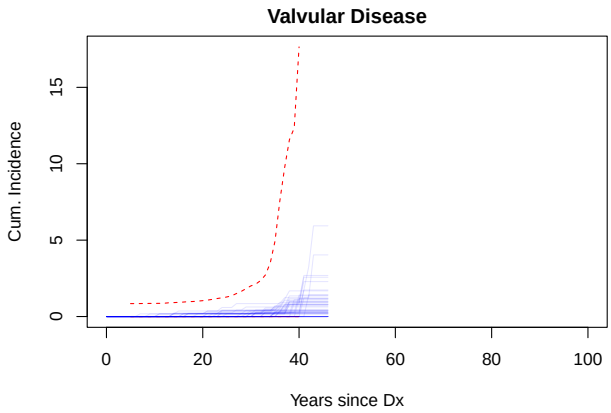




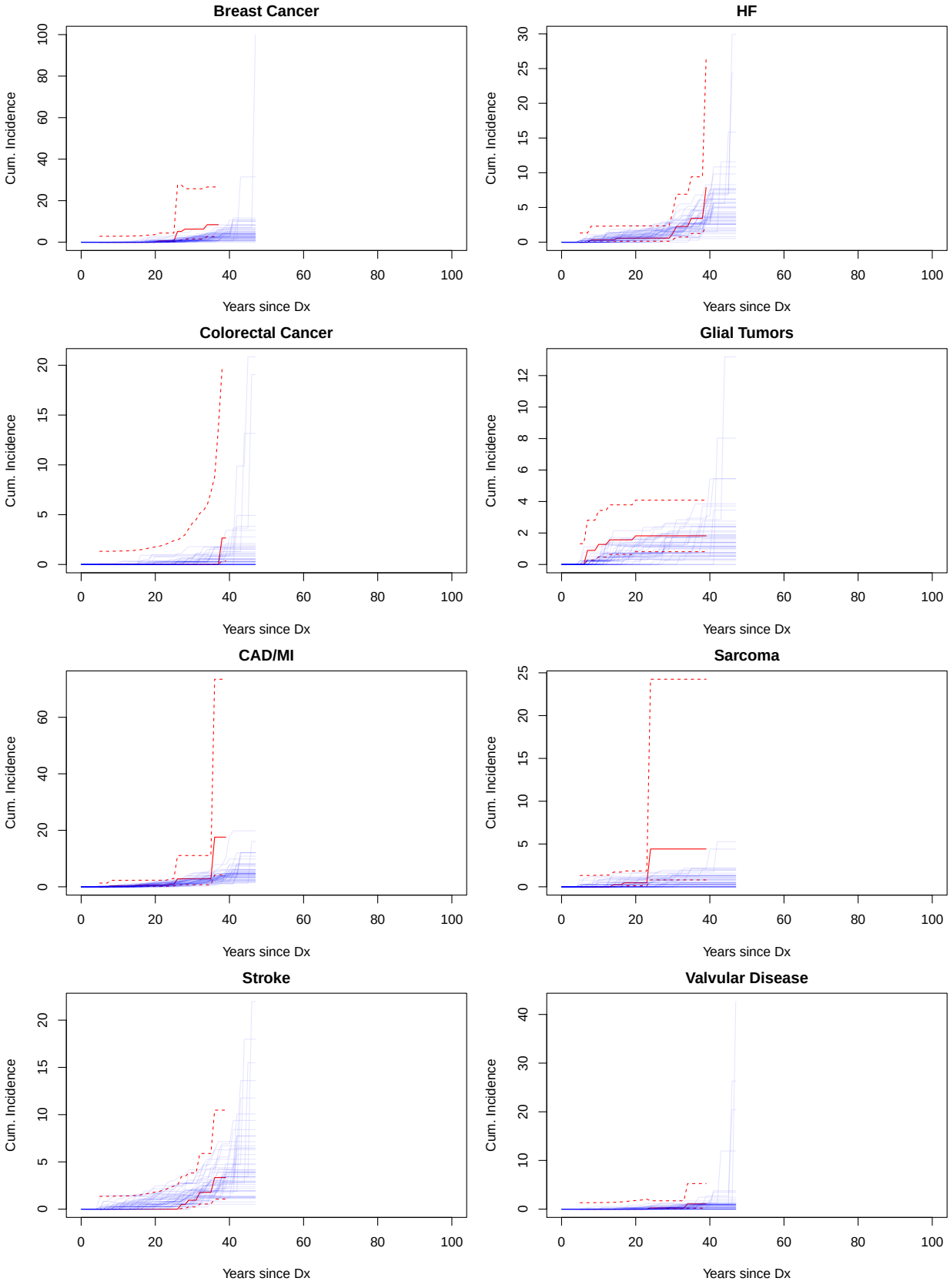




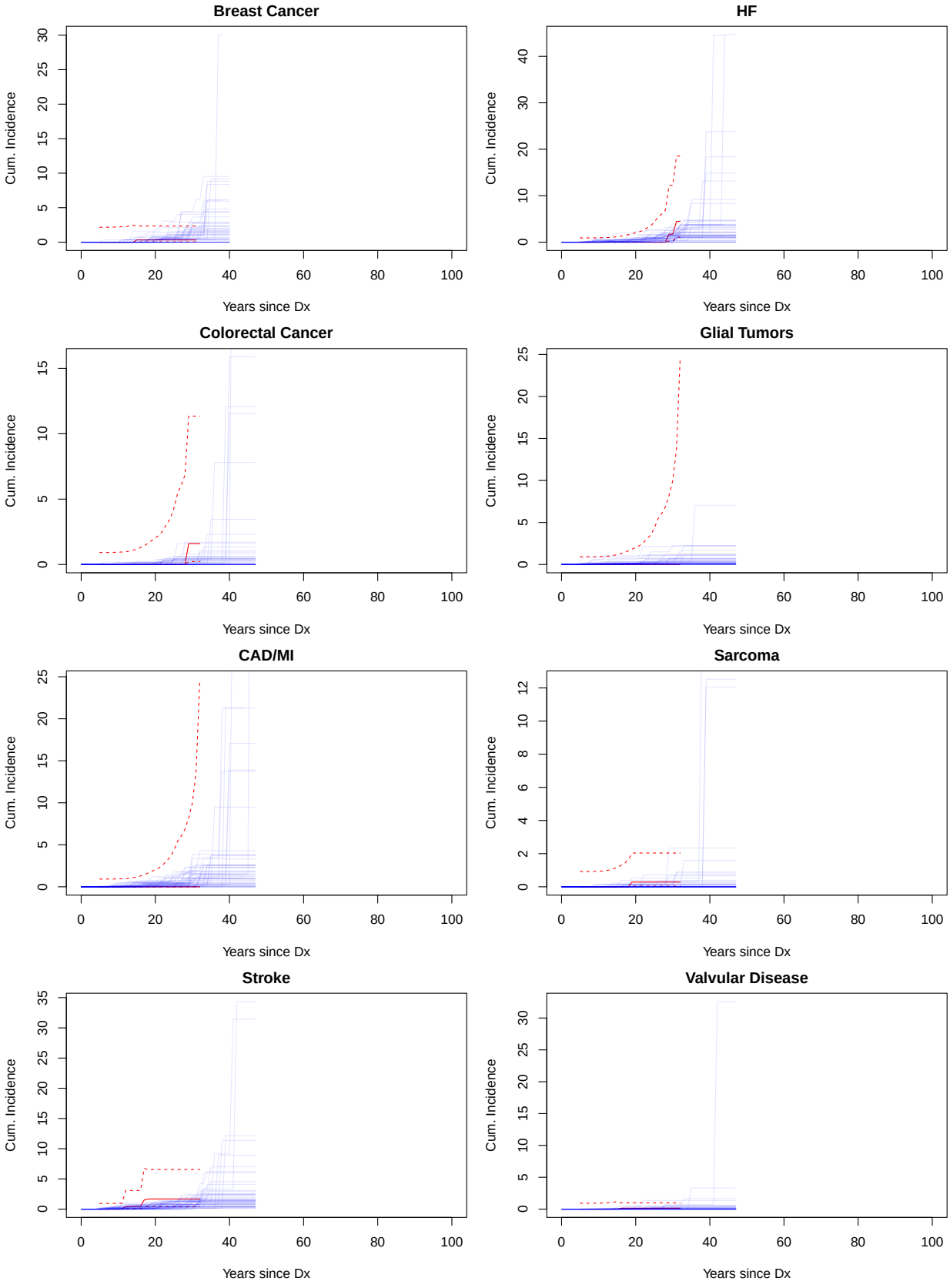




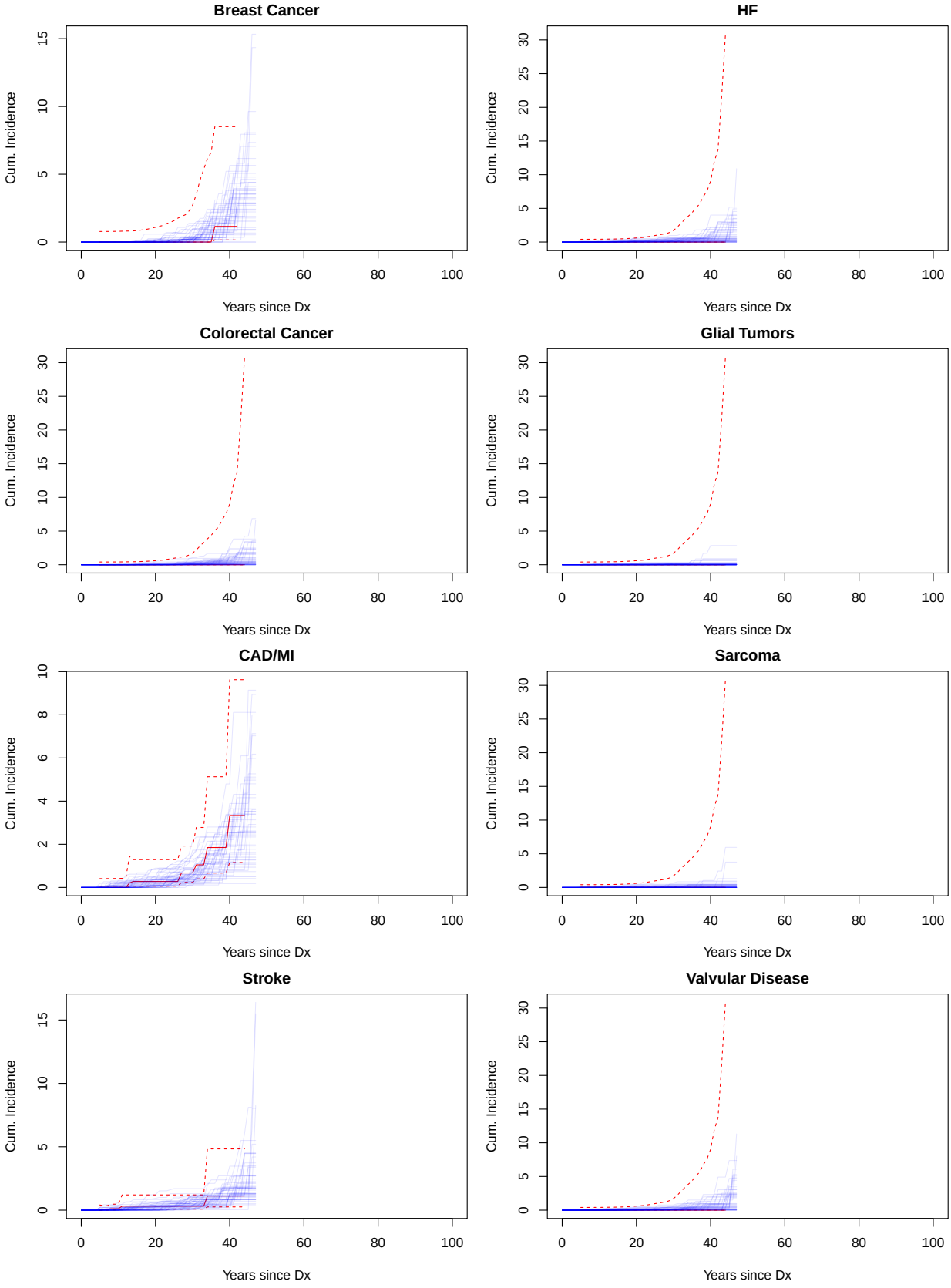
4.3.1.84 ALL grp: 1980s HR-like



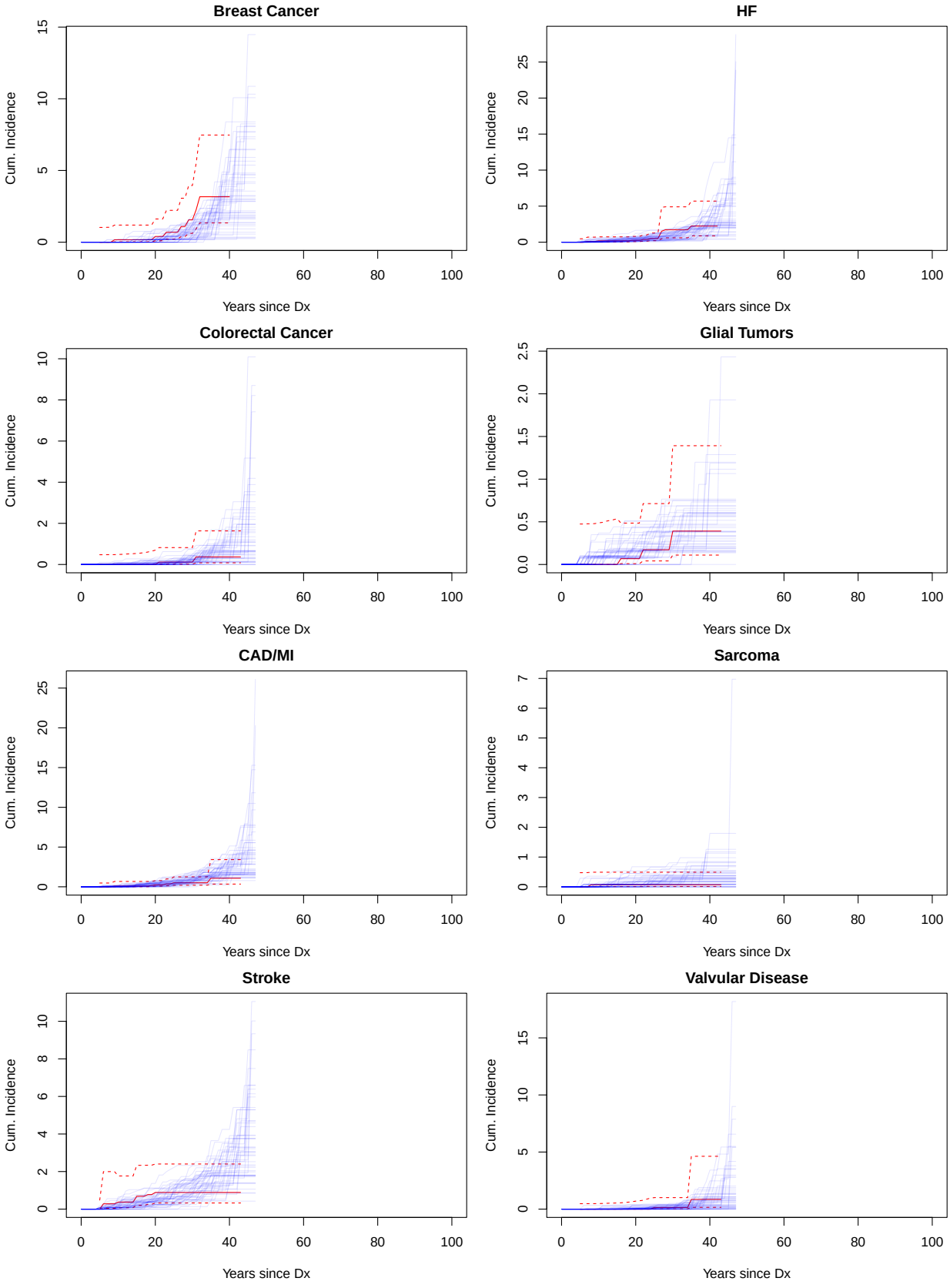
4.3.1.85 ALL grp: 1990s HR-like



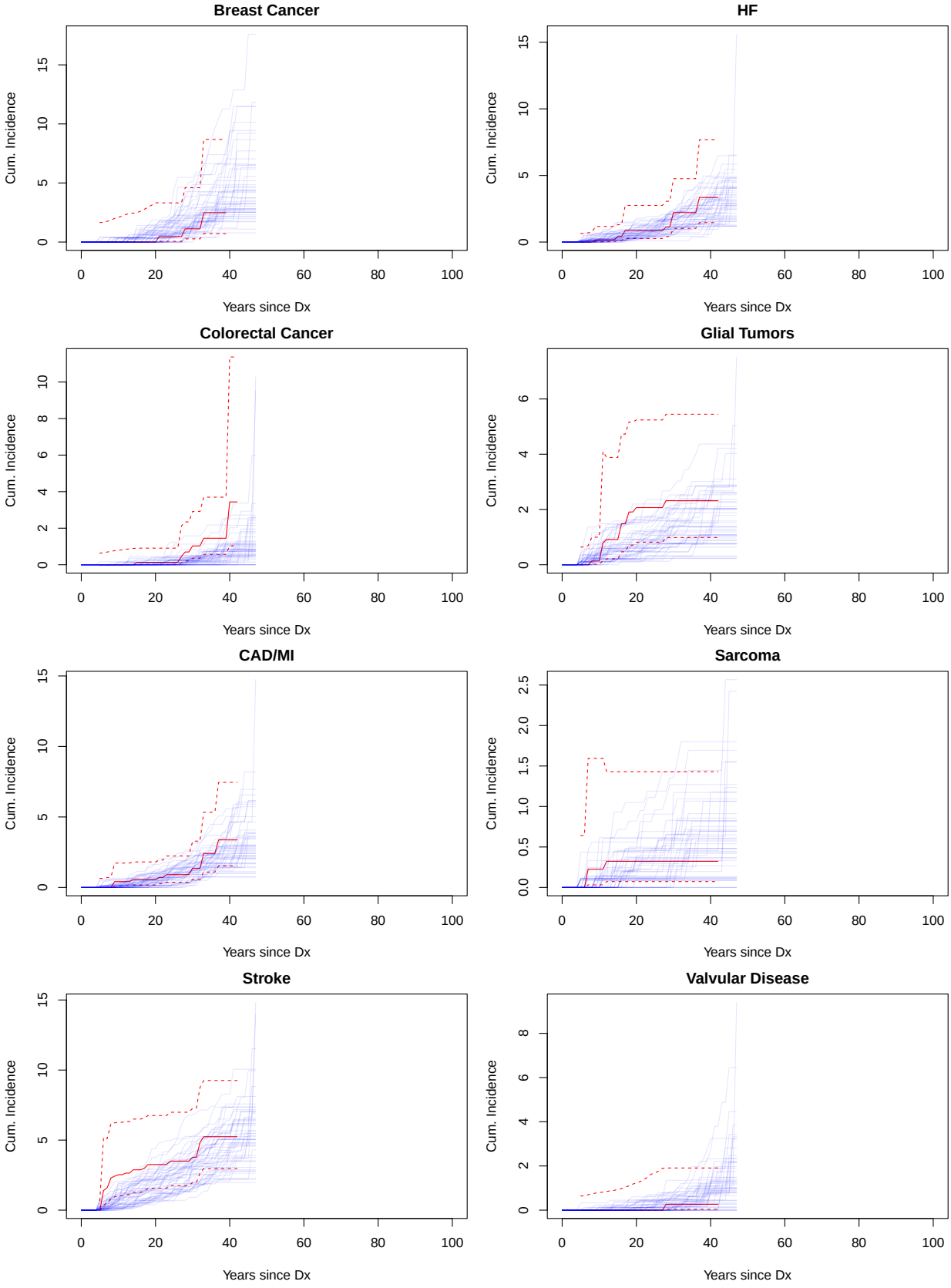
4.3.1.86 ALL grp: 1990s SR/Essig



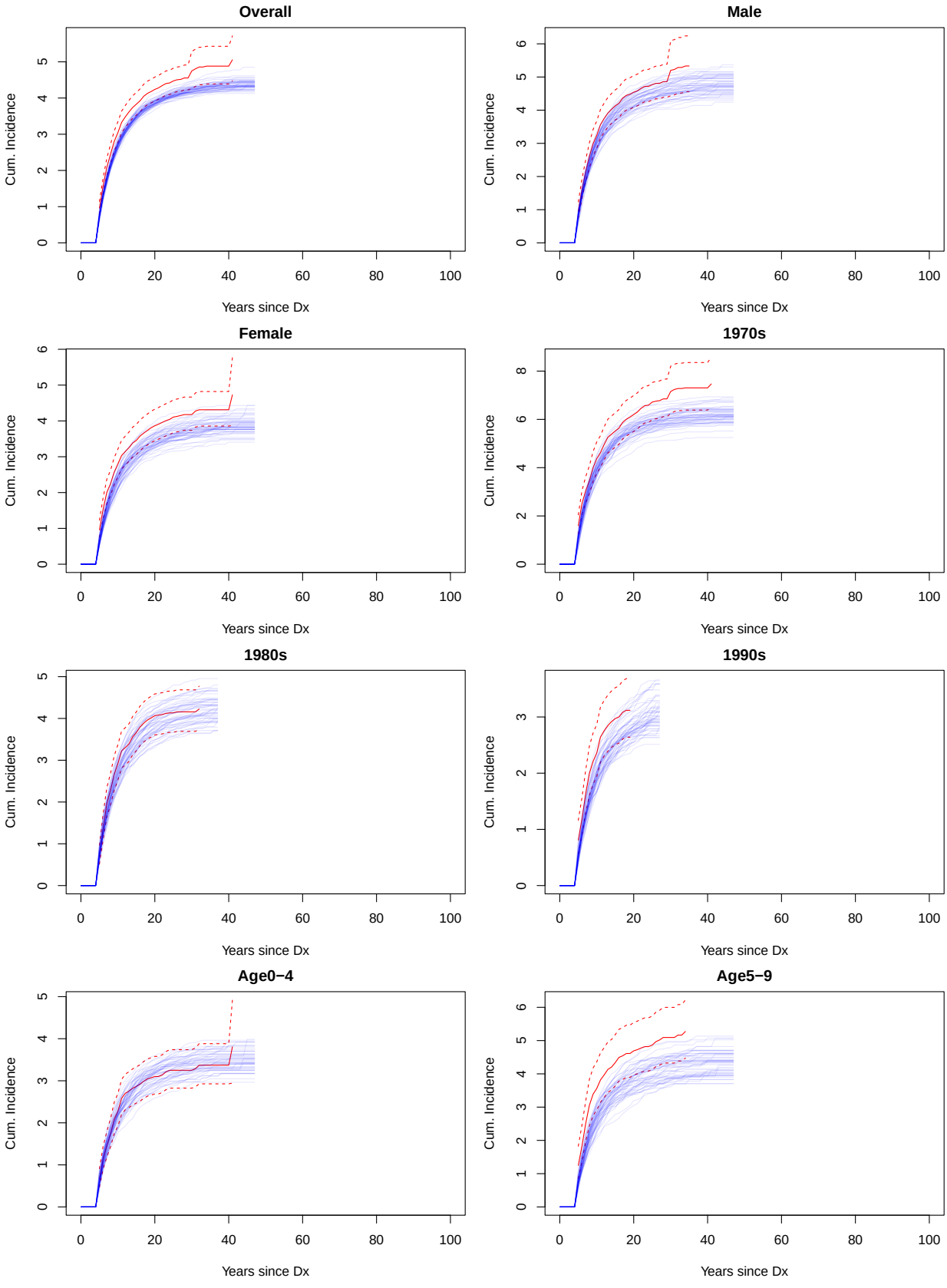
4.3.1.87 ALL grp: Other

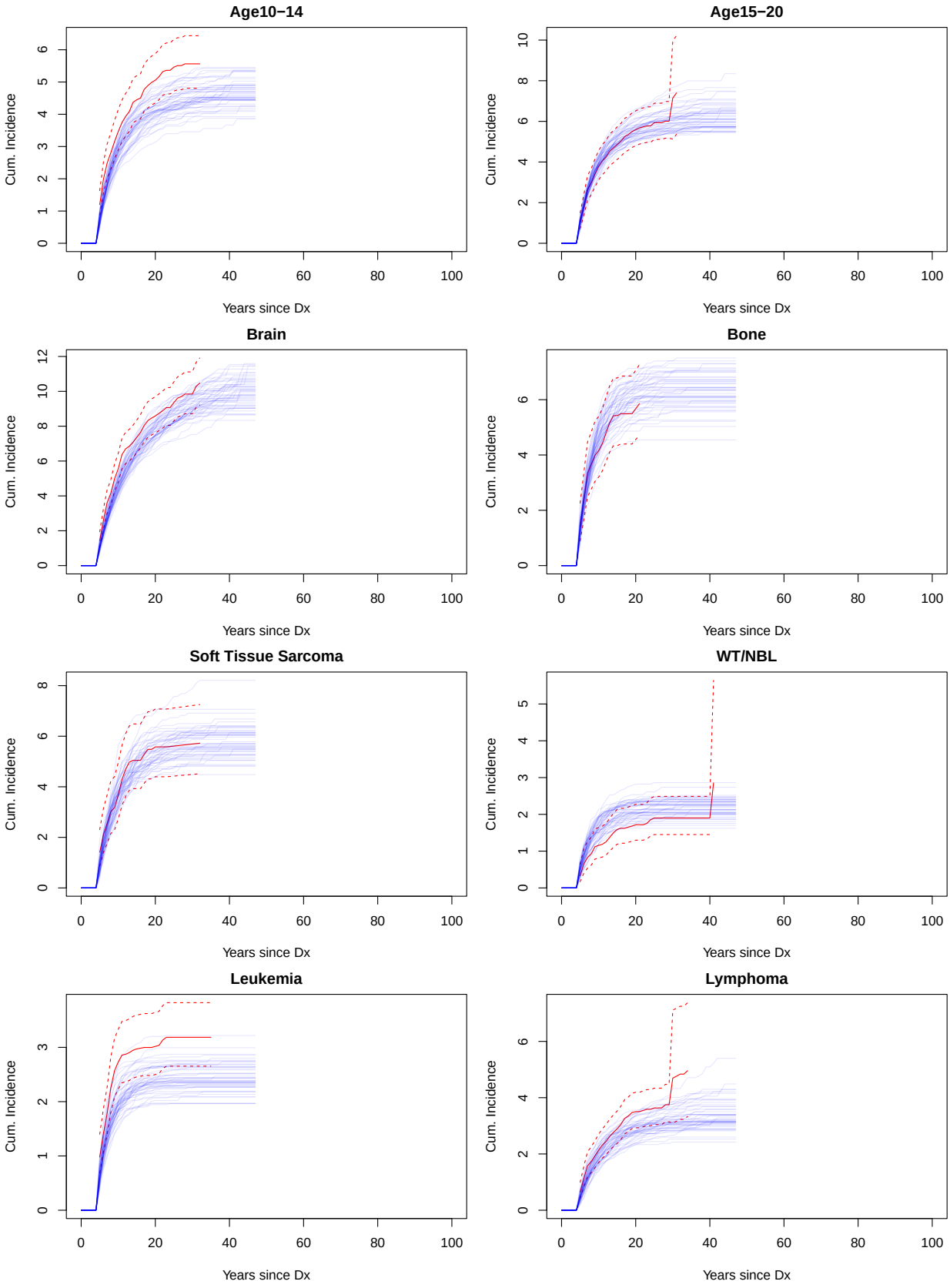


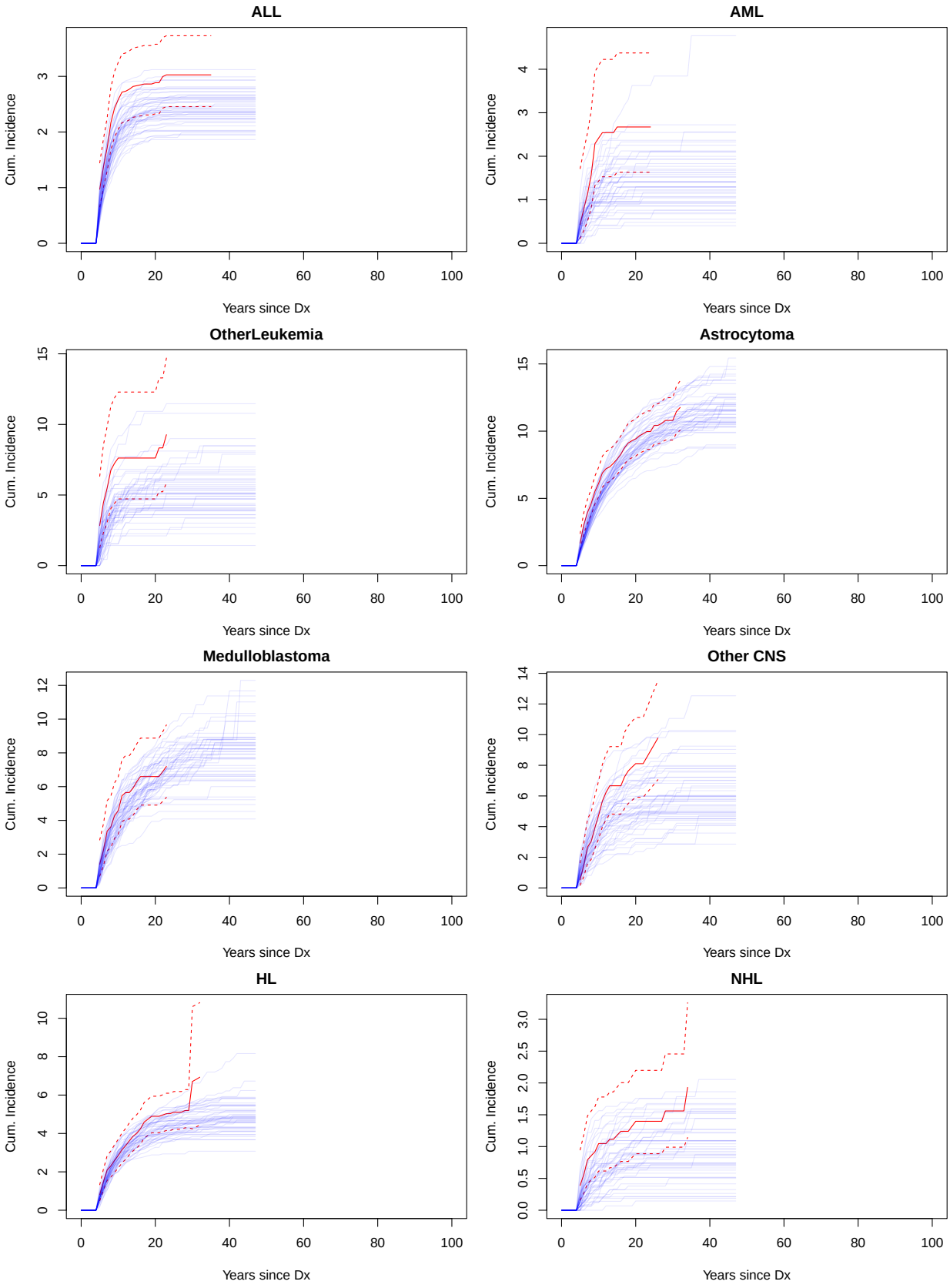
4.3.1.88 ALL grp: Relapse/Transplant

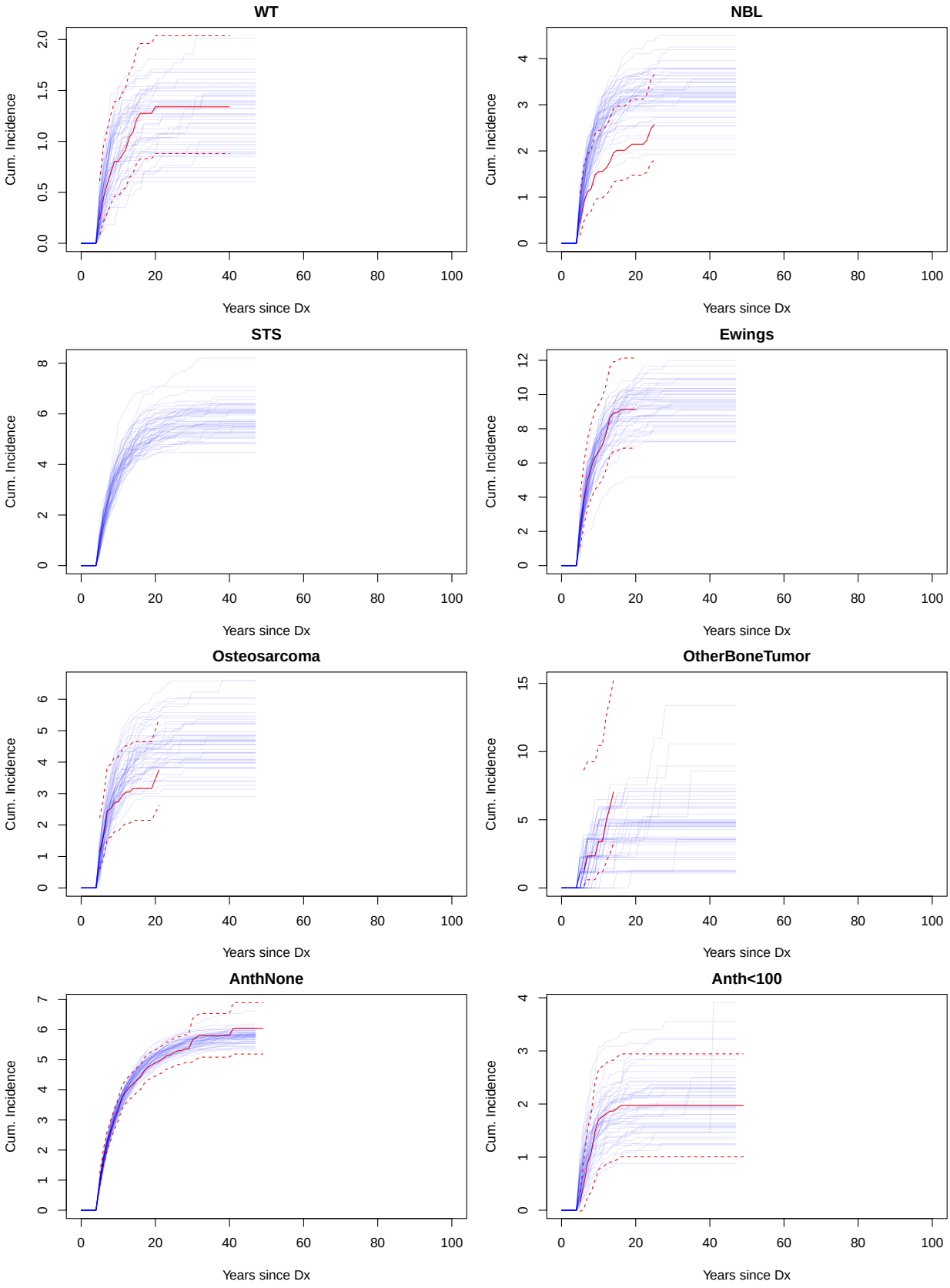


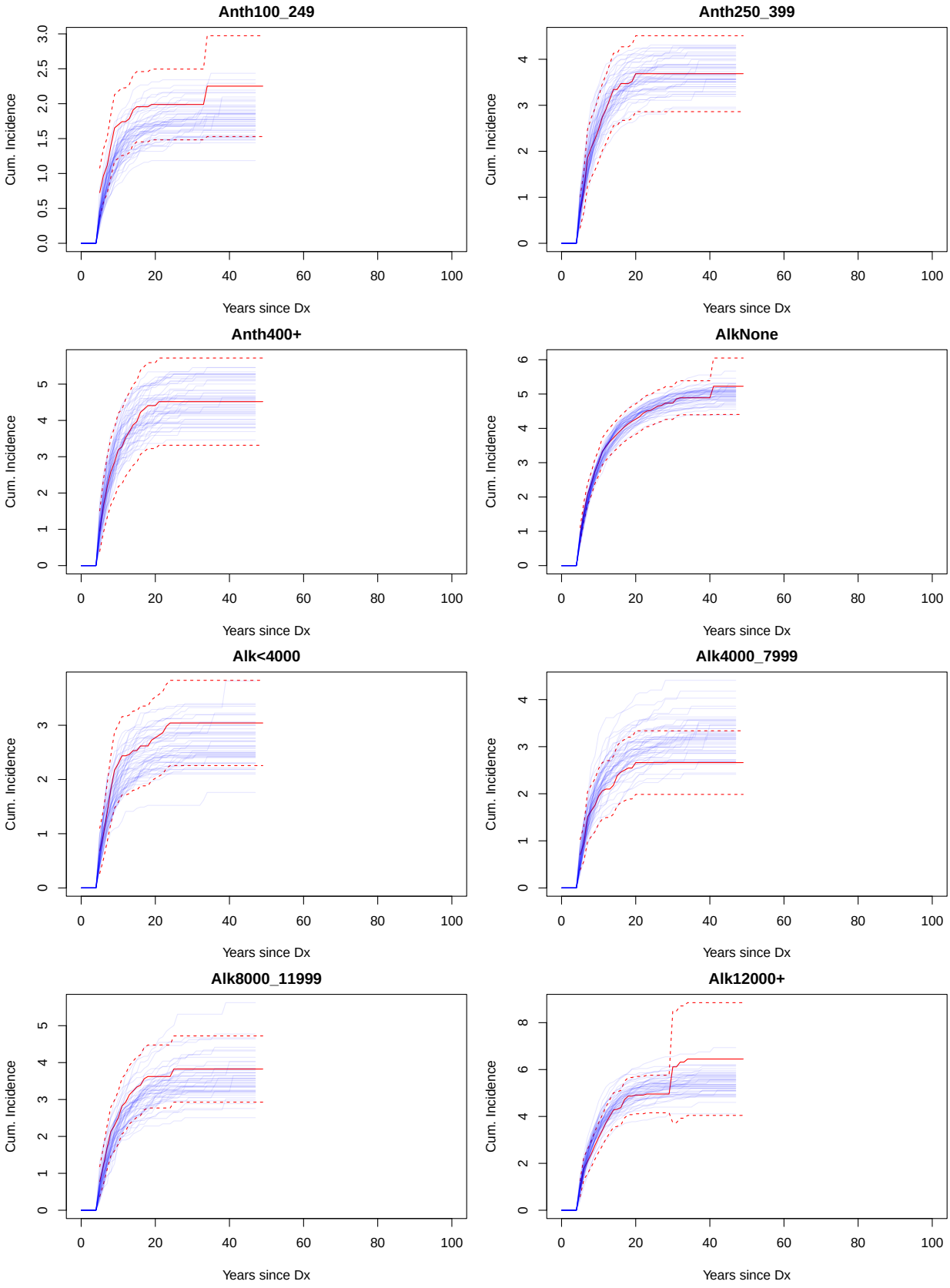
4.3.2 Late Recurrence

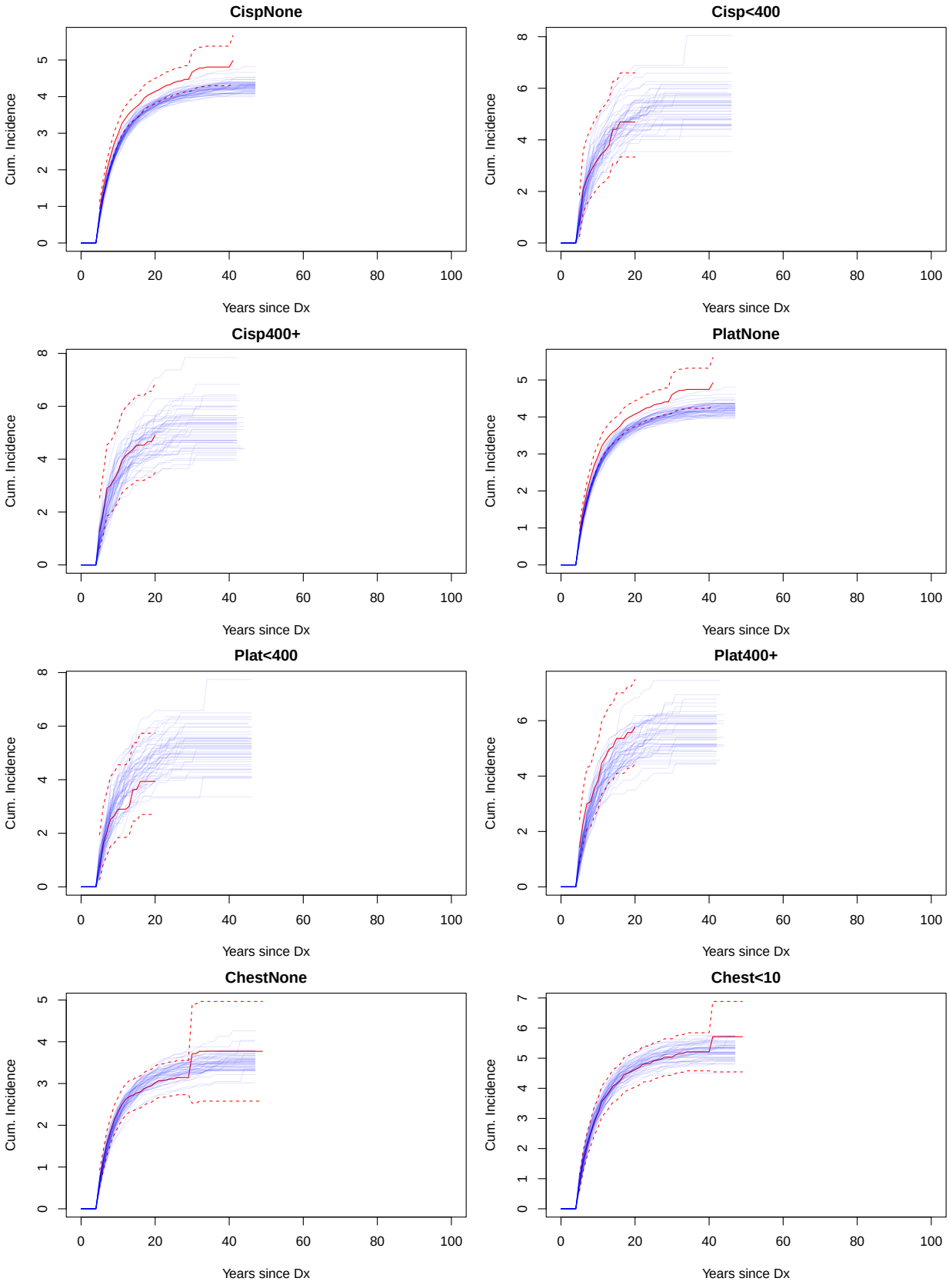


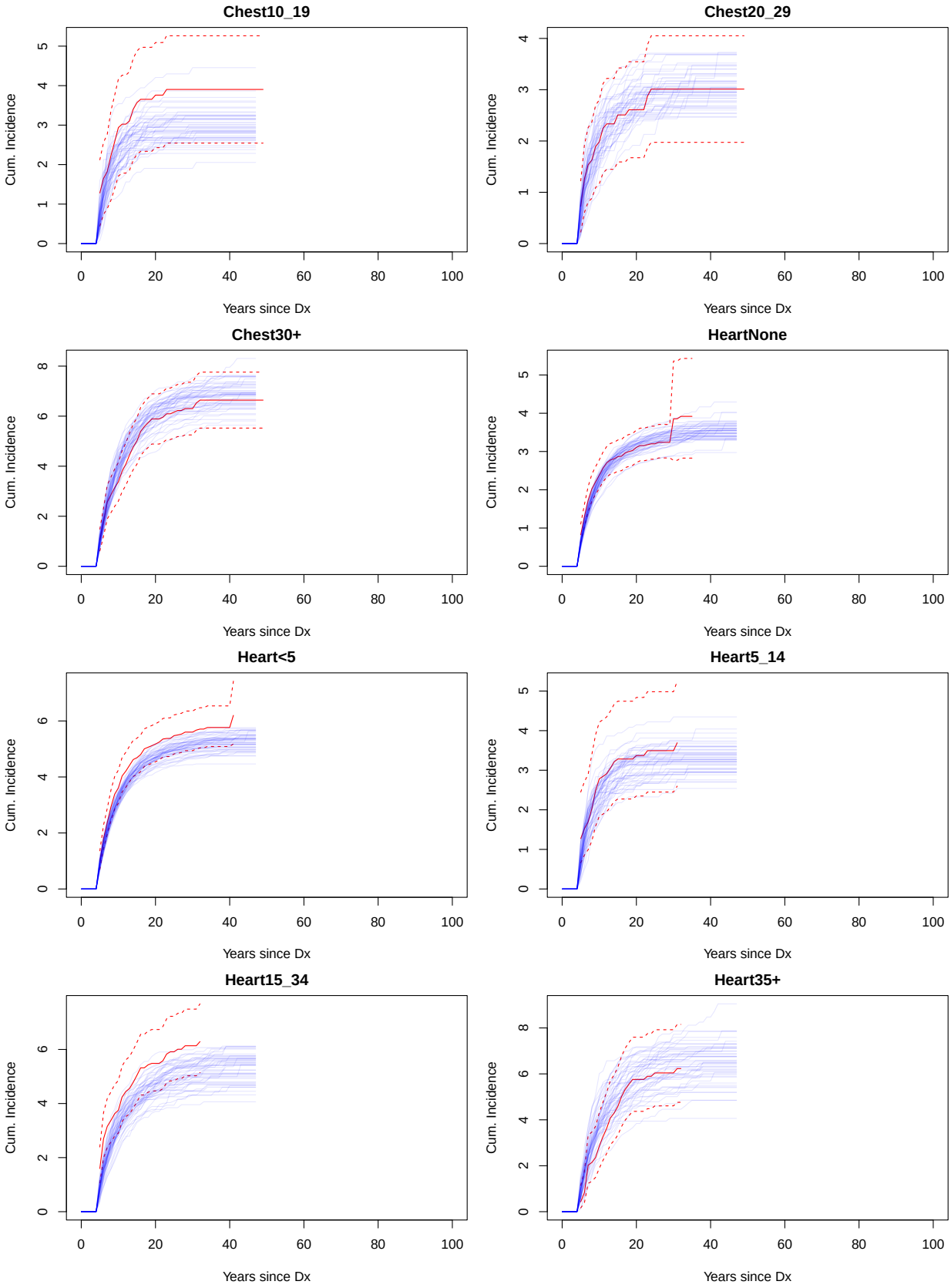

Age10−14
Age15−20
Brain
Bone
Soft Tissue Sarcoma
WT/NBL
Leukemia
Lymphoma
Cum. Incidence
Years since Dx

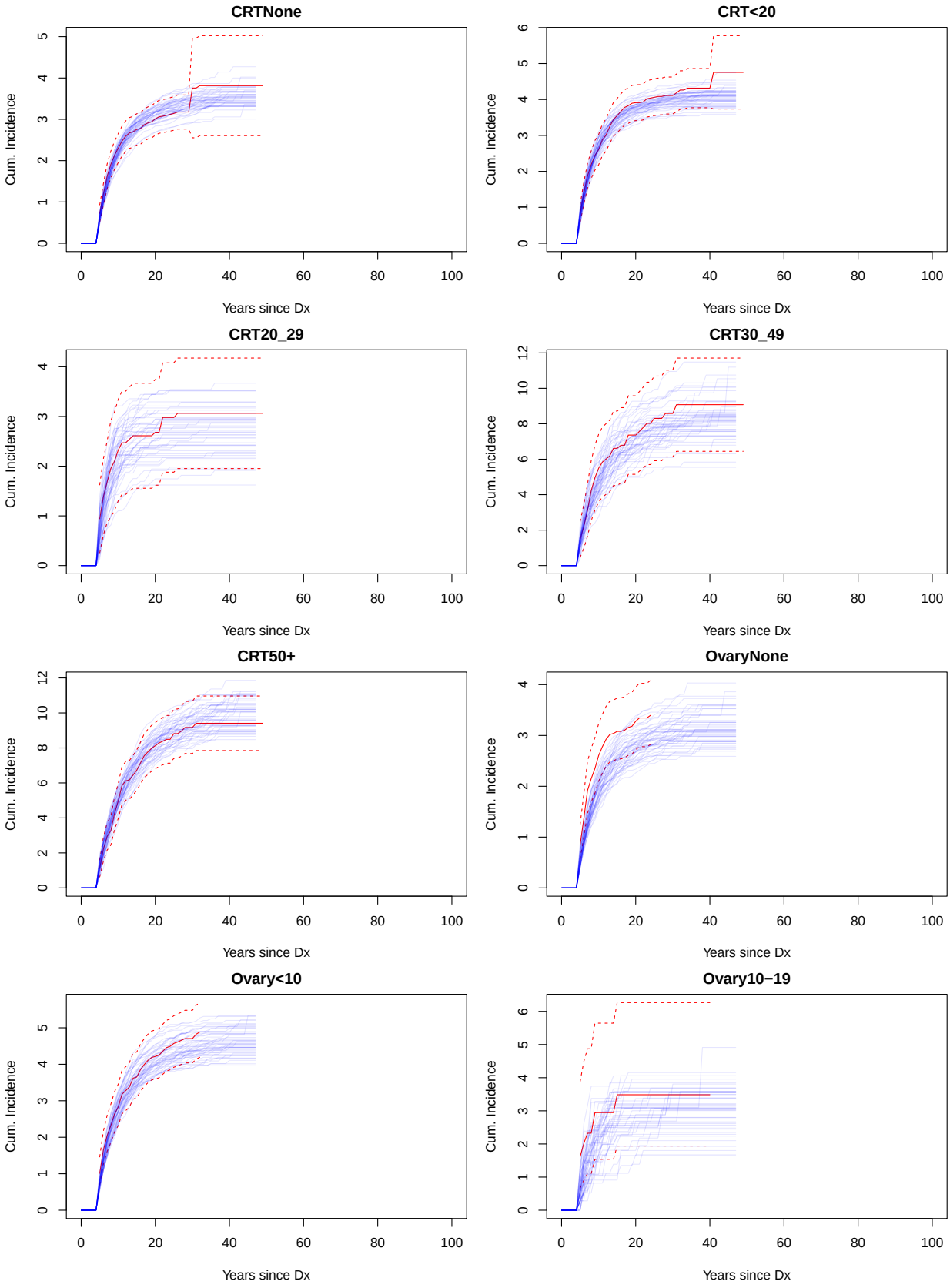

ALL
AML
OtherLeukemia
Astrocytoma
Medulloblastoma
Other CNS
HL
NHL
Cum. Incidence
Years since Dx

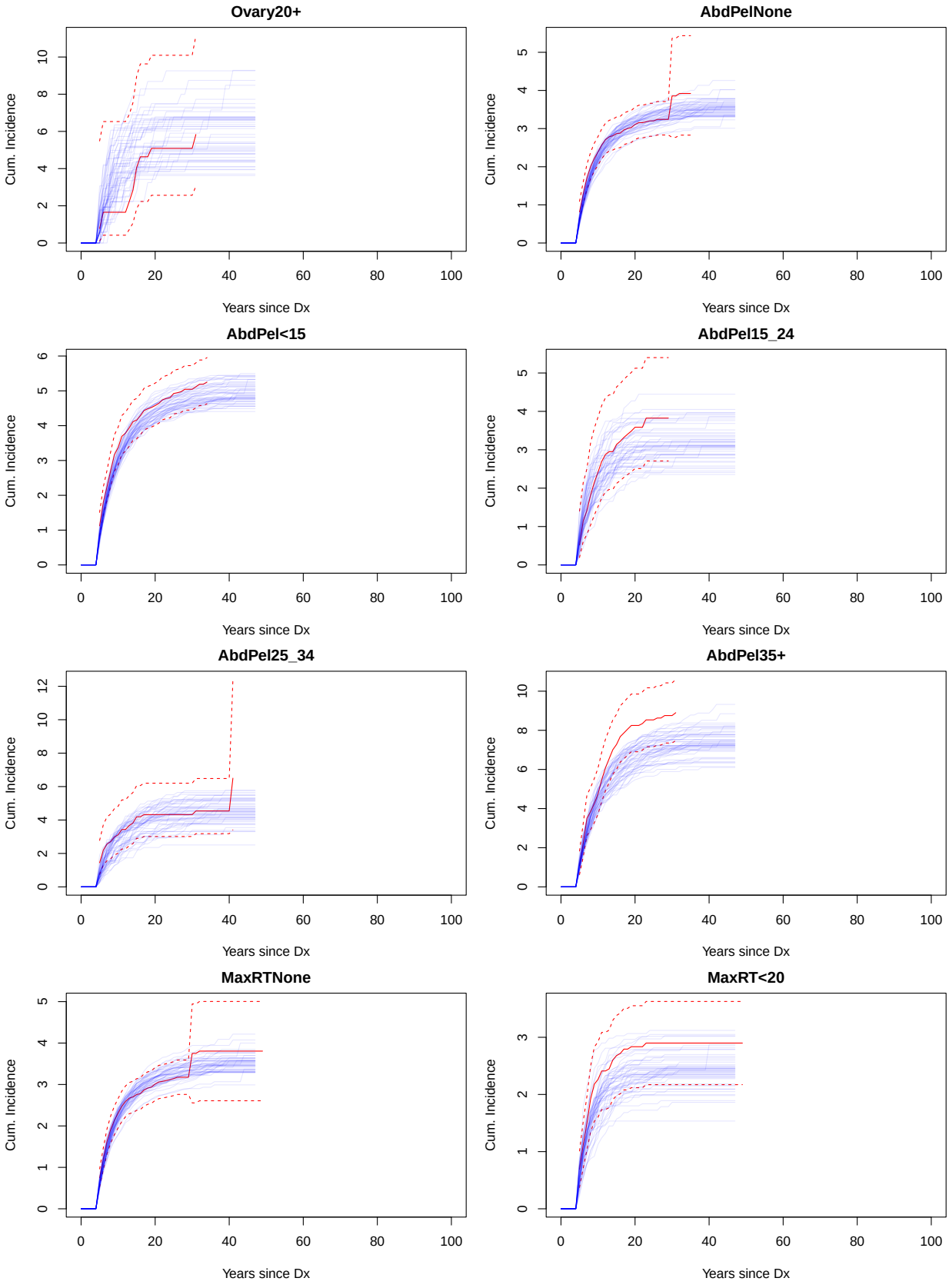

WT
NBL
STS
Ewings
Osteosarcoma
OtherBoneTumor
AnthNone
Anth<100
Cum. Incidence
Years since Dx

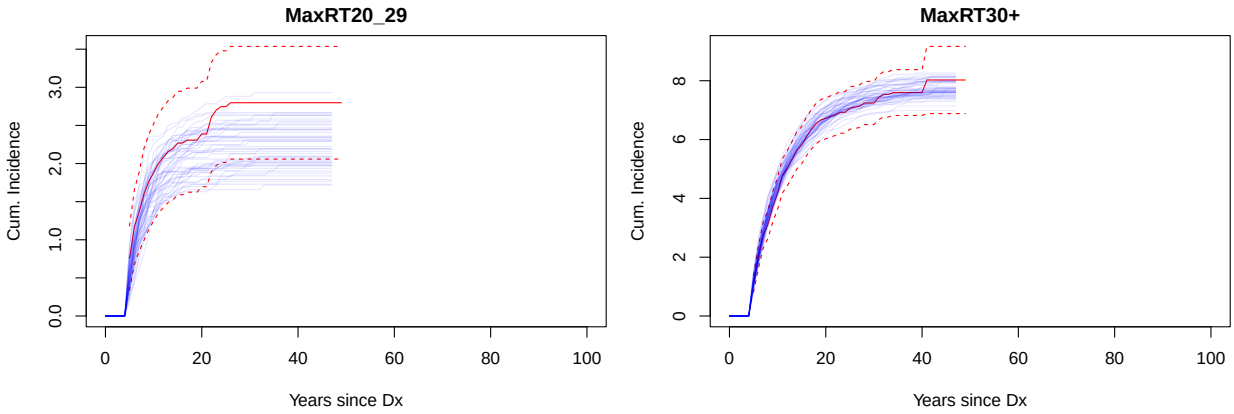

Anth100_249
Anth250_399
Anth400+
AlkNone
Alk<4000
Alk4000_7999
Alk8000_11999
Alk12000+
Cum. Incidence
Years since Dx


CispNone
Cisp<400
Cisp400+
PlatNone
Plat<400
Plat400+
ChestNone
Chest<10
Cum. Incidence
Years since Dx

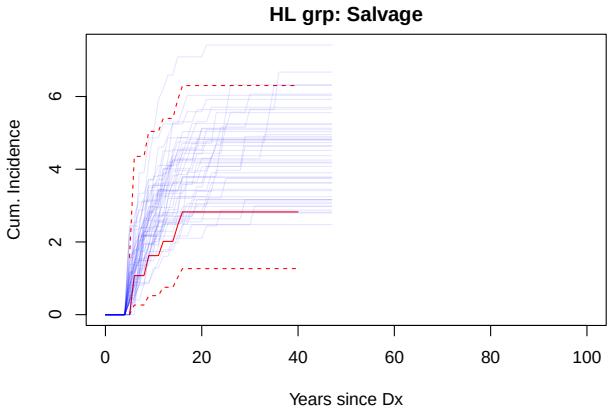

Chest10_19
Chest20_29
Chest30+
HeartNone
Heart<5
Heart5_14
Heart15_34
Heart35+
Cum. Incidence
Years since Dx
0
20
40
60
80
100

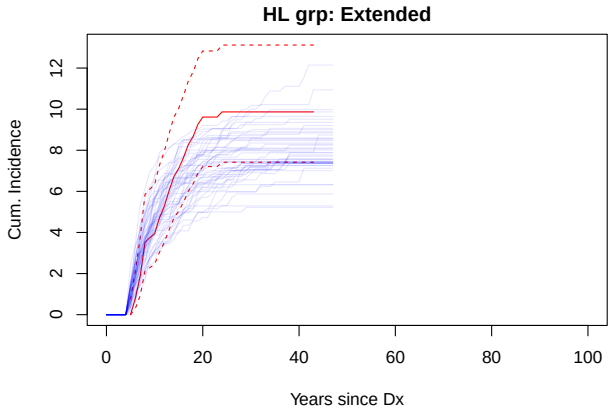

CRTNone
CRT<20
CRT20_29
CRT30_49
CRT50+
OvaryNone
Ovary<10
Ovary10−19
Cum. Incidence
Years since Dx

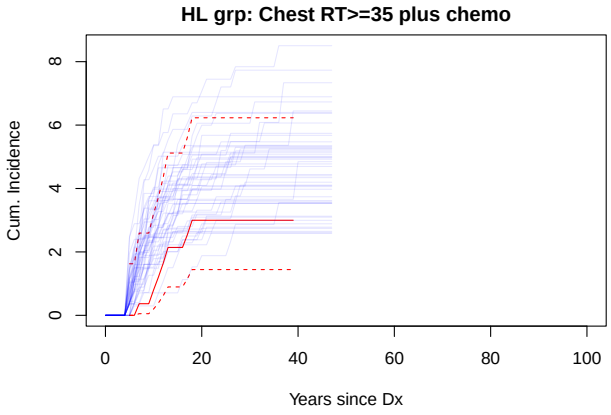

Ovary20+
AbdPelNone
AbdPel<15
AbdPel15_24
AbdPel25_34
AbdPel35+
MaxRTNone
MaxRT<20
Cum. Incidence
Years since Dx

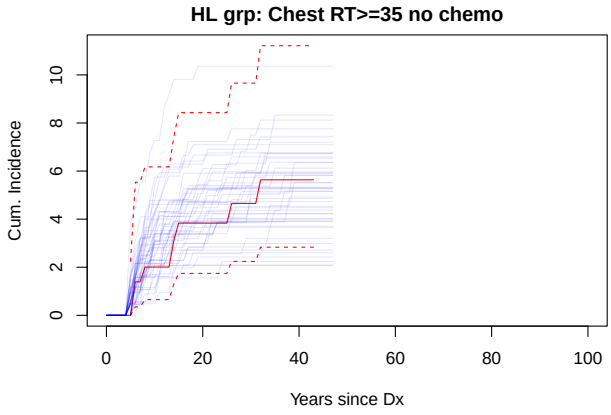

MaxRT20_29
Cum. Incidence
0.0
1.0
2.0
3.0
0
20
40
60
80
100
Years since Dx

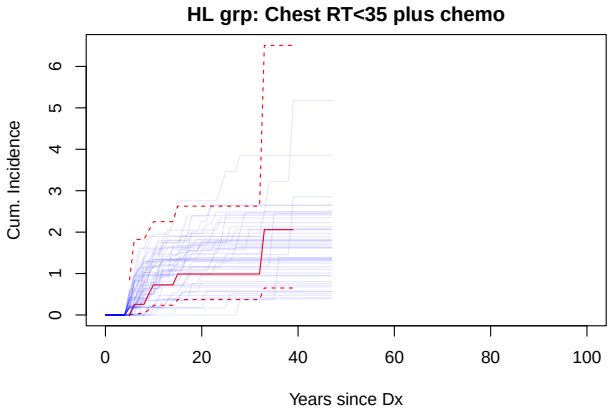
MaxRT30+
Cum. Incidence
0
2
4
6
8
0
20
40
60
80
100
Years since Dx

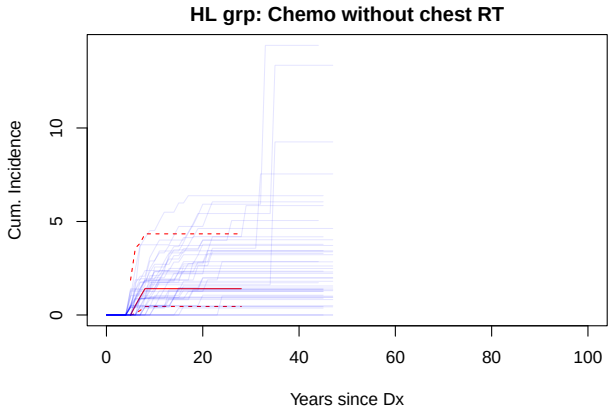

HL grp: Salvage
Cum. Incidence
0
2
4
6
0
20
40
60
80
100
Years since Dx

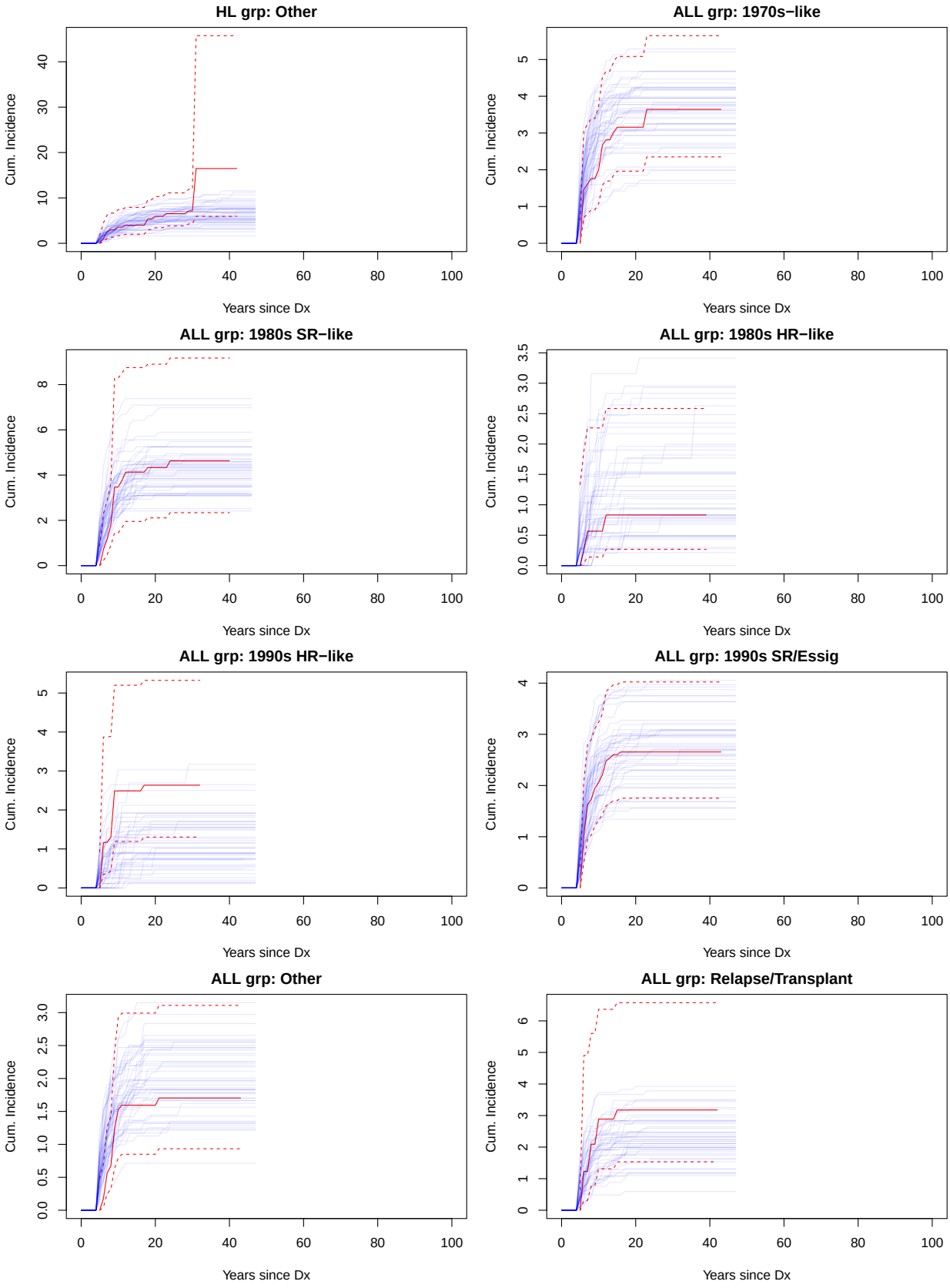

HL grp: Extended
Cum. Incidence
0
2
4
6
8
10
12
0
20
40
60
80
100
Years since Dx


HL grp: Chest RT>=35 plus chemo
Cum. Incidence
0
2
4
6
8
0
20
40
60
80
100
Years since Dx

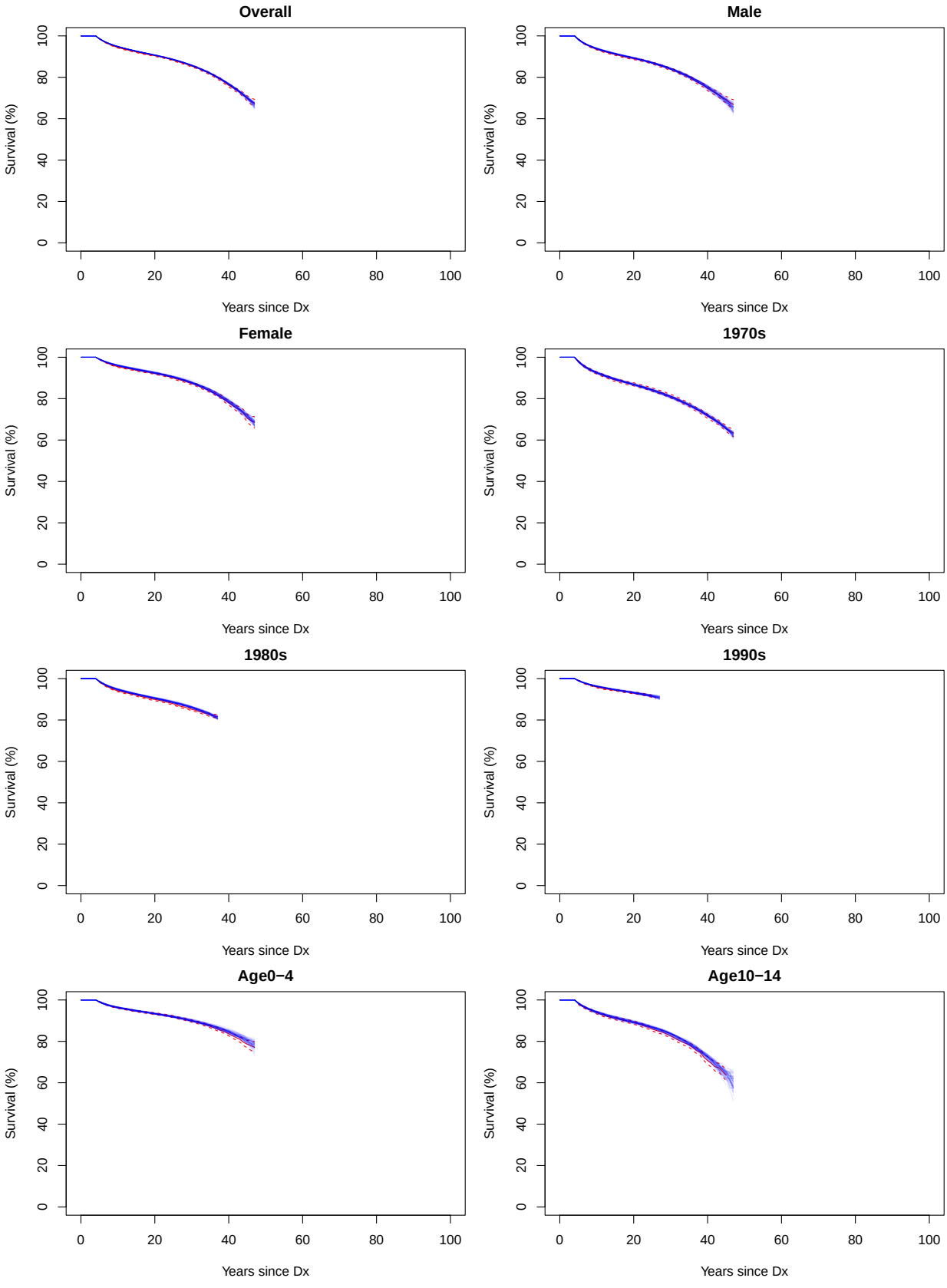

HL grp: Chest RT>=35 no chemo
Cum. Incidence
0
2
4
6
8
10
0
20
40
60
80
100
Years since Dx

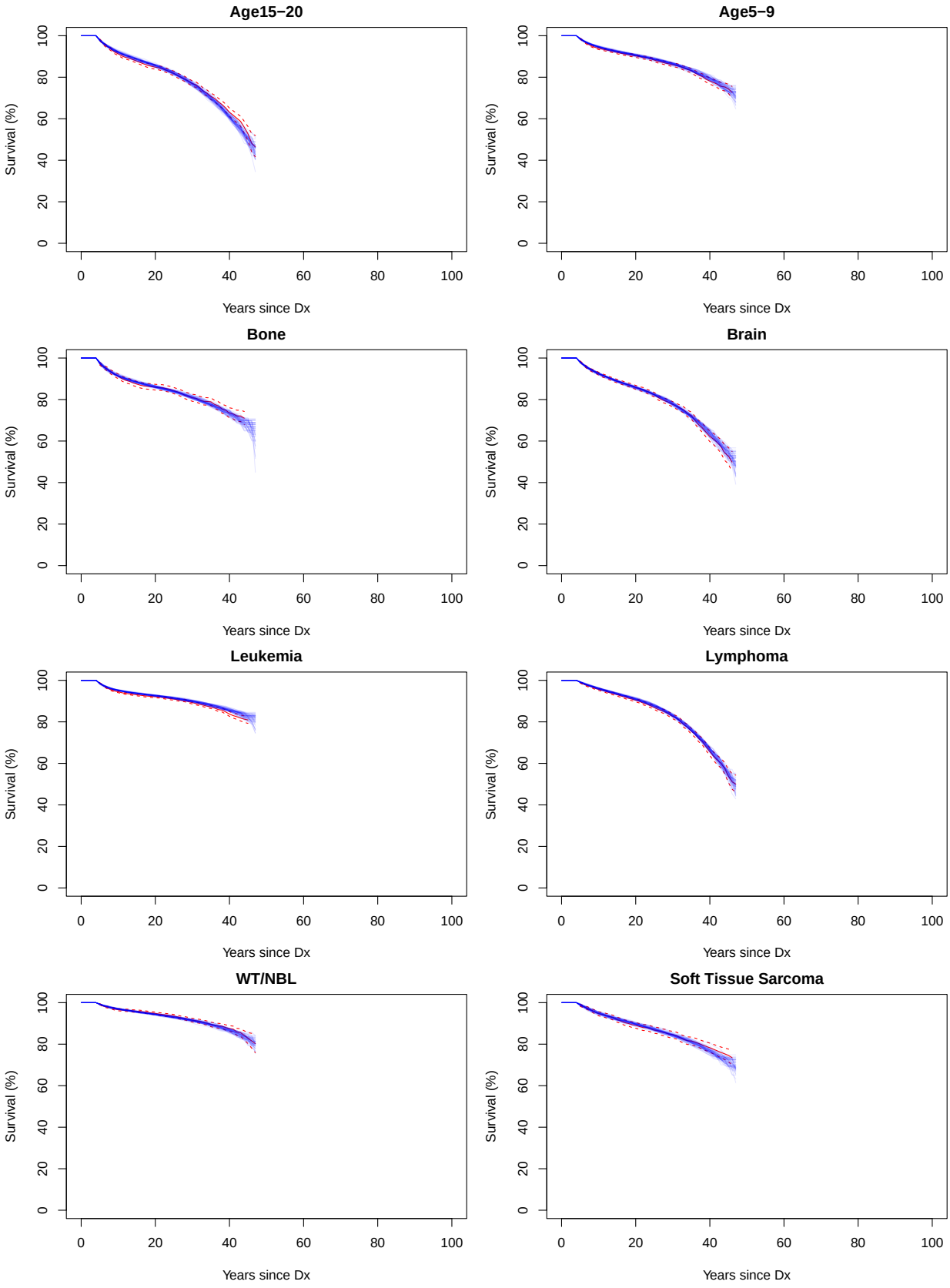

HL grp: Chest RT<35 plus chemo
Cum. Incidence
0
1
2
3
4
5
6
0
20
40
60
80
100
Years since Dx

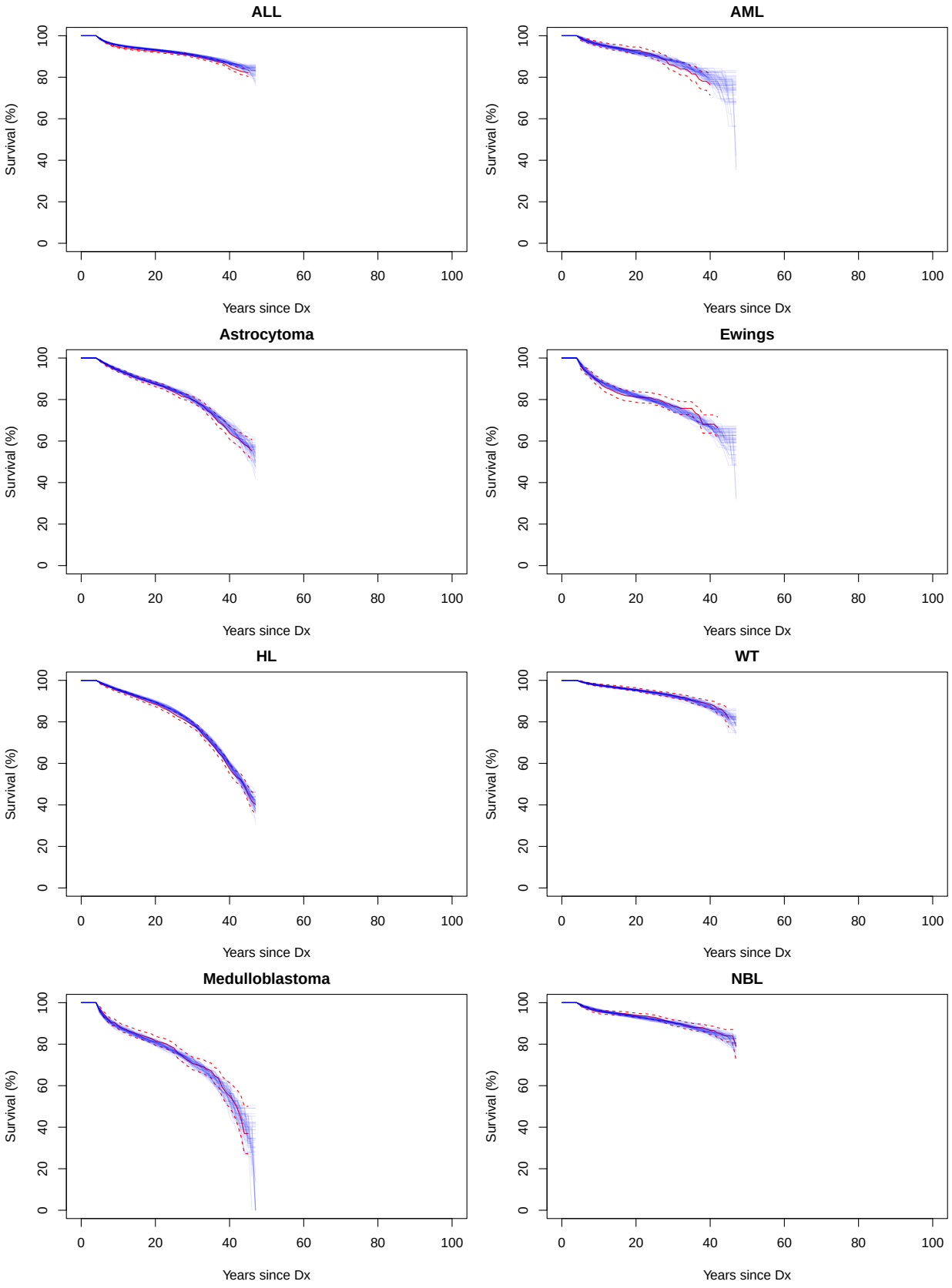

HL grp: Chemo without chest RT
Cum. Incidence
0
5
10
0
20
40
60
80
100
Years since Dx

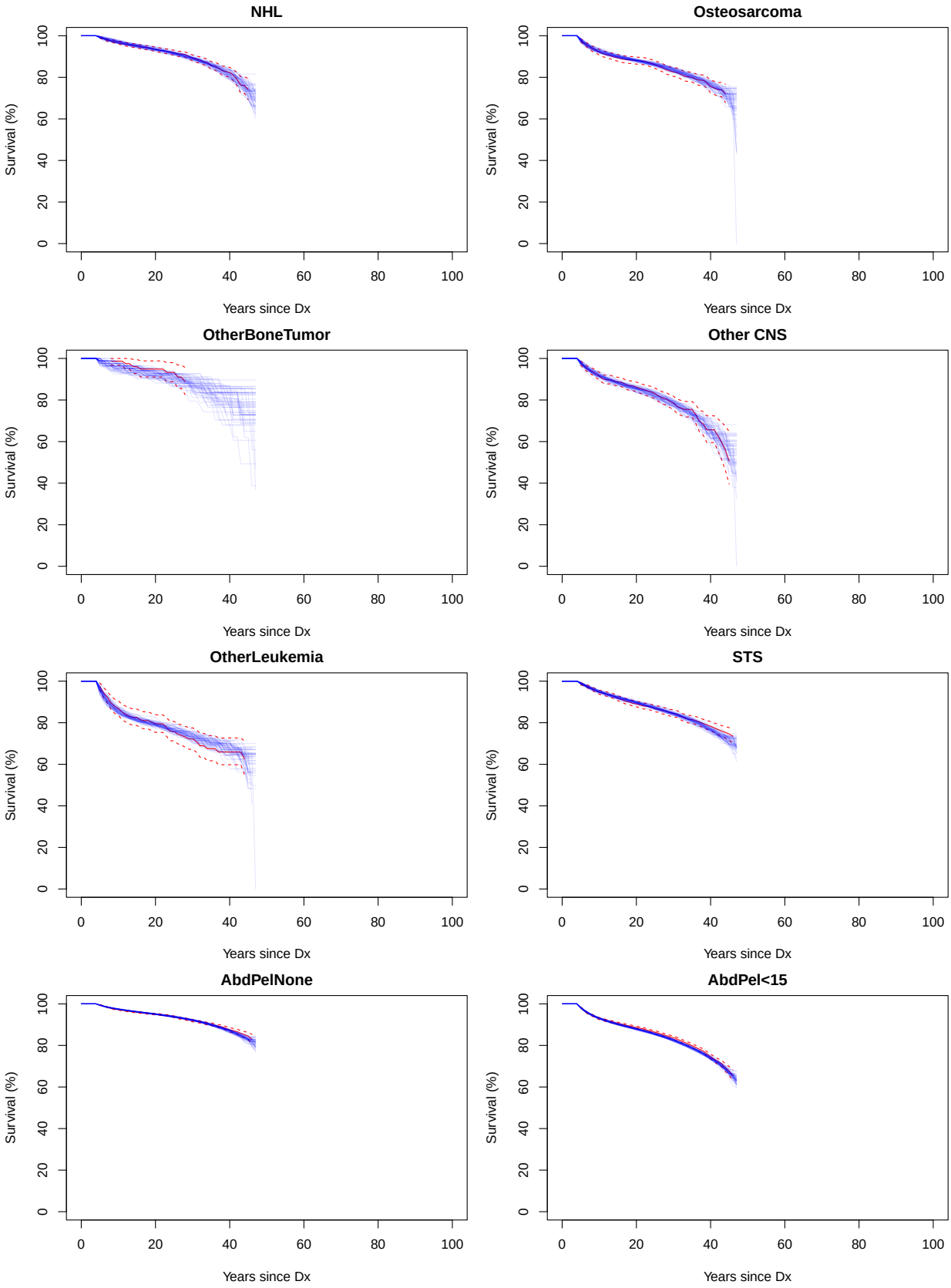

HL grp: Other
ALL grp: 1970s−like
ALL grp: 1980s SR−like
ALL grp: 1980s HR−like
ALL grp: 1990s HR−like
ALL grp: 1990s SR/Essig
ALL grp: Other
ALL grp: Relapse/Transplant
Cum. Incidence
Years since Dx

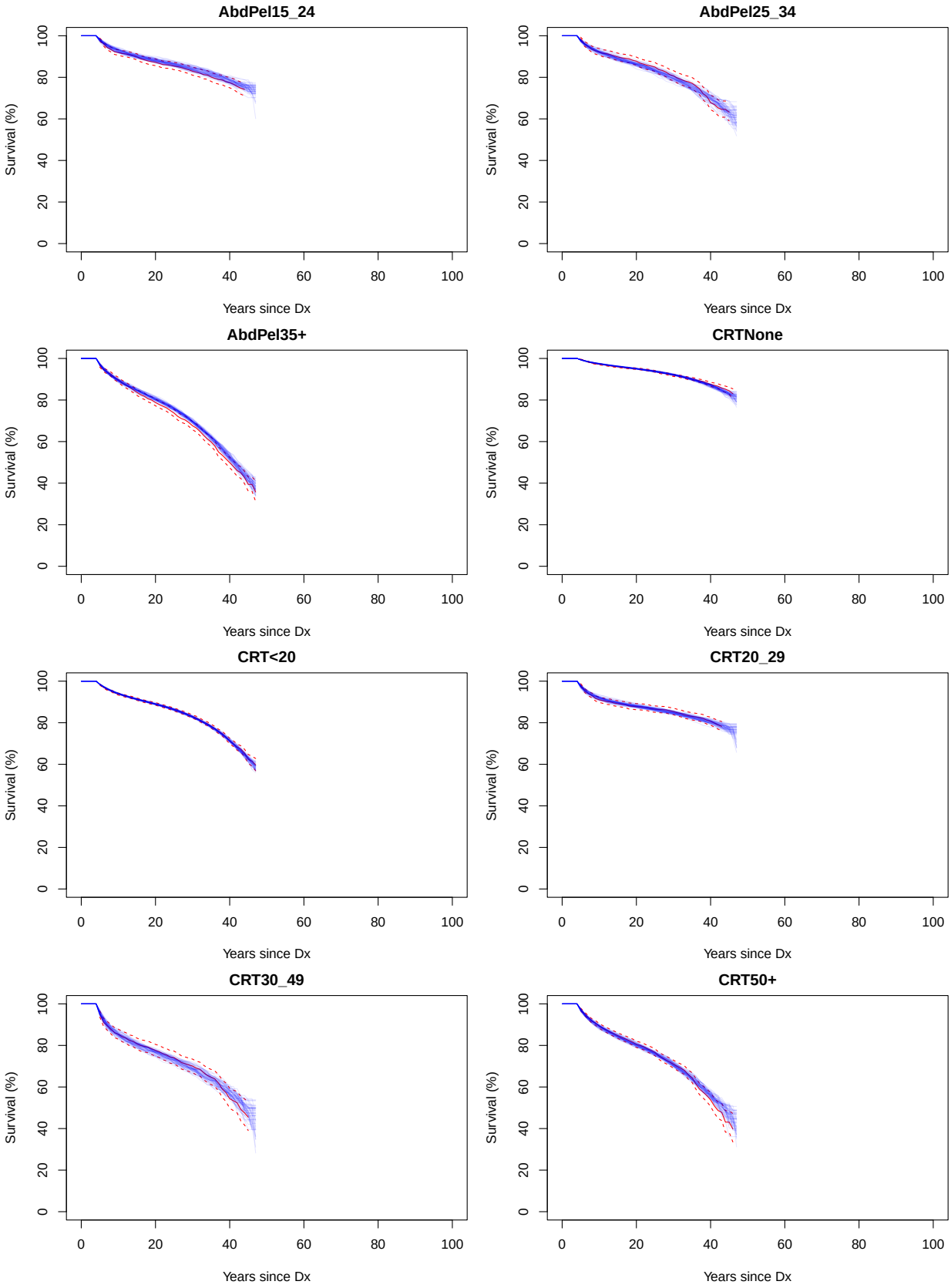
4.3.3 Survival

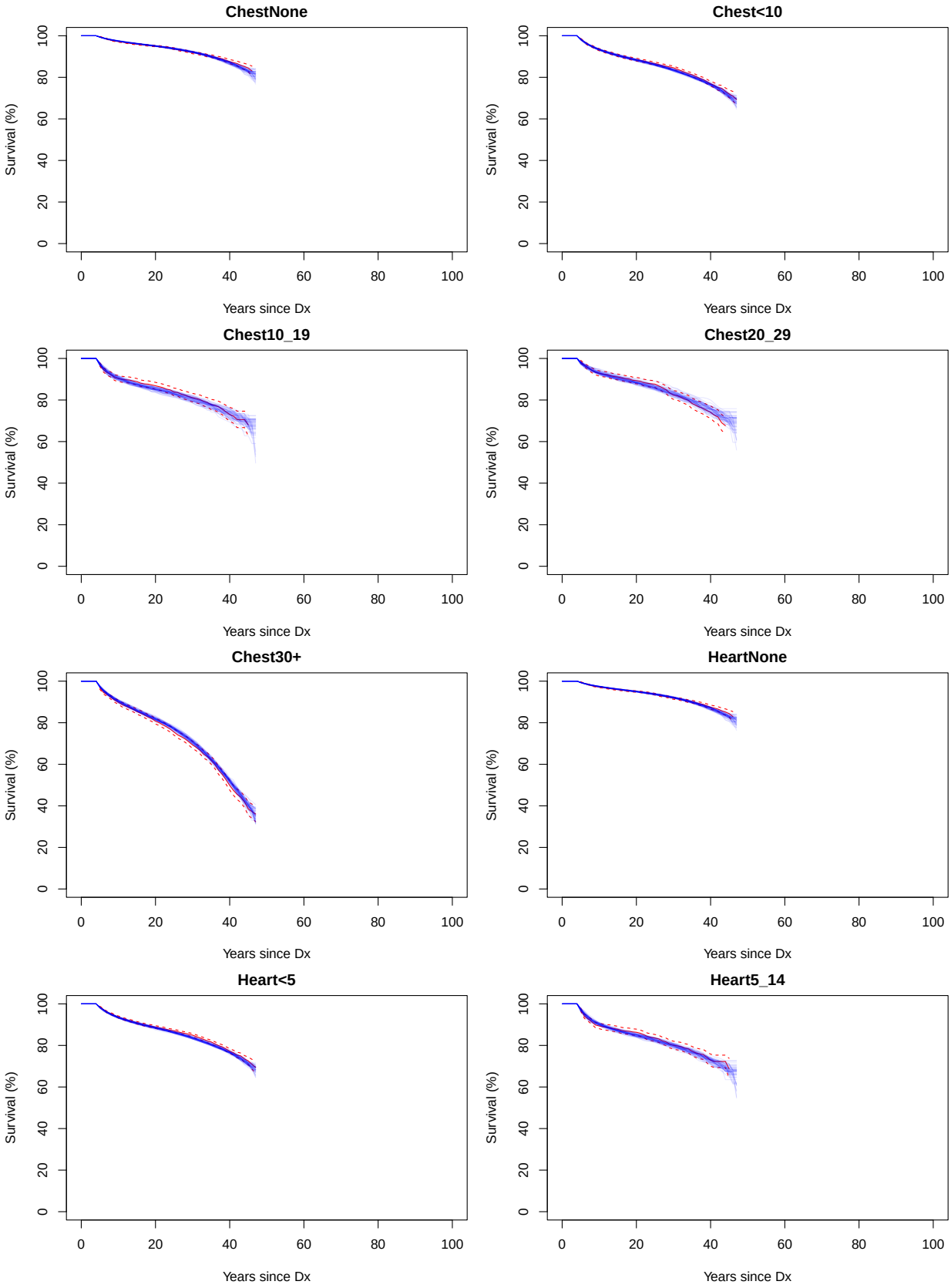


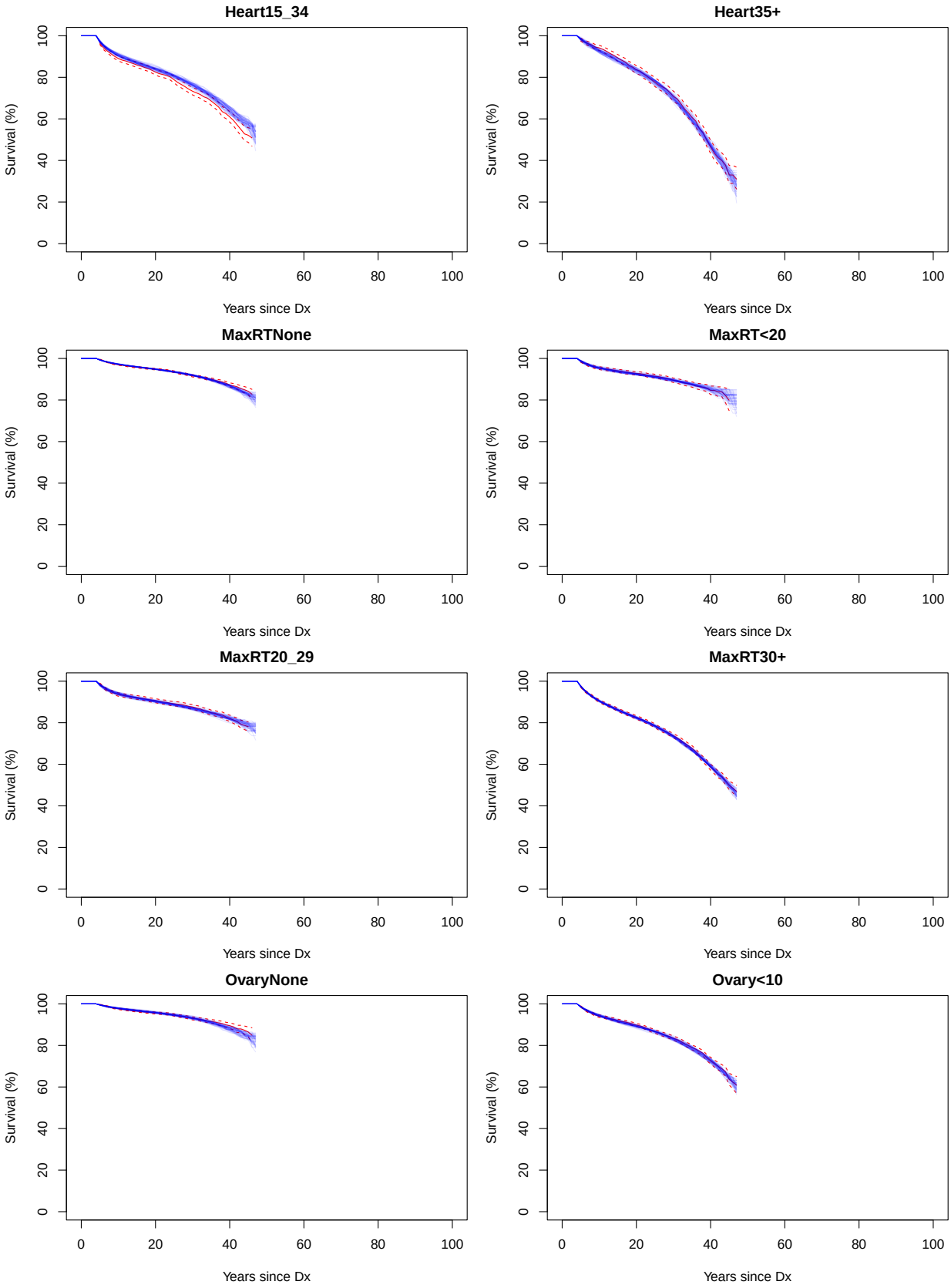

Age15−20
Age5−9
Bone
Brain
Leukemia
Lymphoma
WT/NBL
Soft Tissue Sarcoma
Survival (%)
Years since Dx
0
20
40
60
80
100

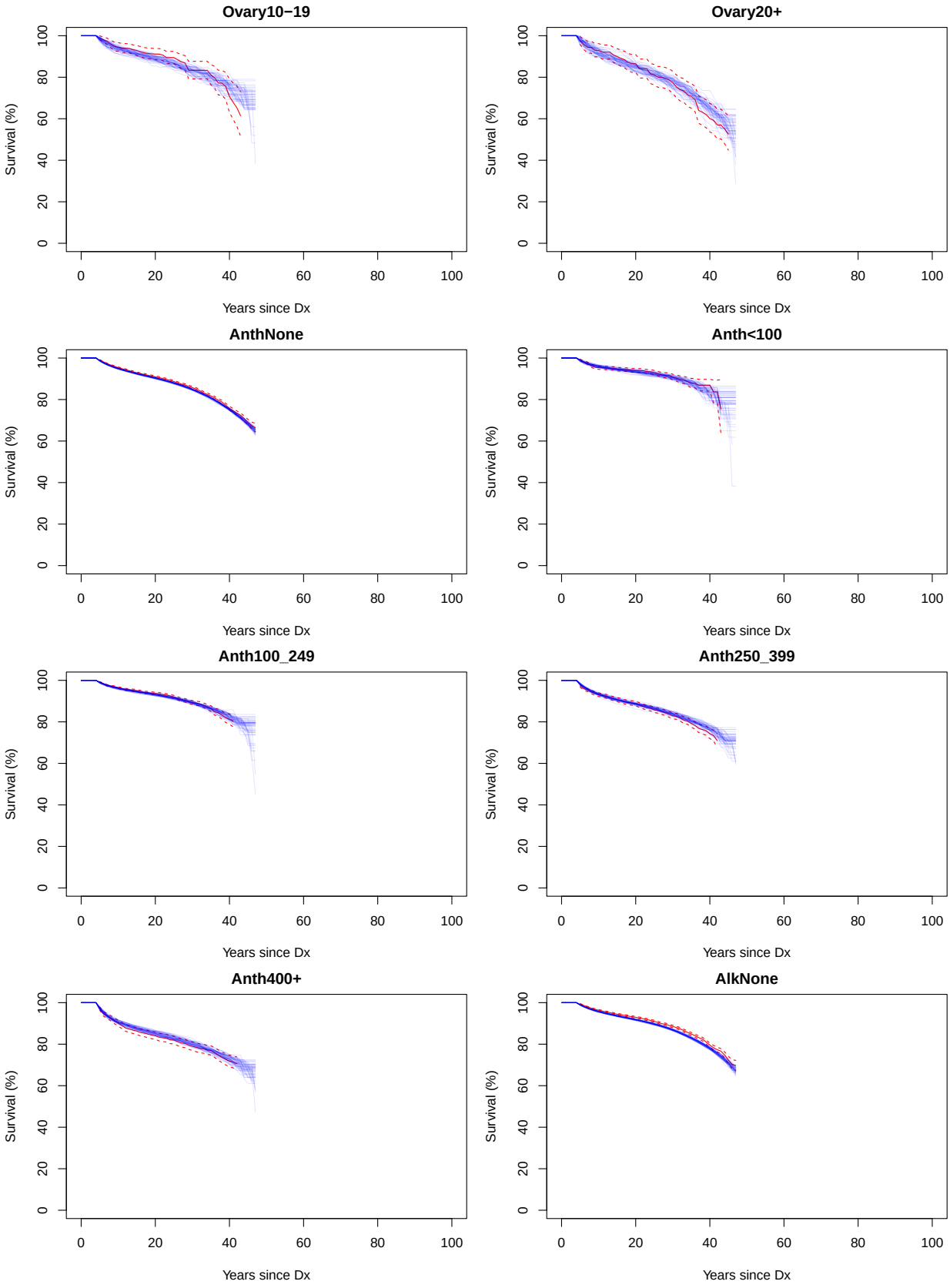

ALL
AML
Astrocytoma
Ewings
HL
WT
Medulloblastoma
NBL
Survival (%)
Years since Dx
0
20
40
60
80
100

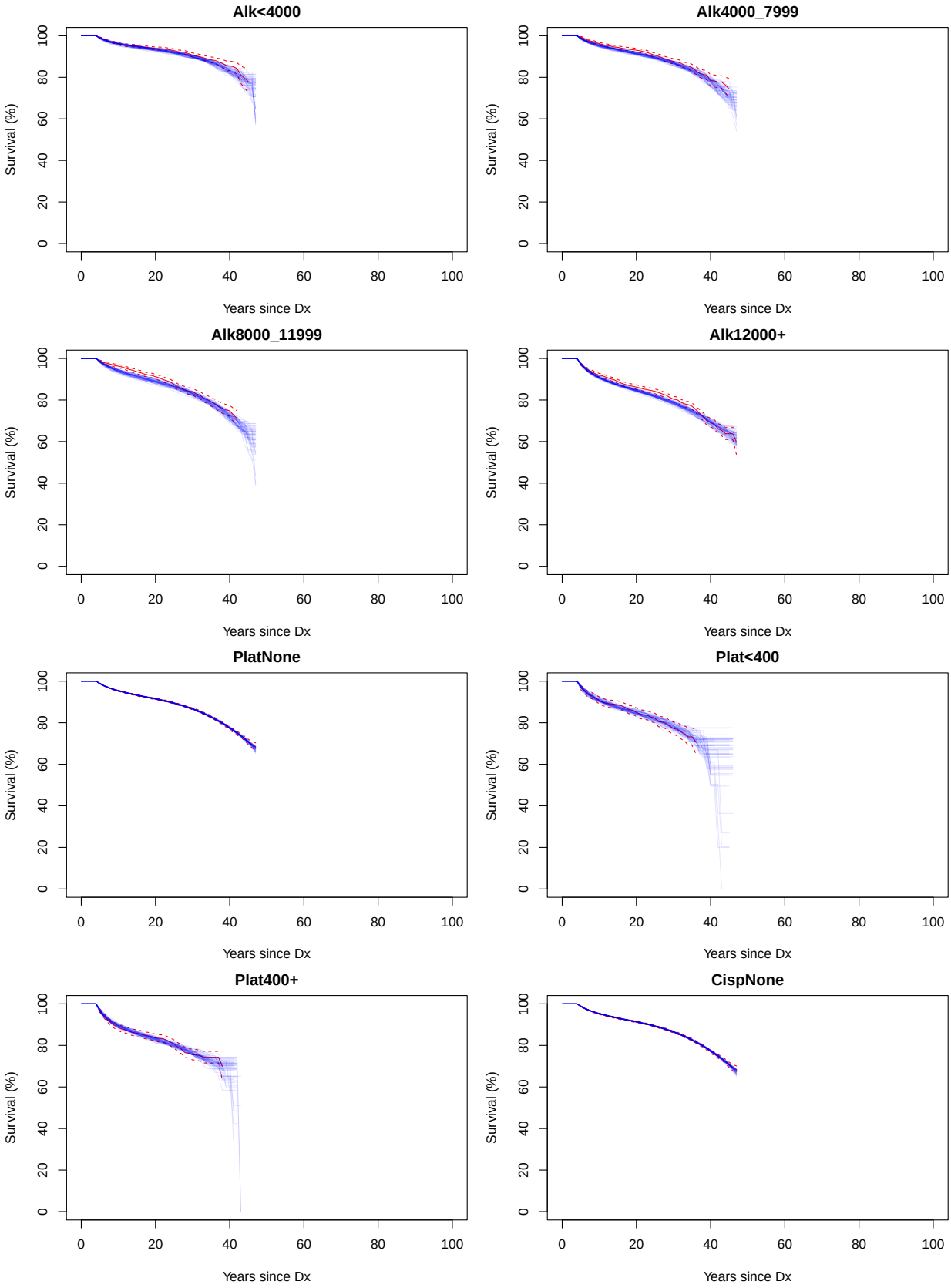

NHL
Osteosarcoma
OtherBoneTumor
Other CNS
OtherLeukemia
STS
AbdPelNone
AbdPel<15
Survival (%)
Years since Dx
0
20
40
60
80
100

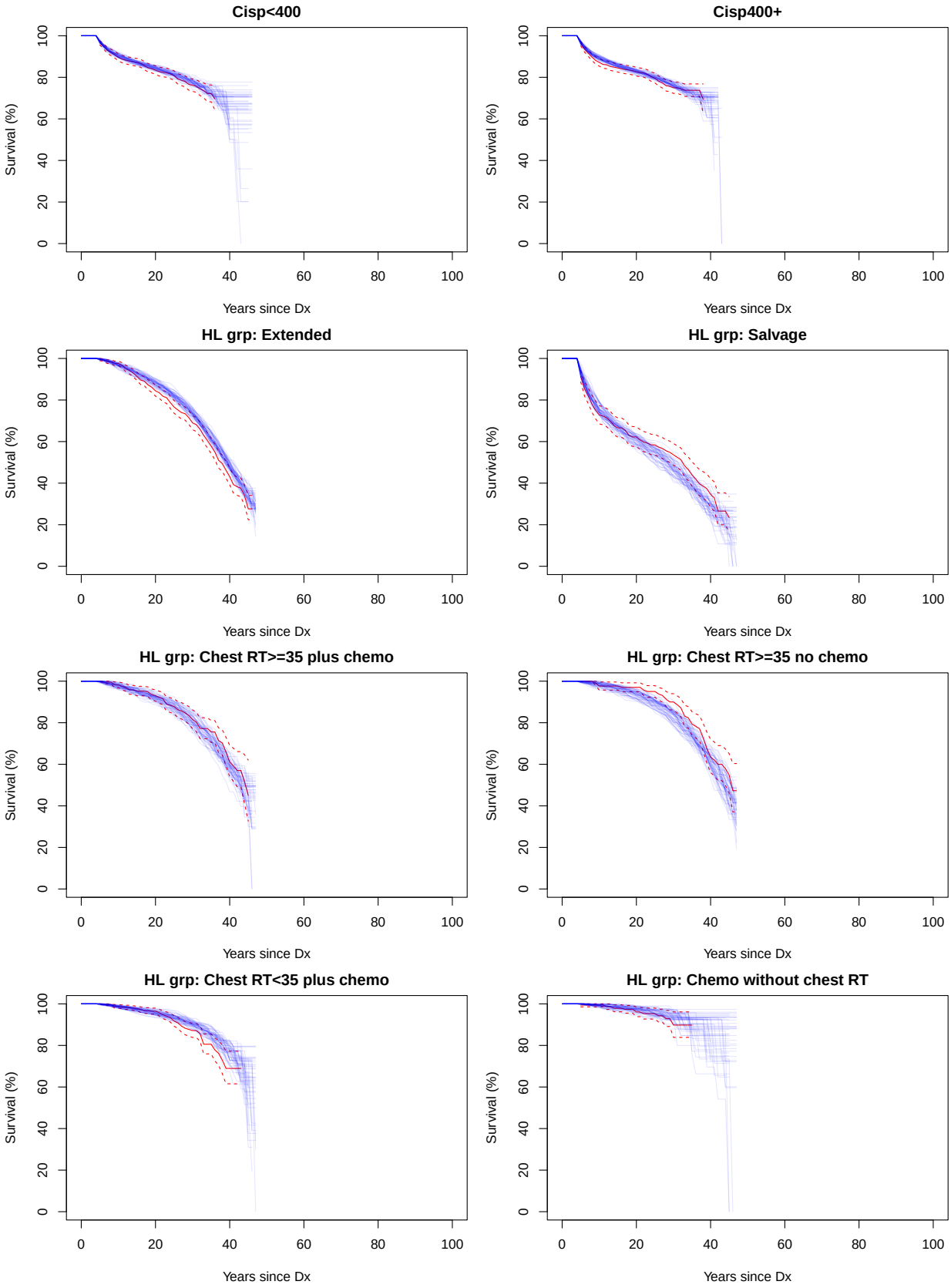

AbdPel15_24
AbdPel25_34
AbdPel35+
CRTNone
CRT<20
CRT20_29
CRT30_49
CRT50+
Survival (%)
Years since Dx
0
20
40
60
80
100

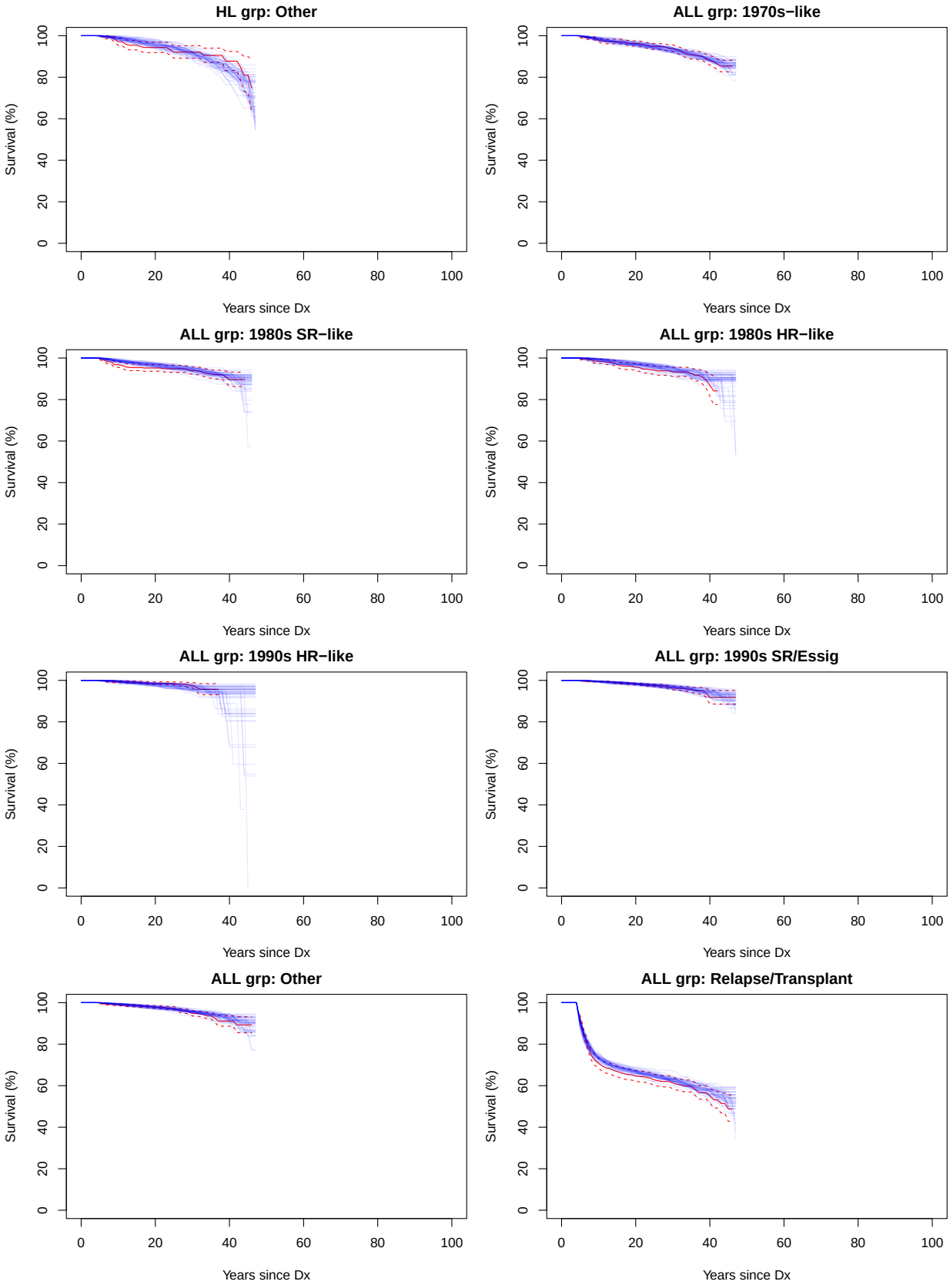

ChestNone
Chest<10
Chest10_19
Chest20_29
Chest30+
HeartNone
Heart<5
Heart5_14
Survival (%)
Years since Dx
0
20
40
60
80
100

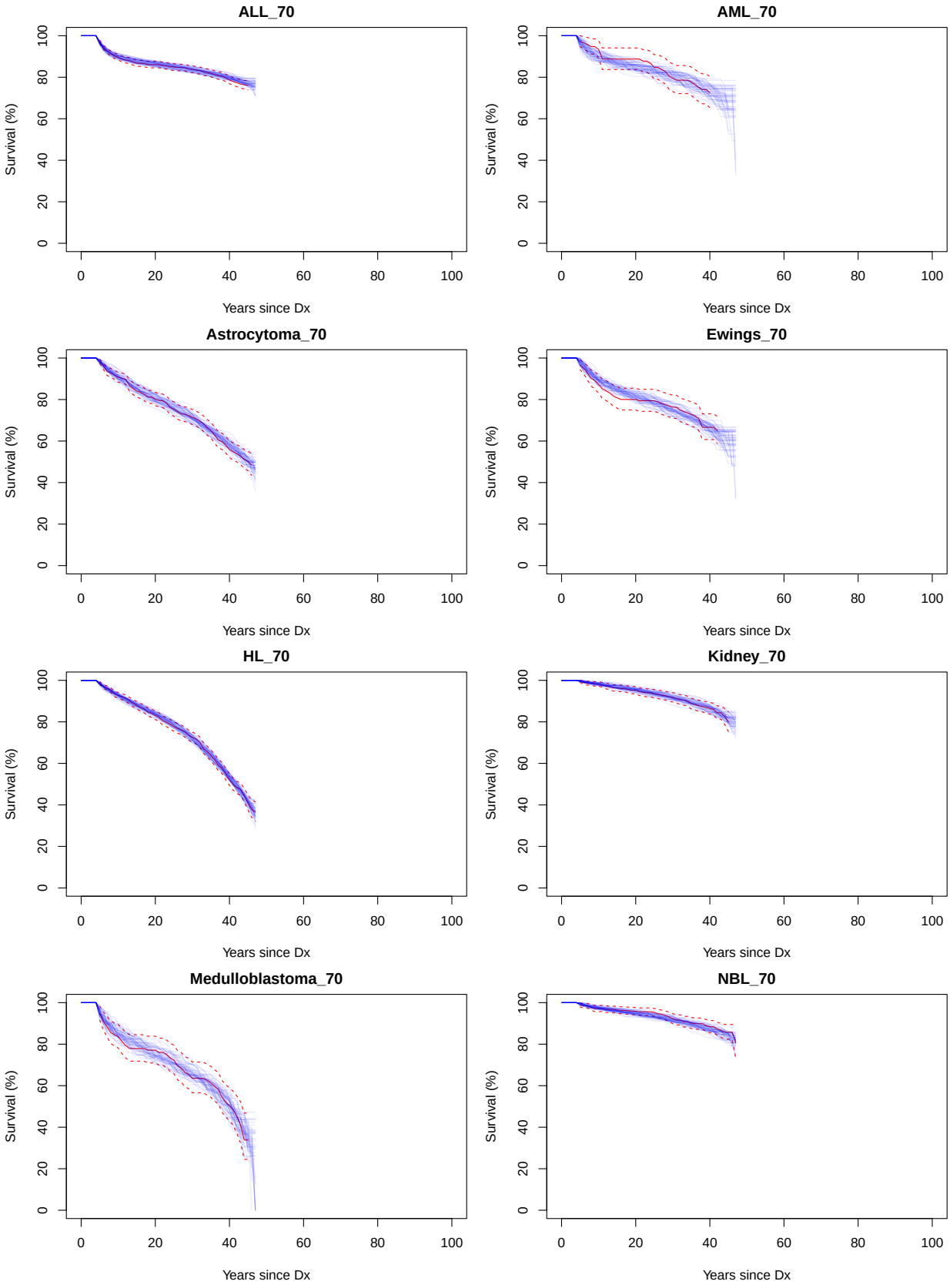

Heart15_34
Heart35+
MaxRTNone
MaxRT<20
MaxRT20_29
MaxRT30+
OvaryNone
Ovary<10
Survival (%)
Years since Dx
0
20
40
60
80
100

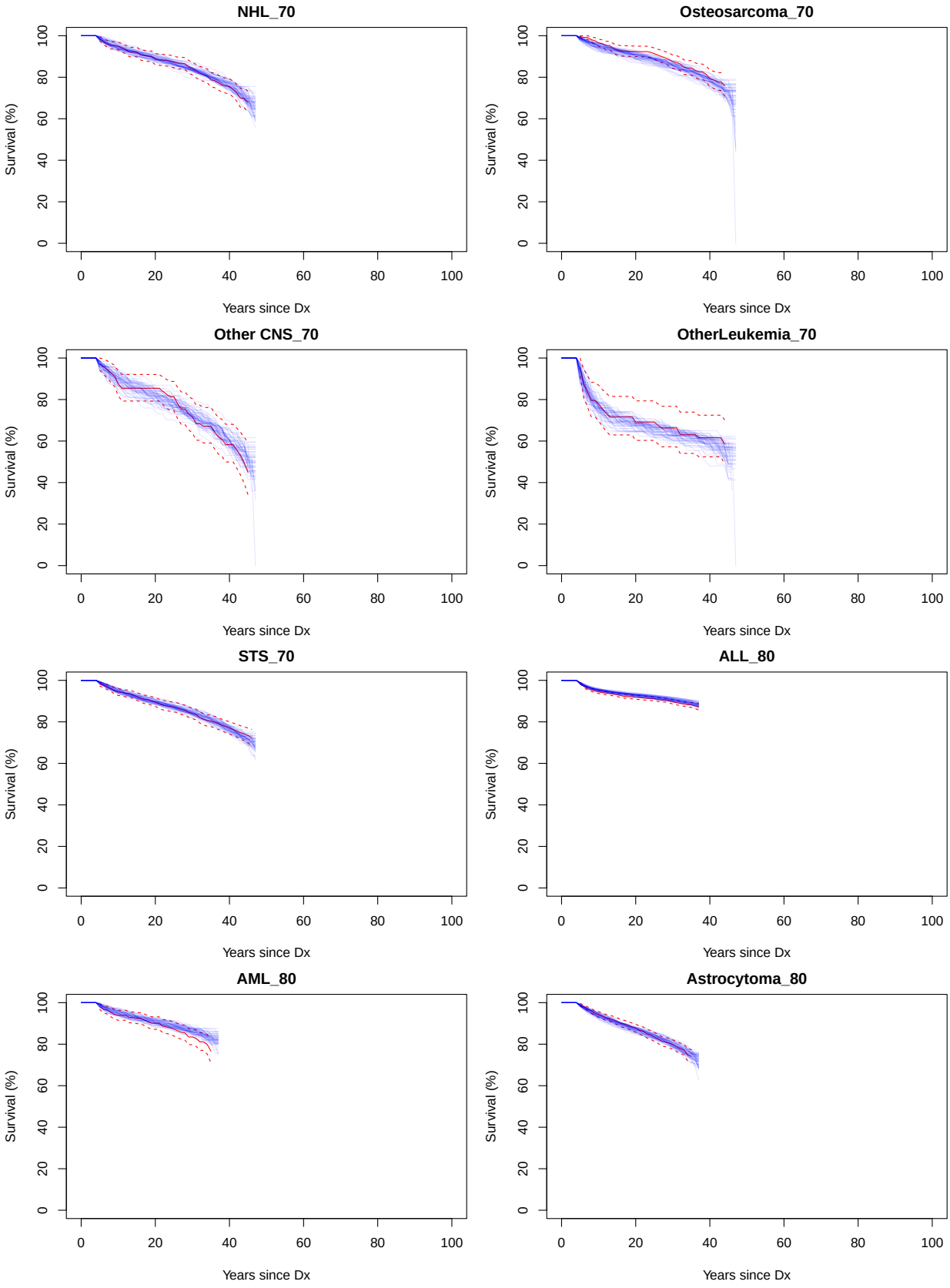

Ovary10−19
Ovary20+
AnthNone
Anth<100
Anth100_249
Anth250_399
Anth400+
AlkNone
Survival (%)
Years since Dx
0
20
40
60
80
100

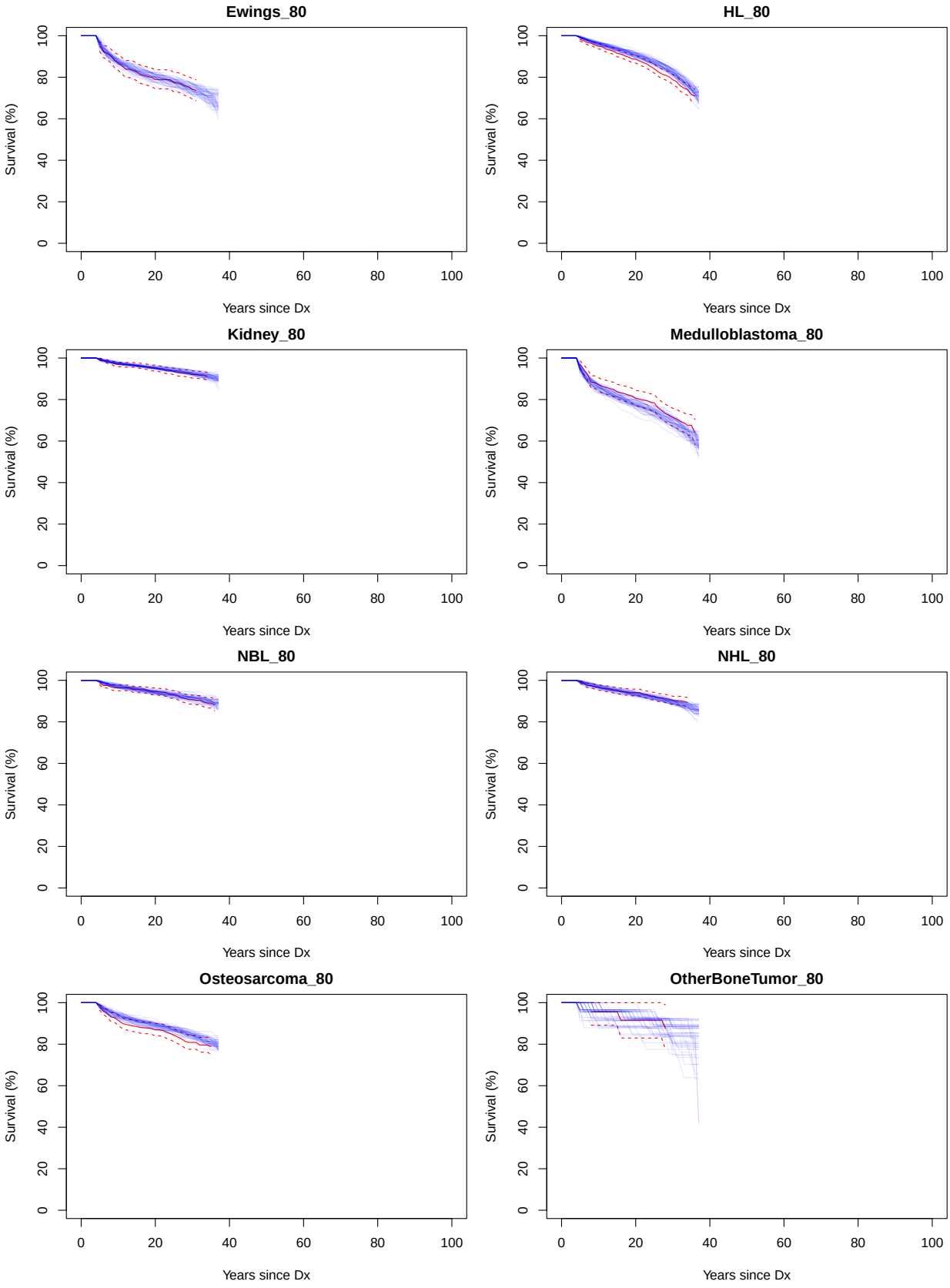

Alk<4000
Alk4000_7999
Alk8000_11999
Alk12000+
PlatNone
Plat<400
Plat400+
CispNone
Survival (%)
Years since Dx
0
20
40
60
80
100

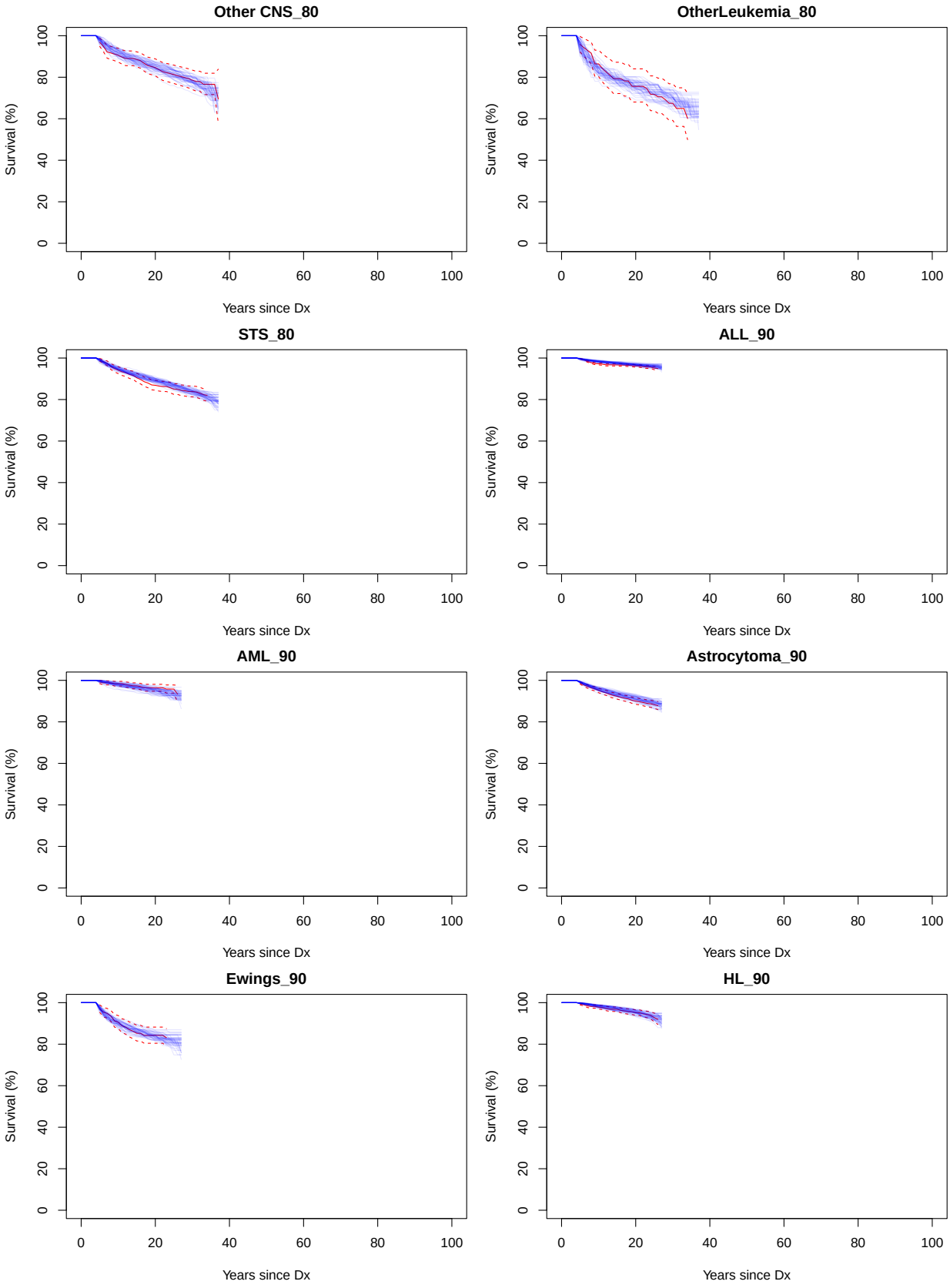

Cisp<400
Cisp400+
HL grp: Extended
HL grp: Salvage
HL grp: Chest RT>=35 plus chemo
HL grp: Chest RT>=35 no chemo
HL grp: Chest RT<35 plus chemo
HL grp: Chemo without chest RT
Survival (%)
Years since Dx
0
20
40
60
80
100

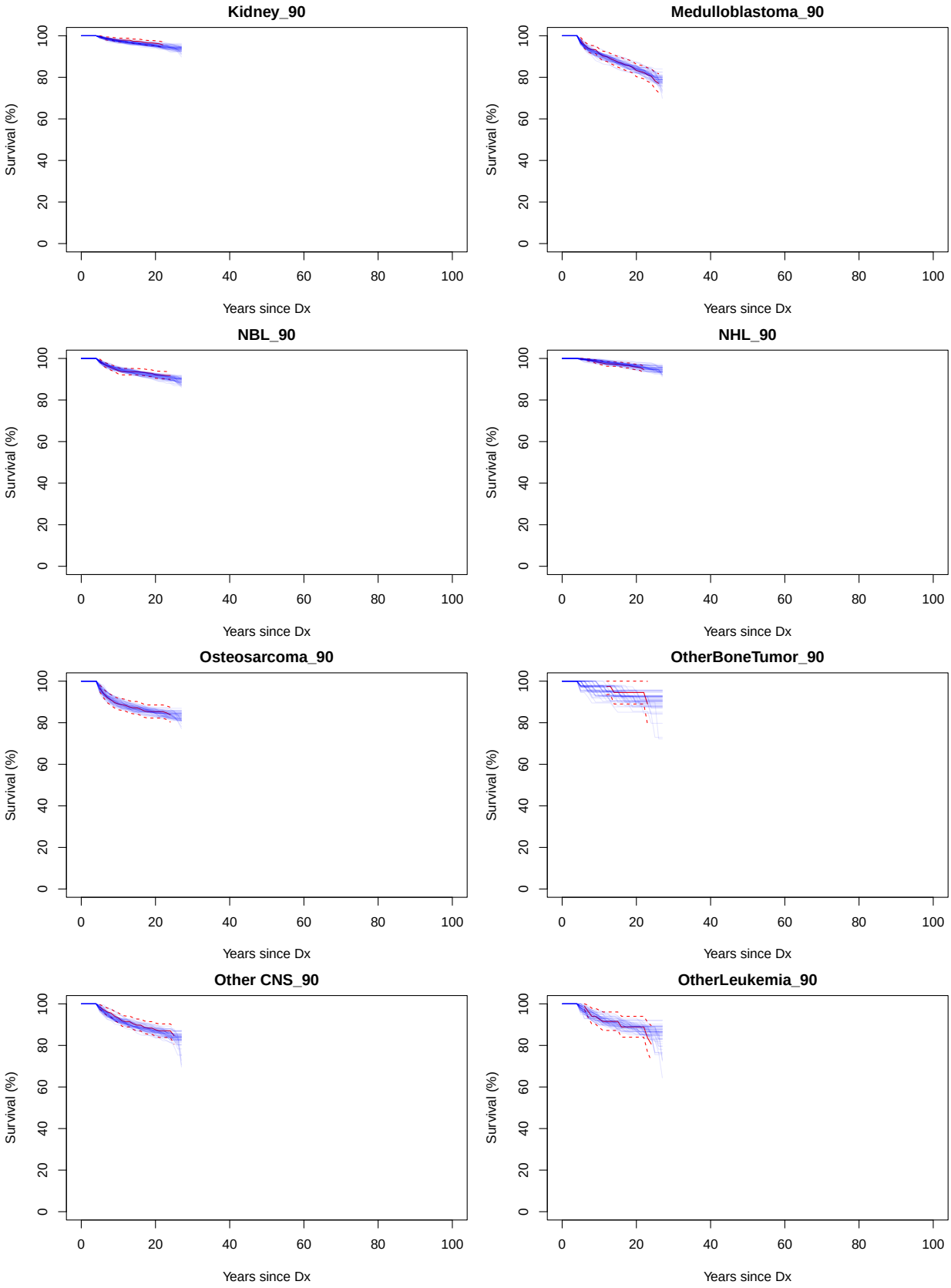

HL grp: Other
ALL grp: 1970s−like
ALL grp: 1980s SR−like
ALL grp: 1980s HR−like
ALL grp: 1990s HR−like
ALL grp: 1990s SR/Essig
ALL grp: Other
ALL grp: Relapse/Transplant
Survival (%)
Years since Dx
0
20
40
60
80
100

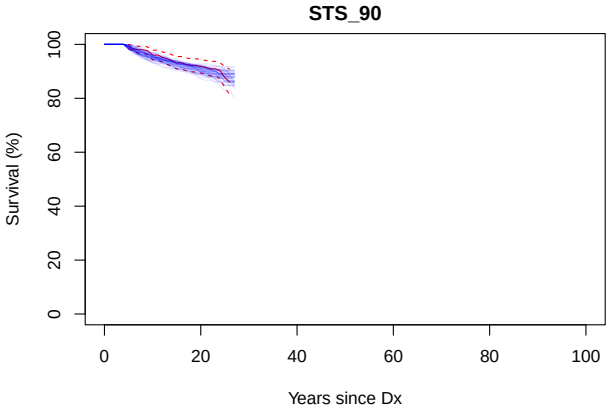

ALL_70
AML_70
Astrocytoma_70
Ewings_70
HL_70
Kidney_70
Medulloblastoma_70
NBL_70
Survival (%)
Years since Dx
0
20
40
60
80
100


NHL_70
Osteosarcoma_70
Other CNS_70
OtherLeukemia_70
STS_70
ALL_80
AML_80
Astrocytoma_80
Survival (%)
Years since Dx
0
20
40
60
80
100


Ewings_80
HL_80
Kidney_80
Medulloblastoma_80
NBL_80
NHL_80
Osteosarcoma_80
OtherBoneTumor_80
Survival (%)
Years since Dx
0
20
40
60
80
100


Other CNS_80
OtherLeukemia_80
STS_80
ALL_90
AML_90
Astrocytoma_90
Ewings_90
HL_90
Survival (%)
Years since Dx
0
20
40
60
80
100

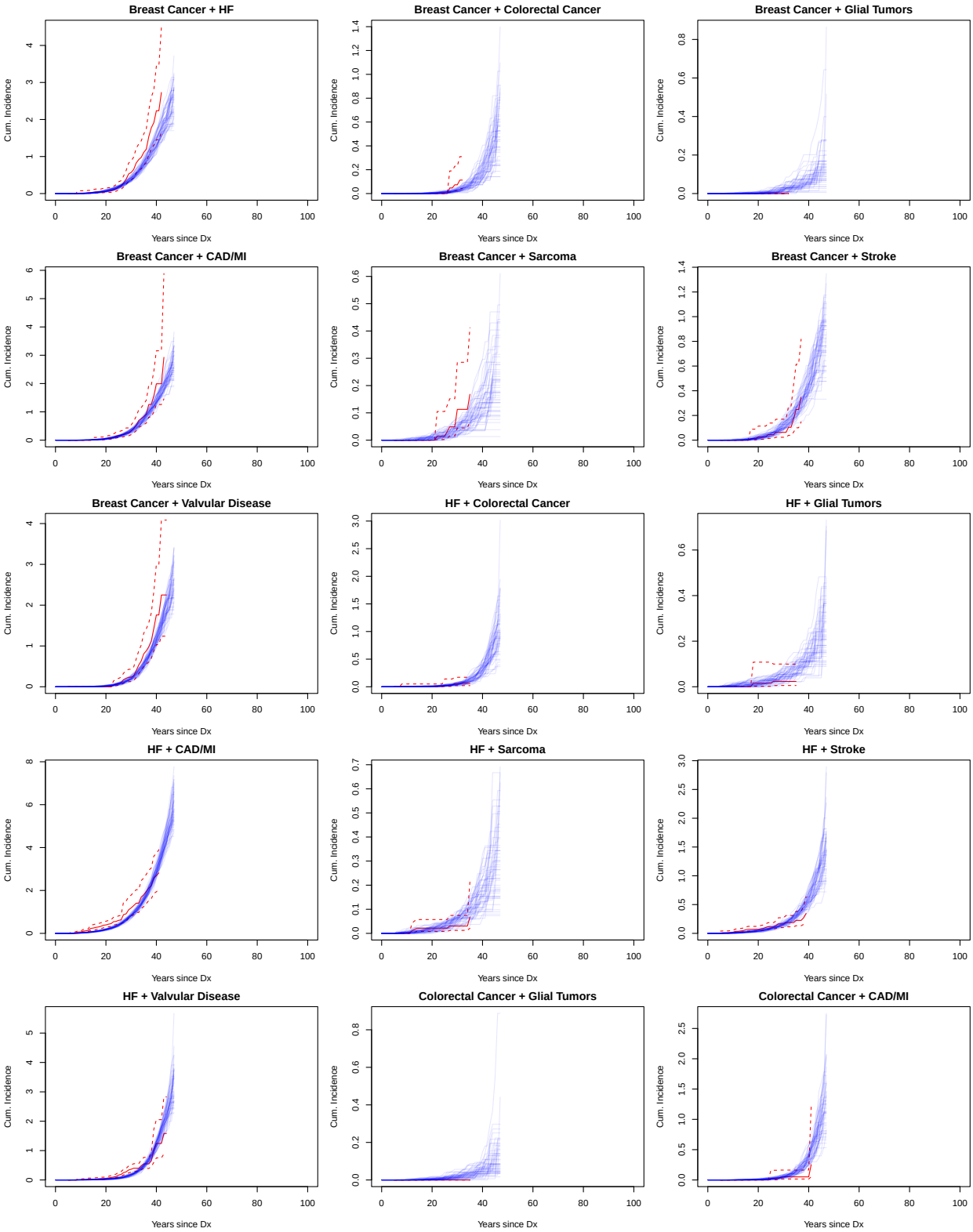

Kidney_90
Medulloblastoma_90
NBL_90
NHL_90
Osteosarcoma_90
OtherBoneTumor_90
Other CNS_90
OtherLeukemia_90
Survival (%)
Years since Dx
0
20
40
60
80
100

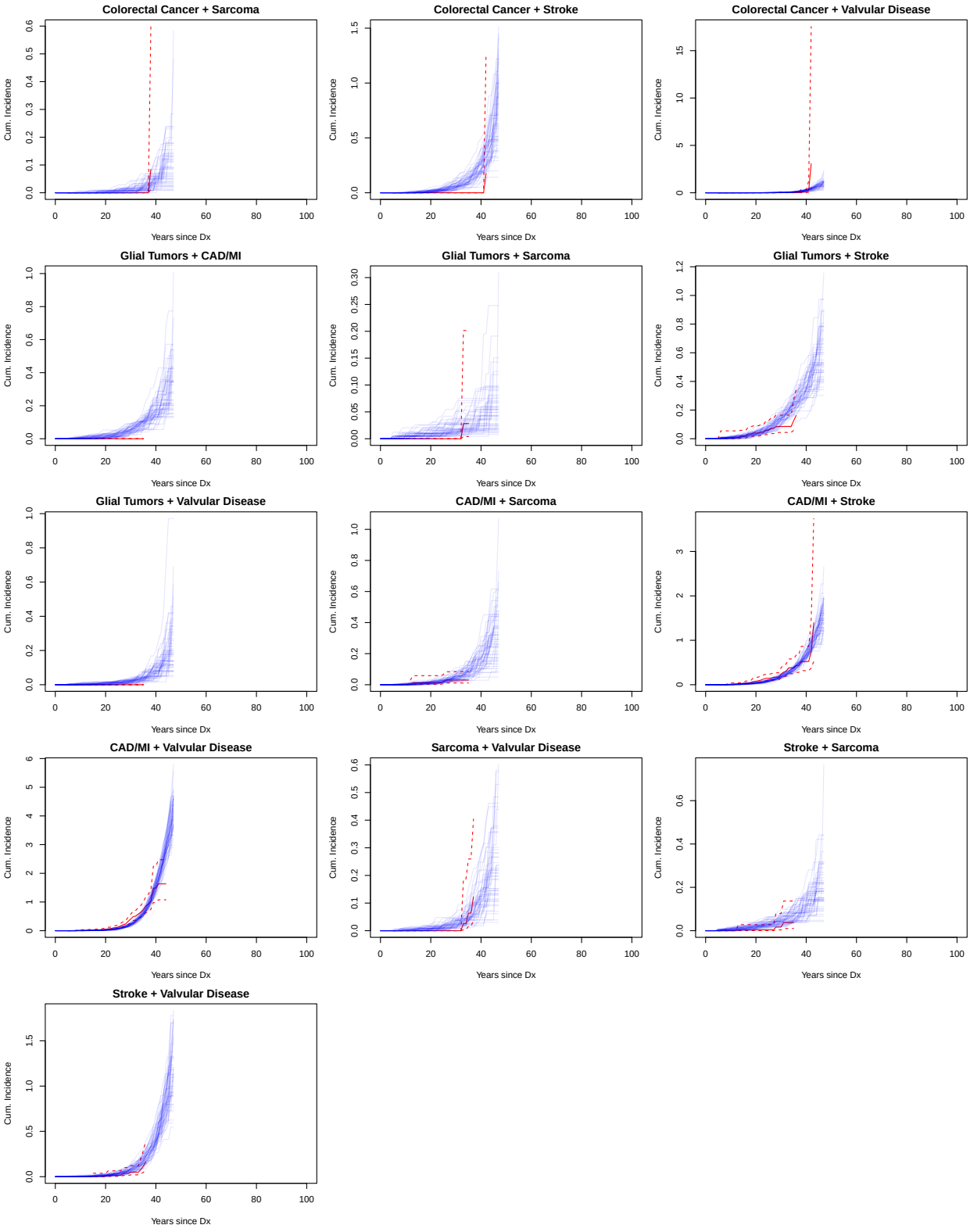

STS_90
Survival (%)
0
20
40
60
80
100
0
20
40
60
80
100
Years since Dx

4.3.4 Joint Cumulative Incidence

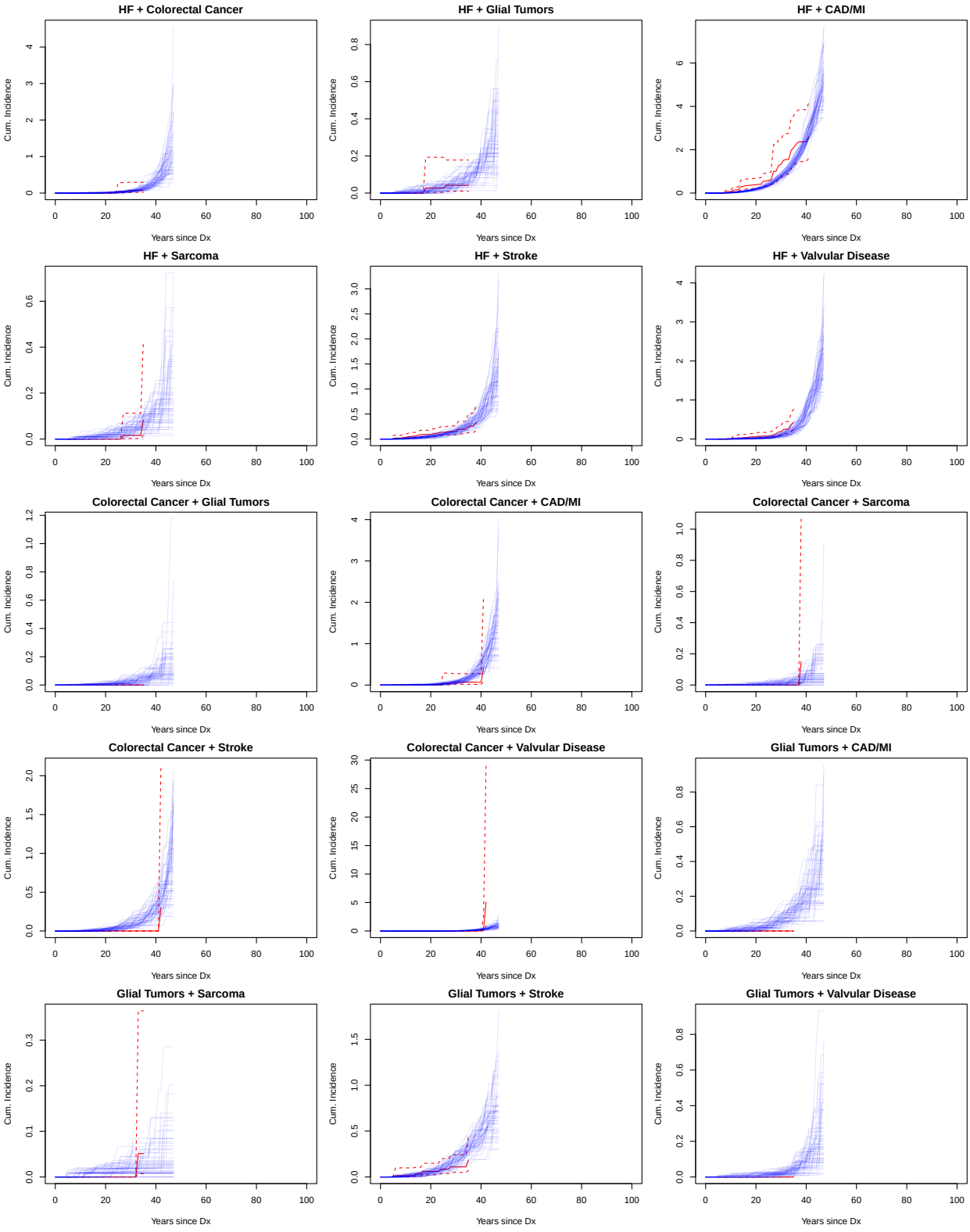
Here we plot the joint cumulative incidence for combinations of 2 diseases by subgroup.

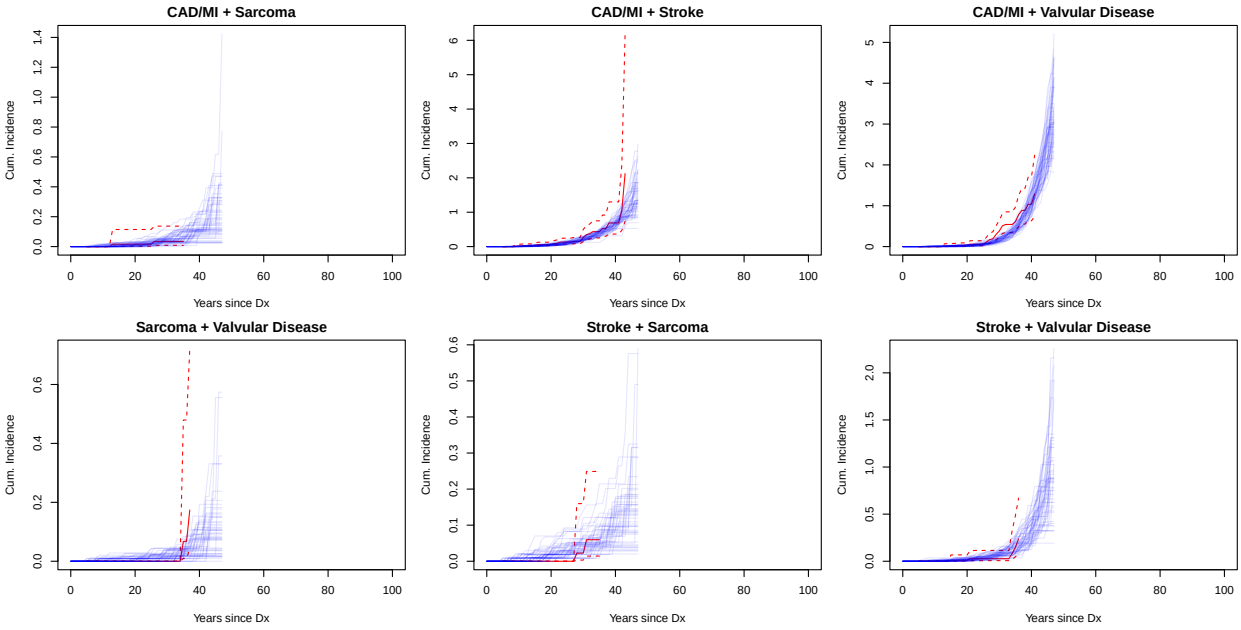
4.3.4.1 Overall



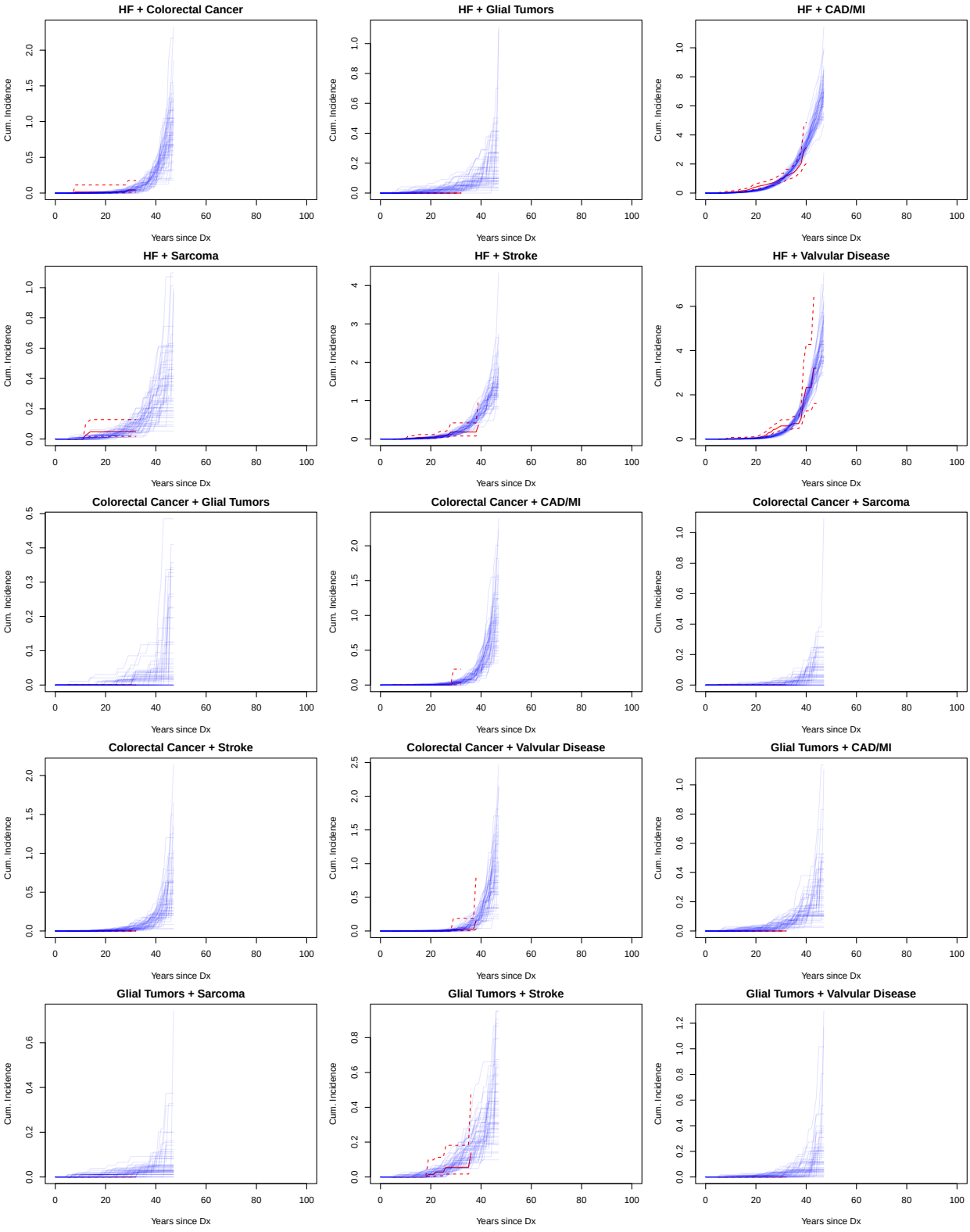

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

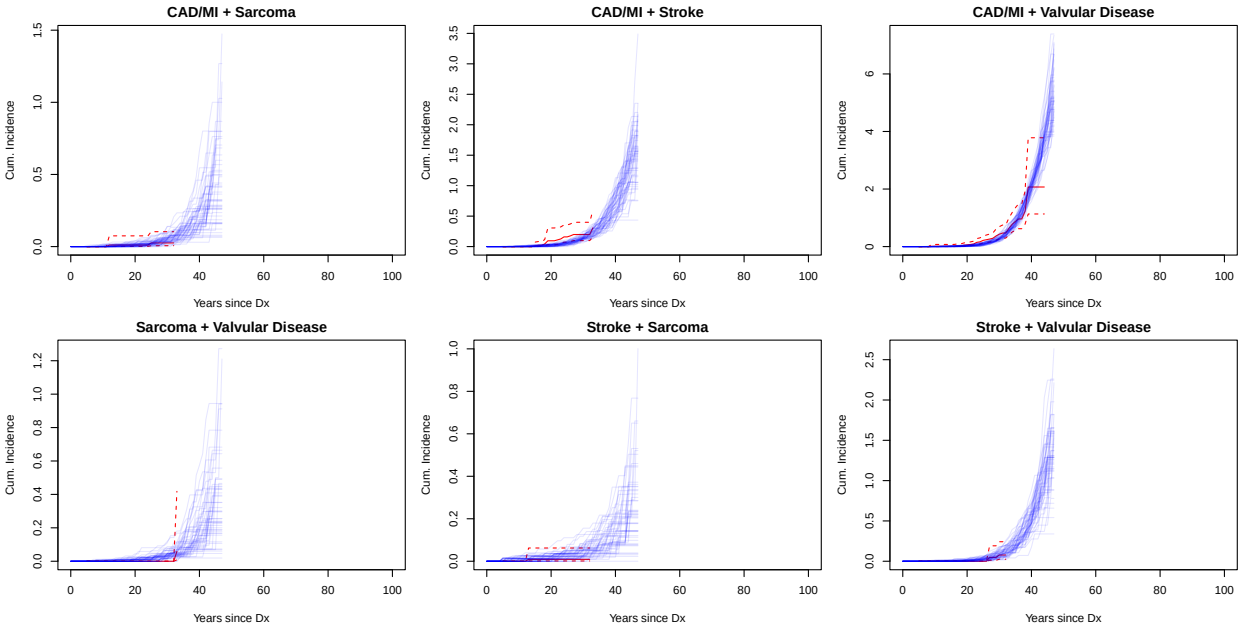
4.3.4.2 Male


HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
Cum. Incidence
Years since Dx

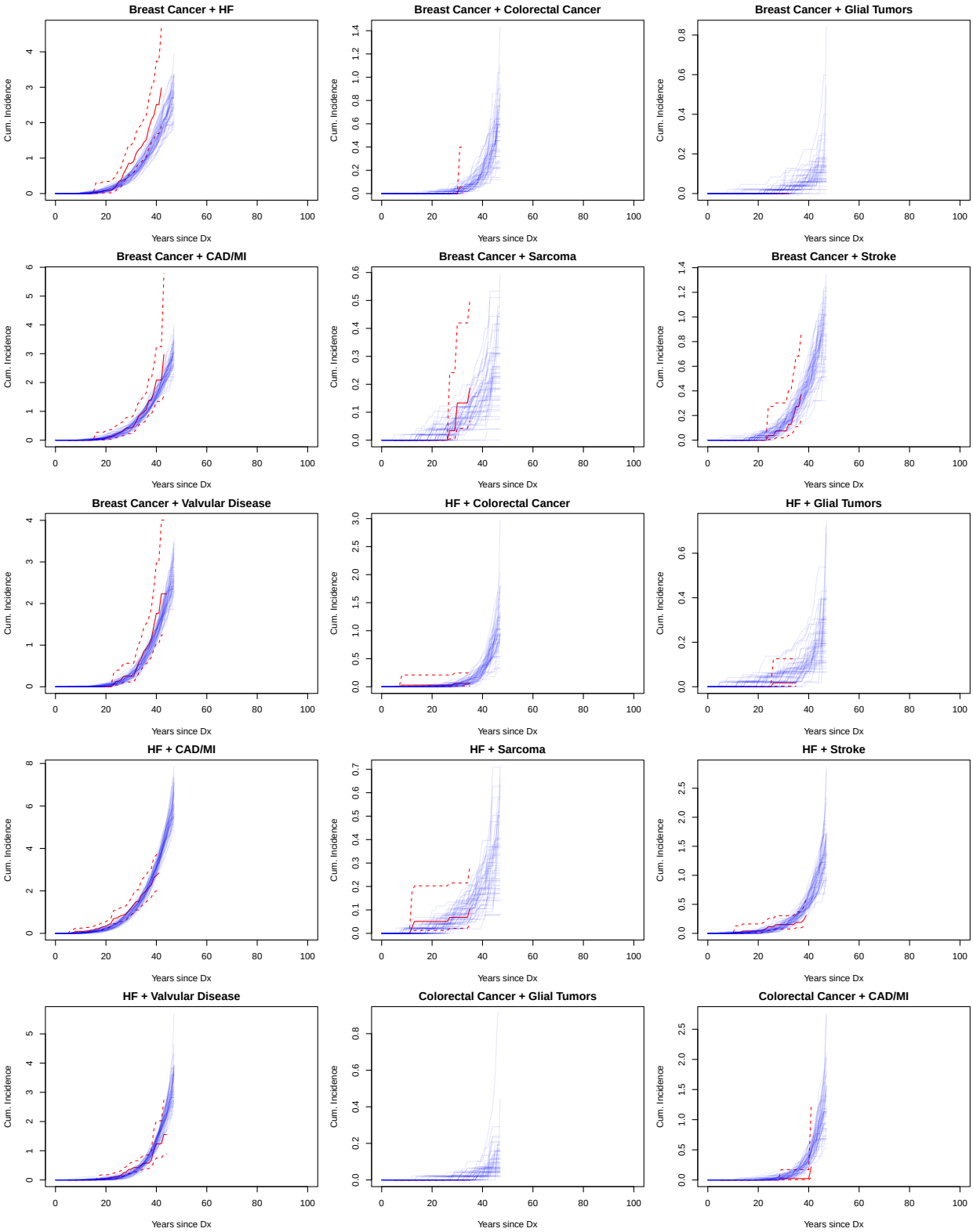

CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

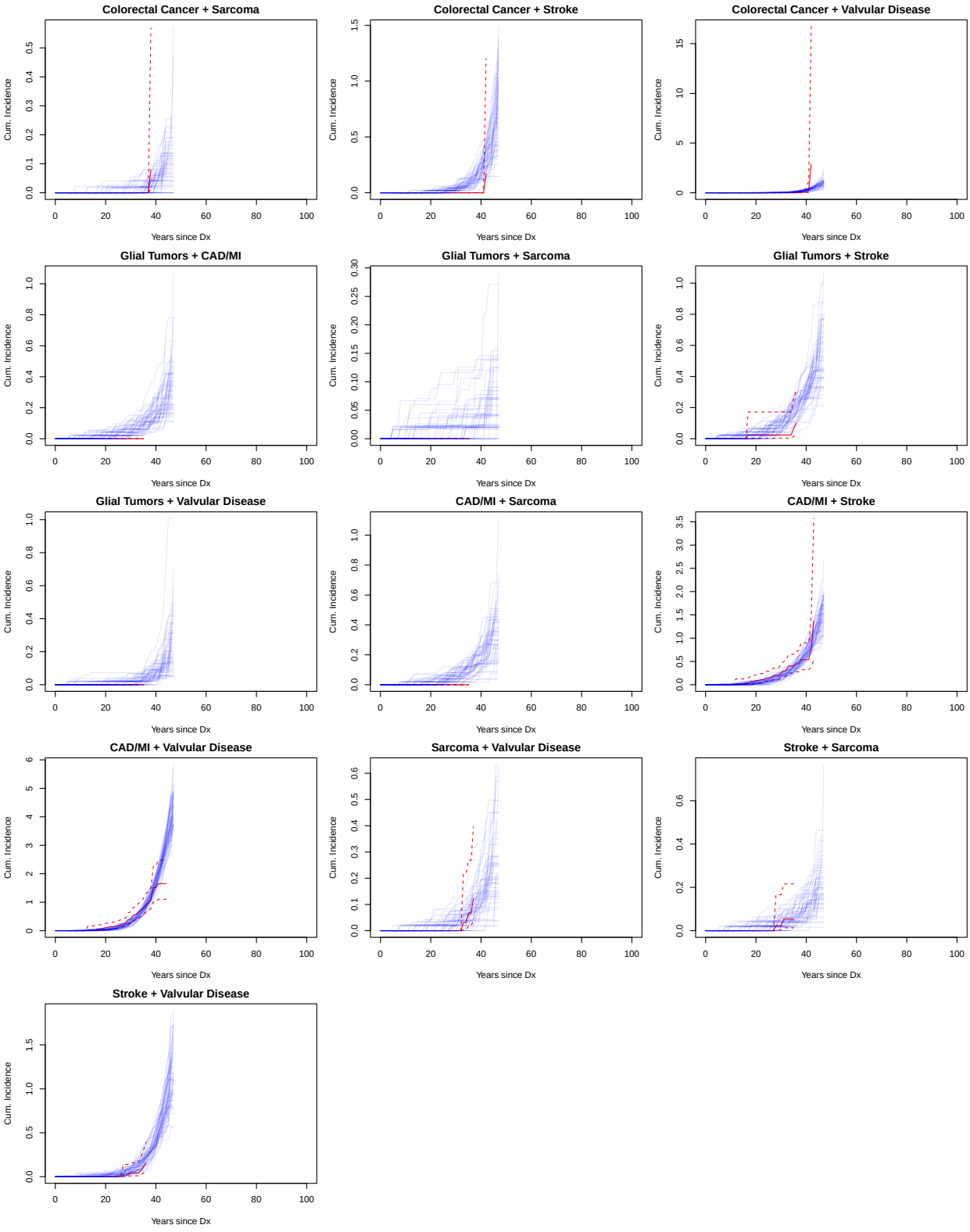
4.3.4.3 Female


HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
Cum. Incidence
Years since Dx

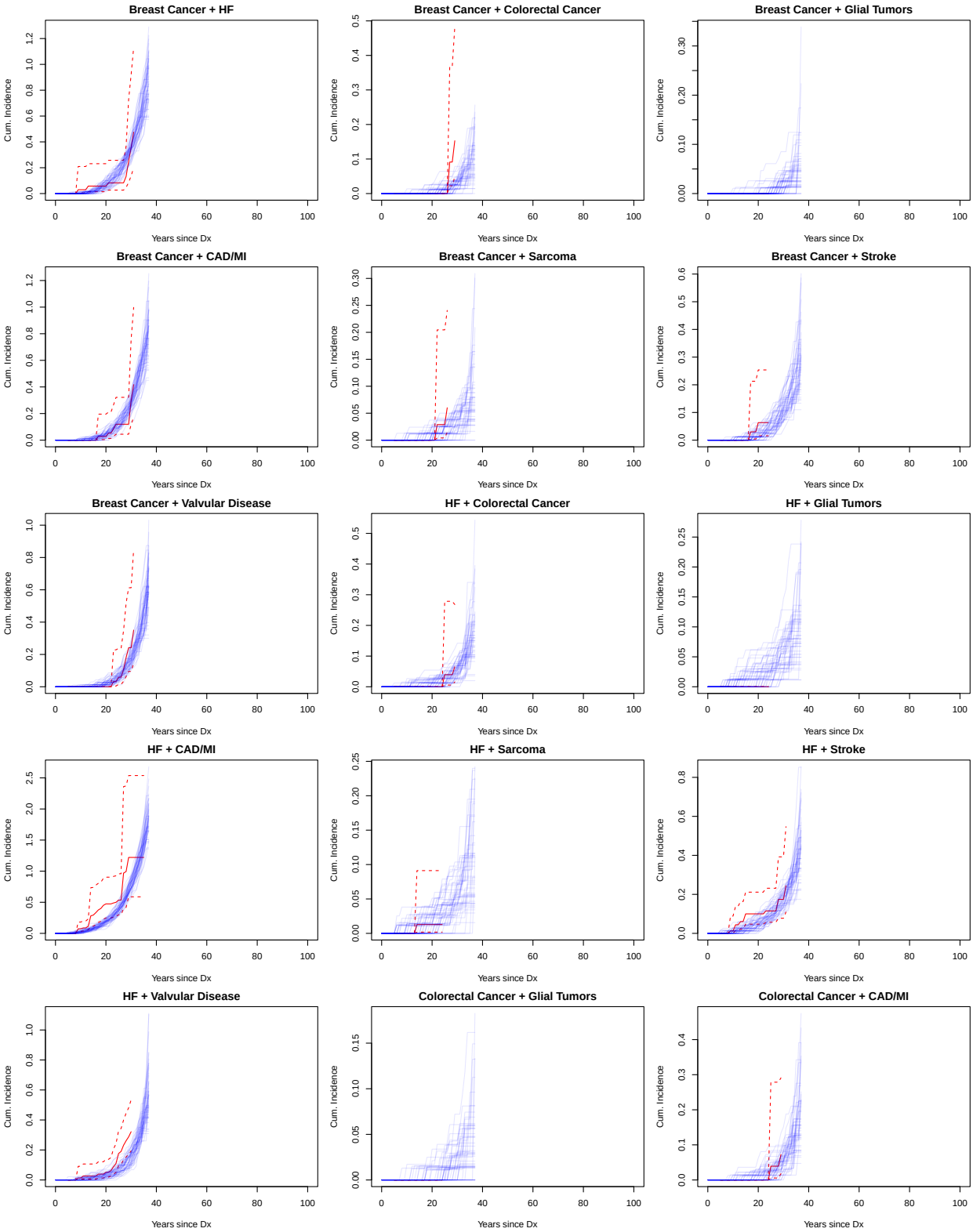

CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

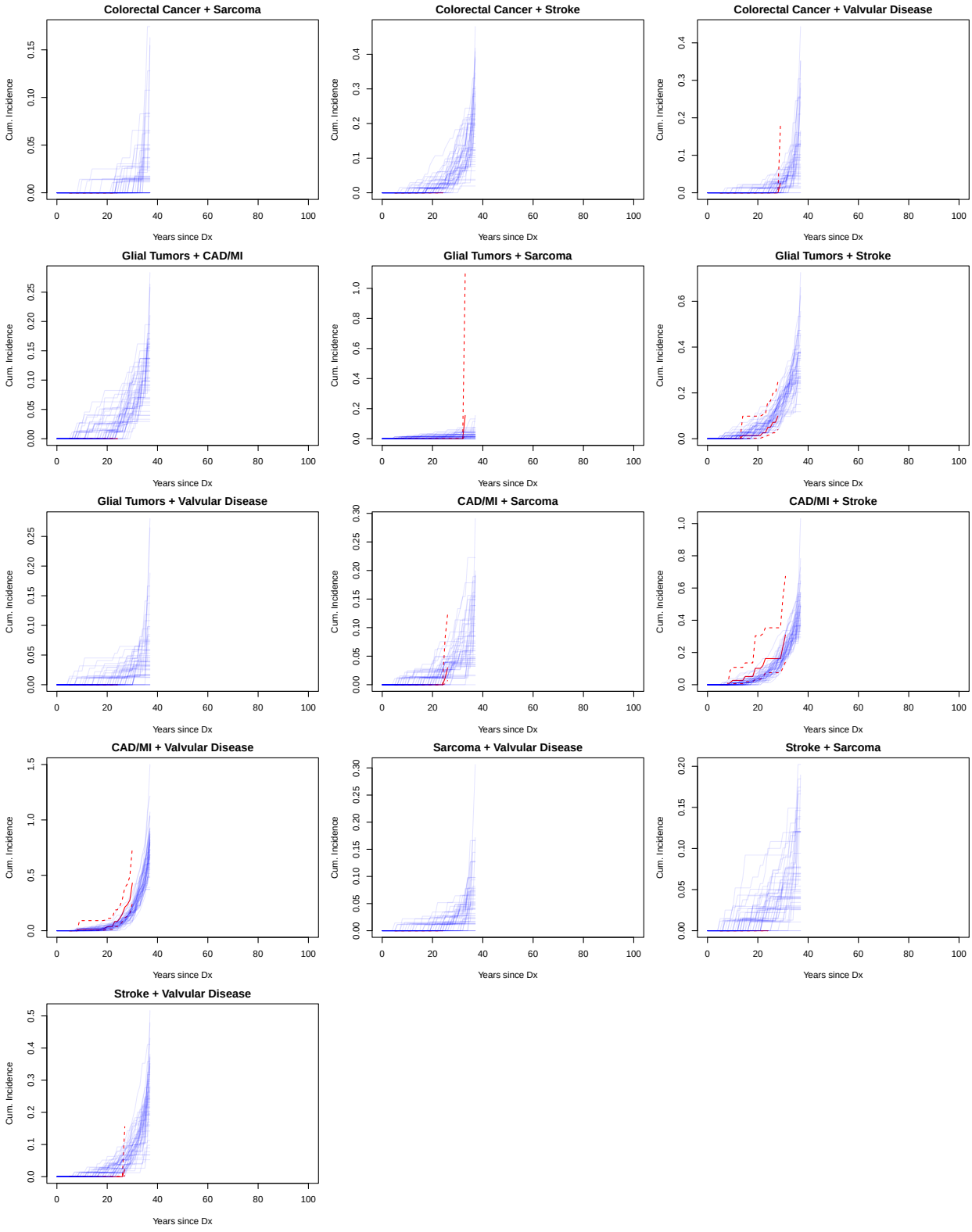
4.3.4.4 1970s


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

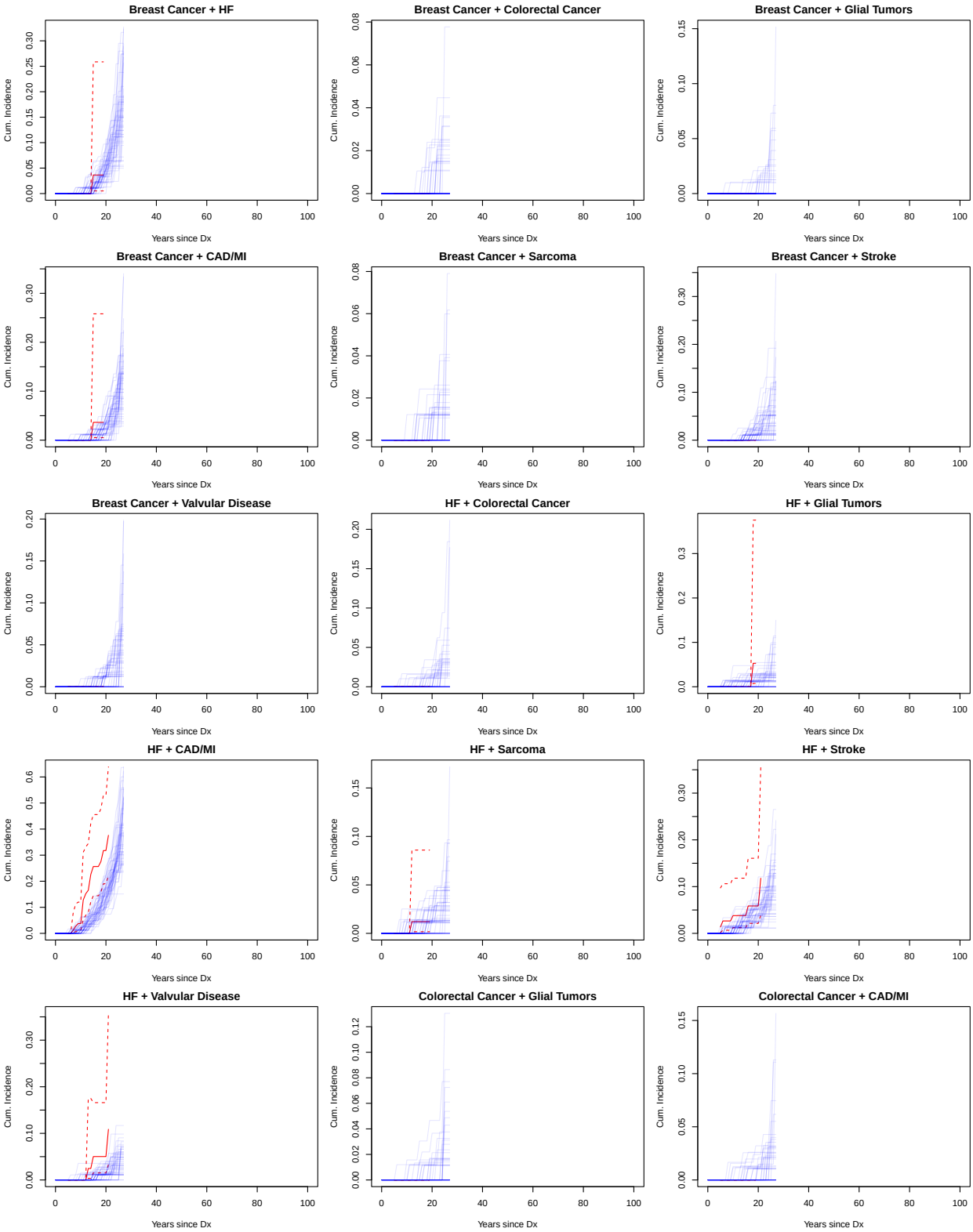

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

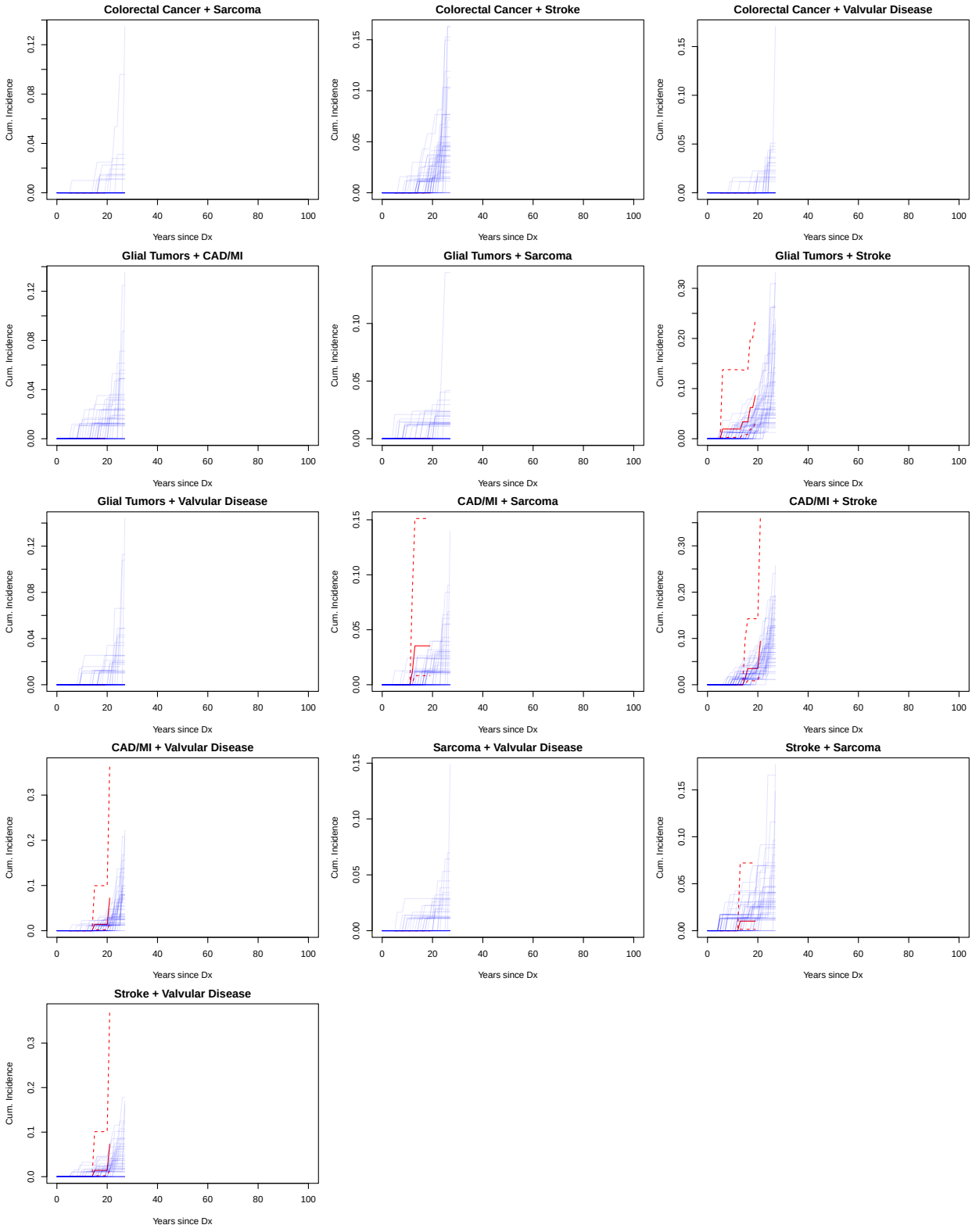
4.3.4.5 1980s


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

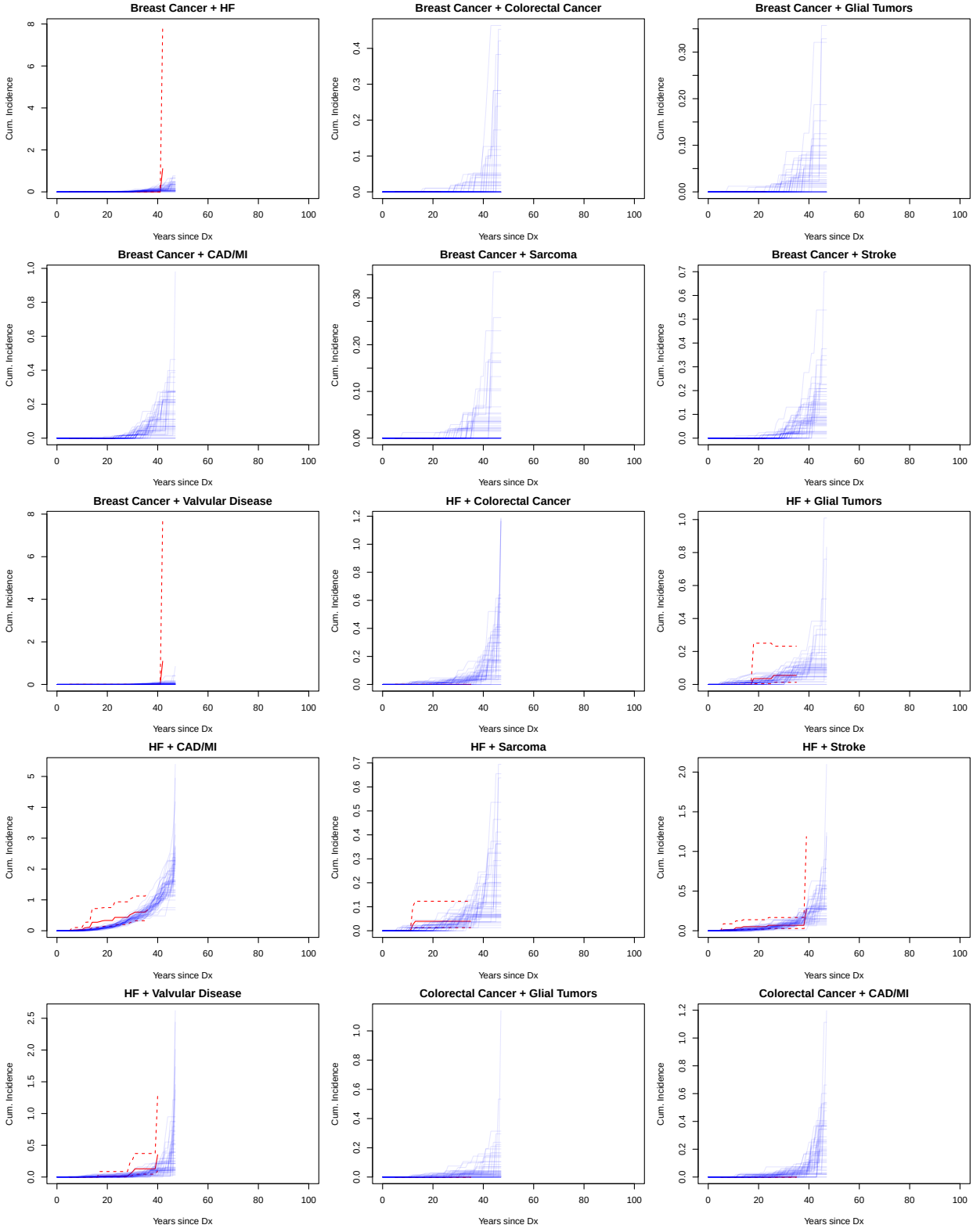

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

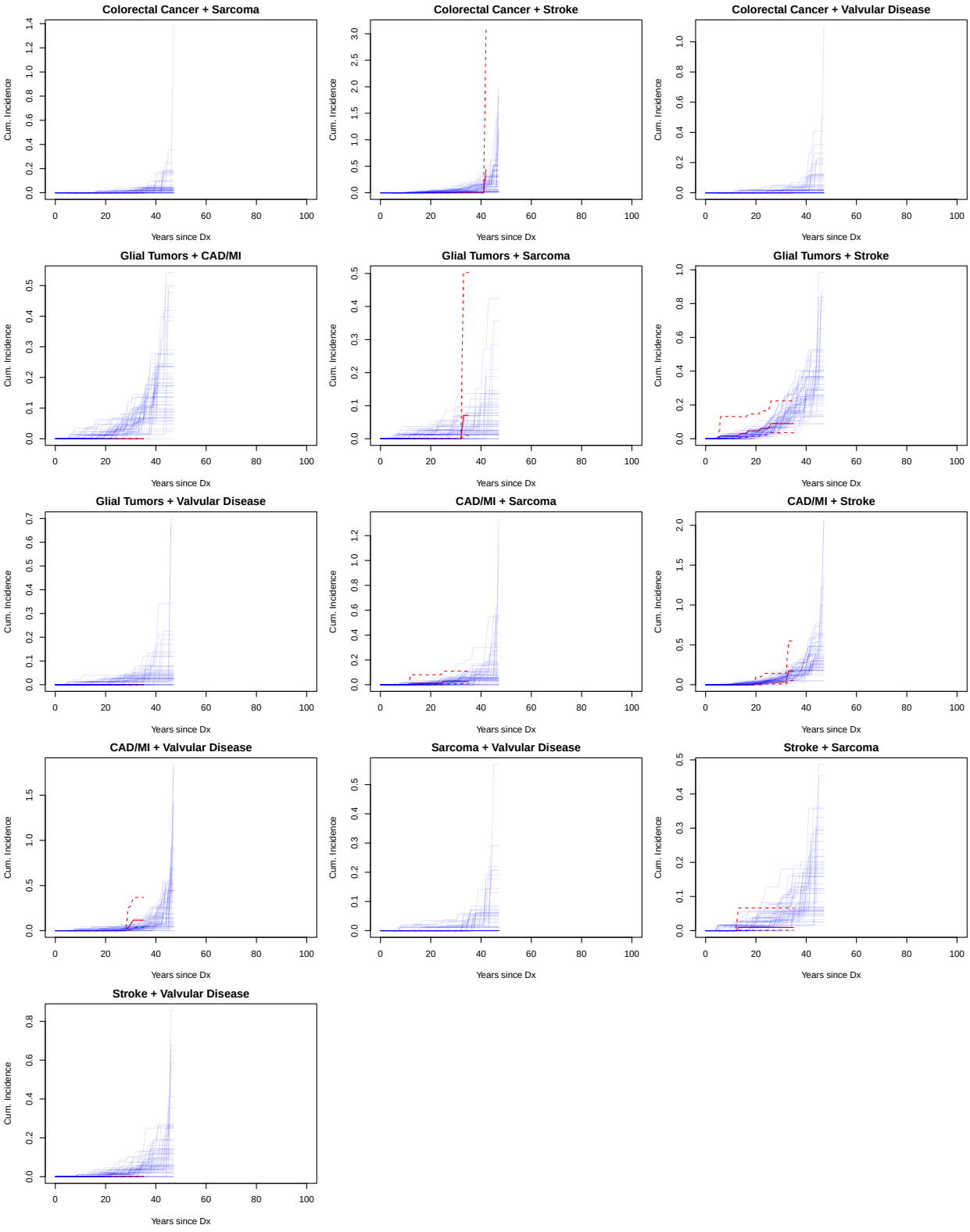
4.3.4.6 1990s


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

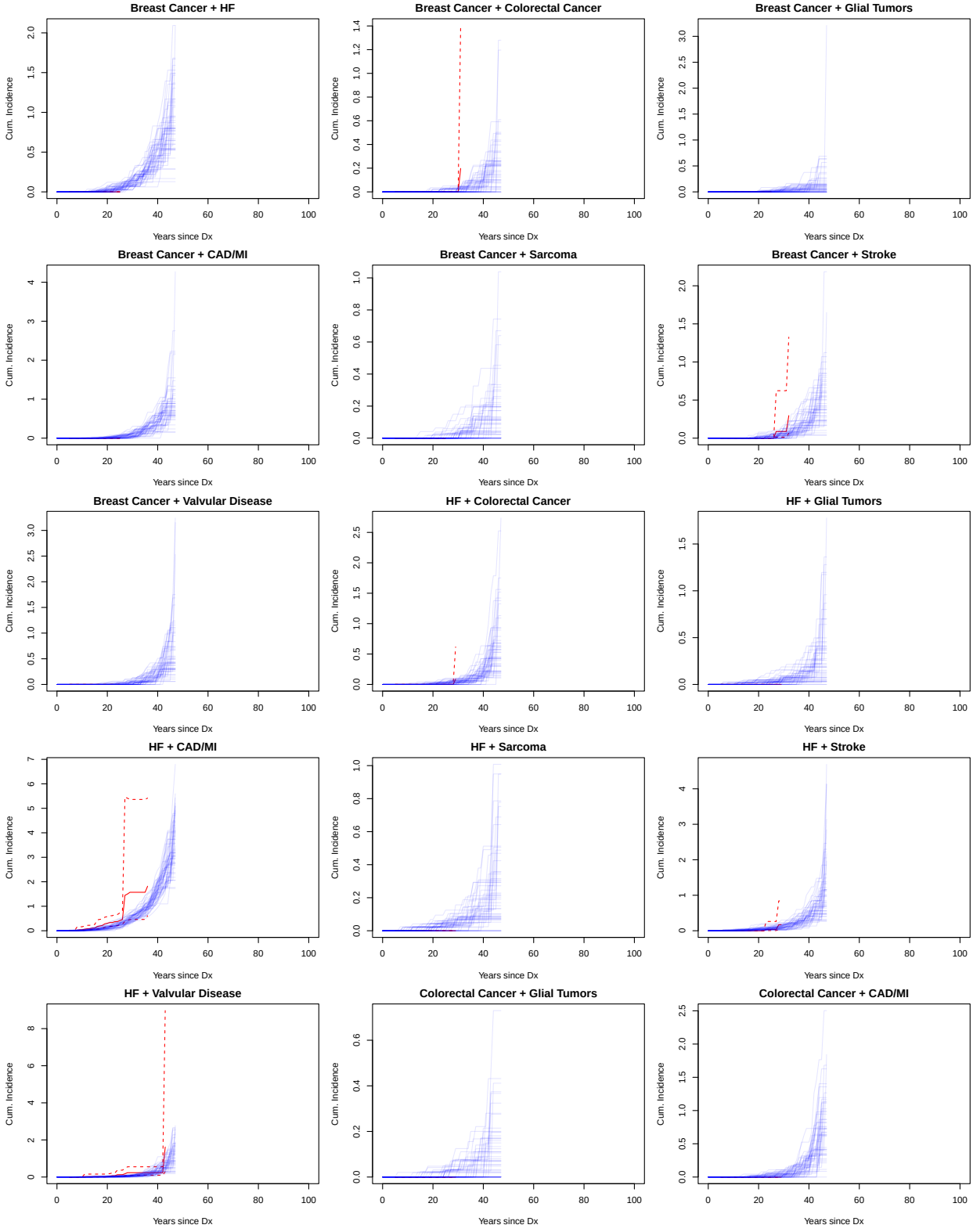

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.7 Age0-4


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx


Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.8 Age5-9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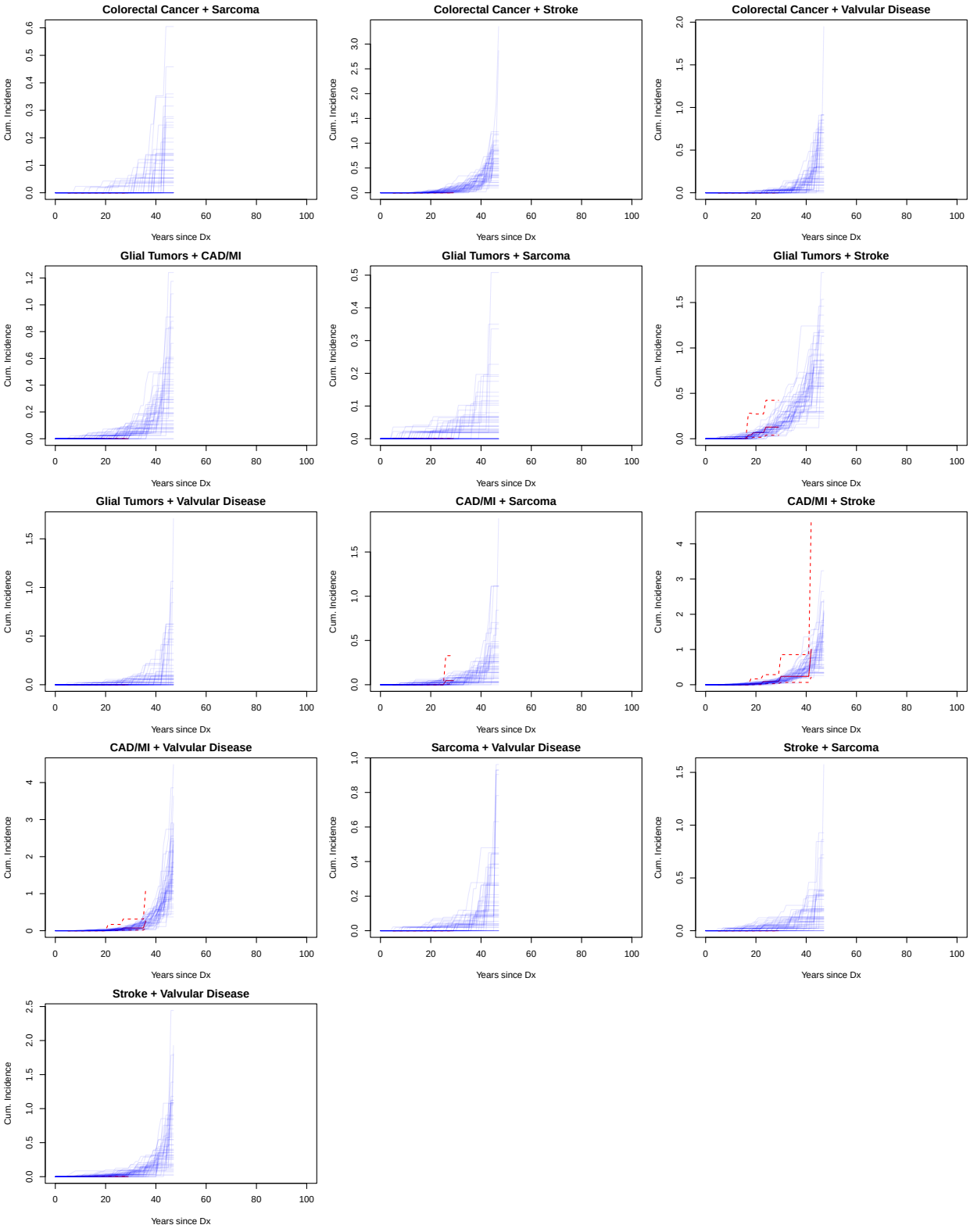
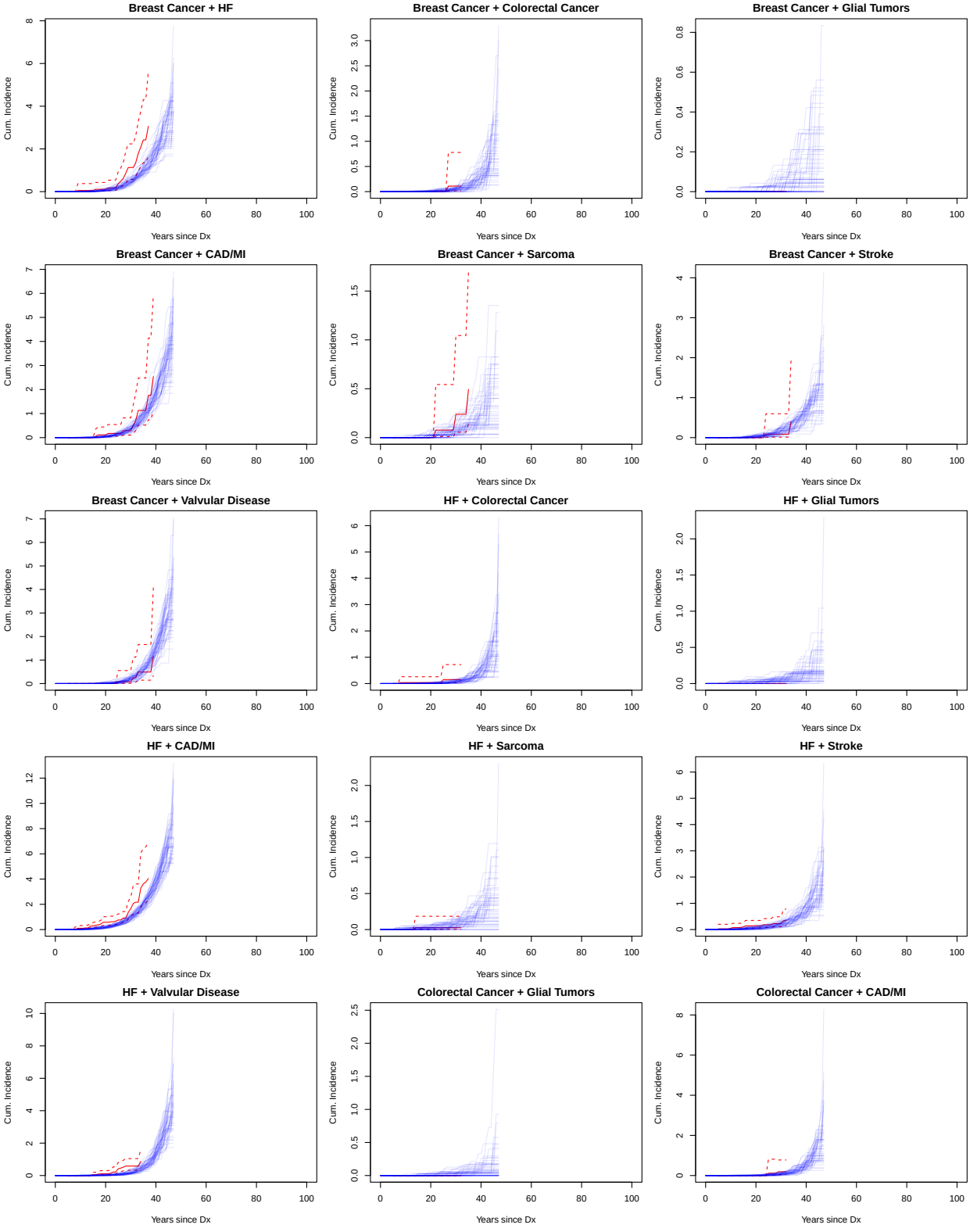
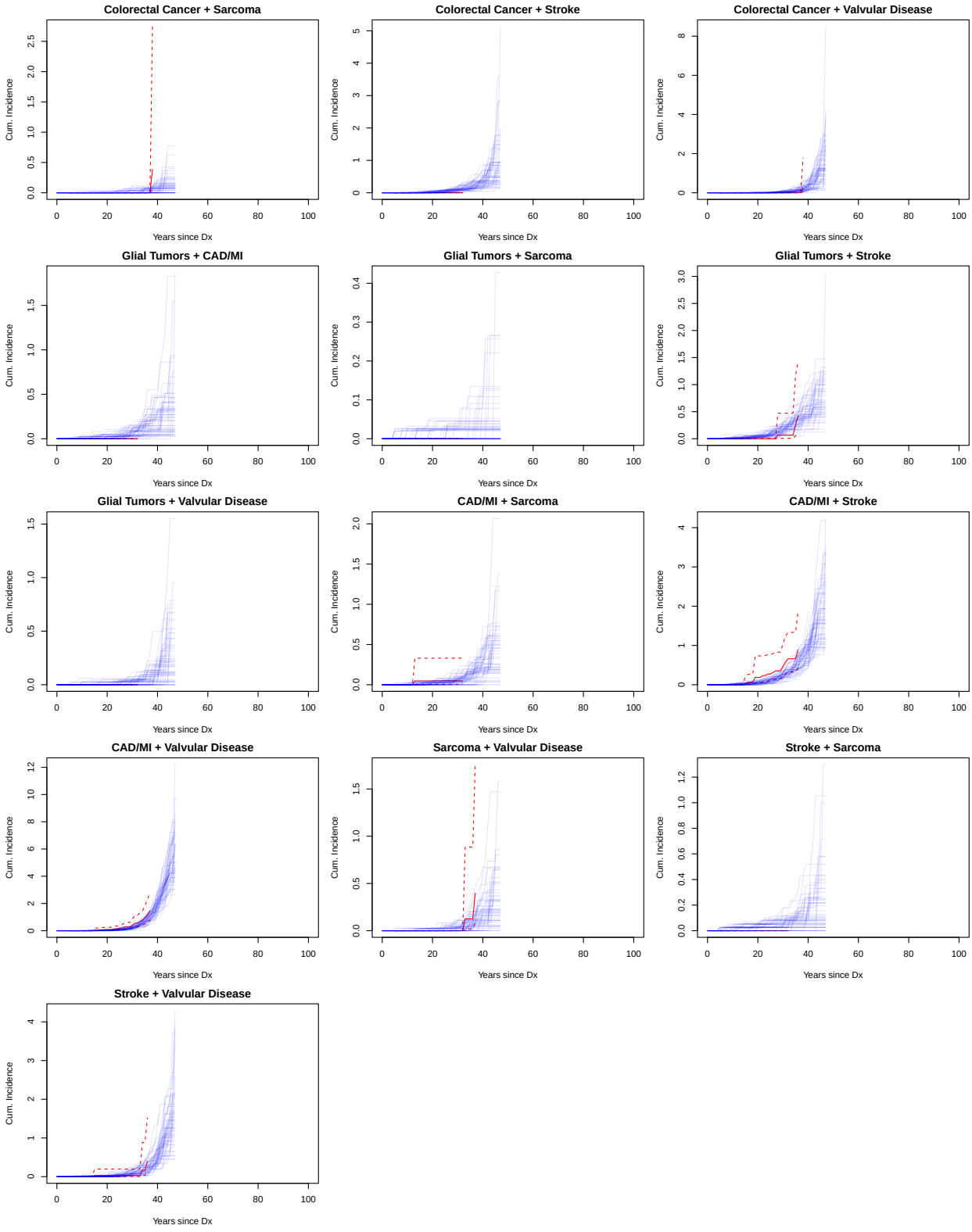
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx


Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.9 Age10-14

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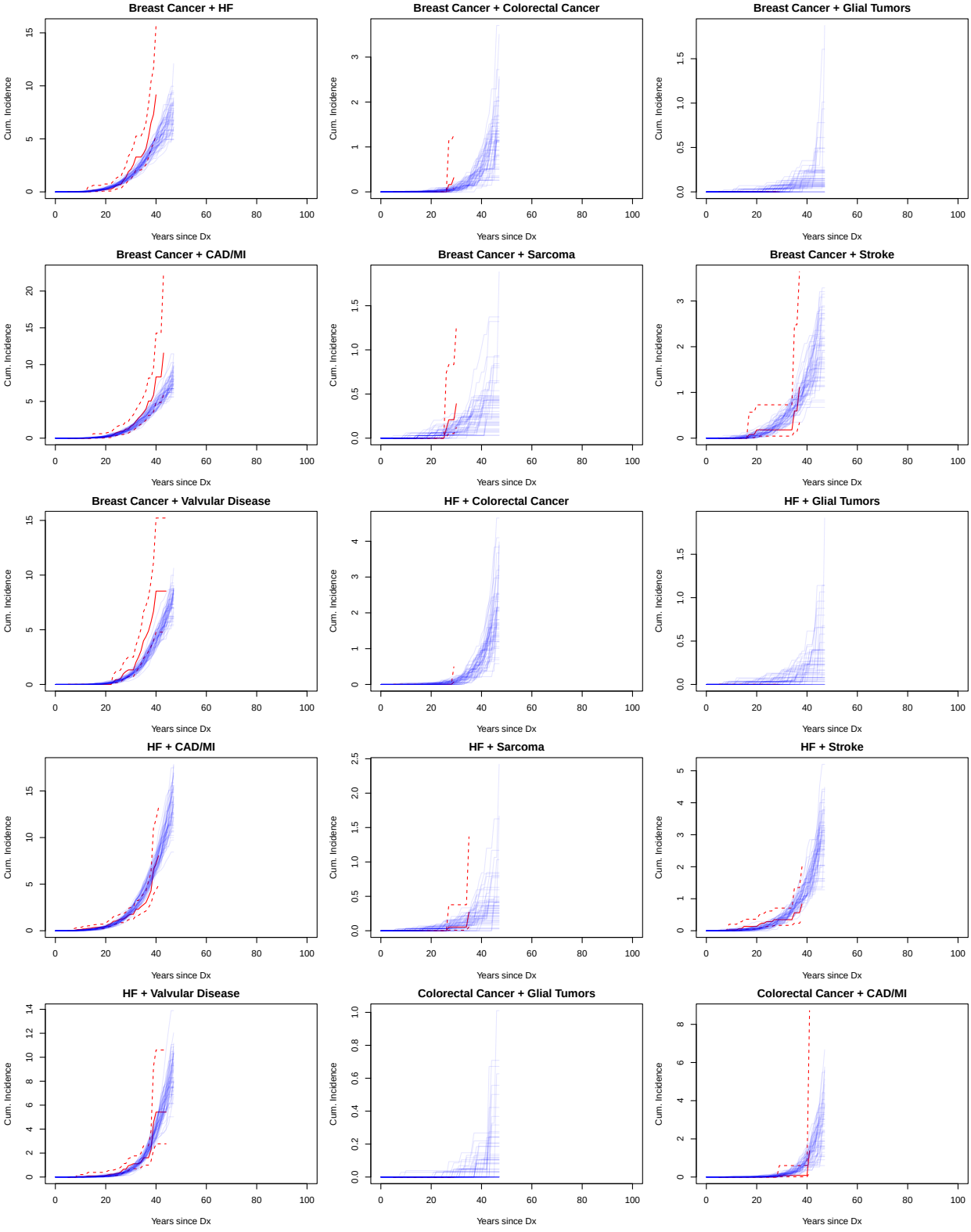
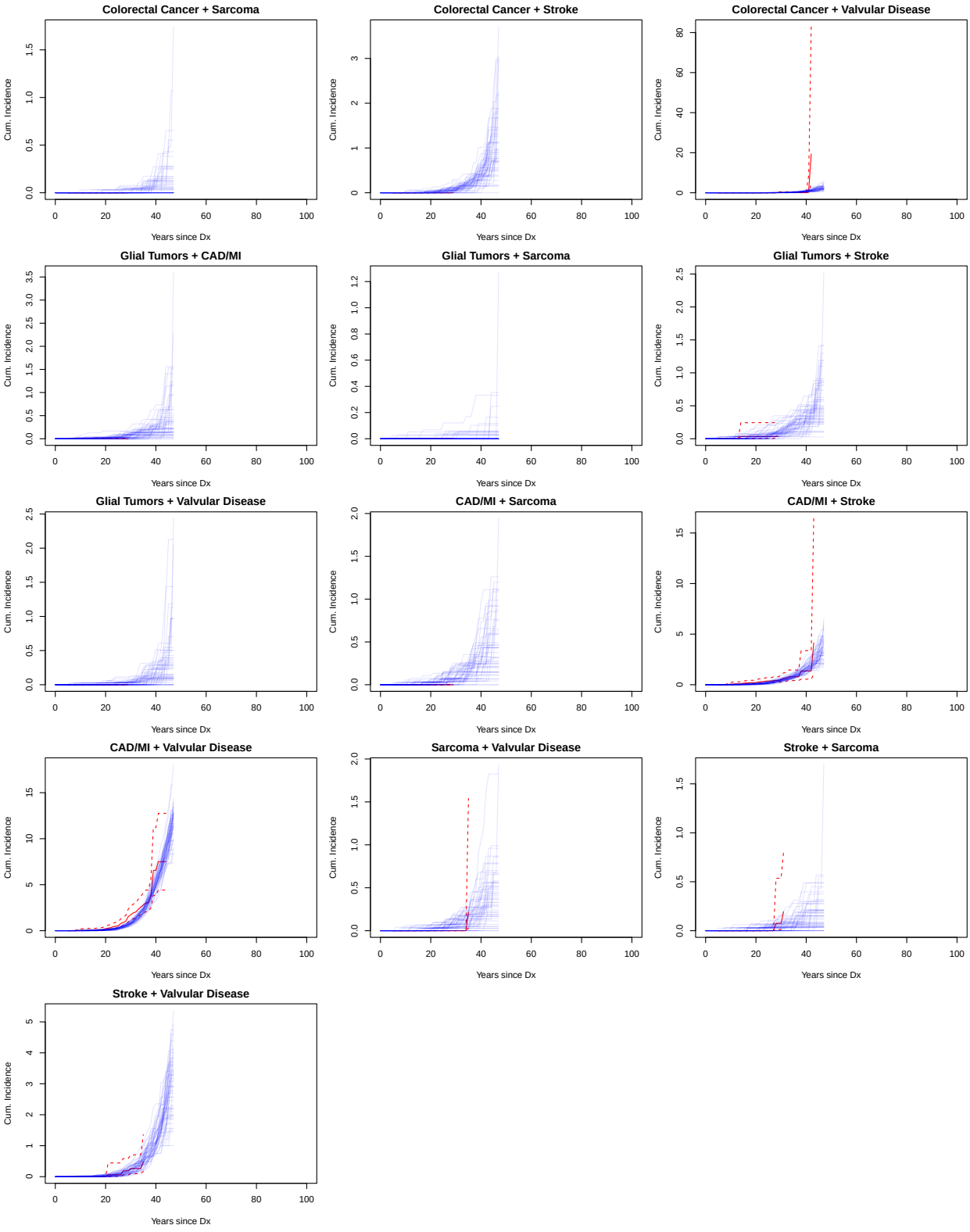
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.10 Age15-20

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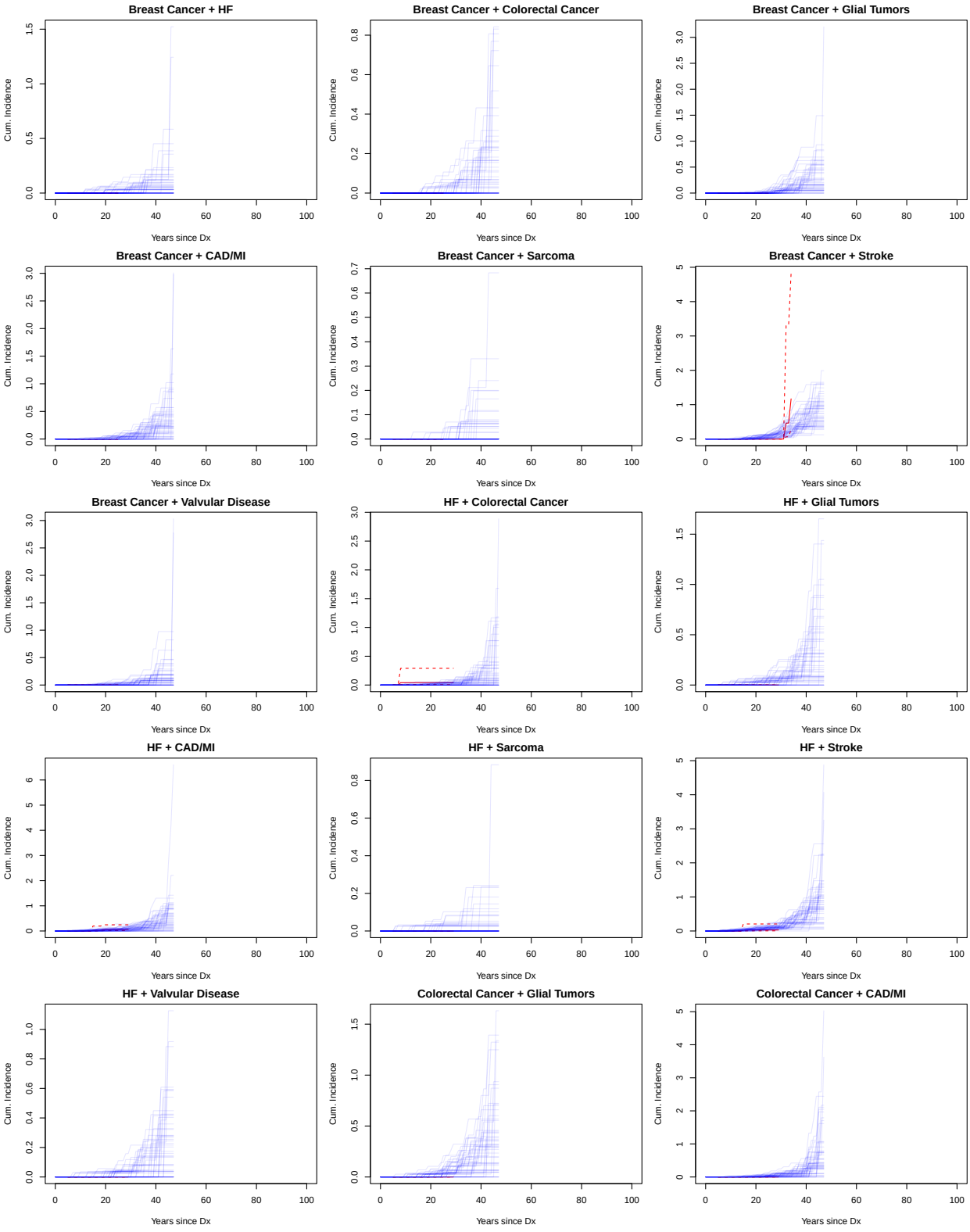
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.11 Brain


Breast Cancer + HF
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Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
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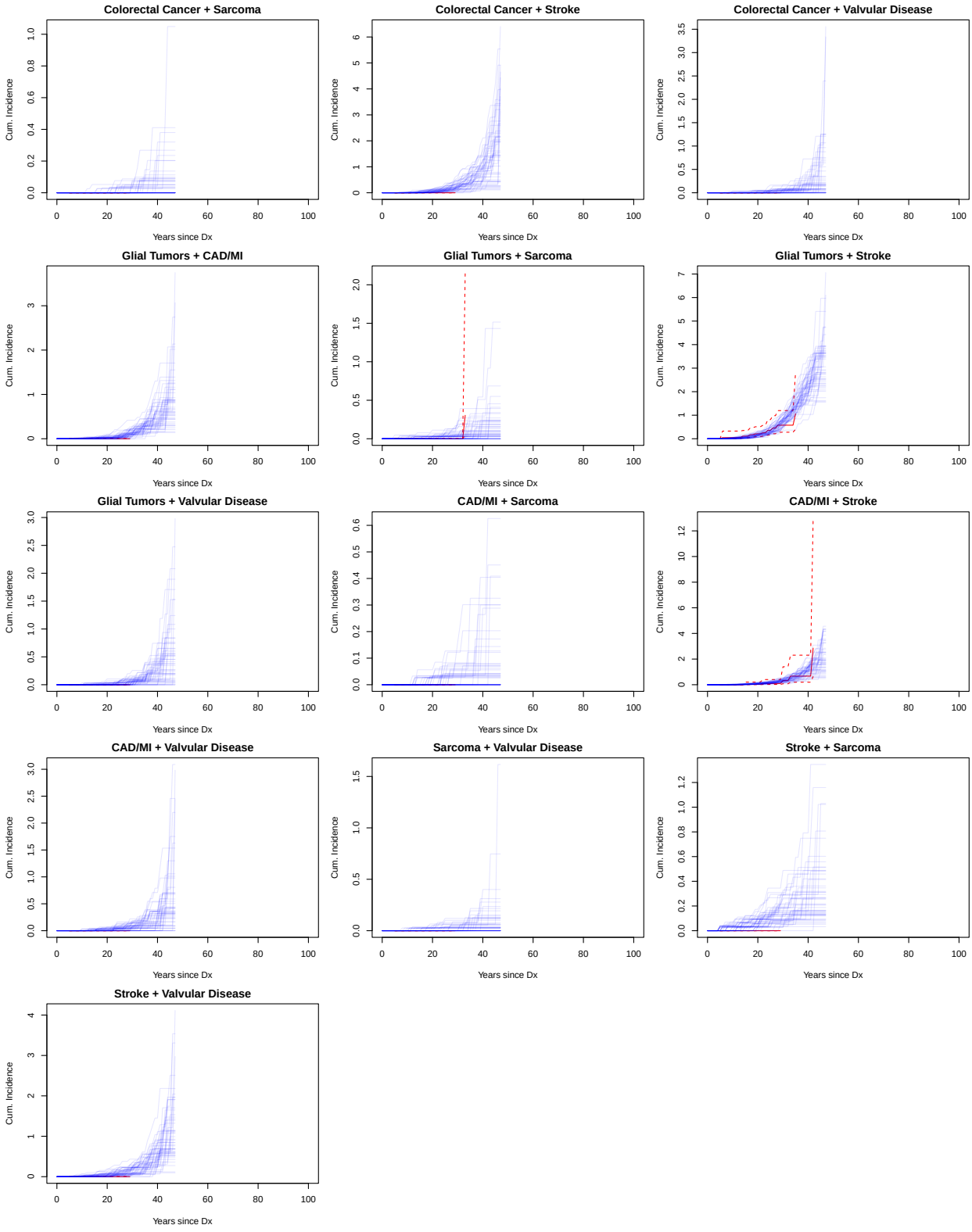
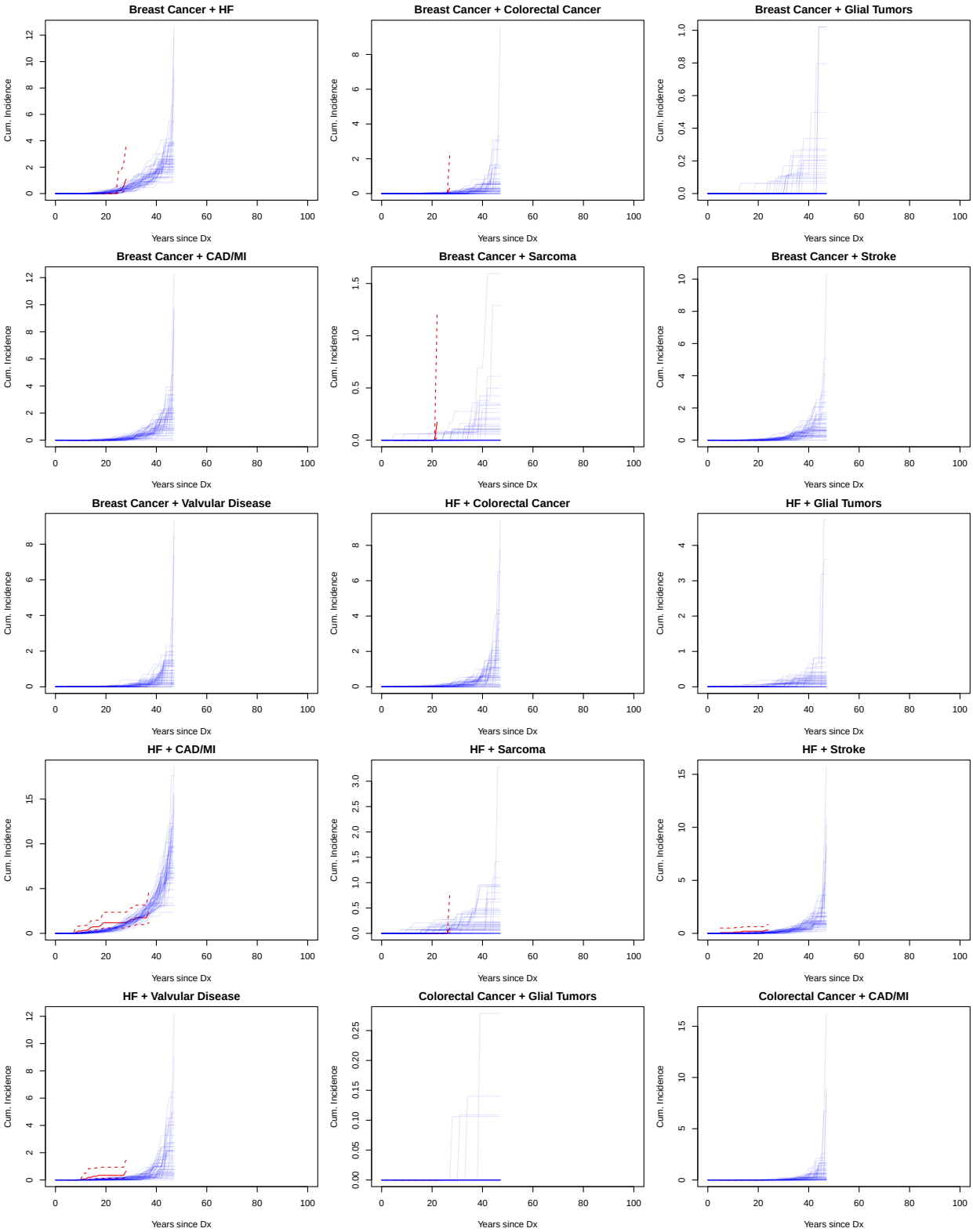
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx


Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.12 Bone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Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
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HF + Glial Tumors
HF + CAD/MI
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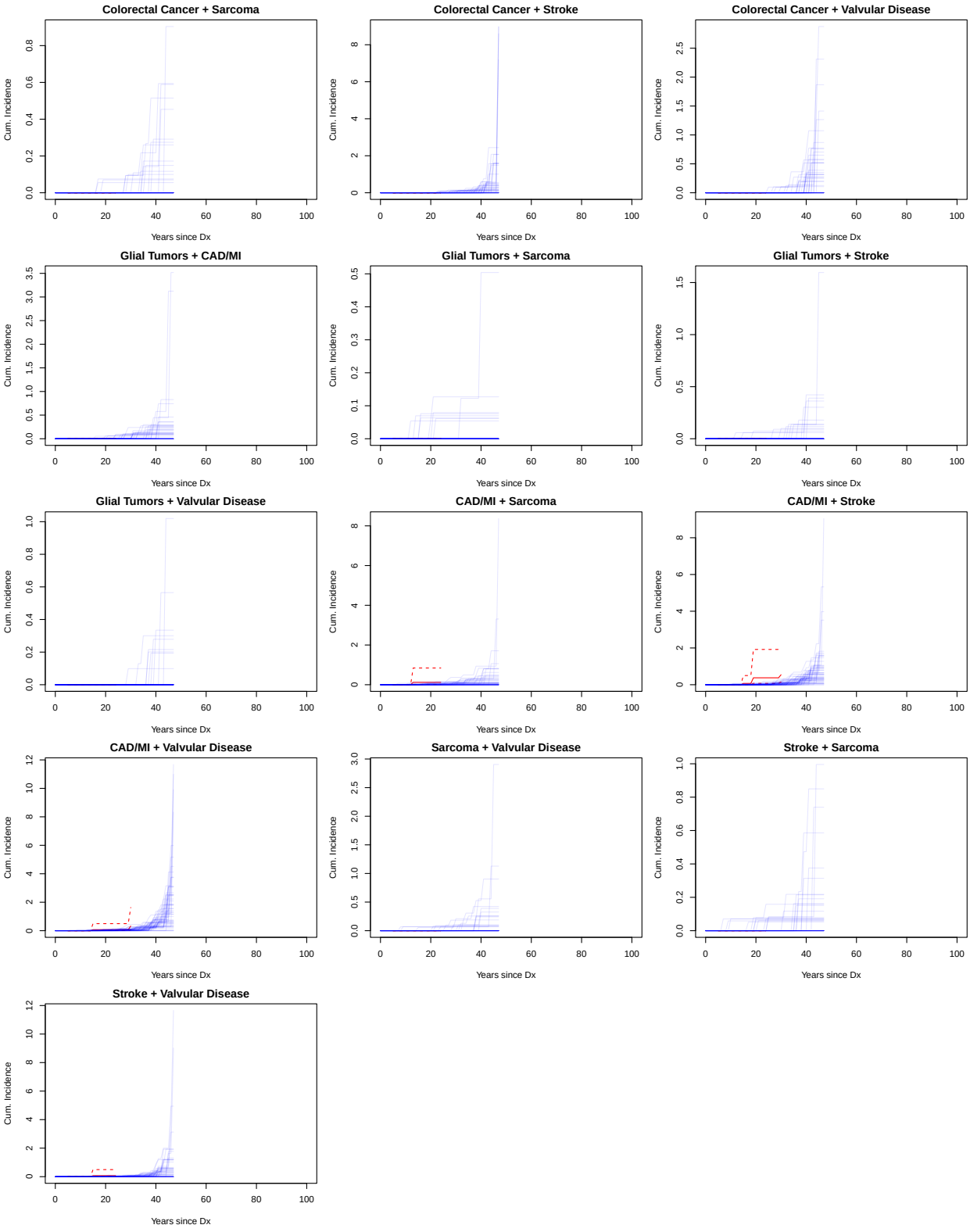
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx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Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
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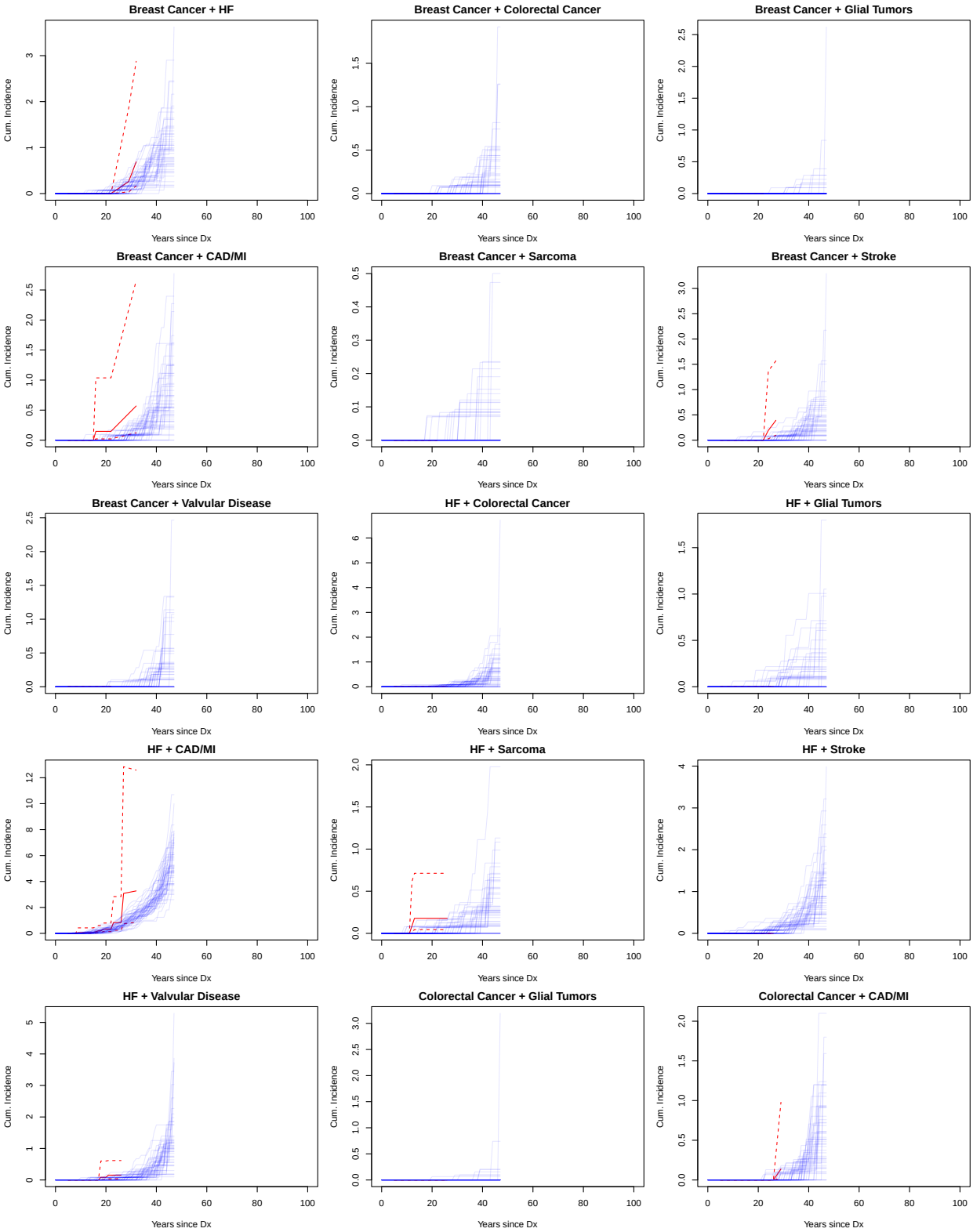
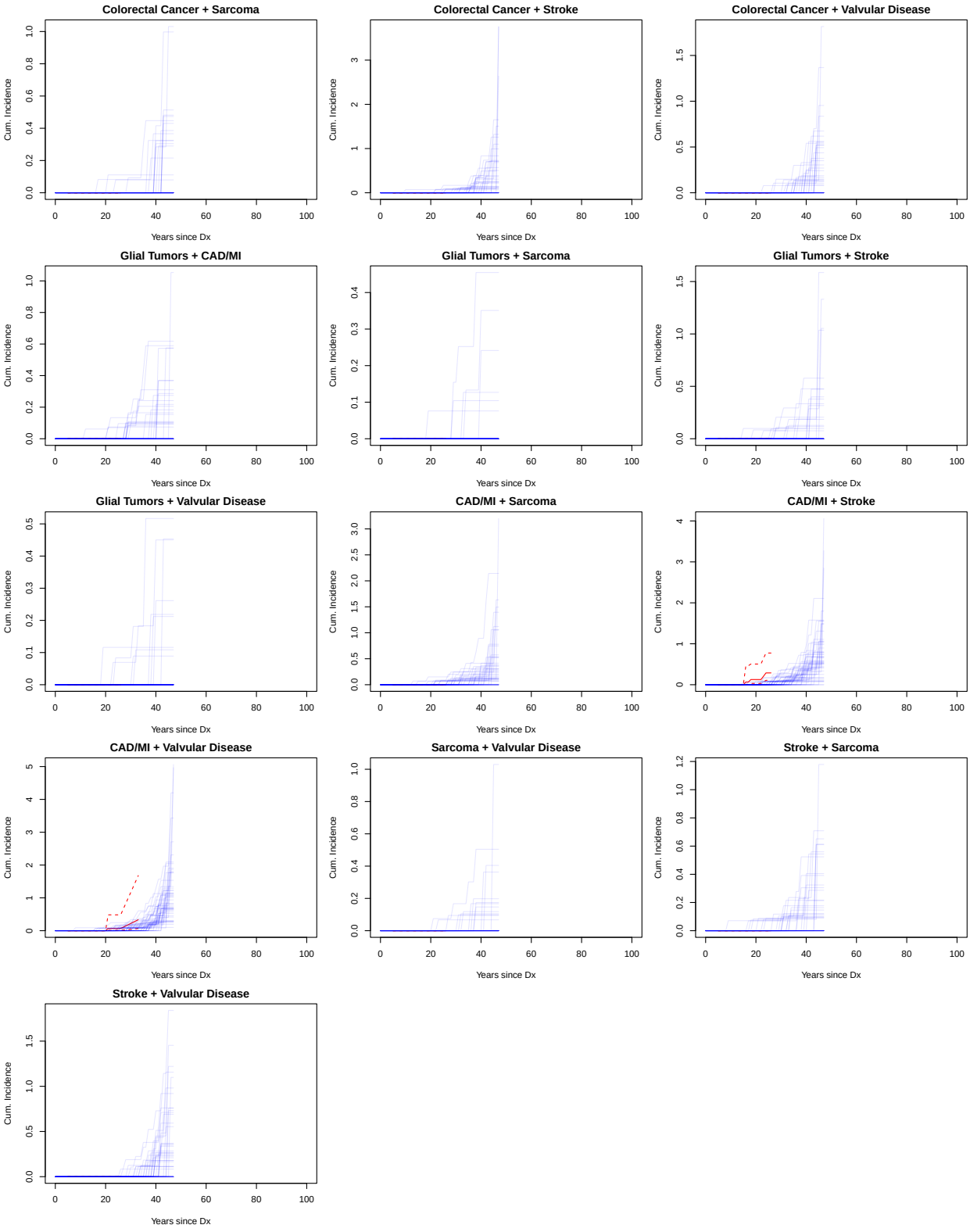
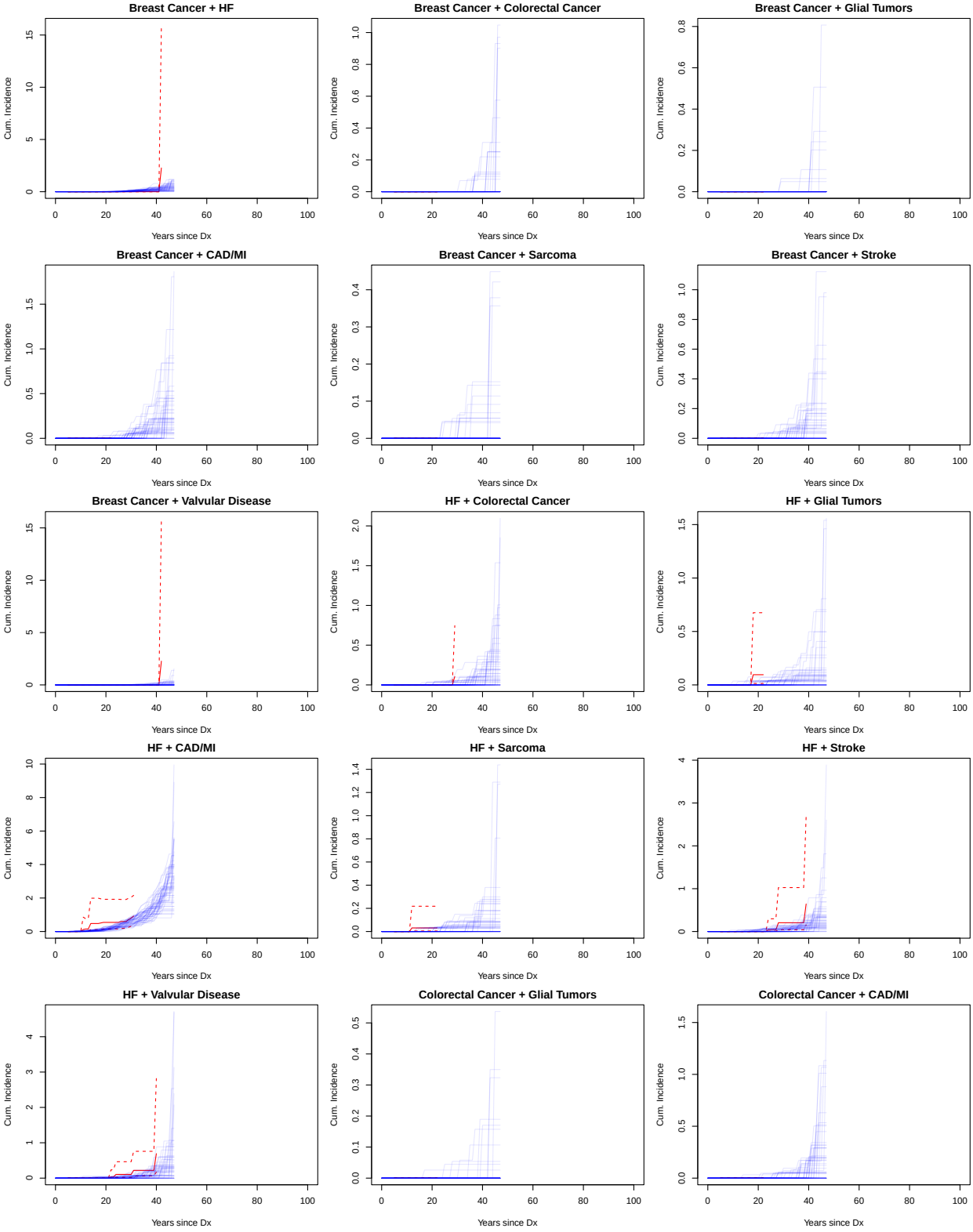
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.13 Soft Tissue Sarcoma




Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.14 WT/NBL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Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
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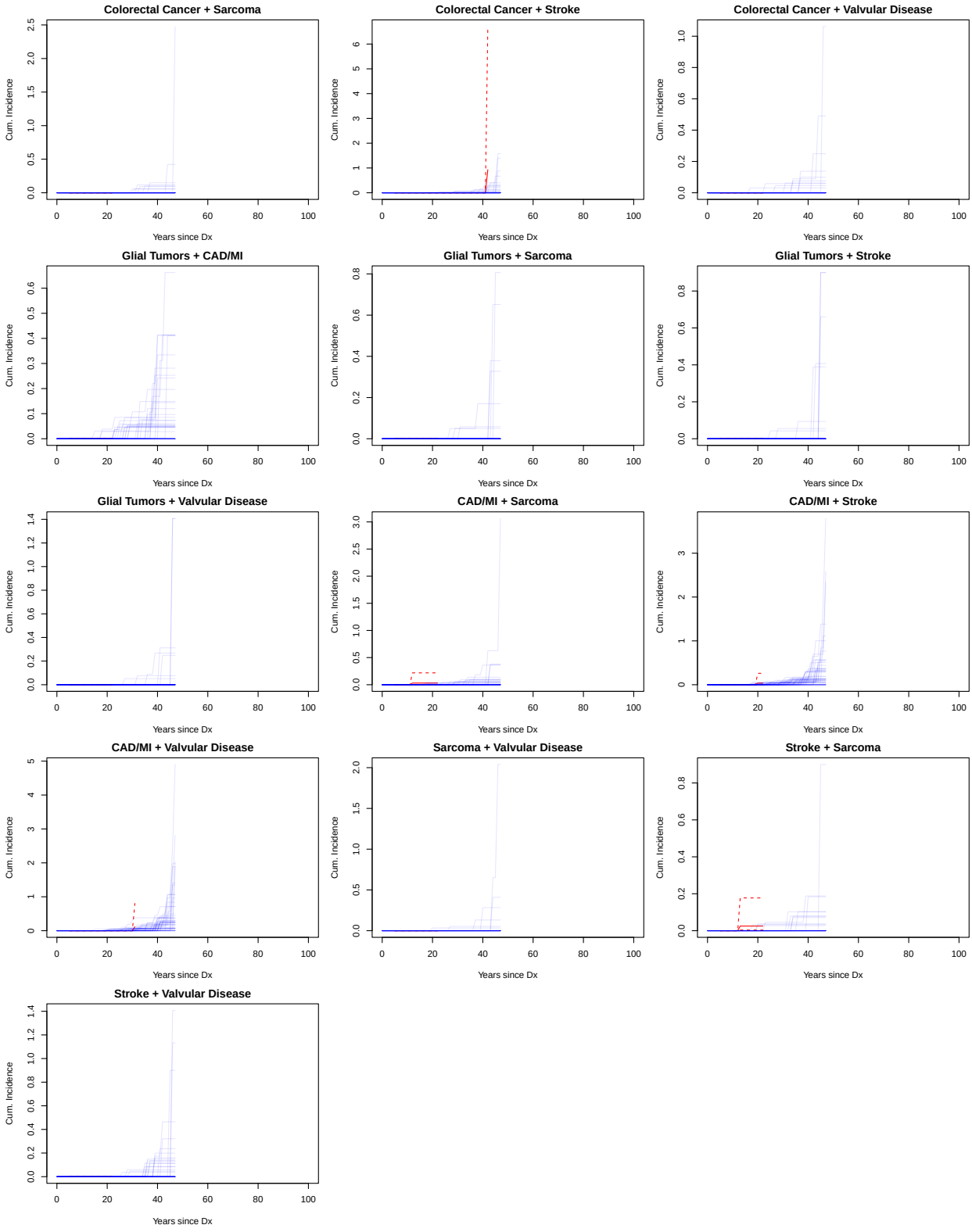
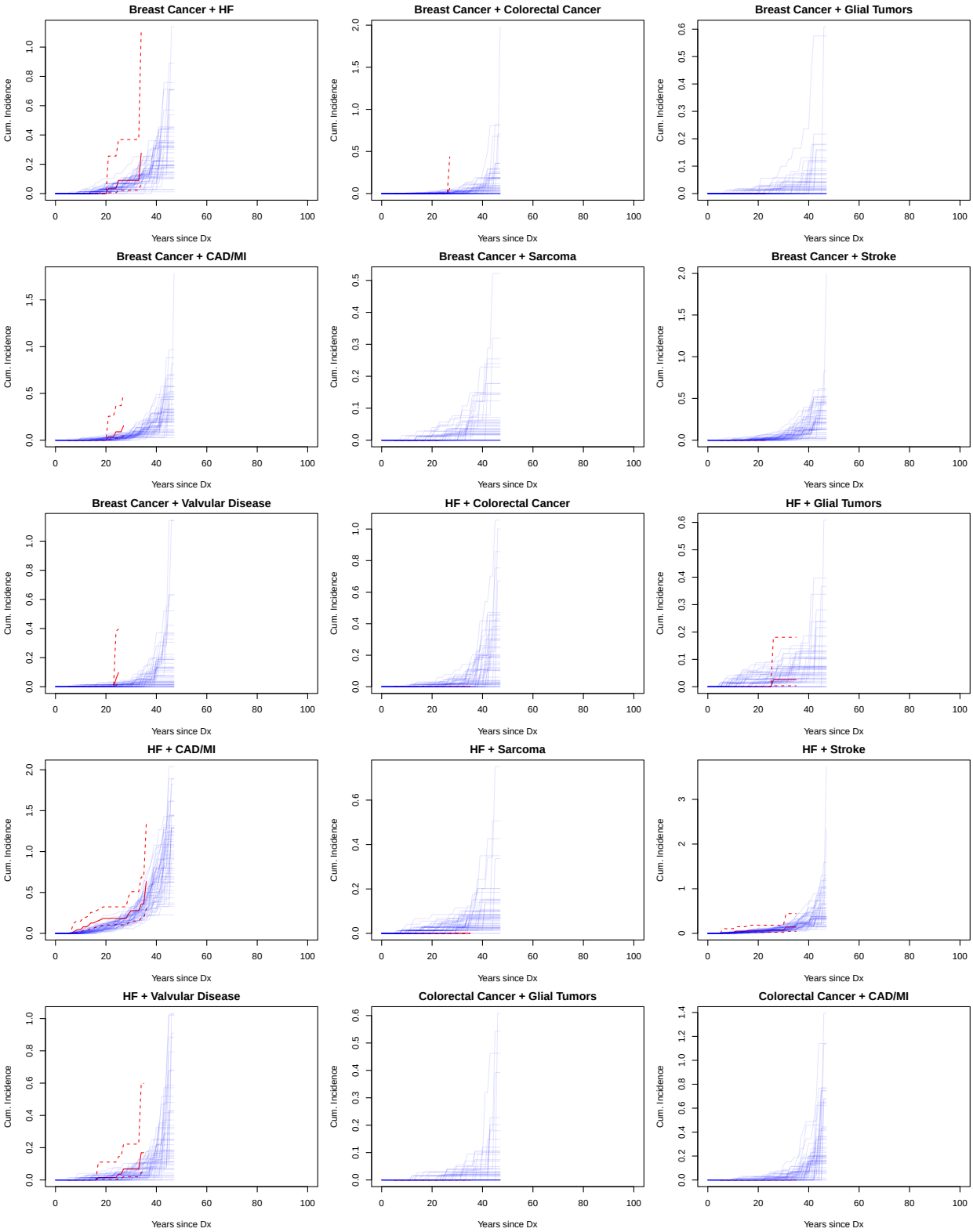
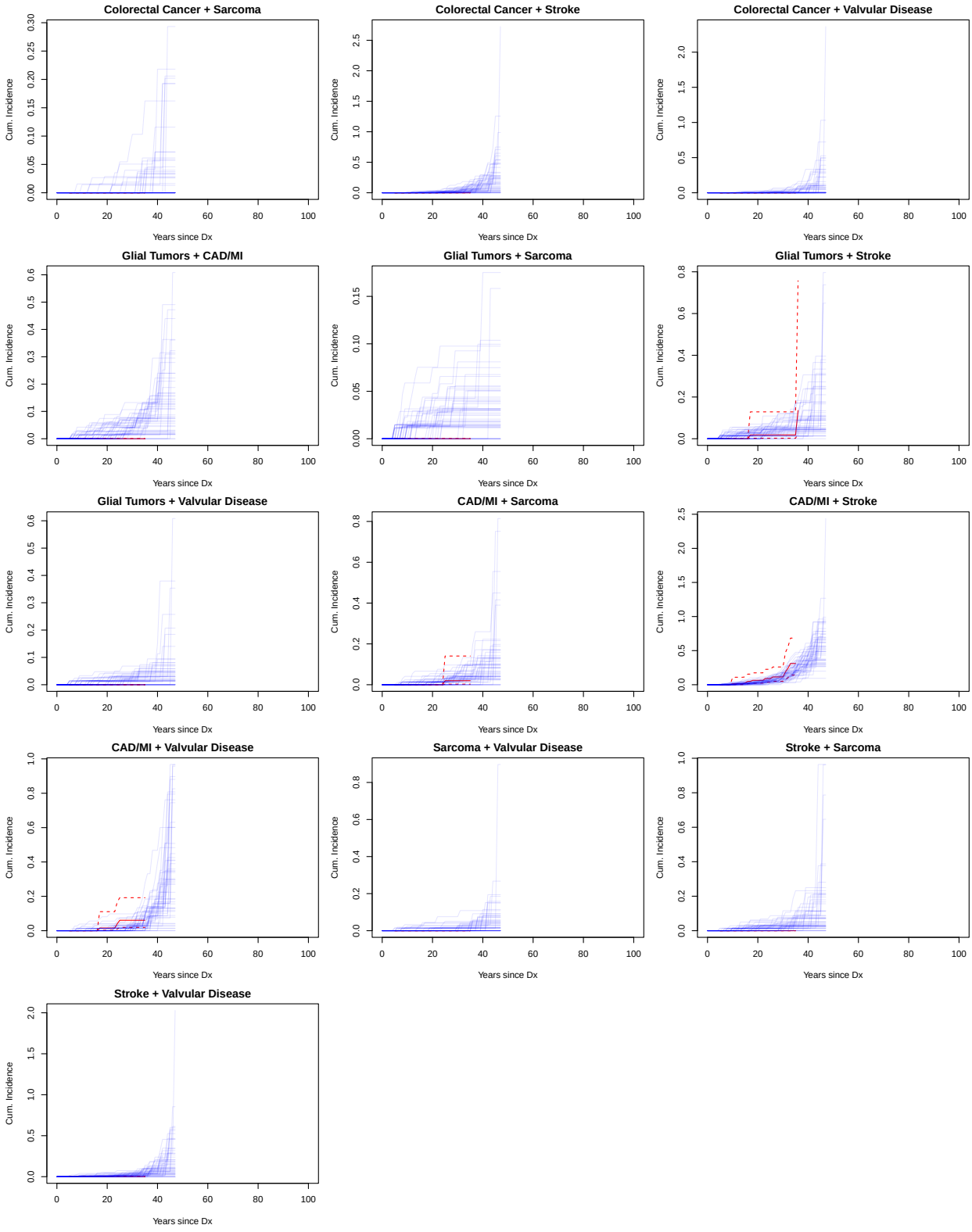
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

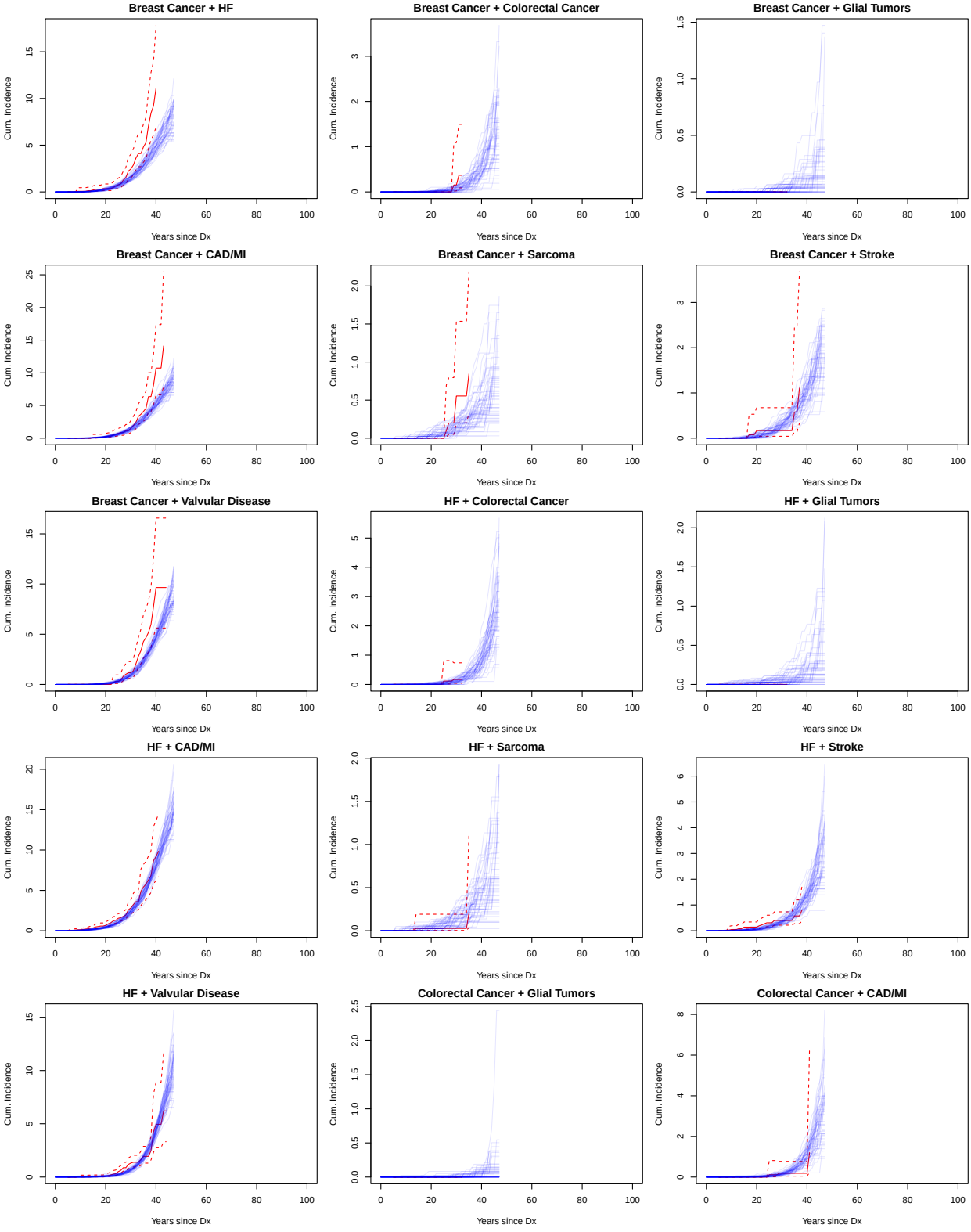

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

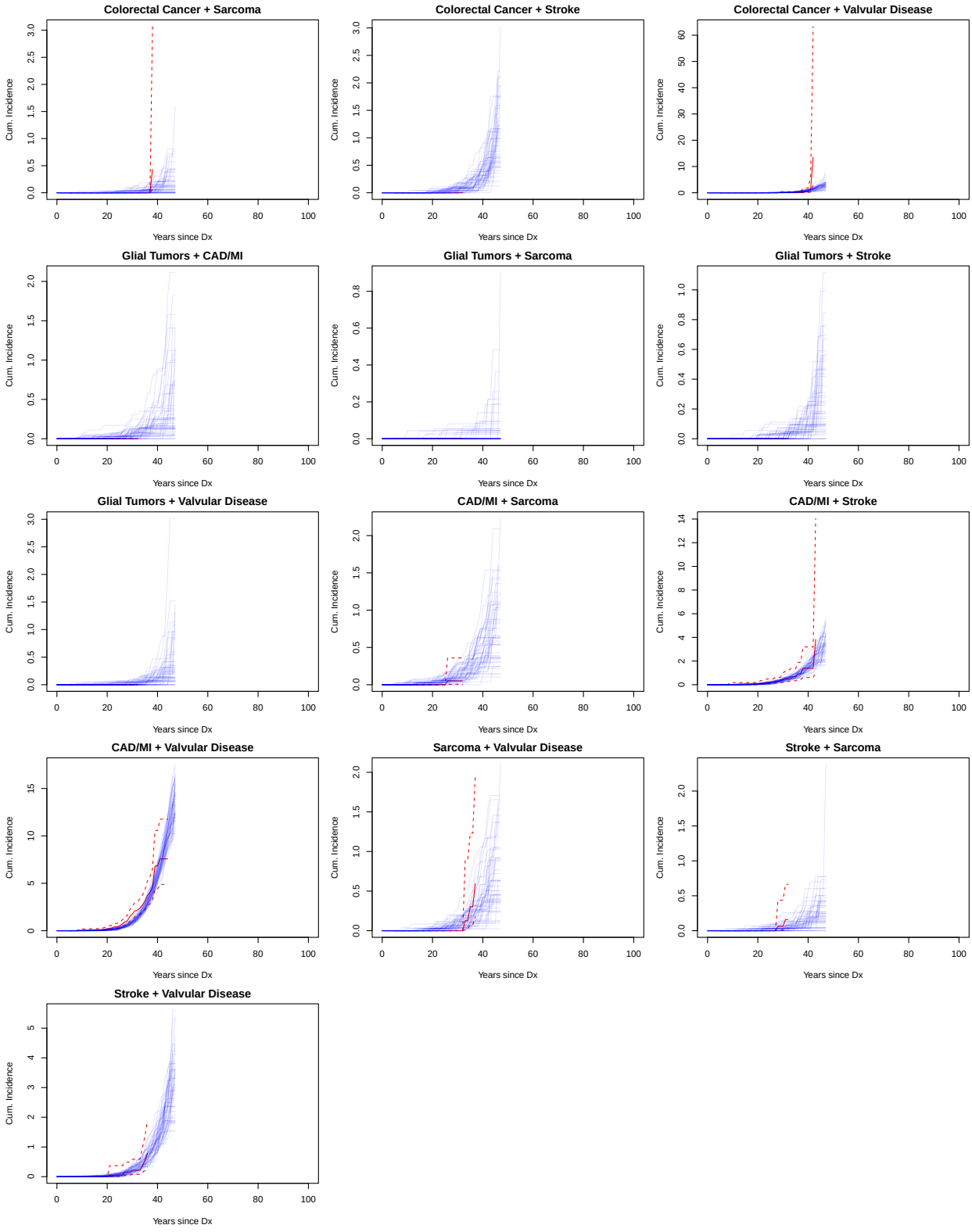
4.3.4.15 Leukemia



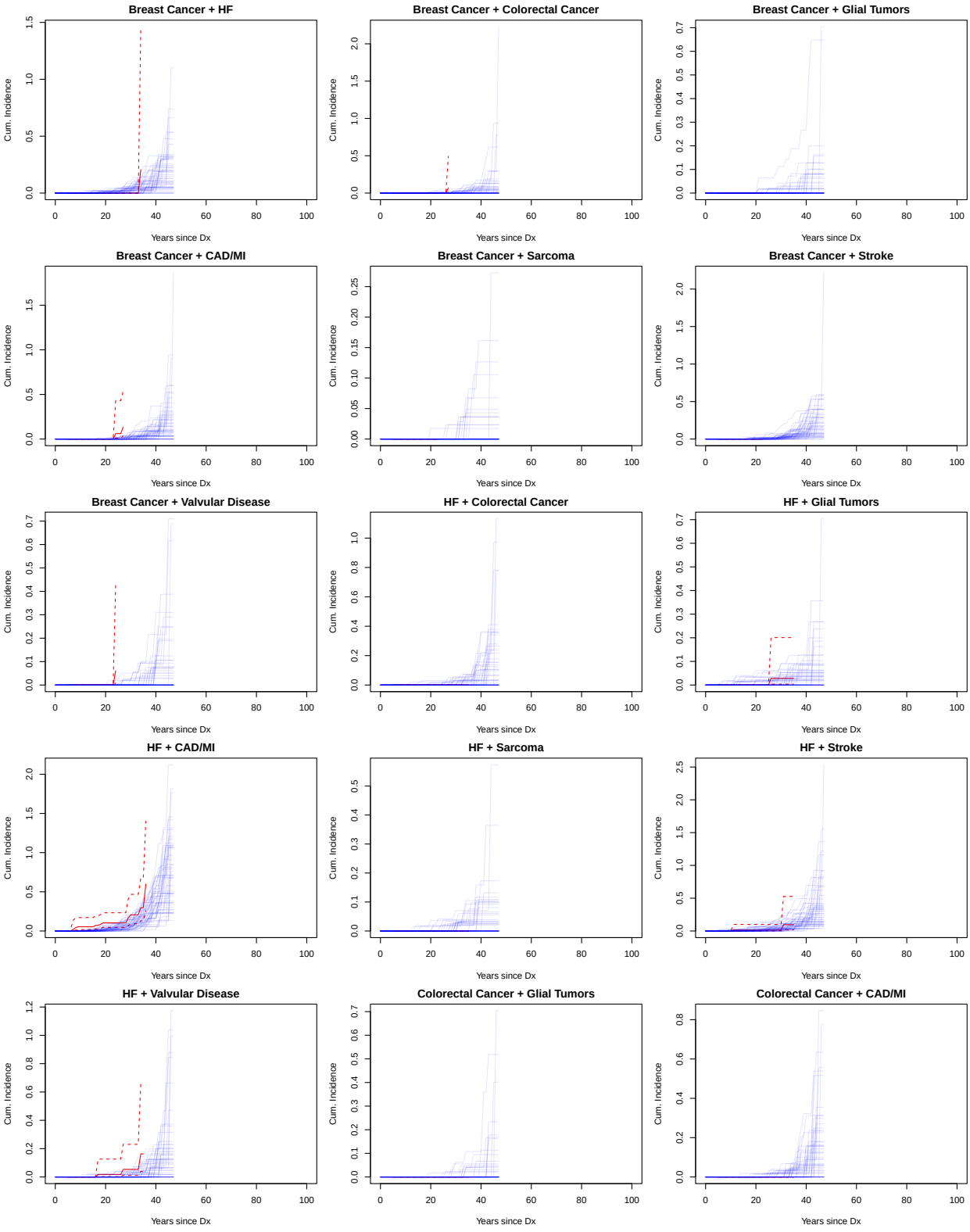

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.16 Lymphoma




Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.17 ALL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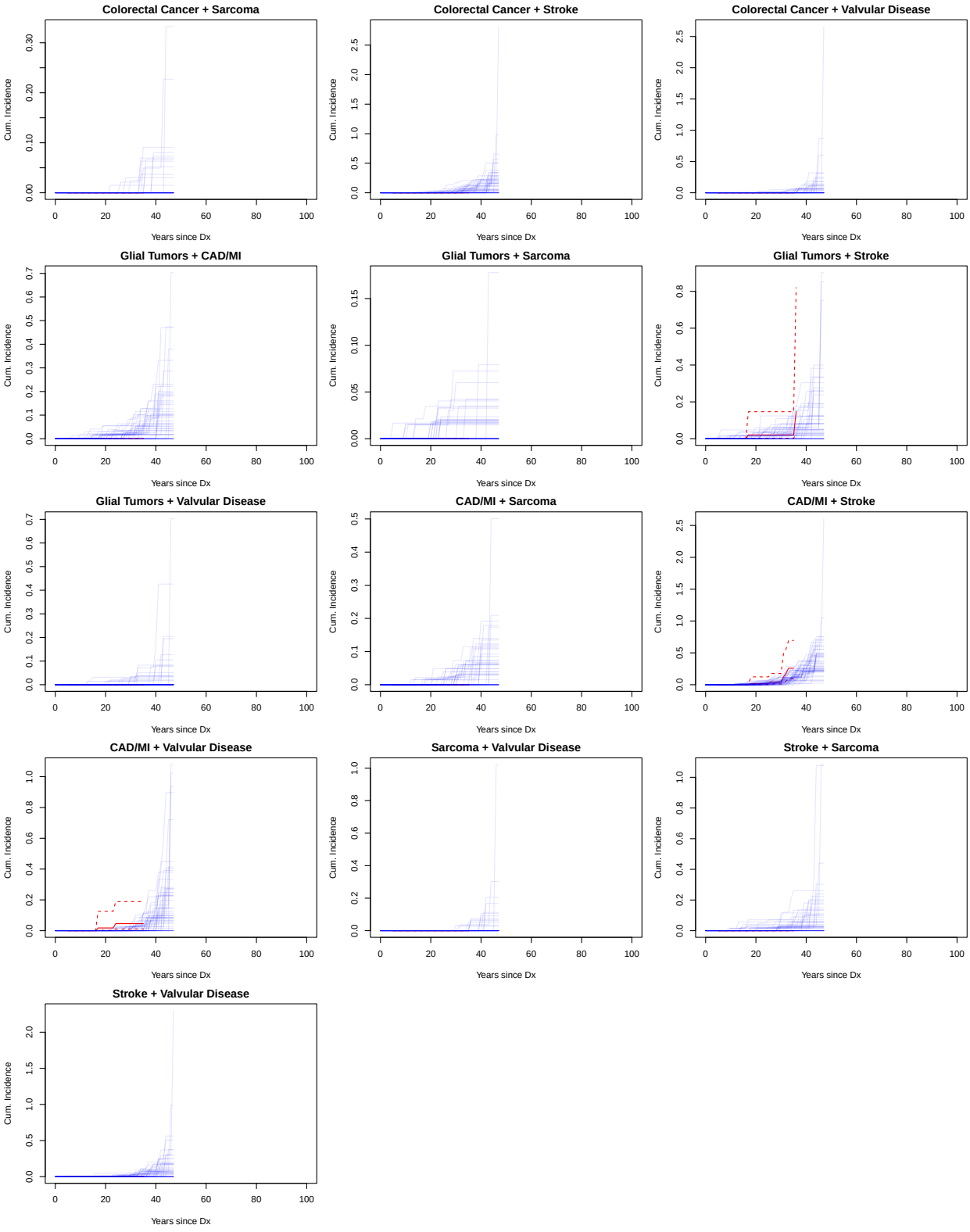
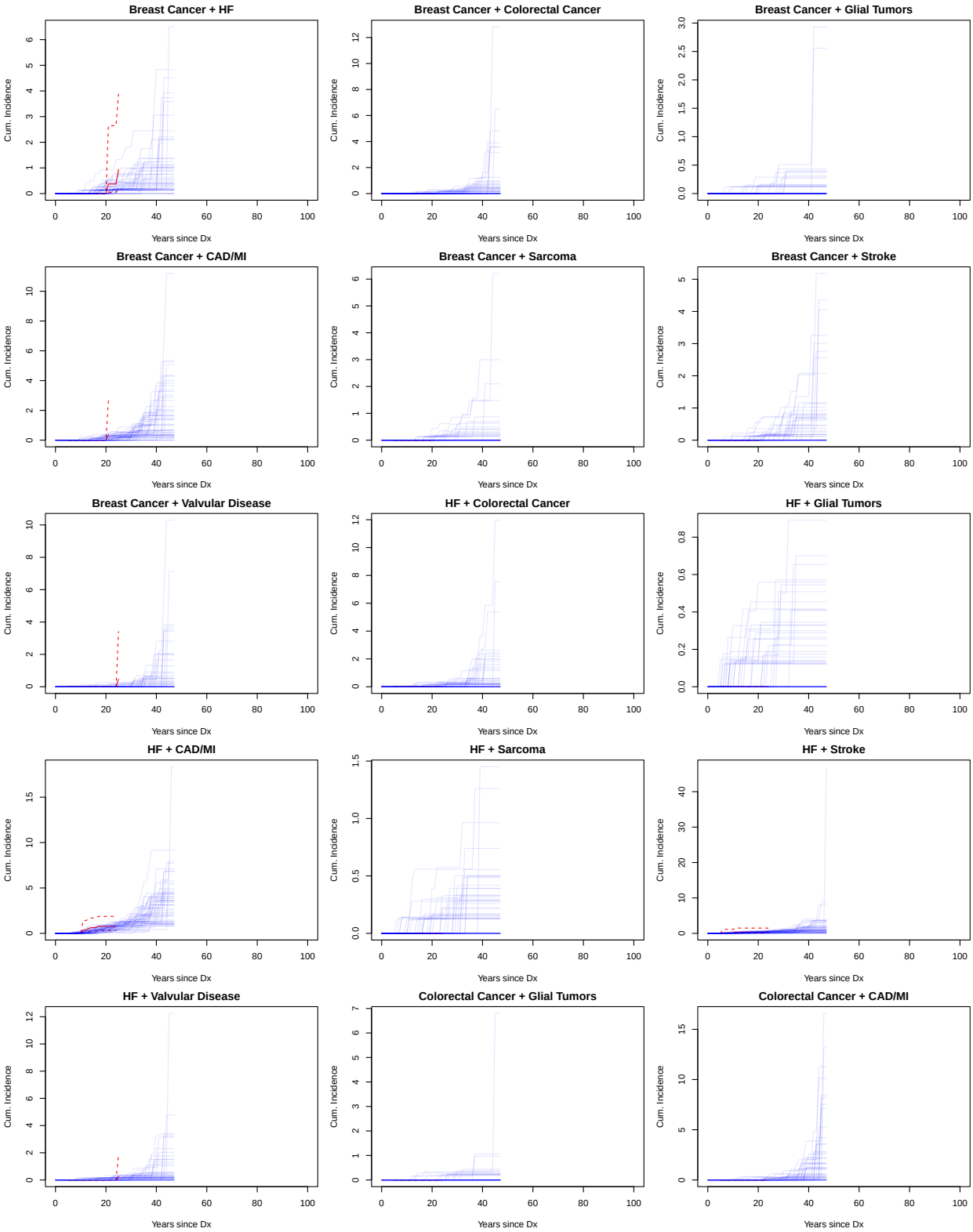
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx


Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.18 AML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HF + Glial Tumors
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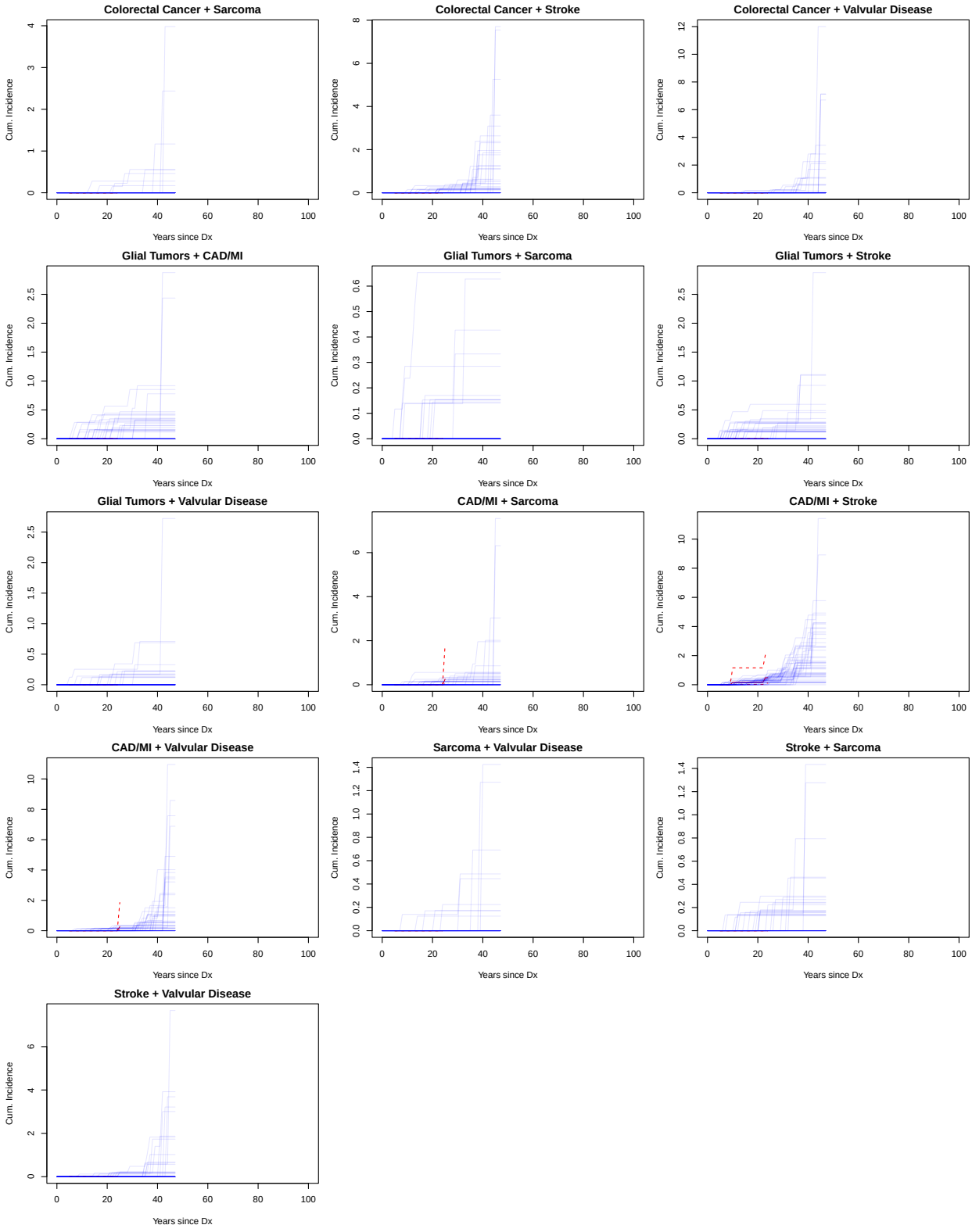
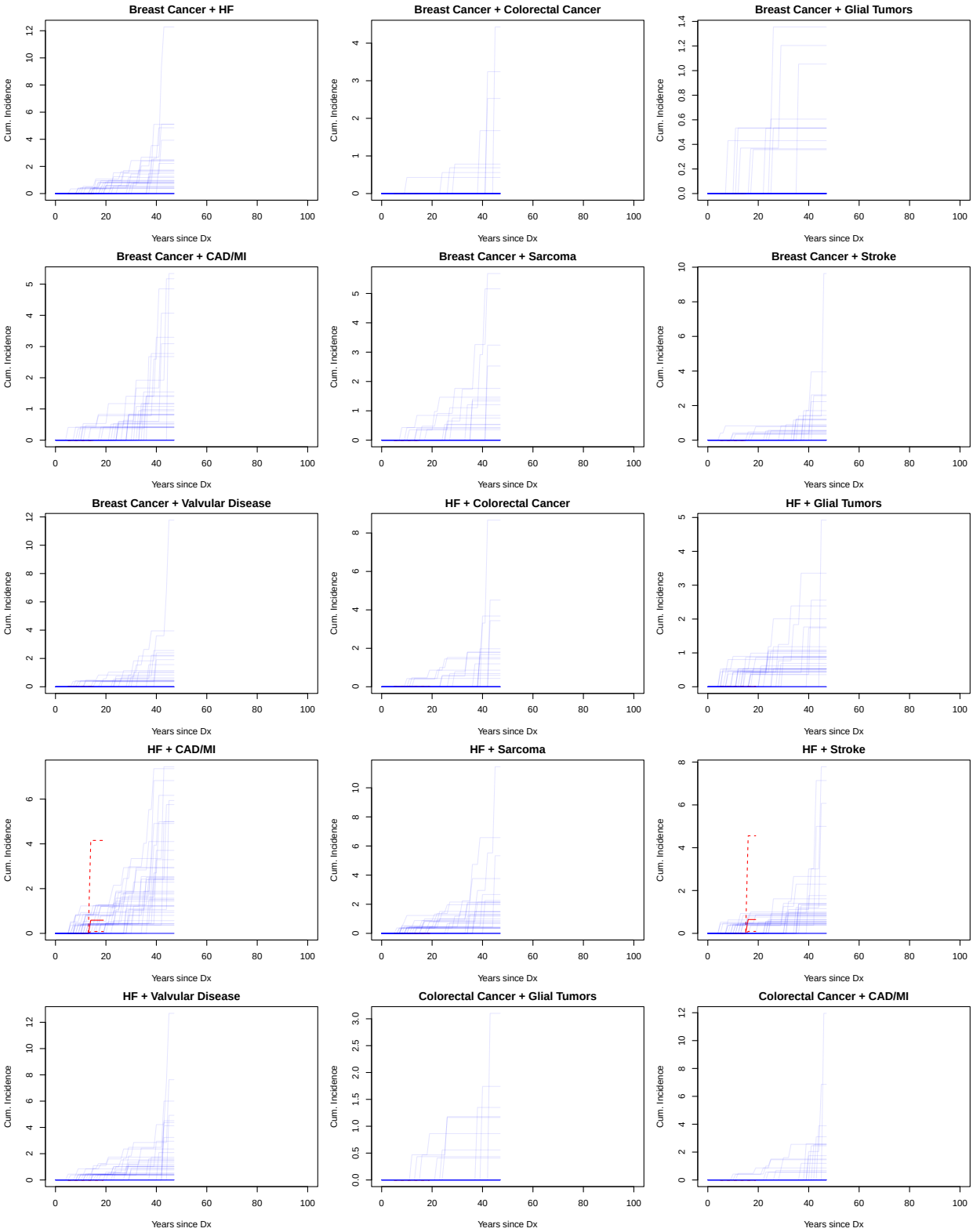
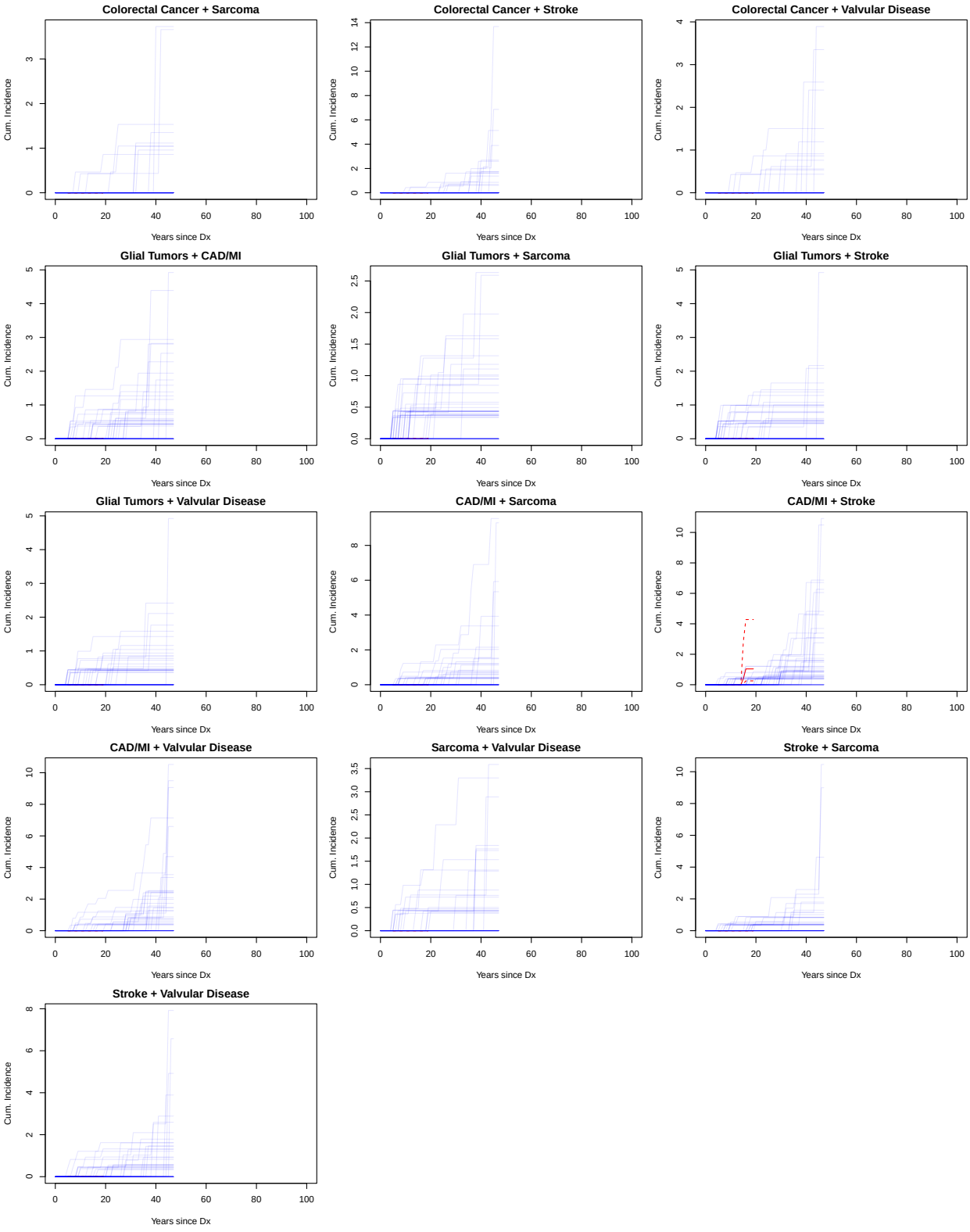
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx


Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.19 OtherLeukemia

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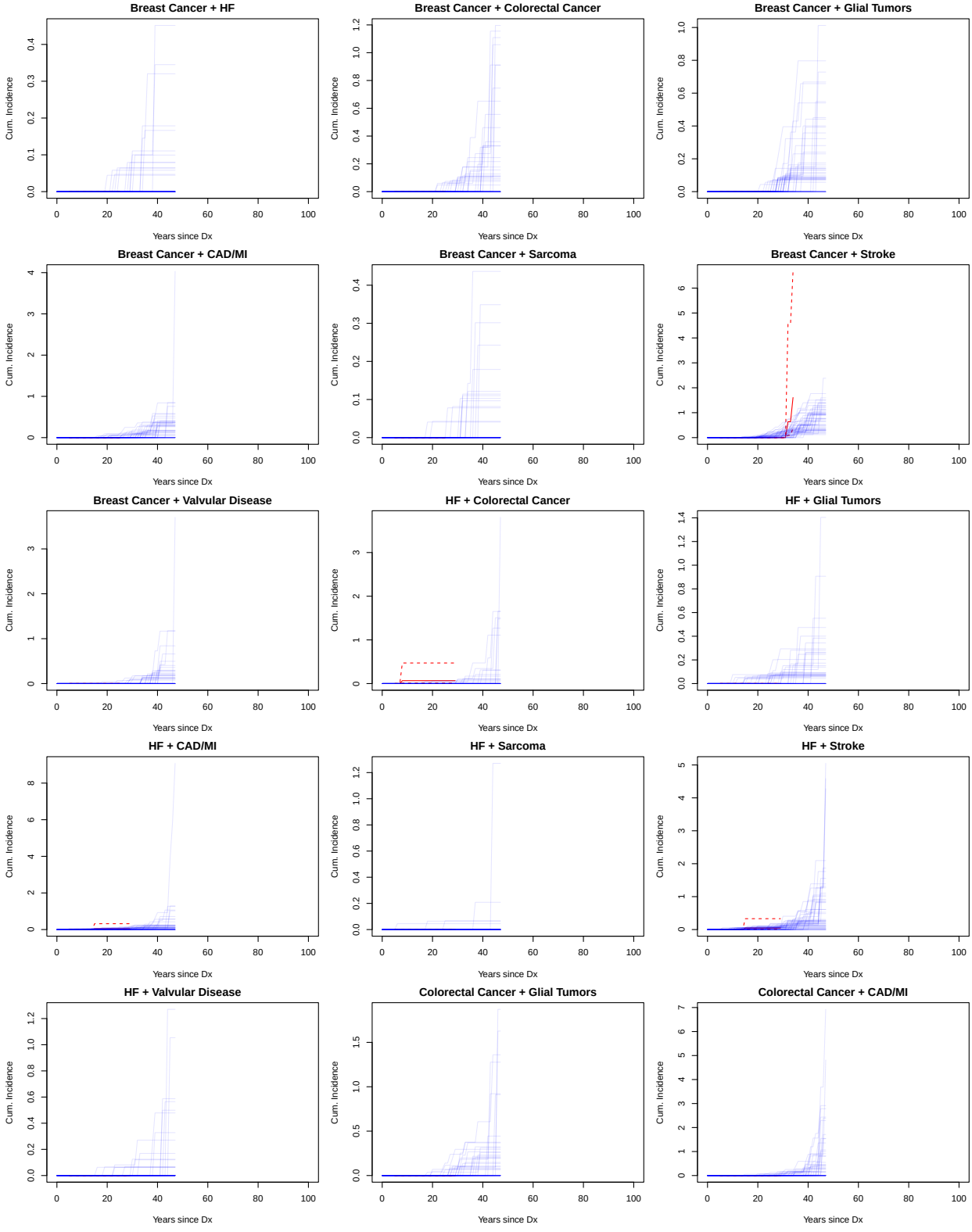
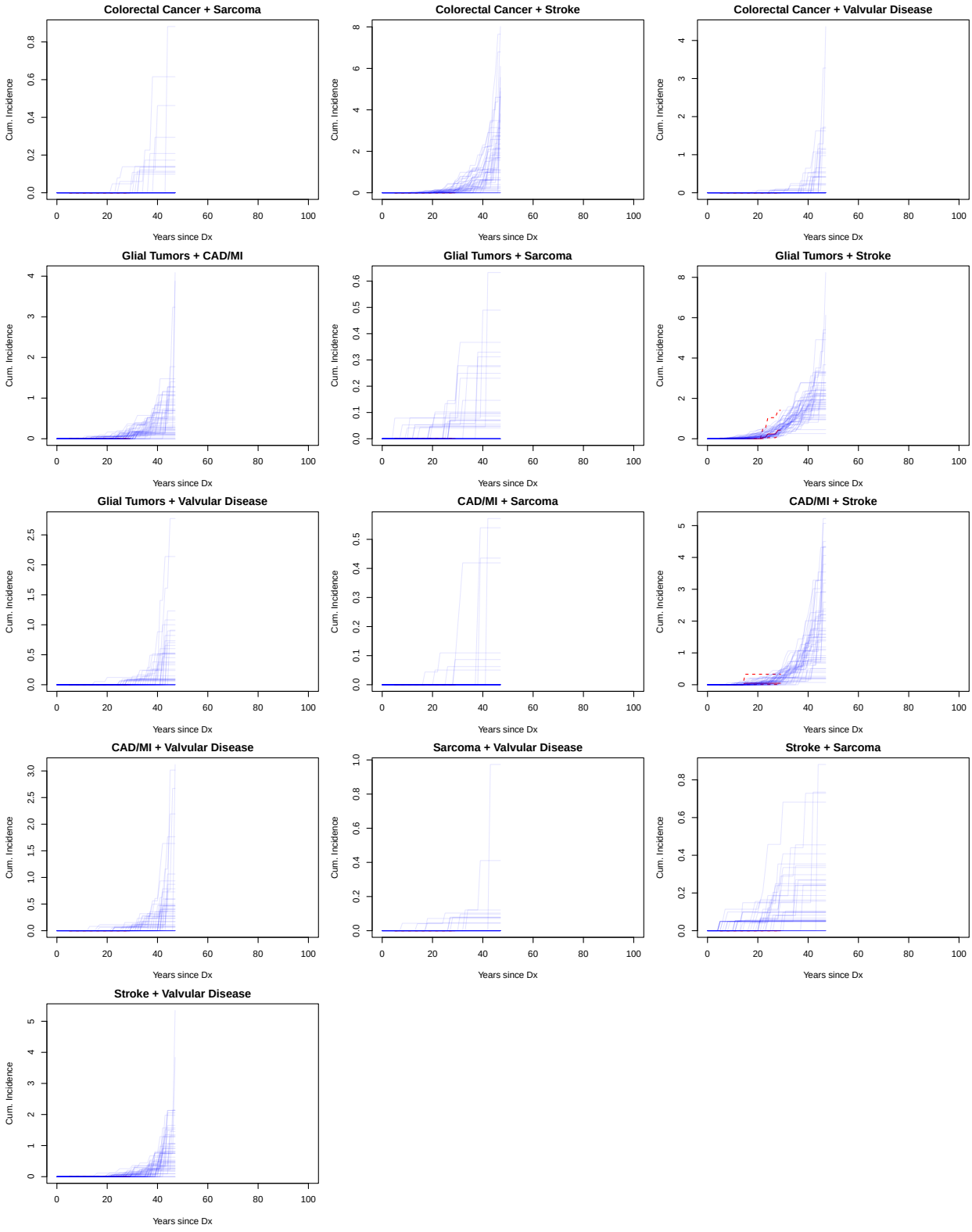
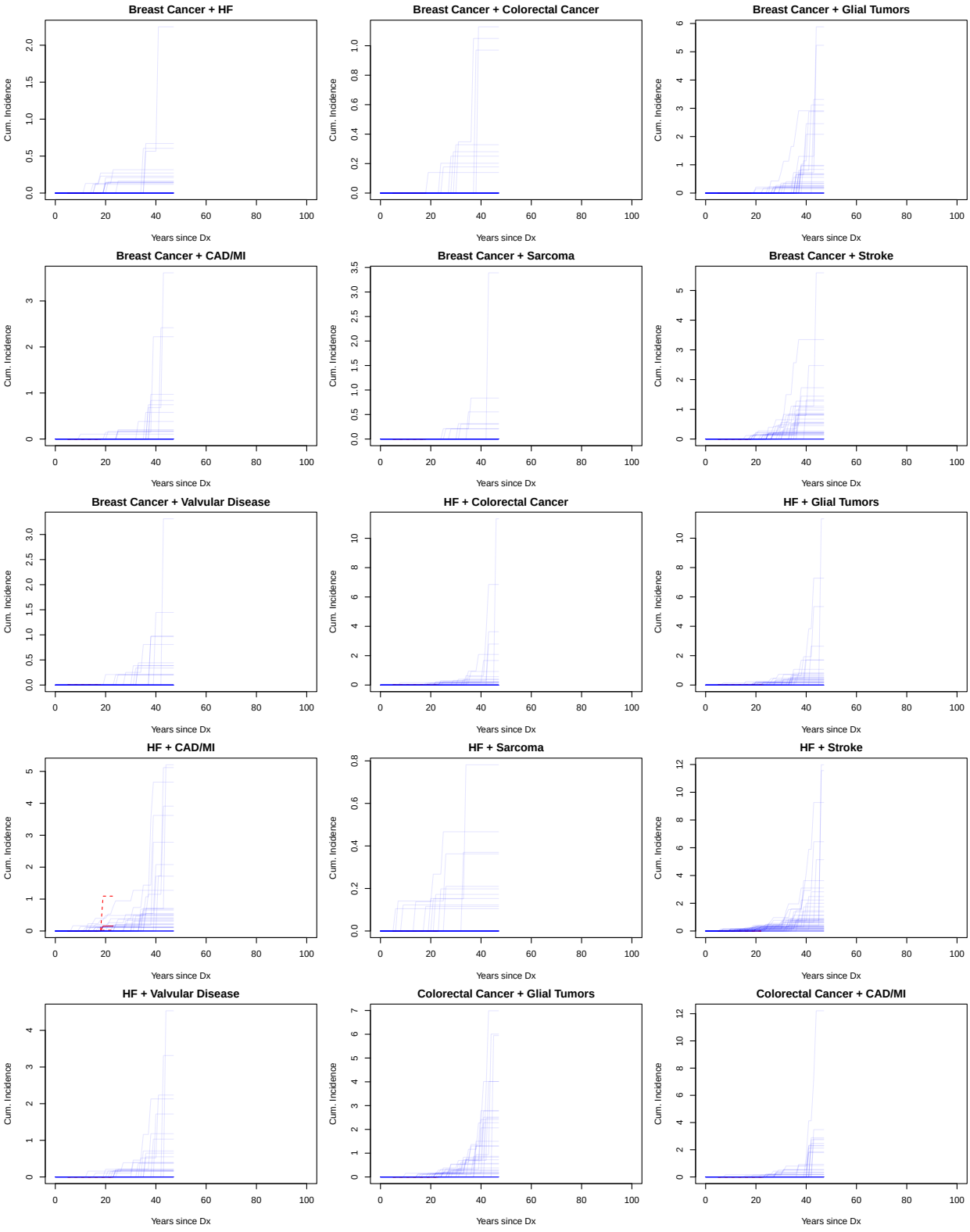
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

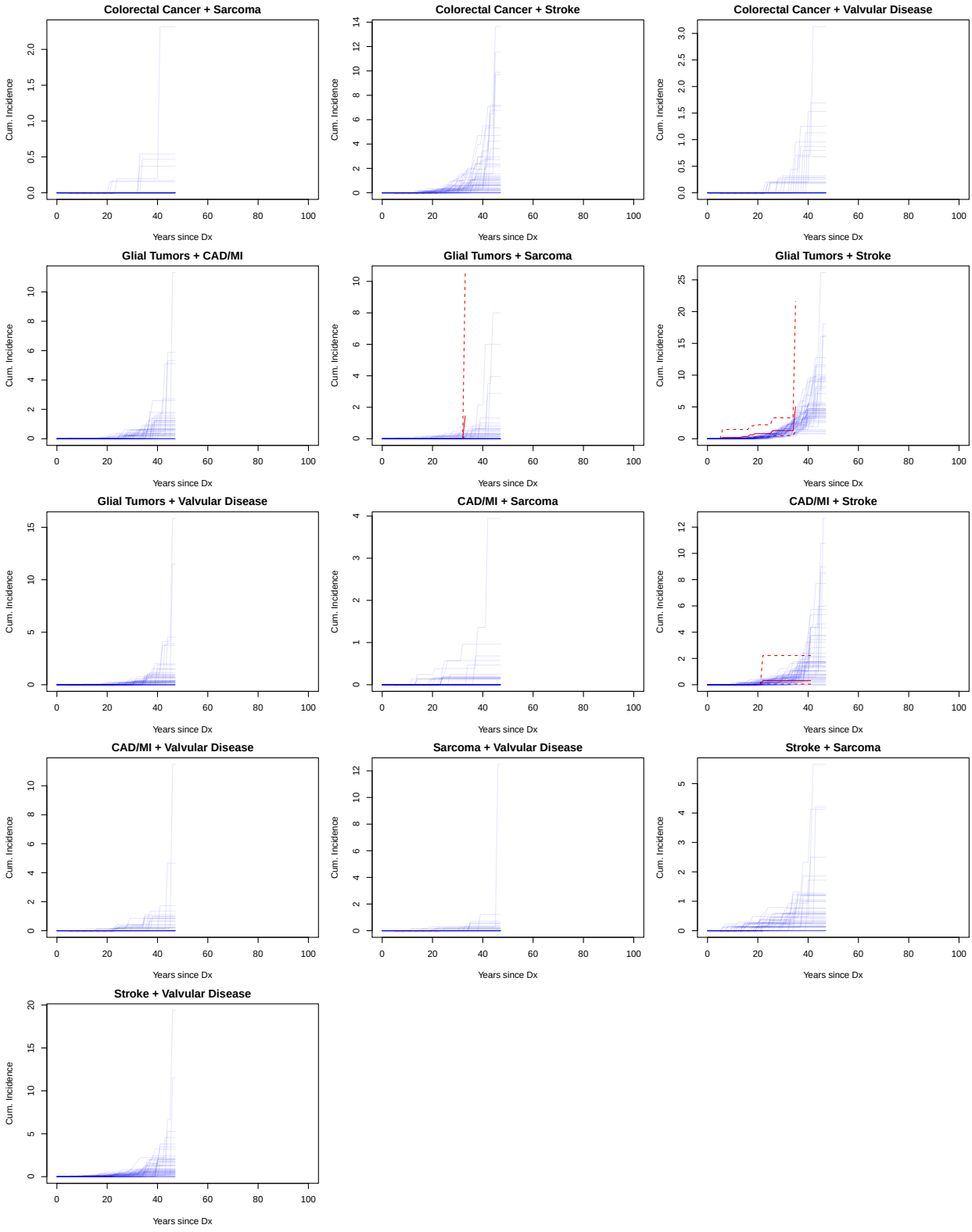
4.3.4.20 Astrocytoma



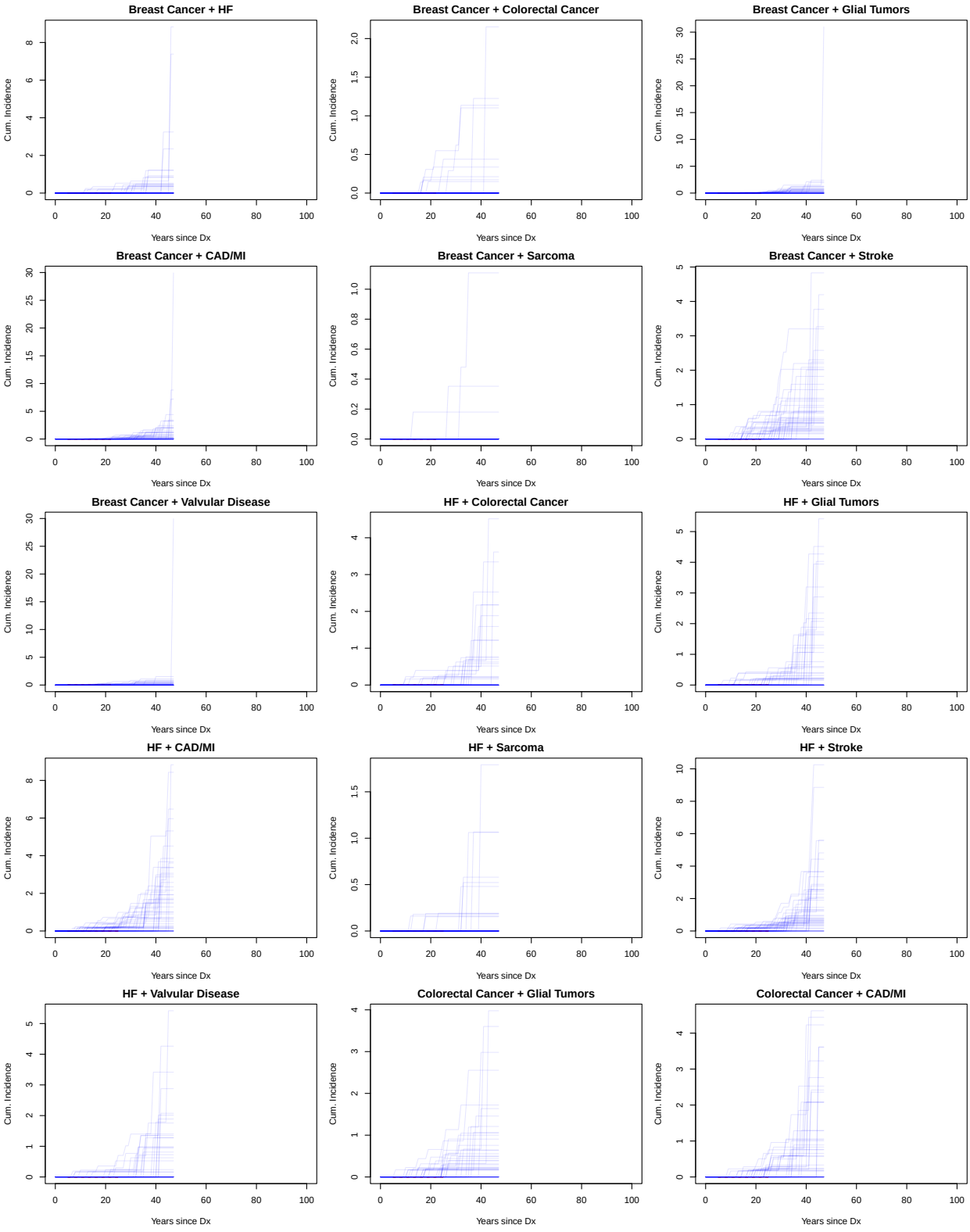

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

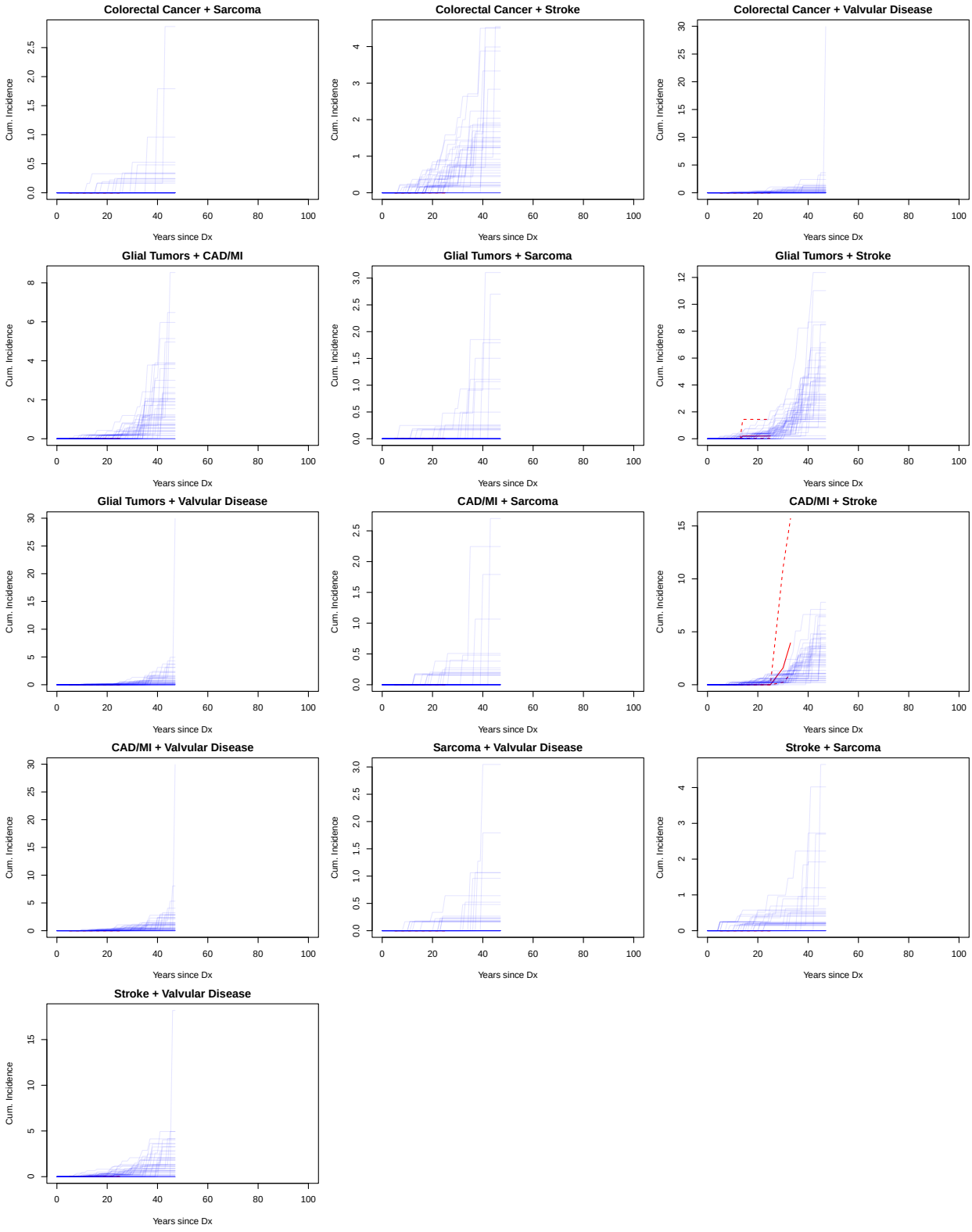
4.3.4.21 Medulloblastoma




Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.22 Other CNS

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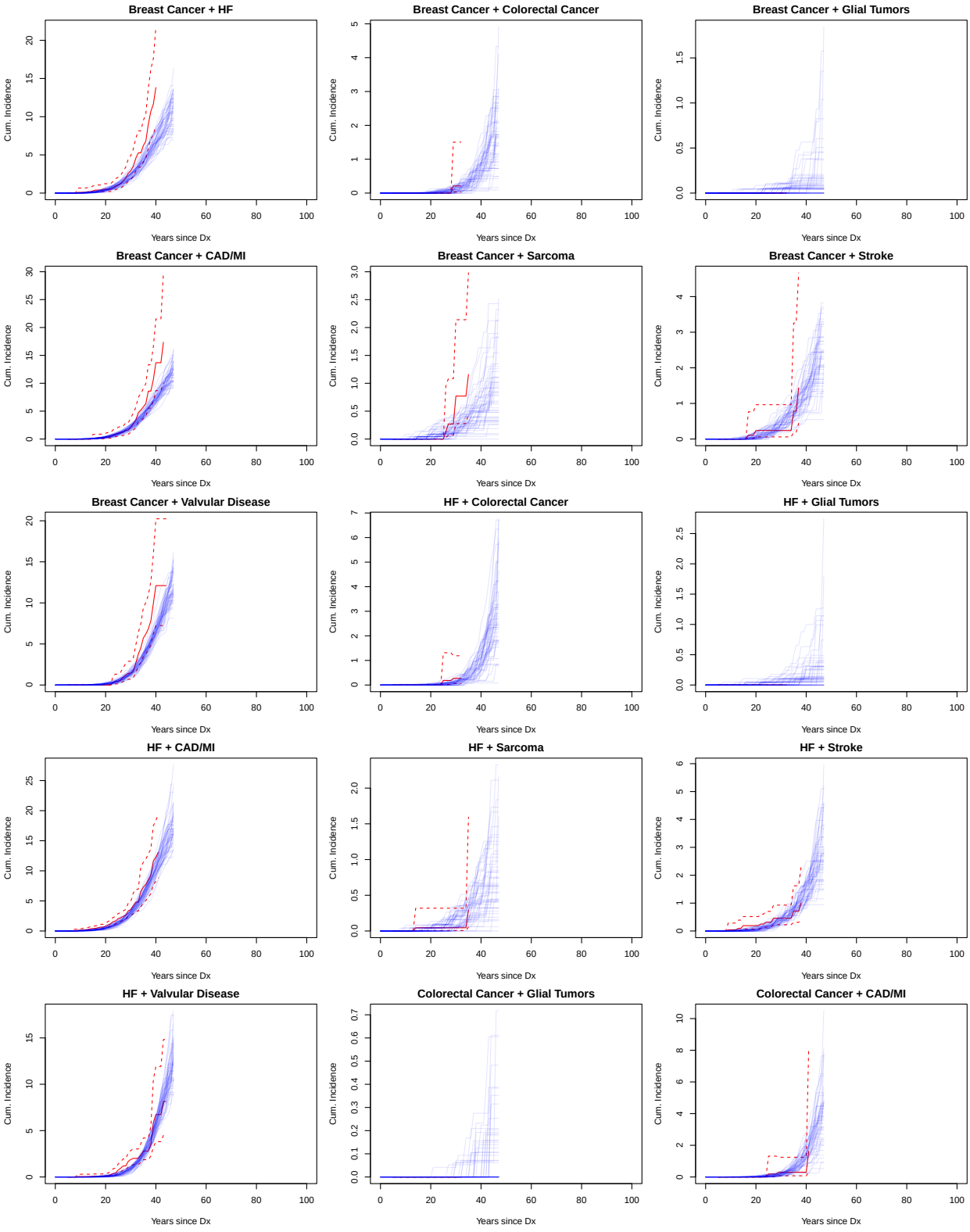
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.23 HL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HF + Glial Tumors
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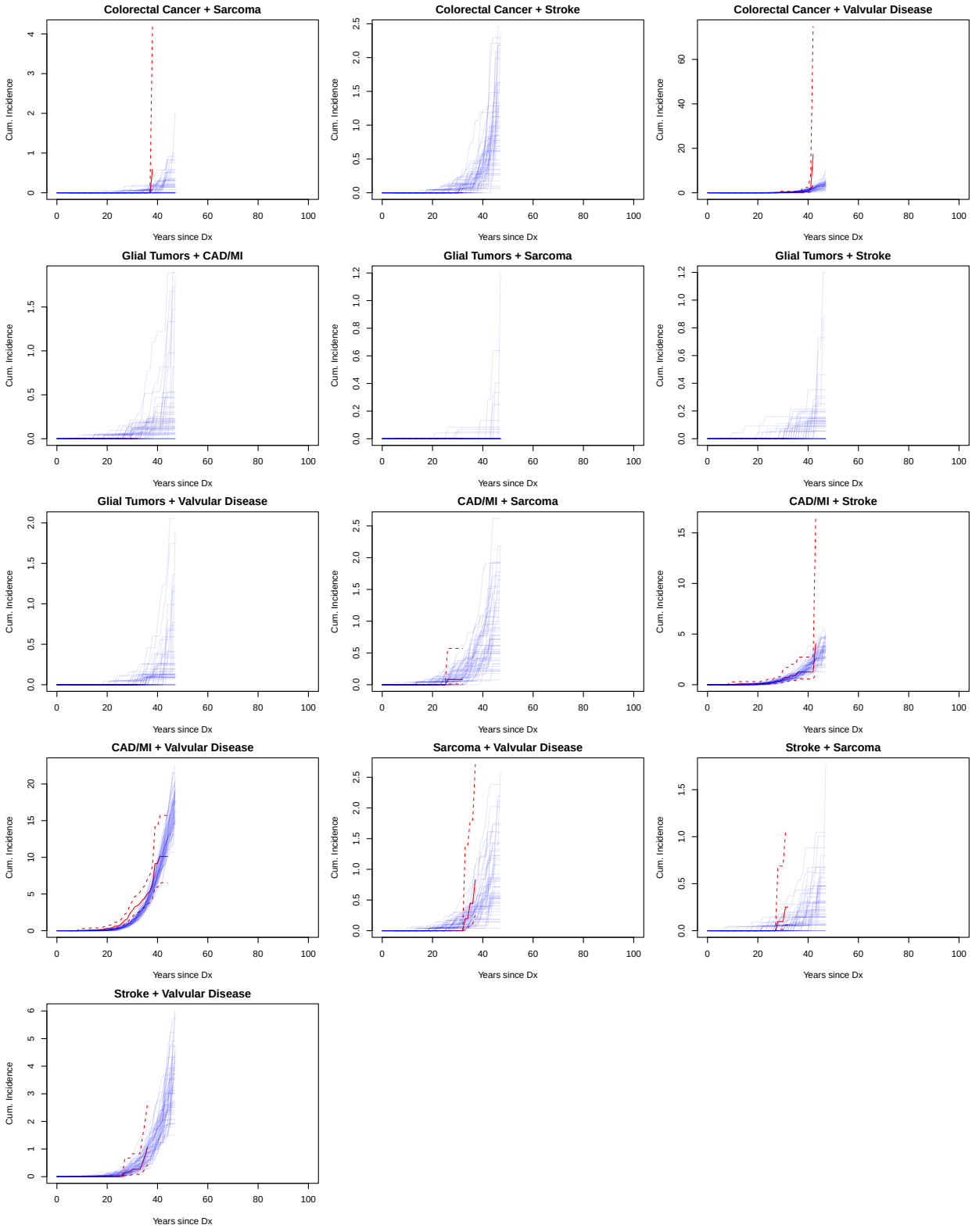
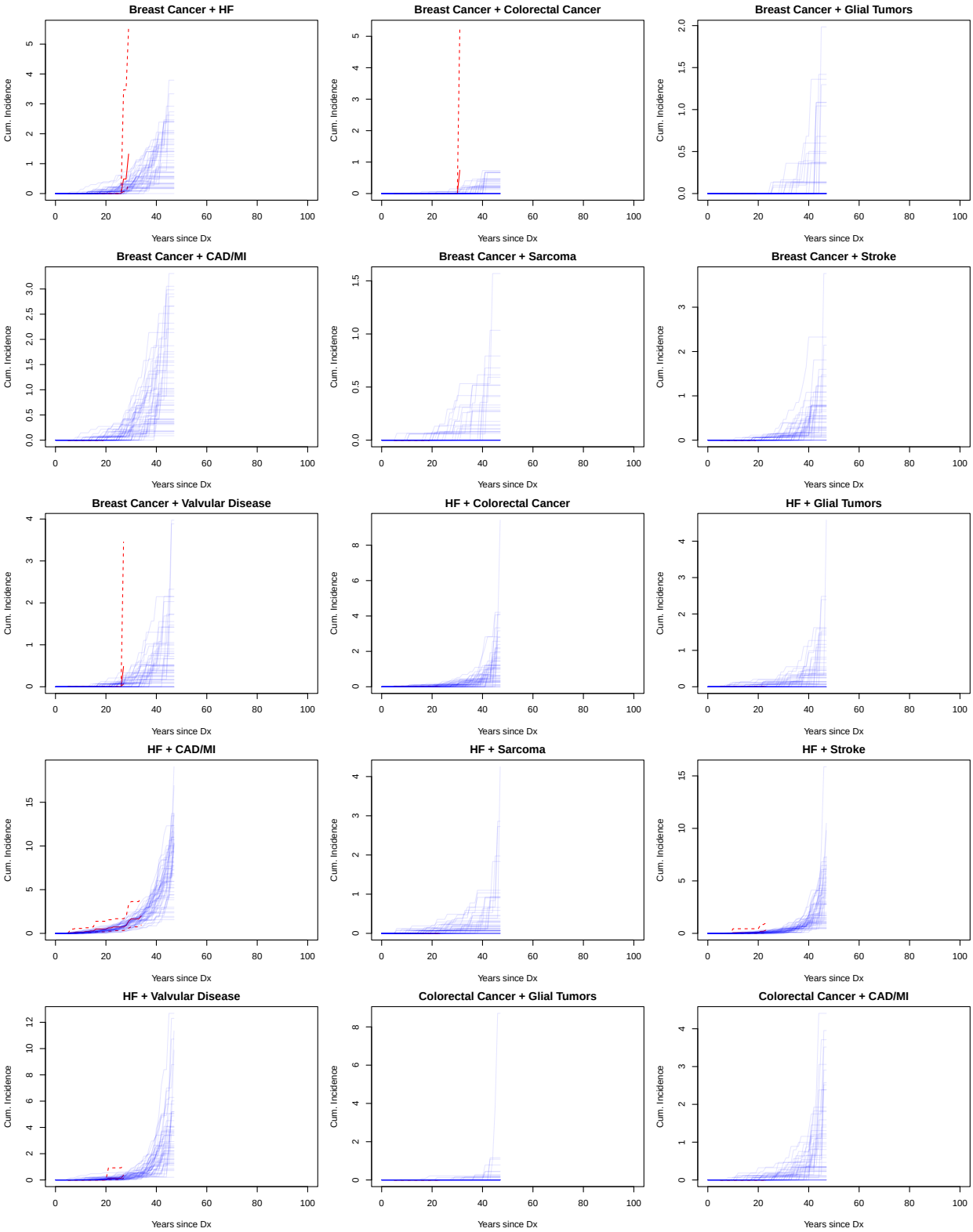
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx


Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.24 NHL


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
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Breast Cancer + CAD/MI
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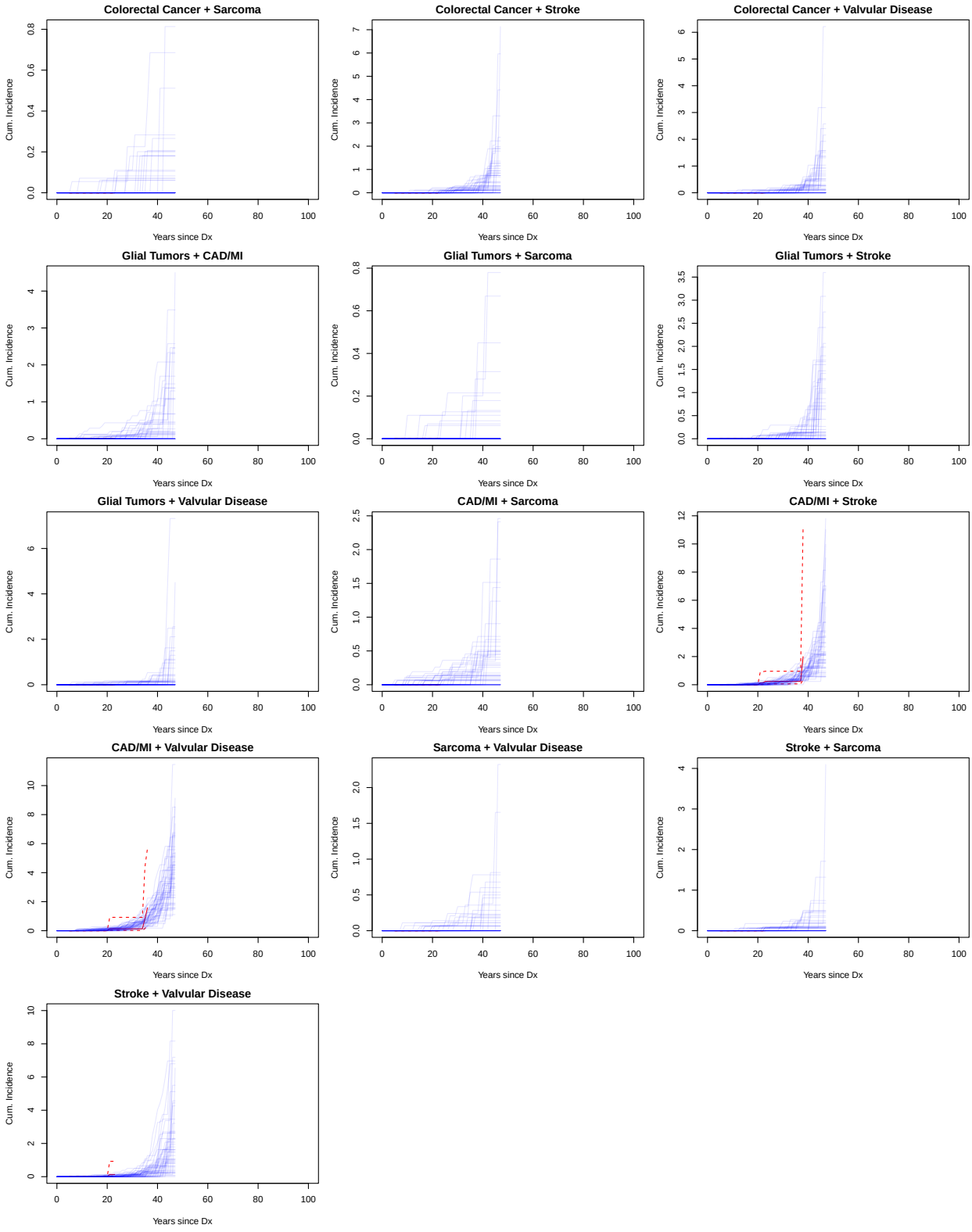
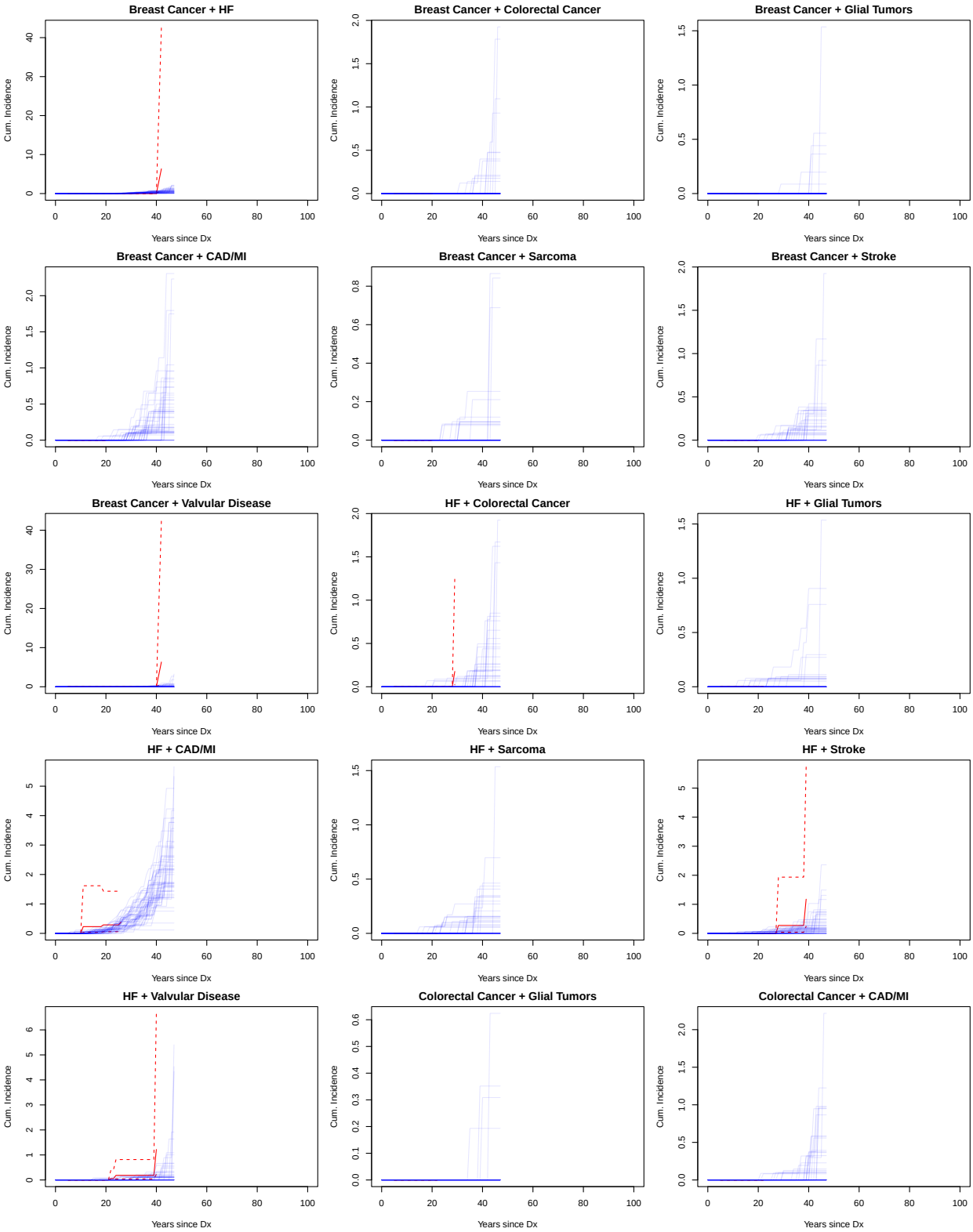
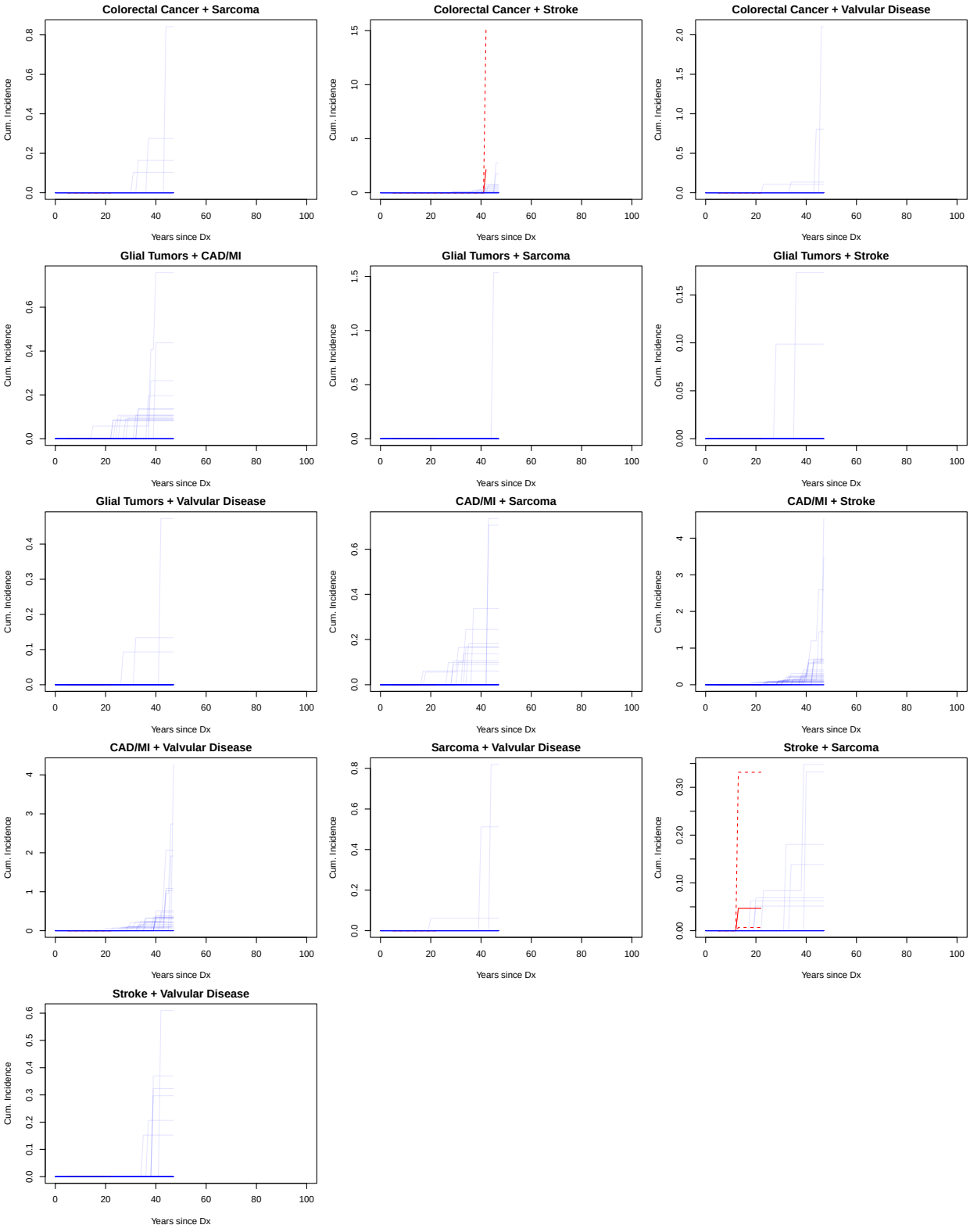
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

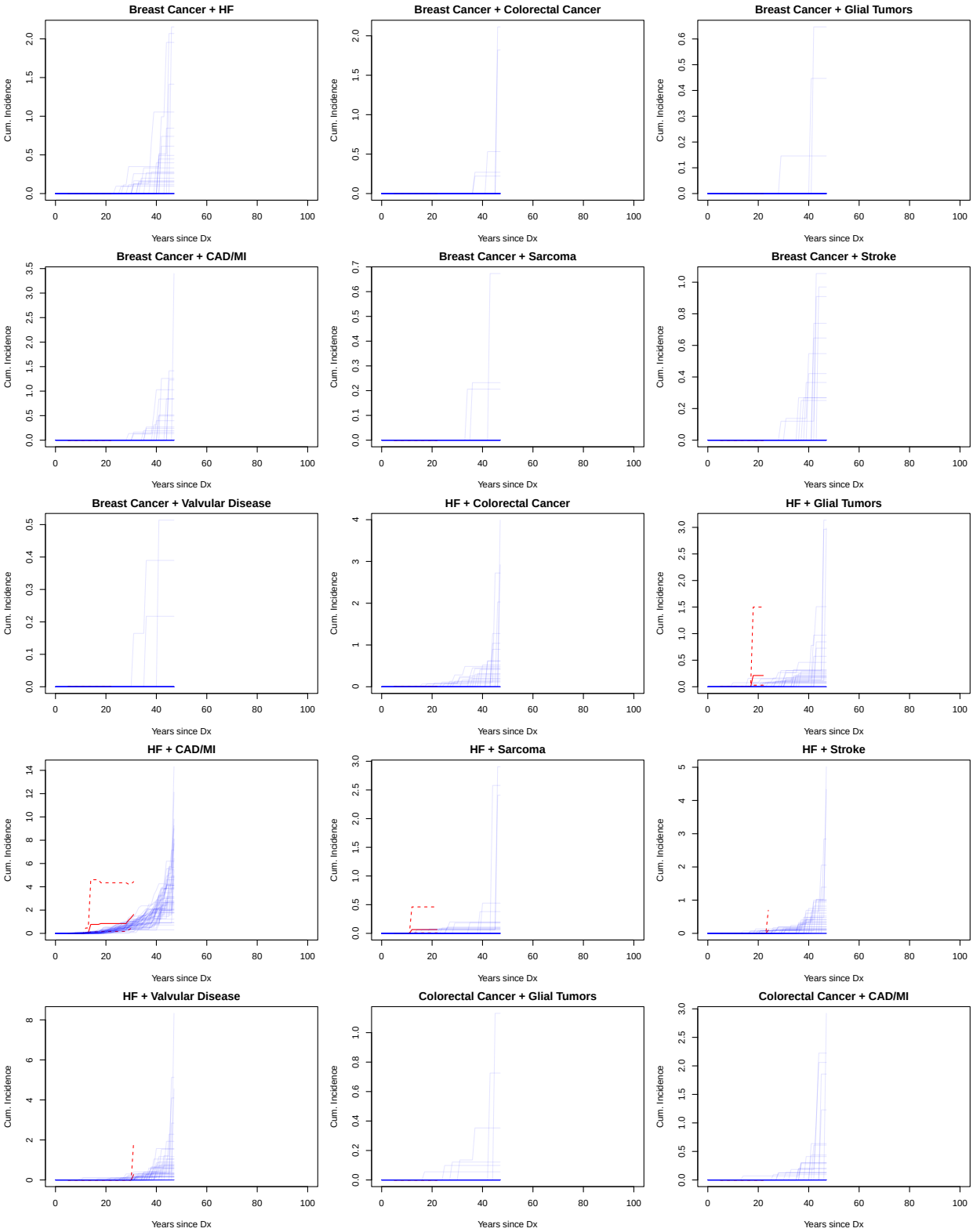

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

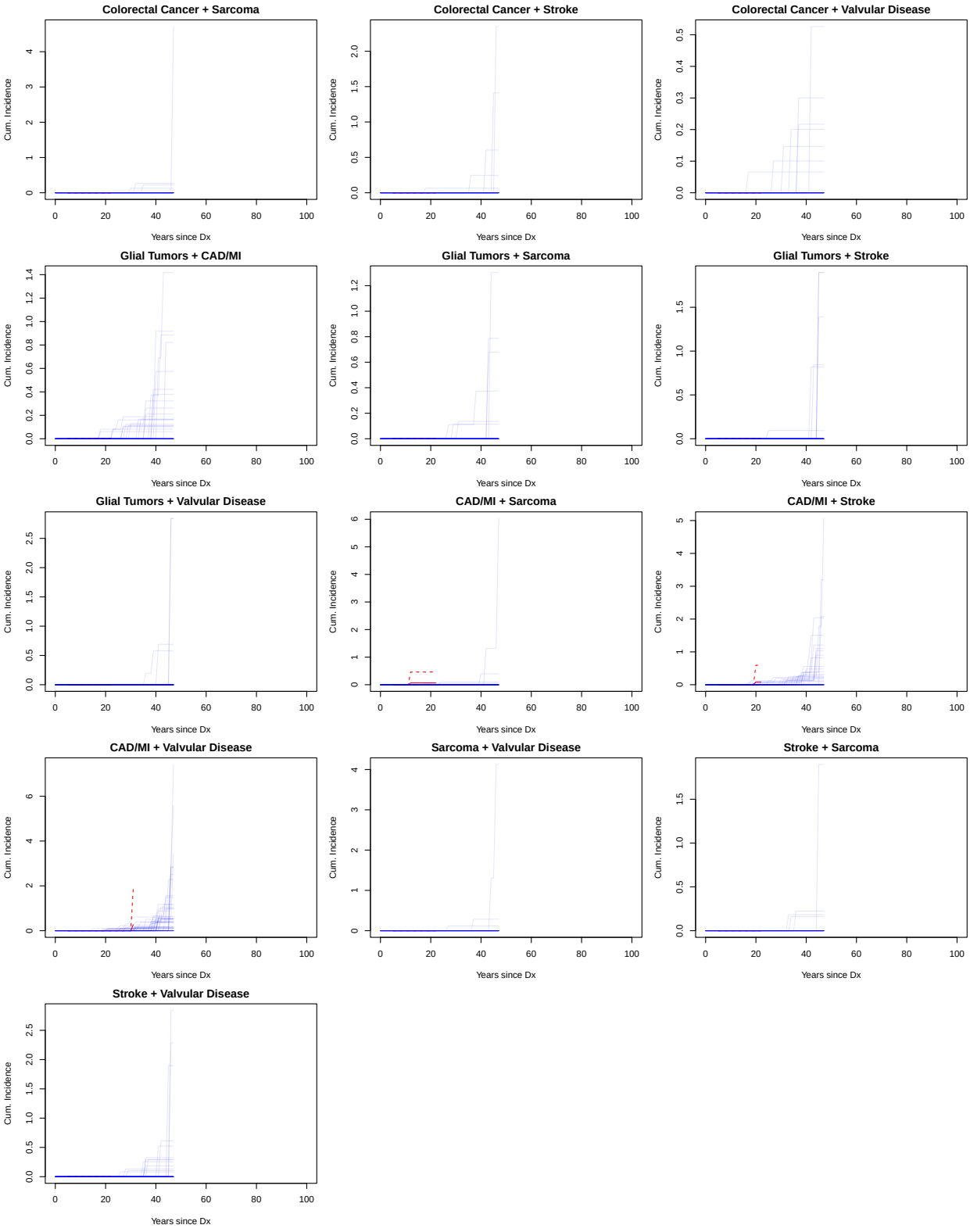
4.3.4.25 WT


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx


Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

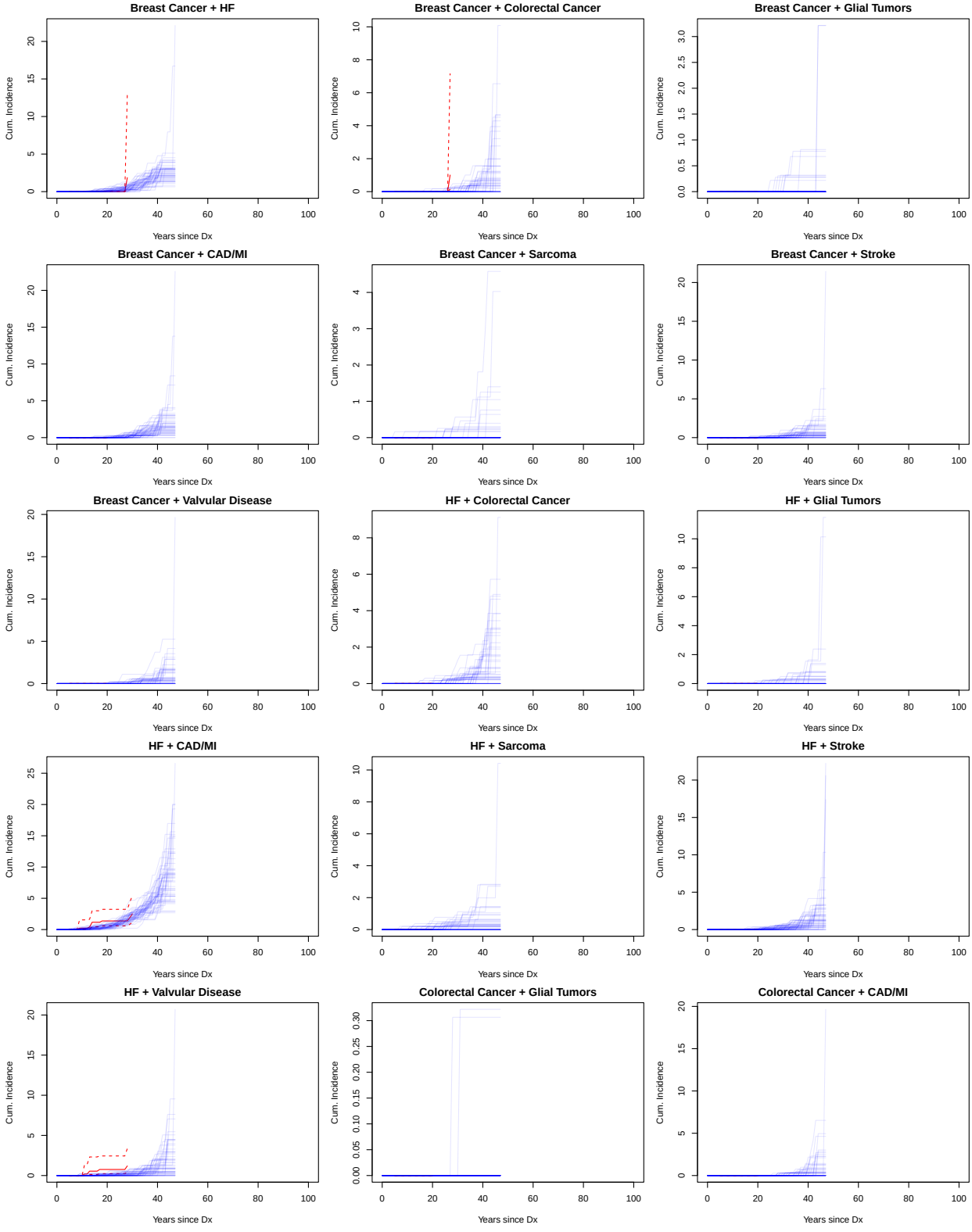
4.3.4.26 NBL

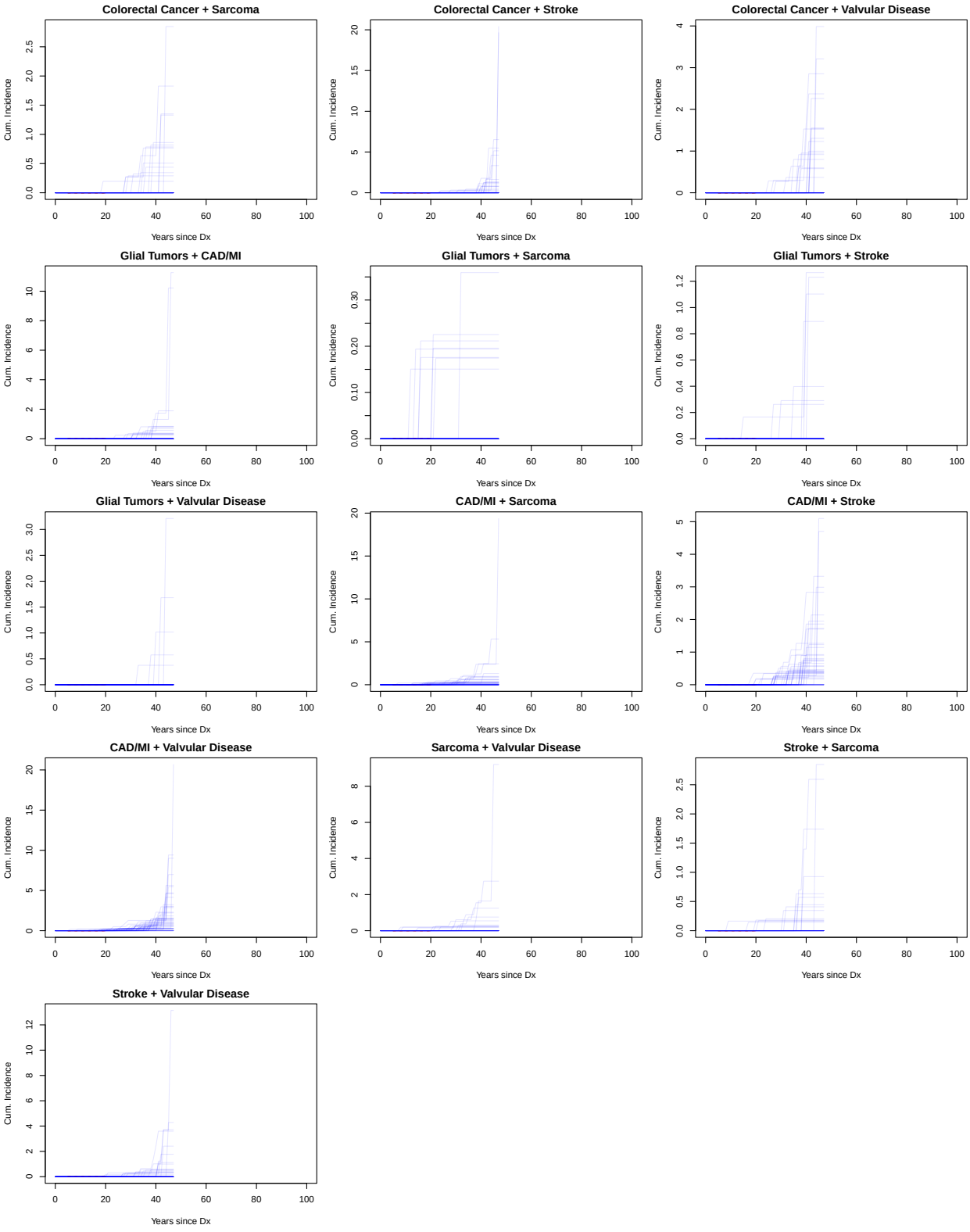

Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx


Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

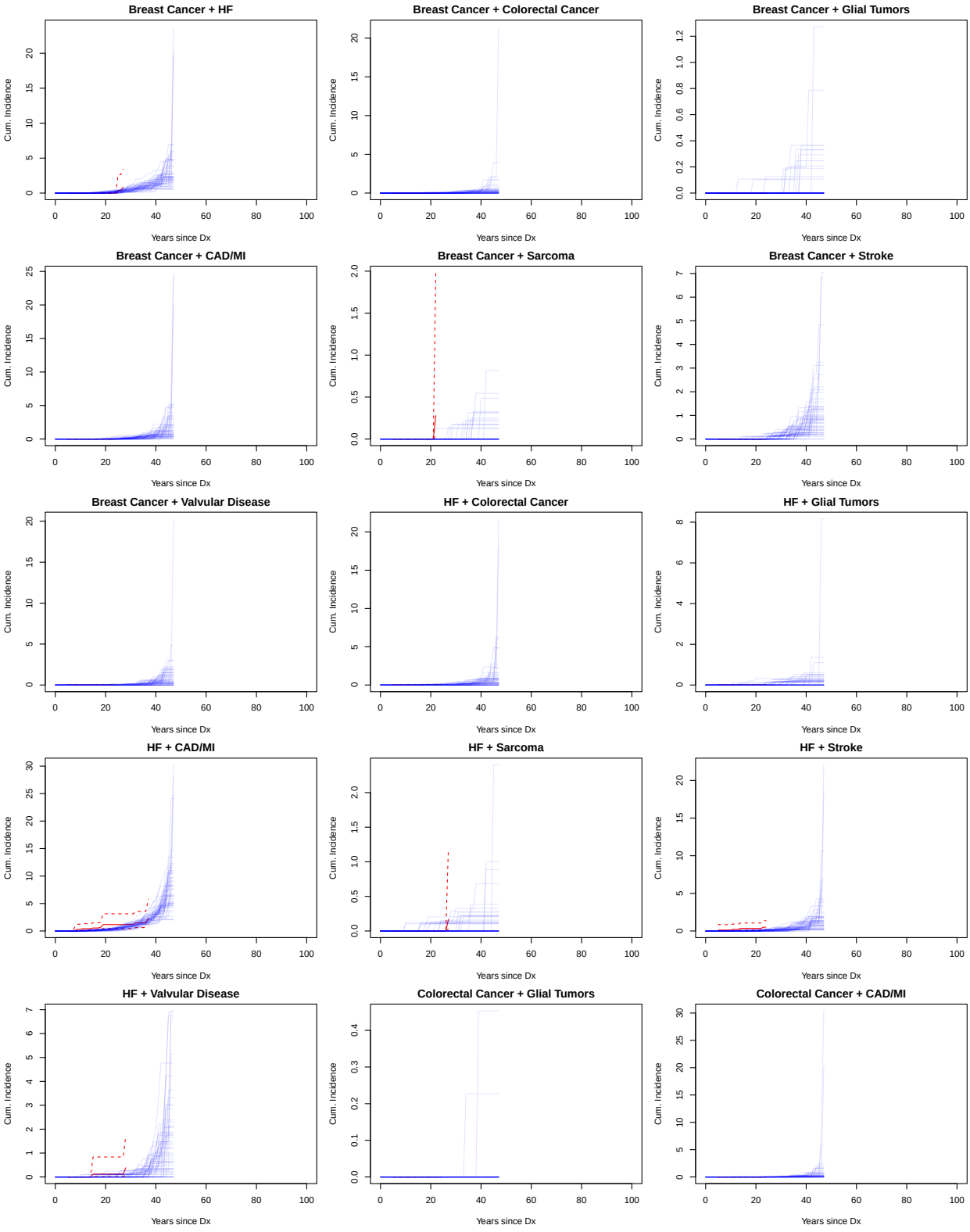
4.3.4.27 STS

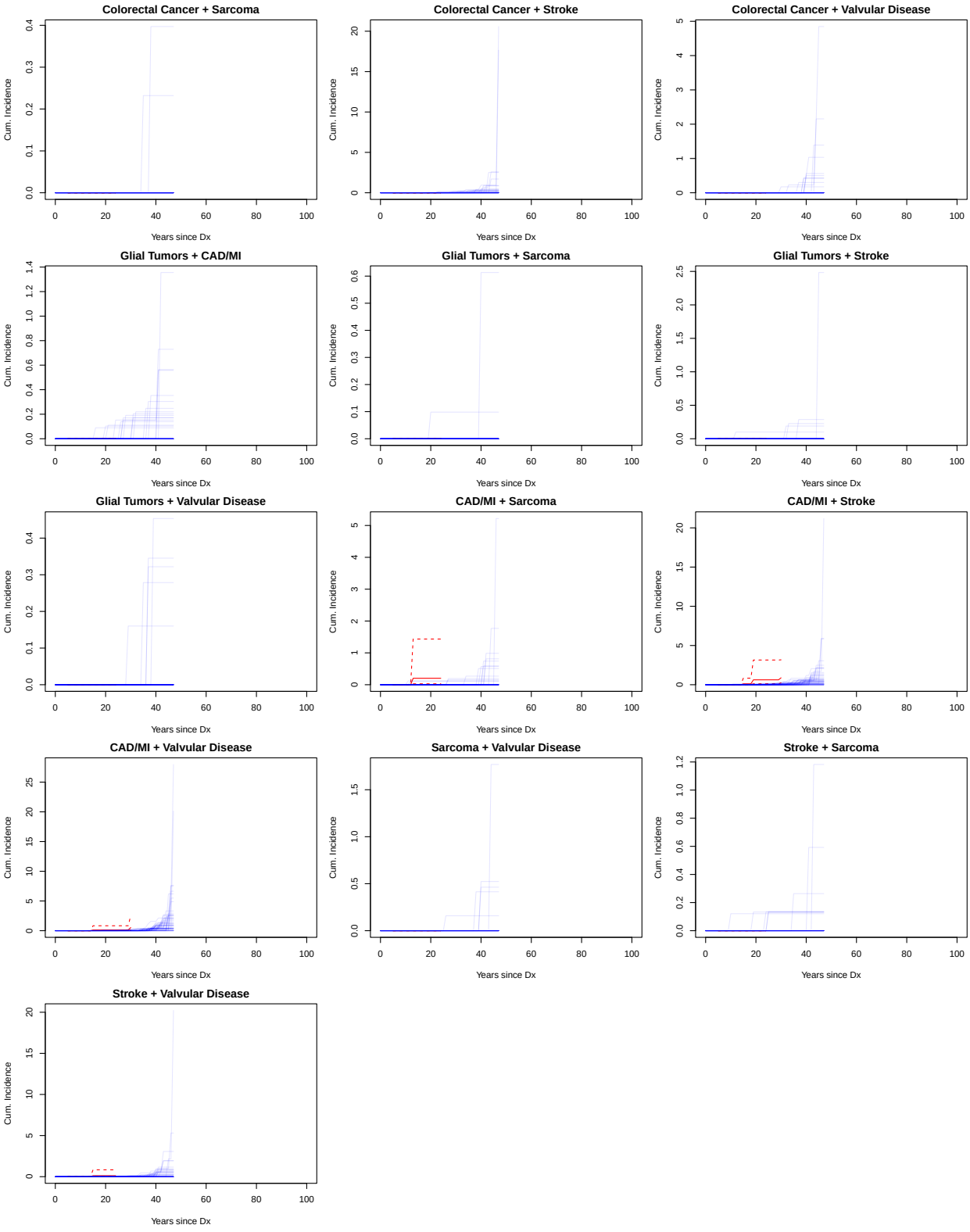
4.3.4.28 Ewings



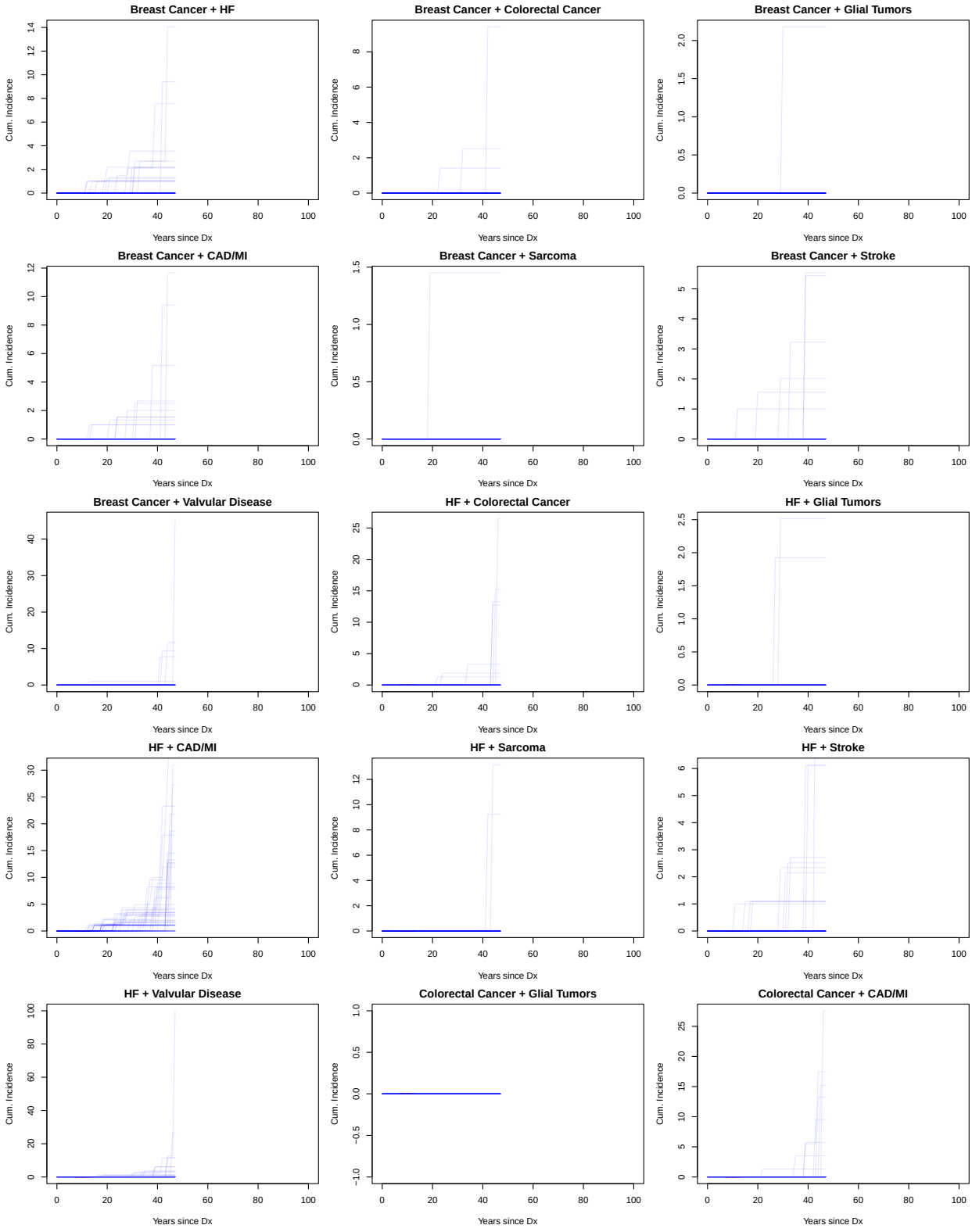

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

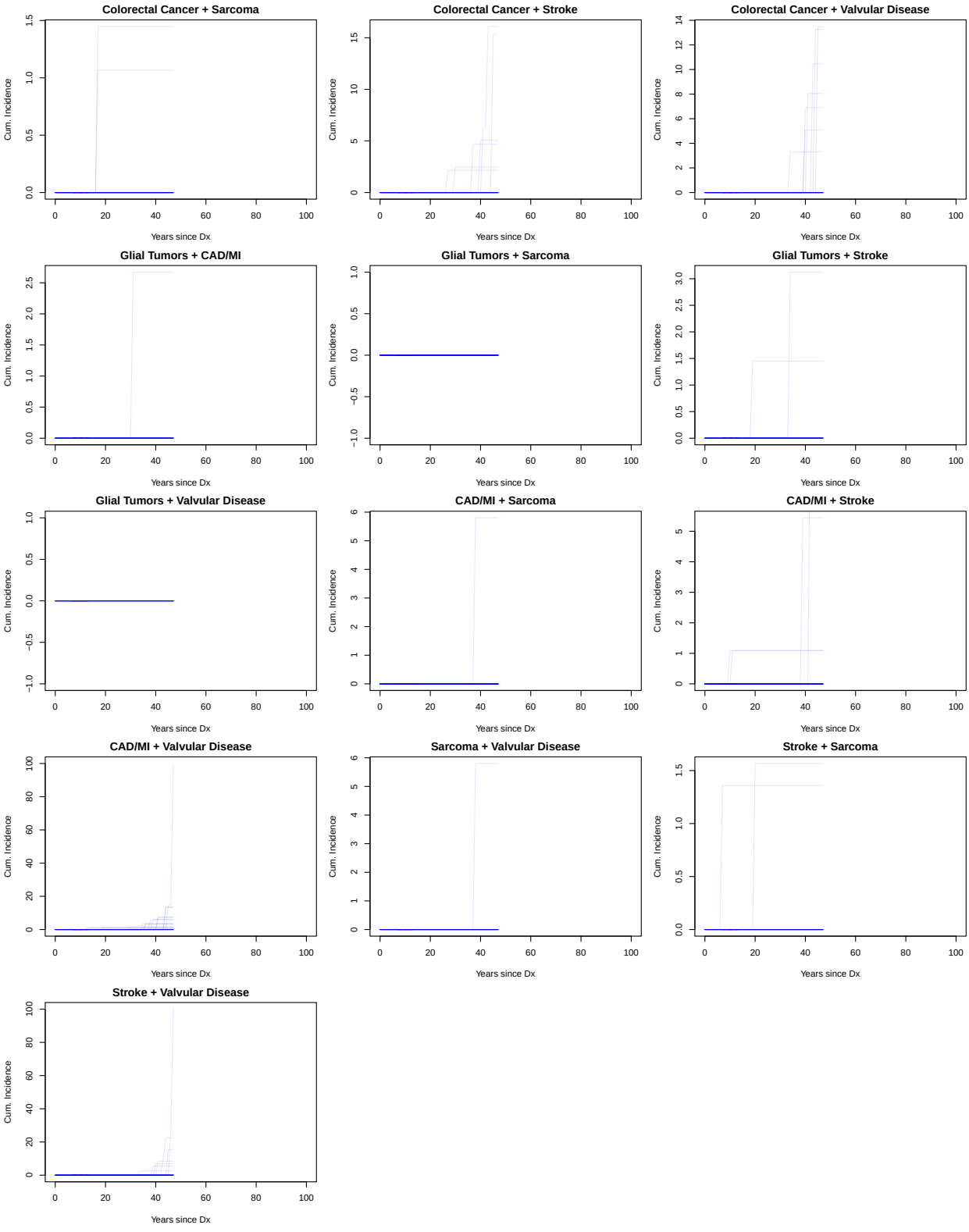
4.3.4.29 Osteosarcoma



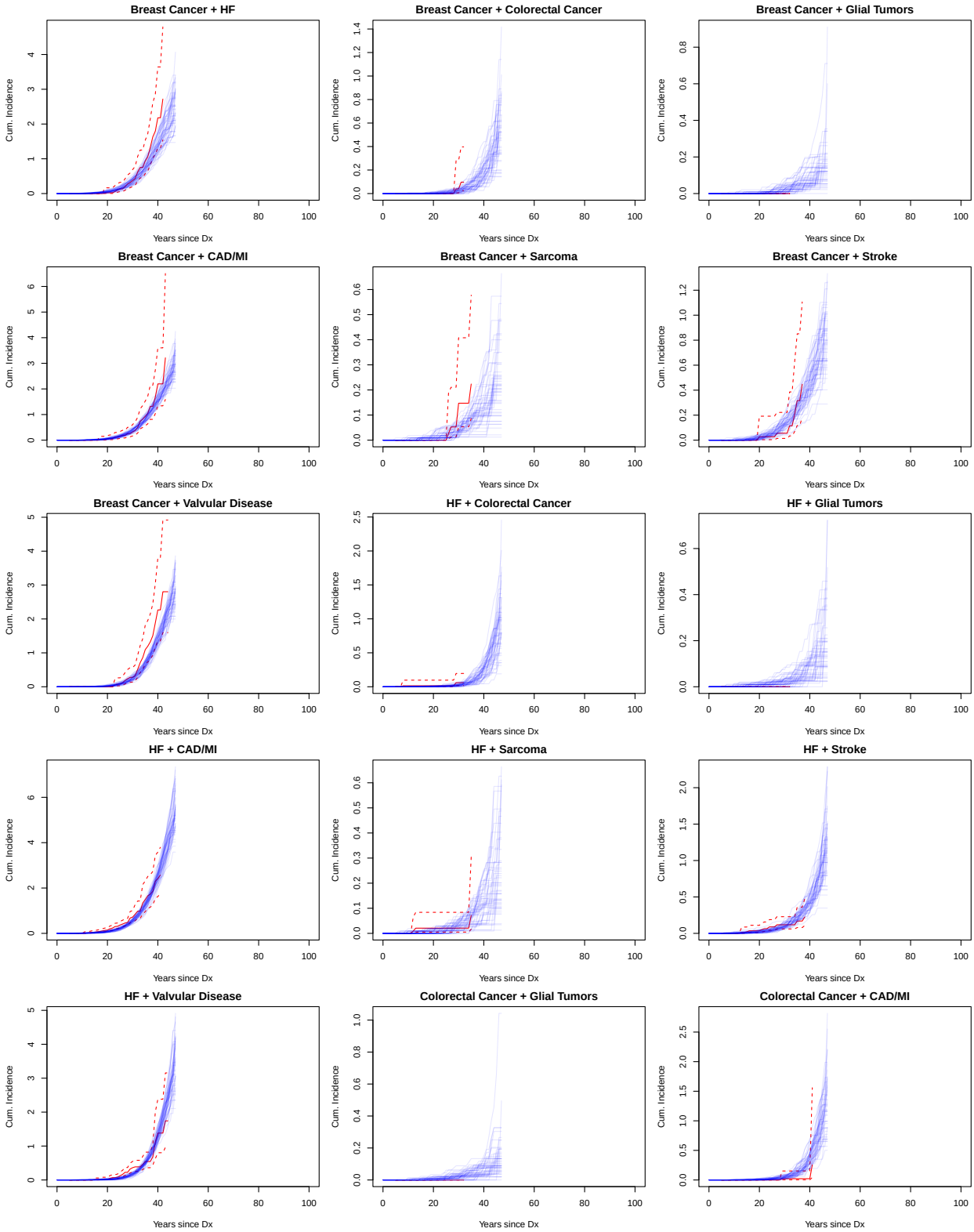

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

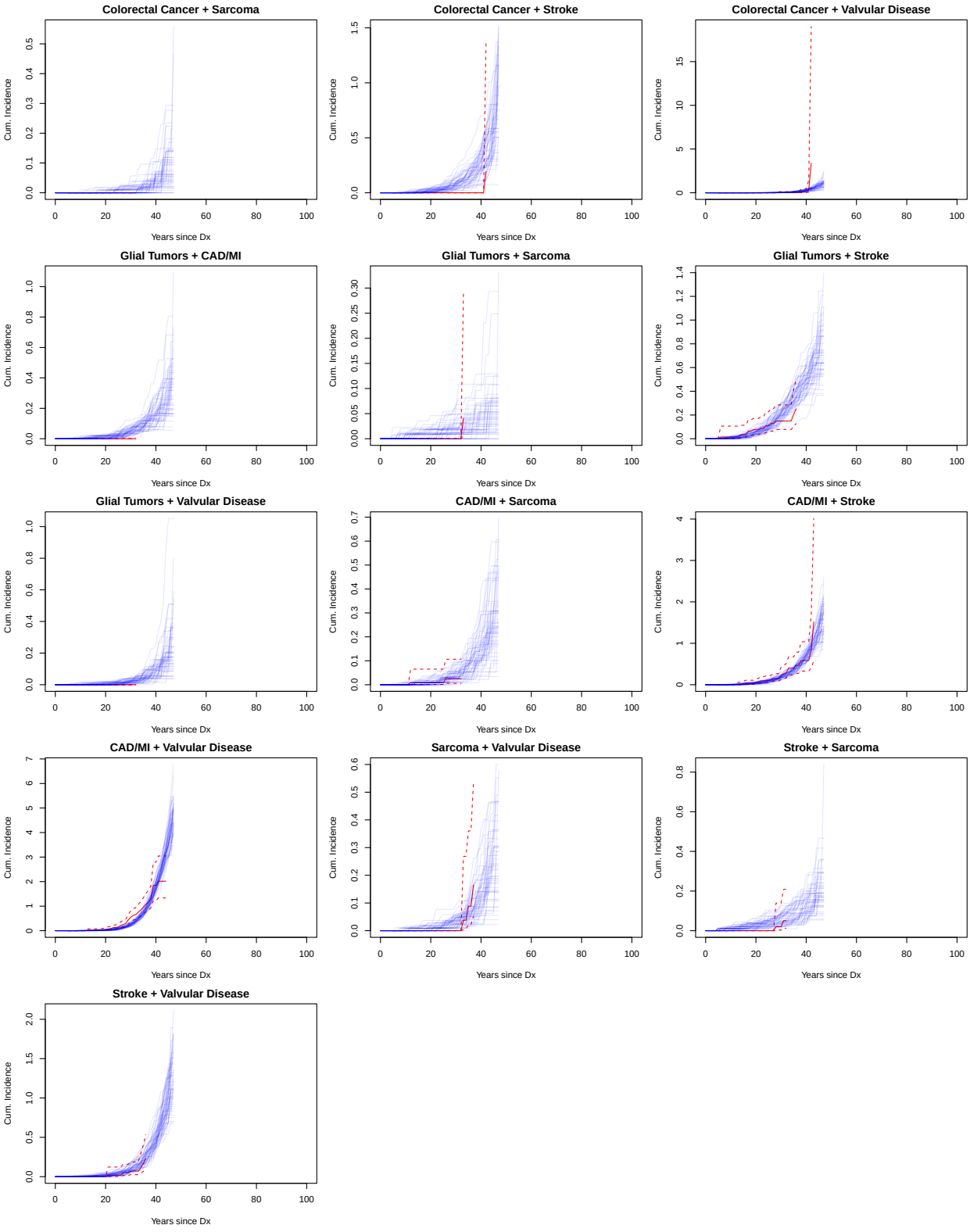
4.3.4.30 OtherBoneTumor



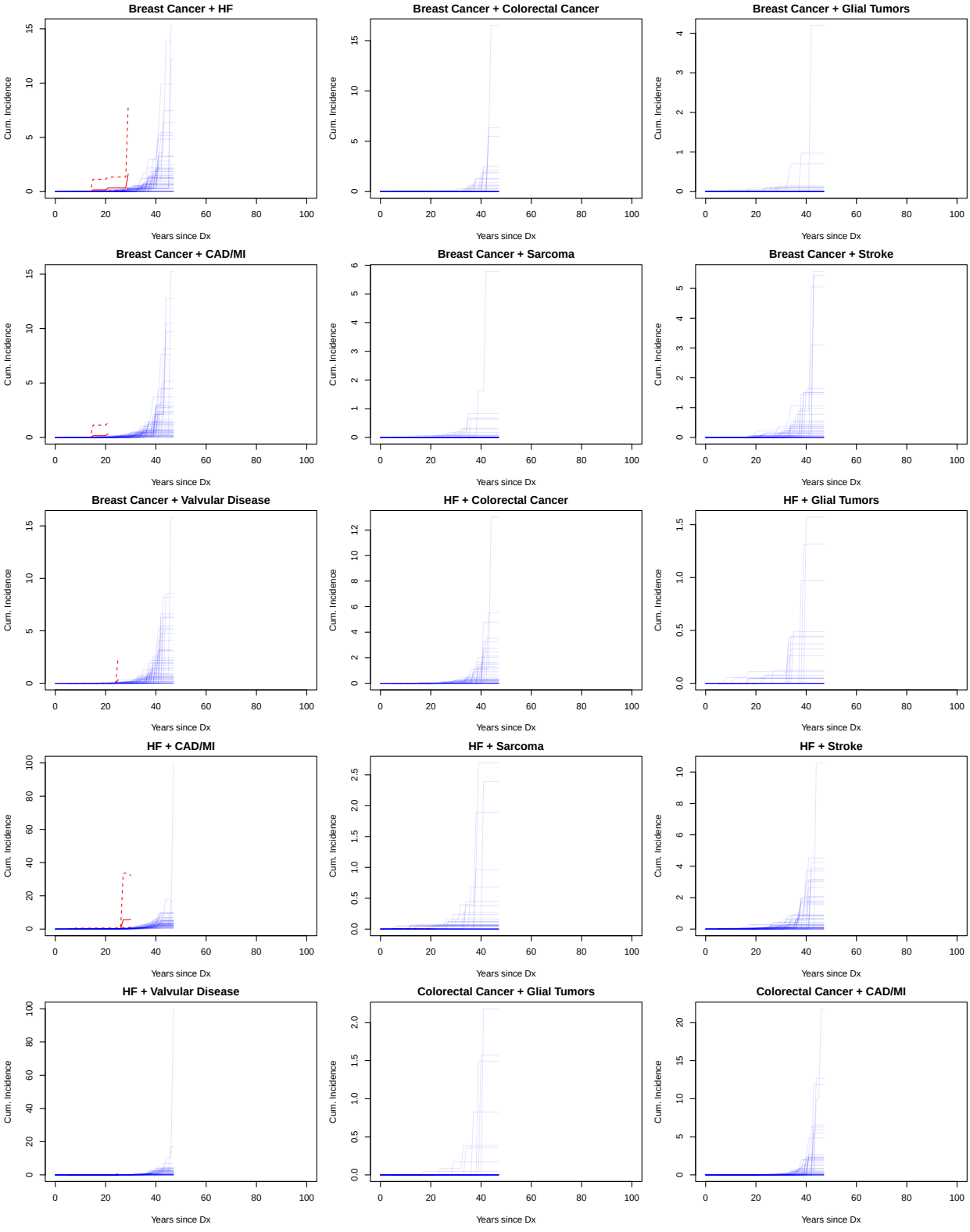

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

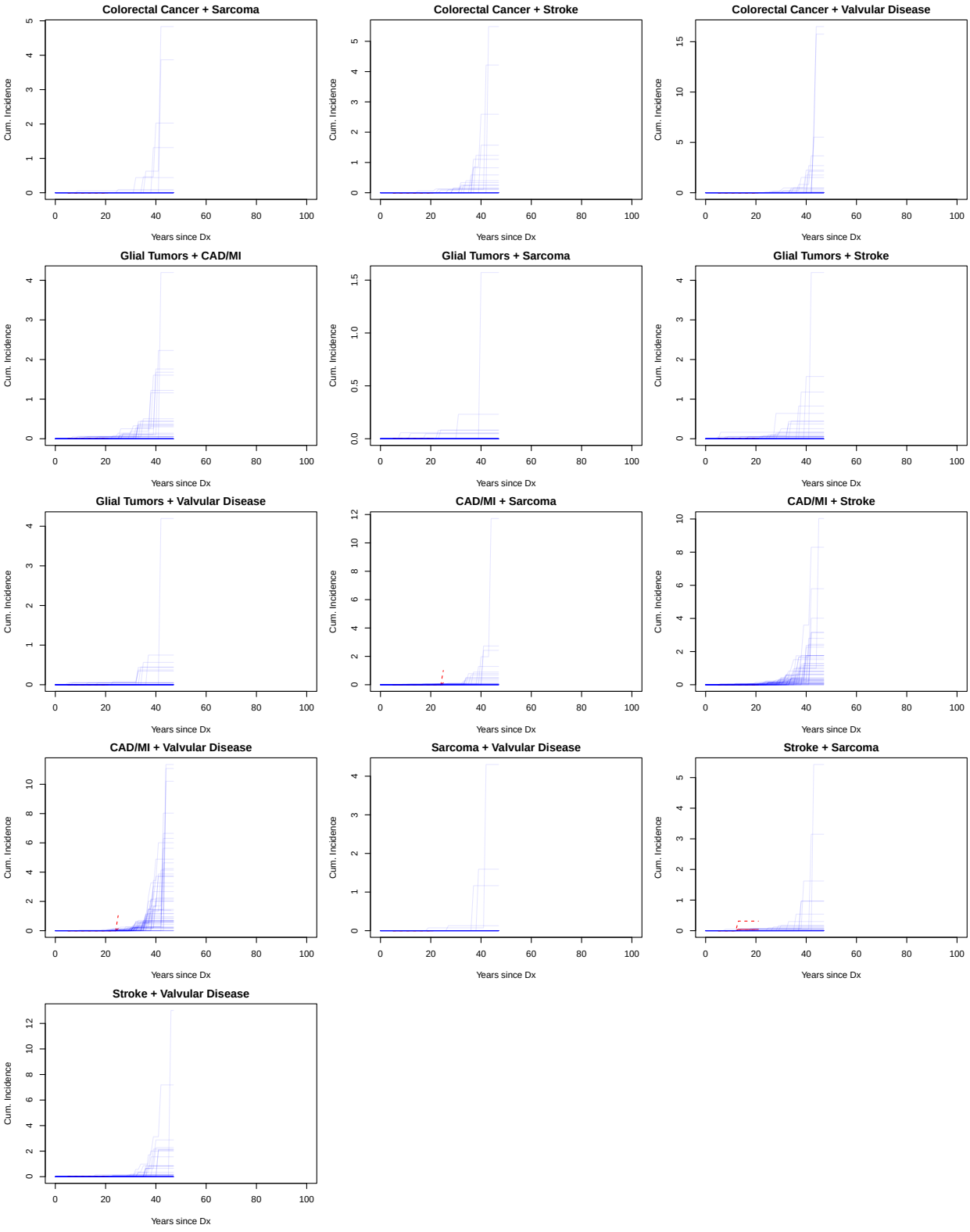
4.3.4.31 AnthNone



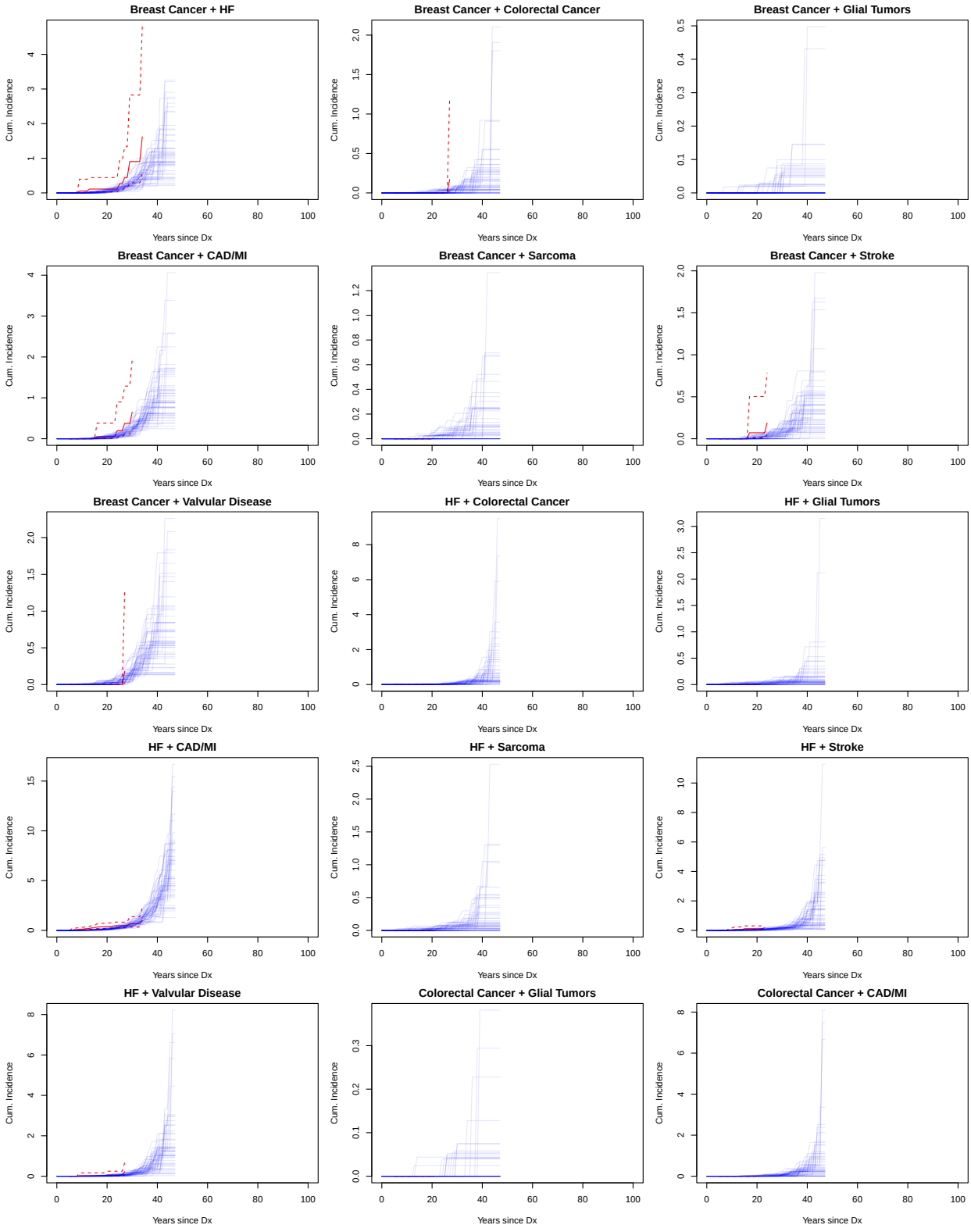

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

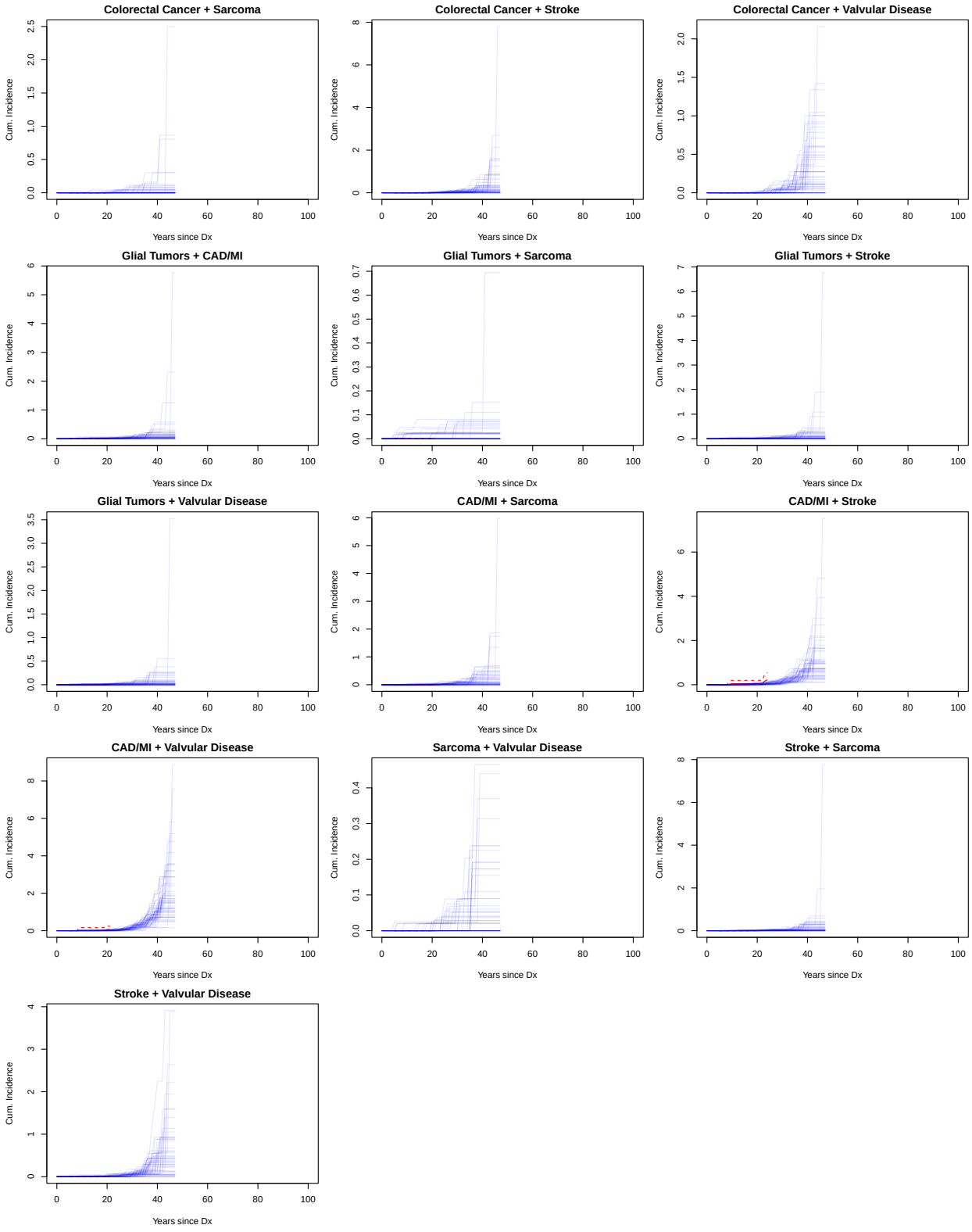
4.3.4.32 Anth<100



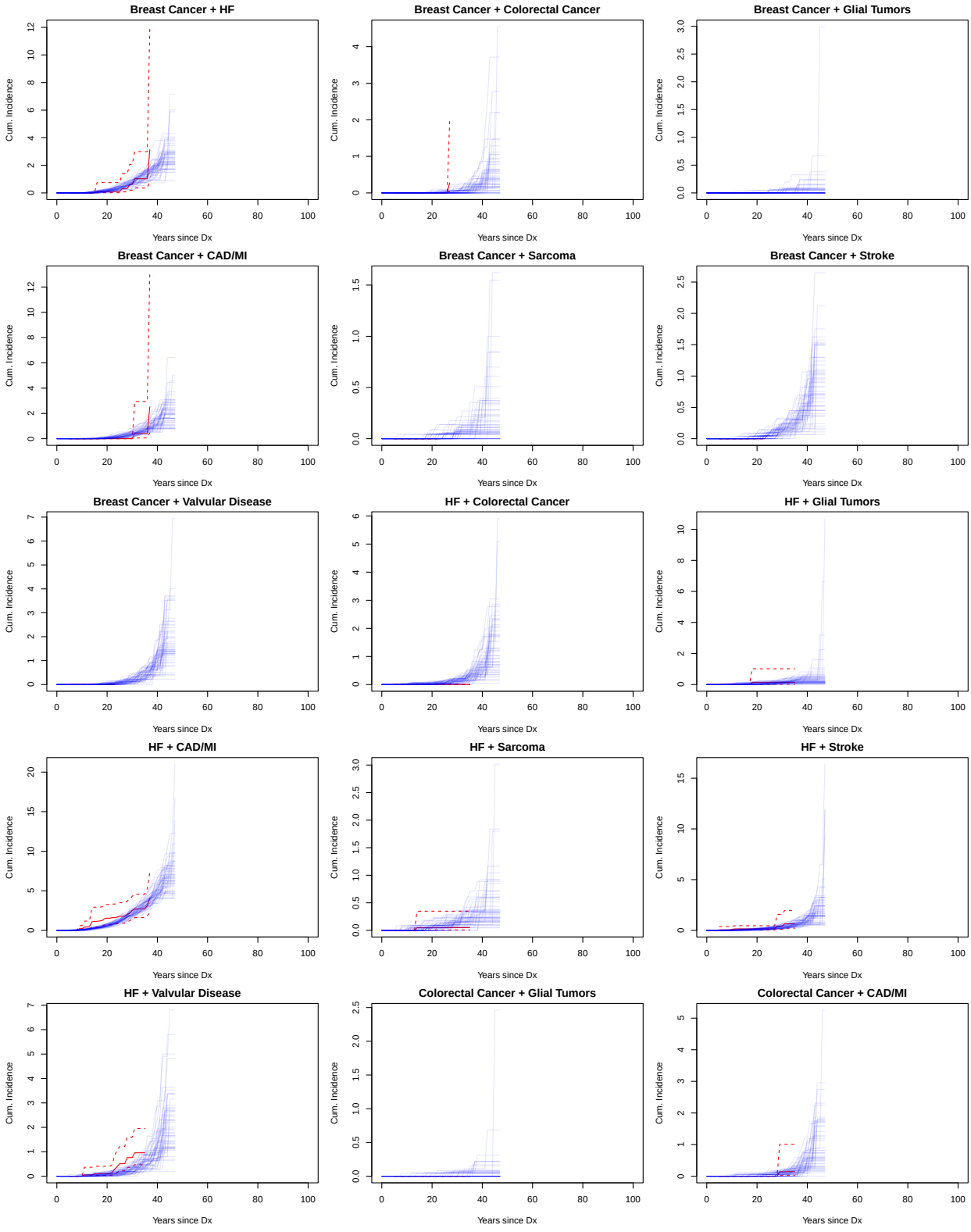

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

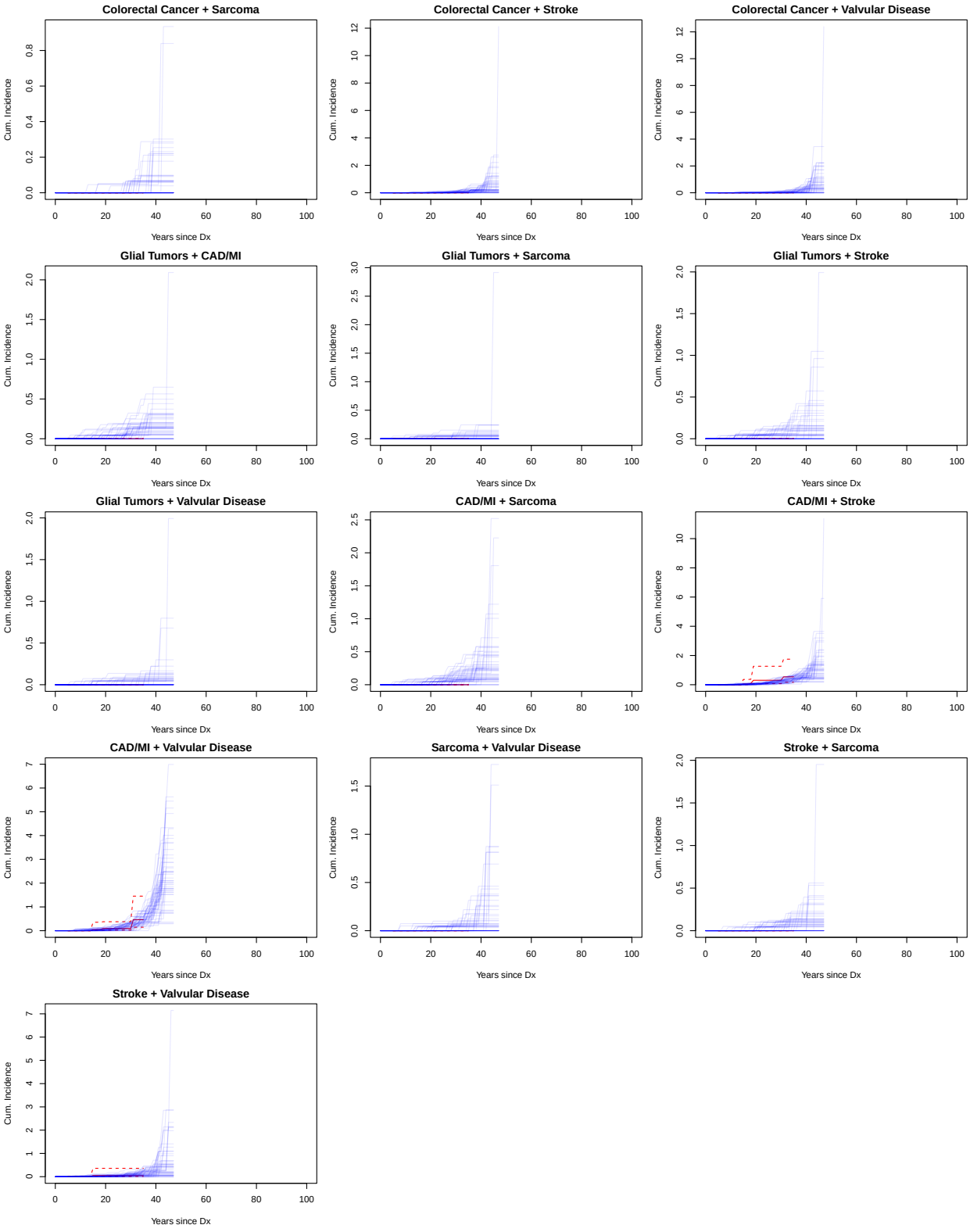
4.3.4.33 Anth100_249



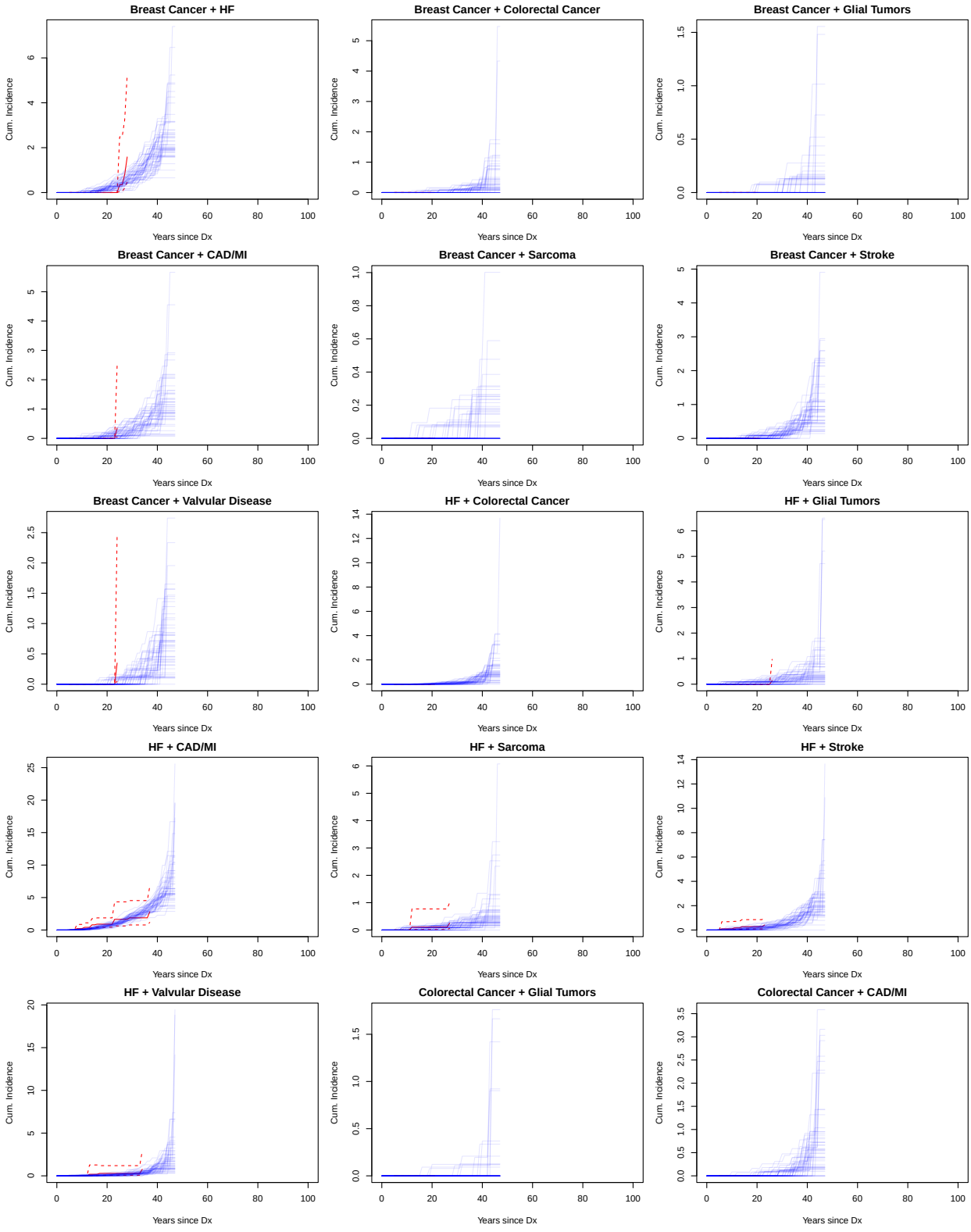

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

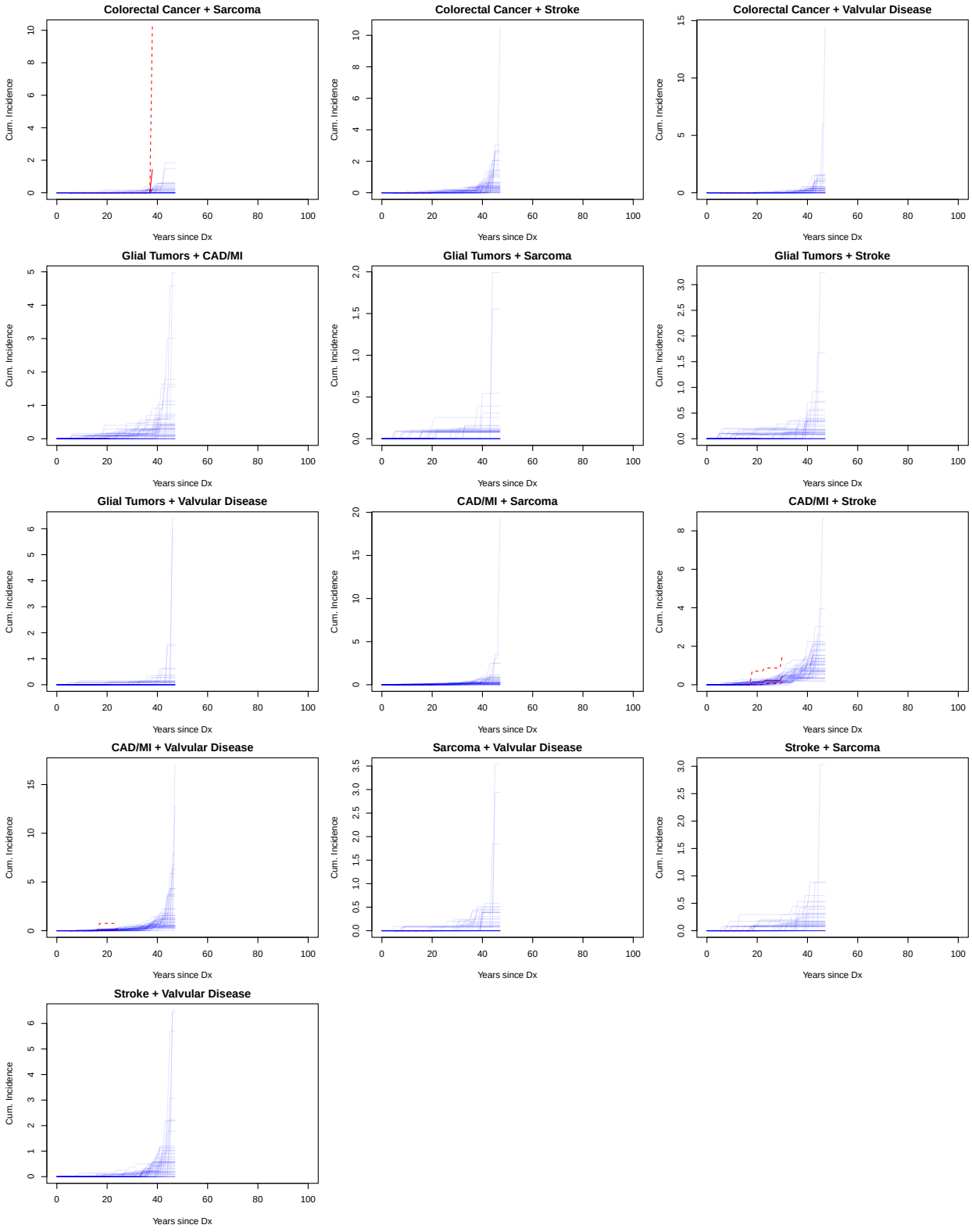
4.3.4.34 Anth250_399



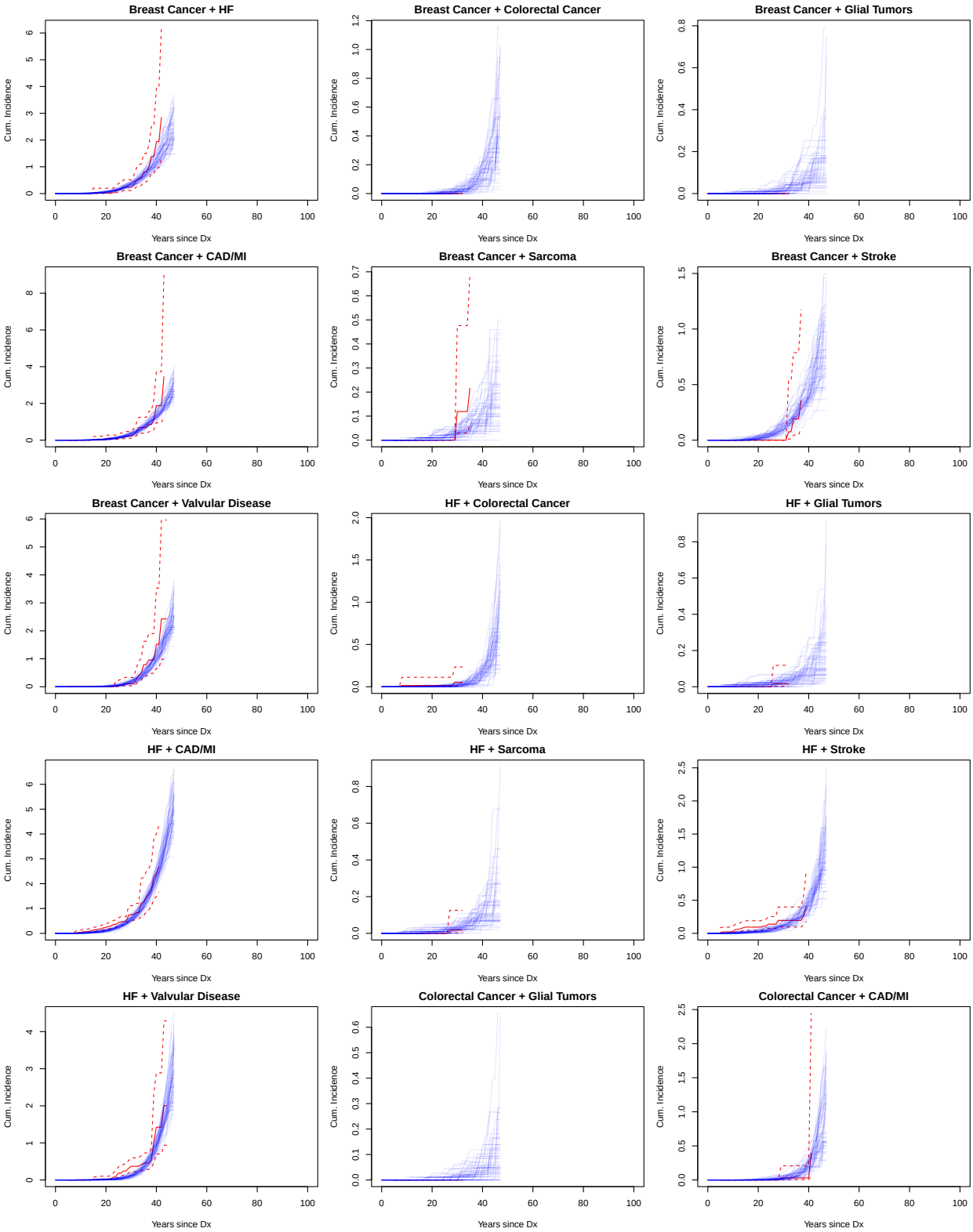

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

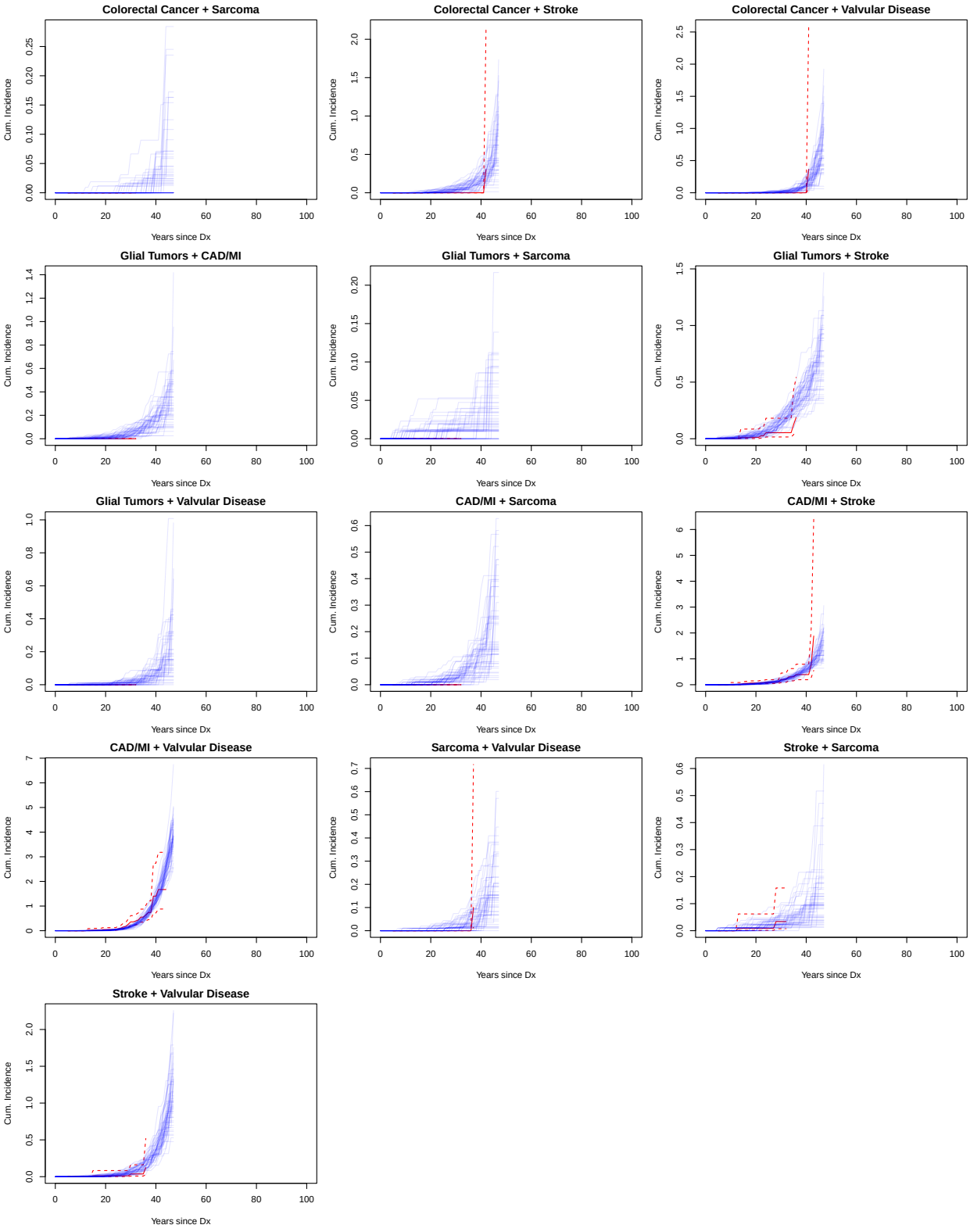
4.3.4.35 Anth400+



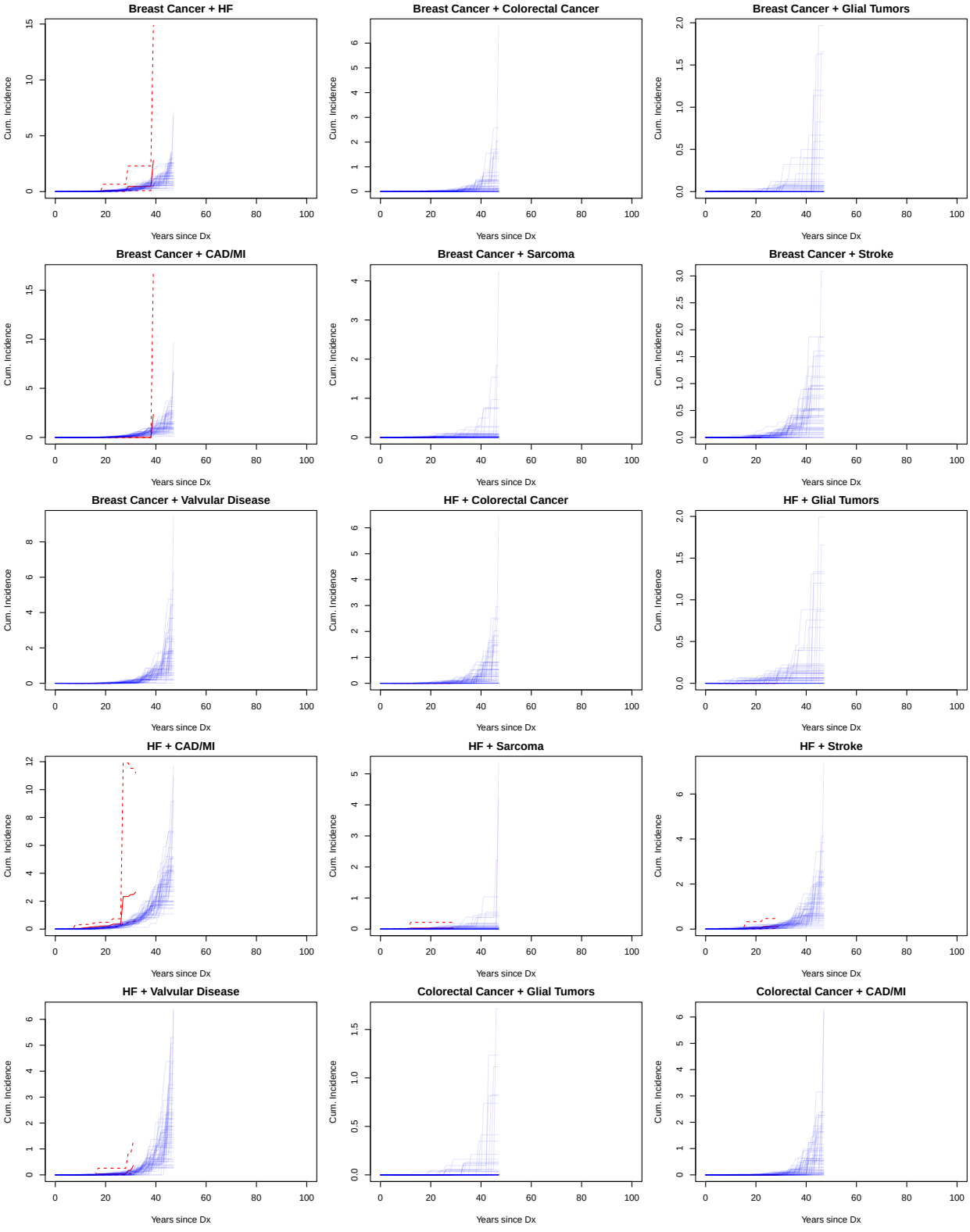

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

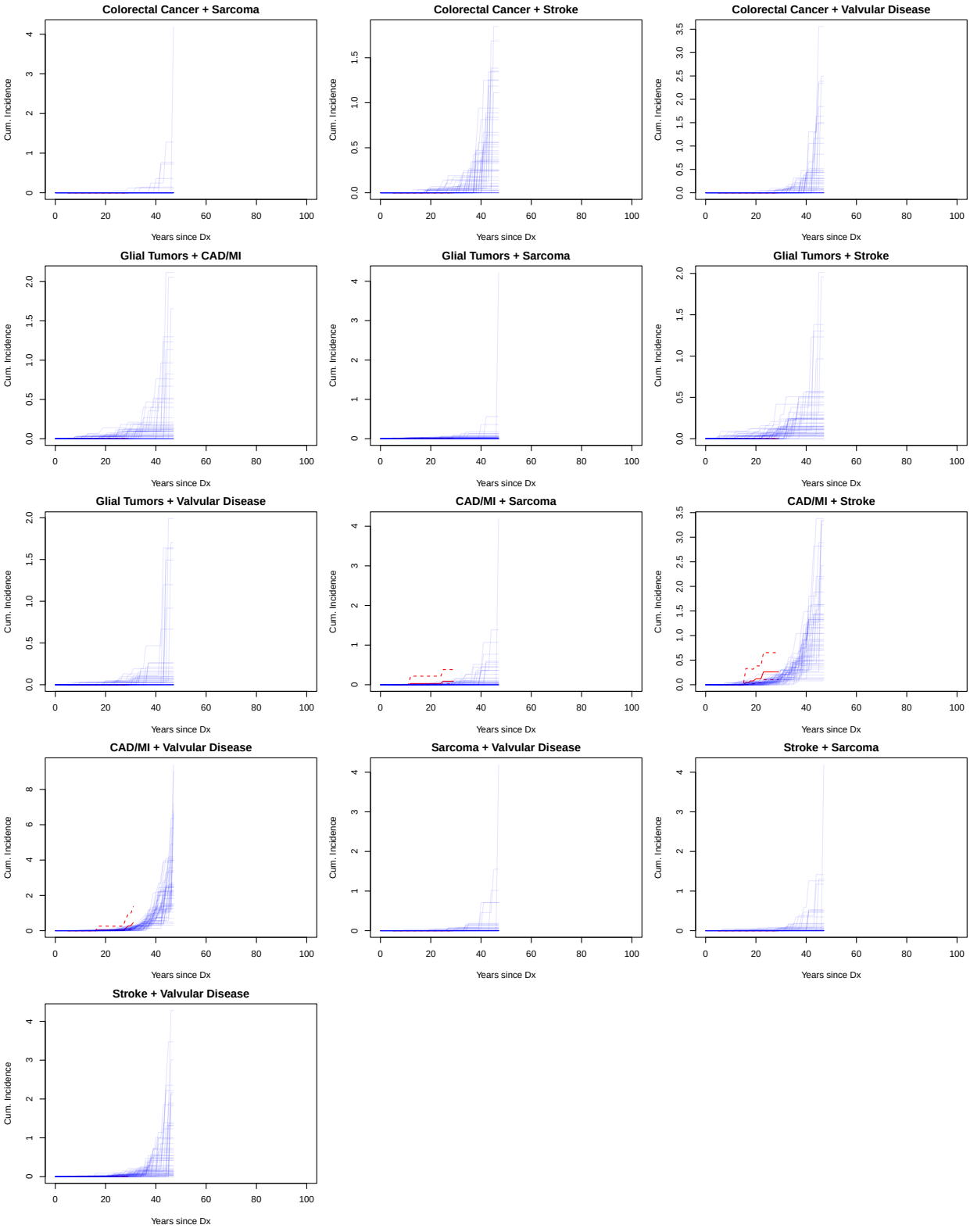
4.3.4.36 AlkNone



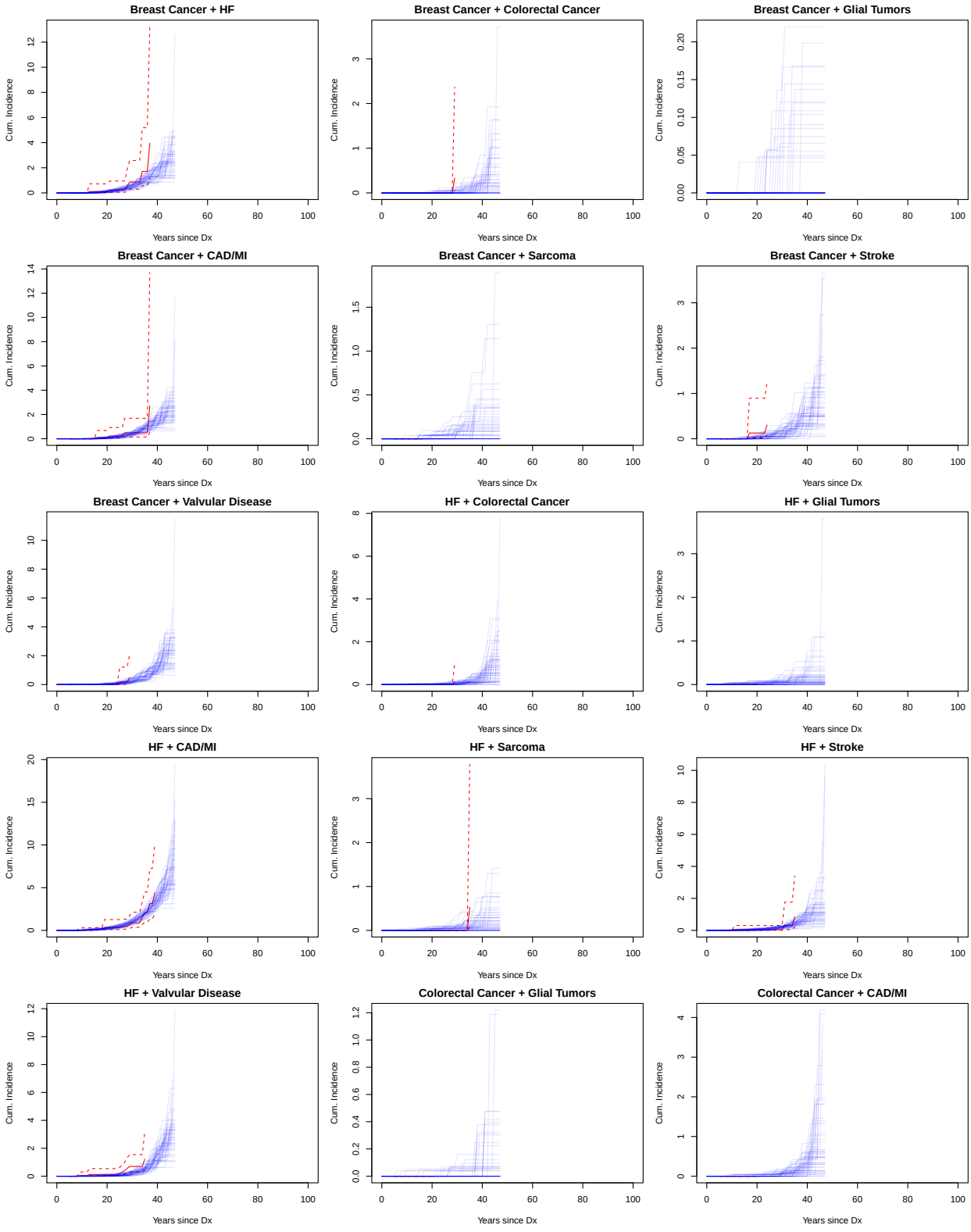

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

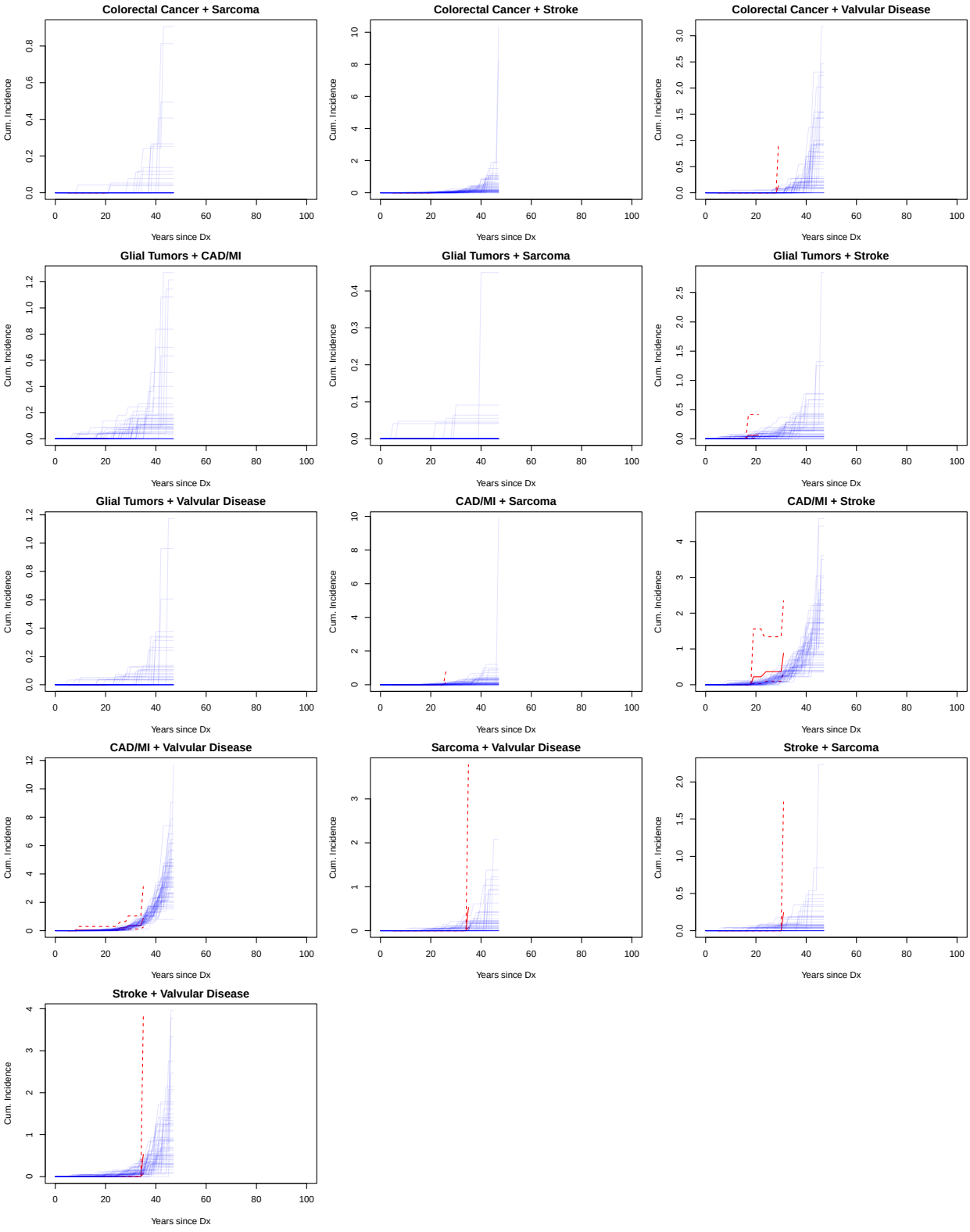
4.3.4.37 Alk<4000



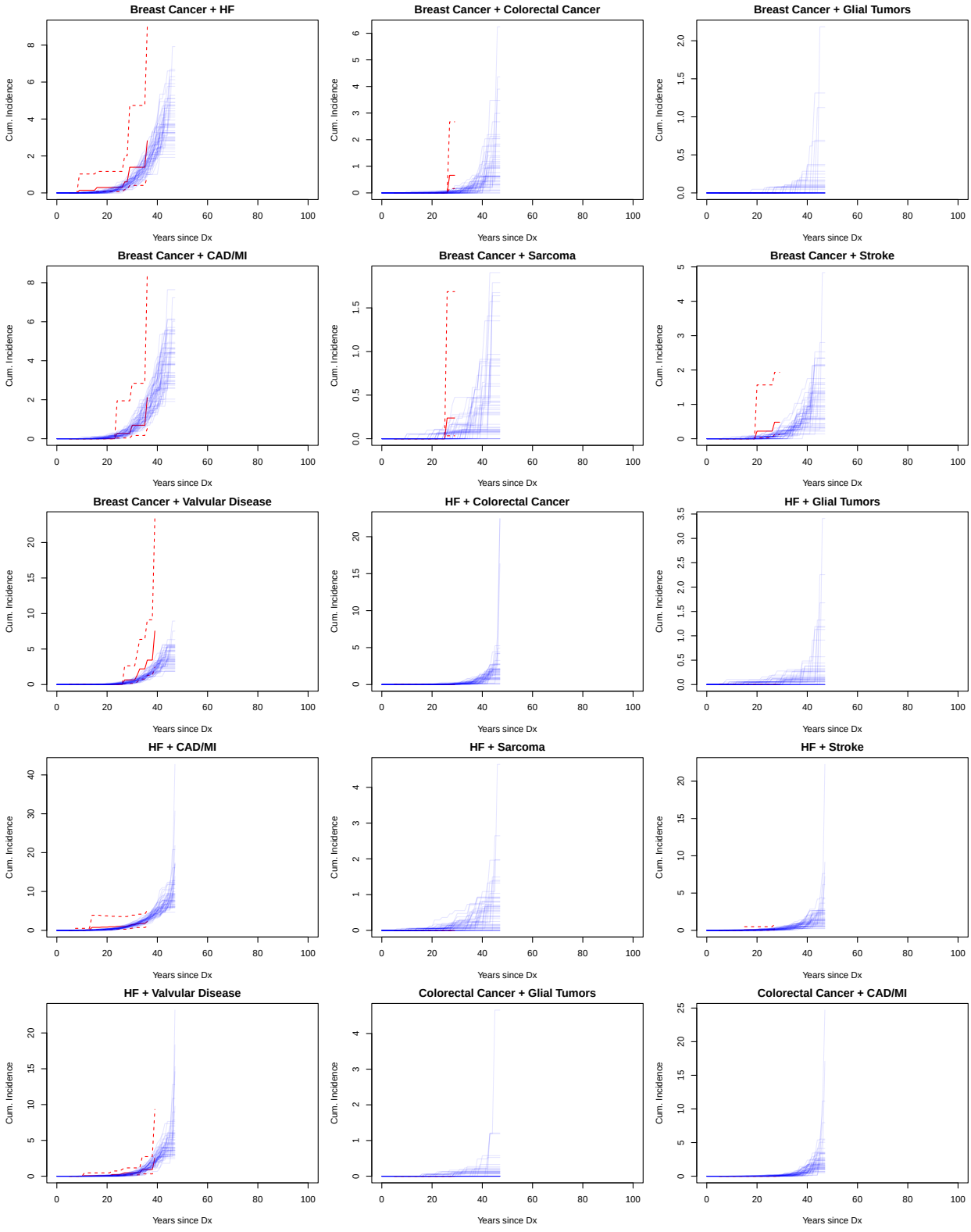

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

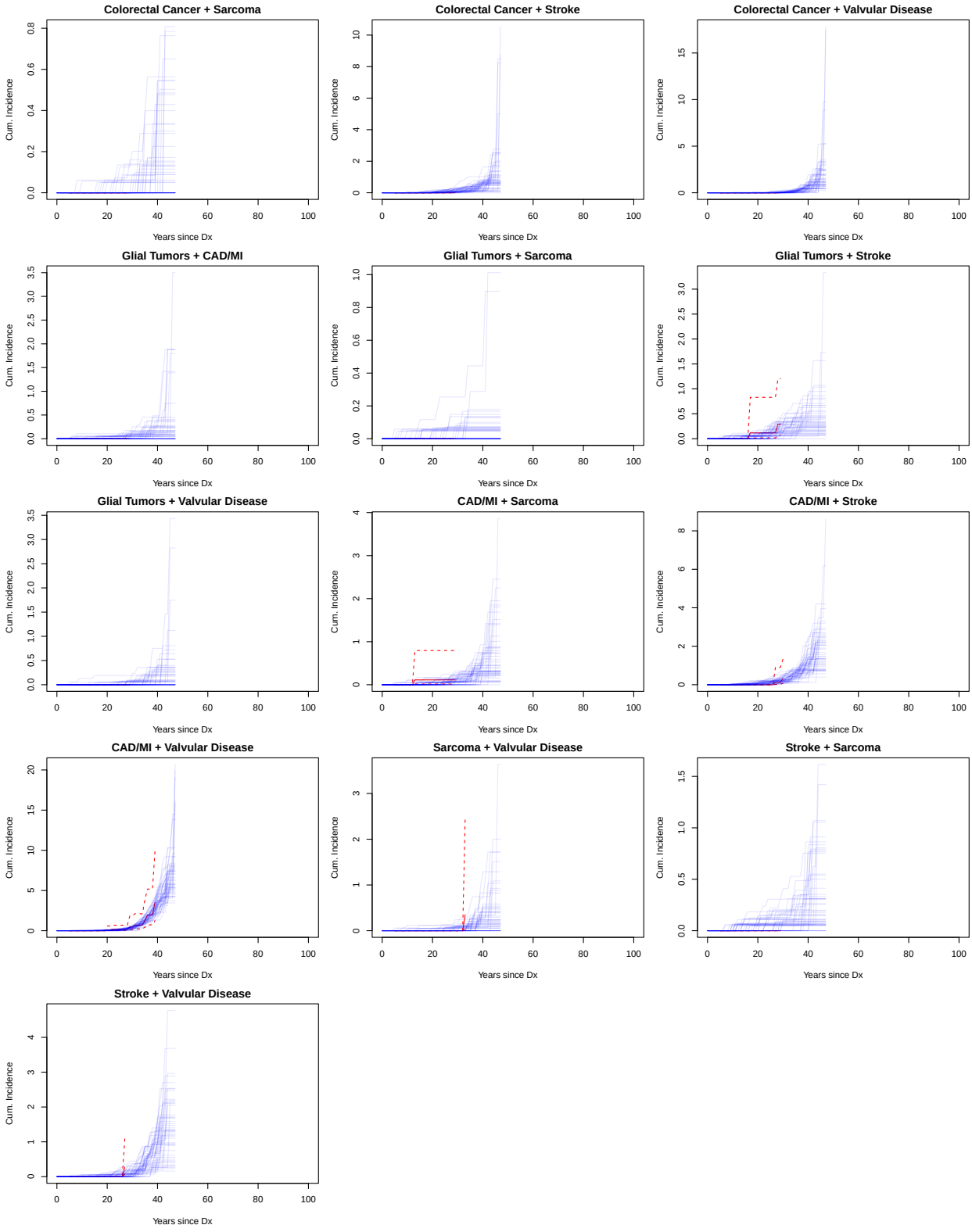
4.3.4.38 Alk4000_7999



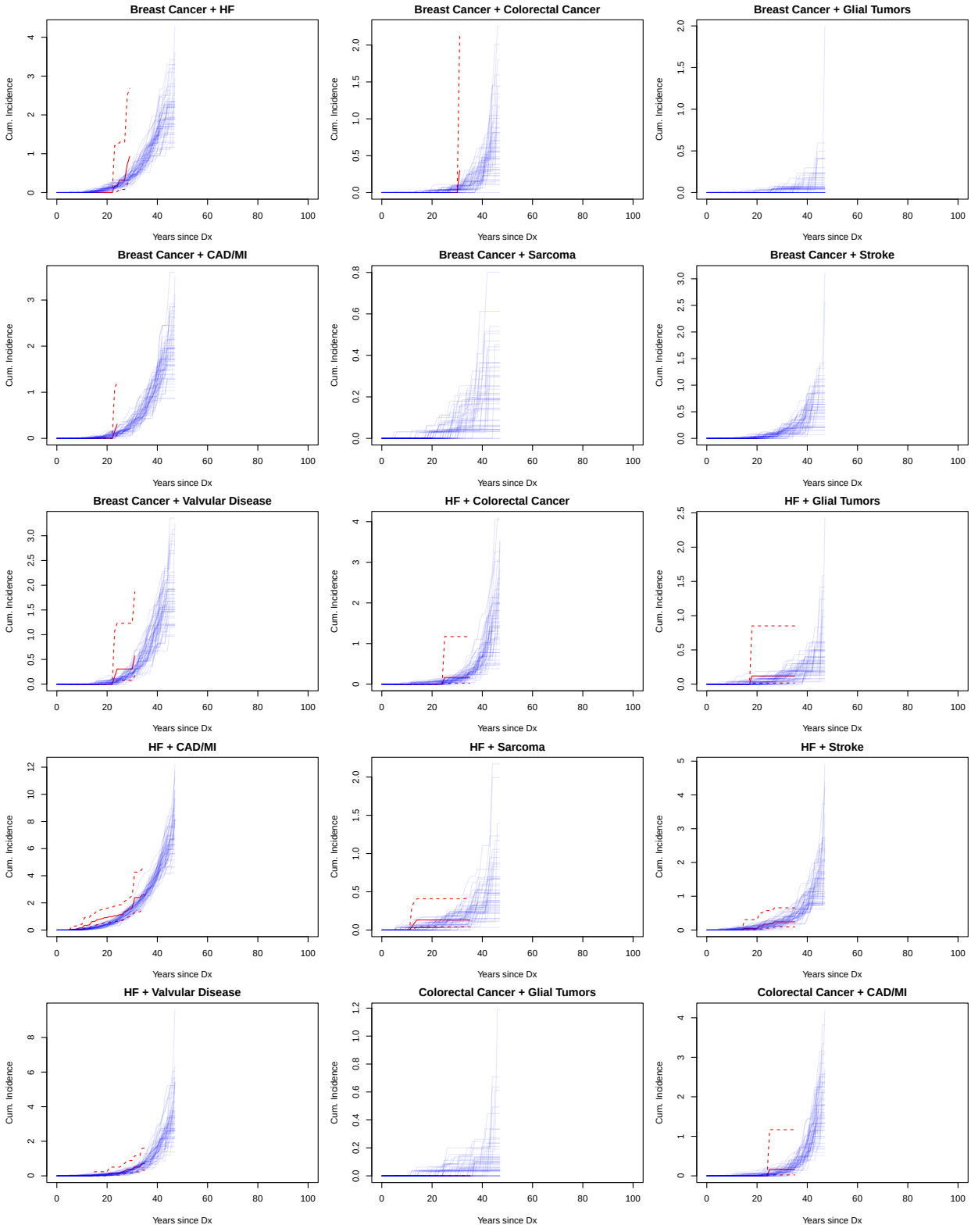

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

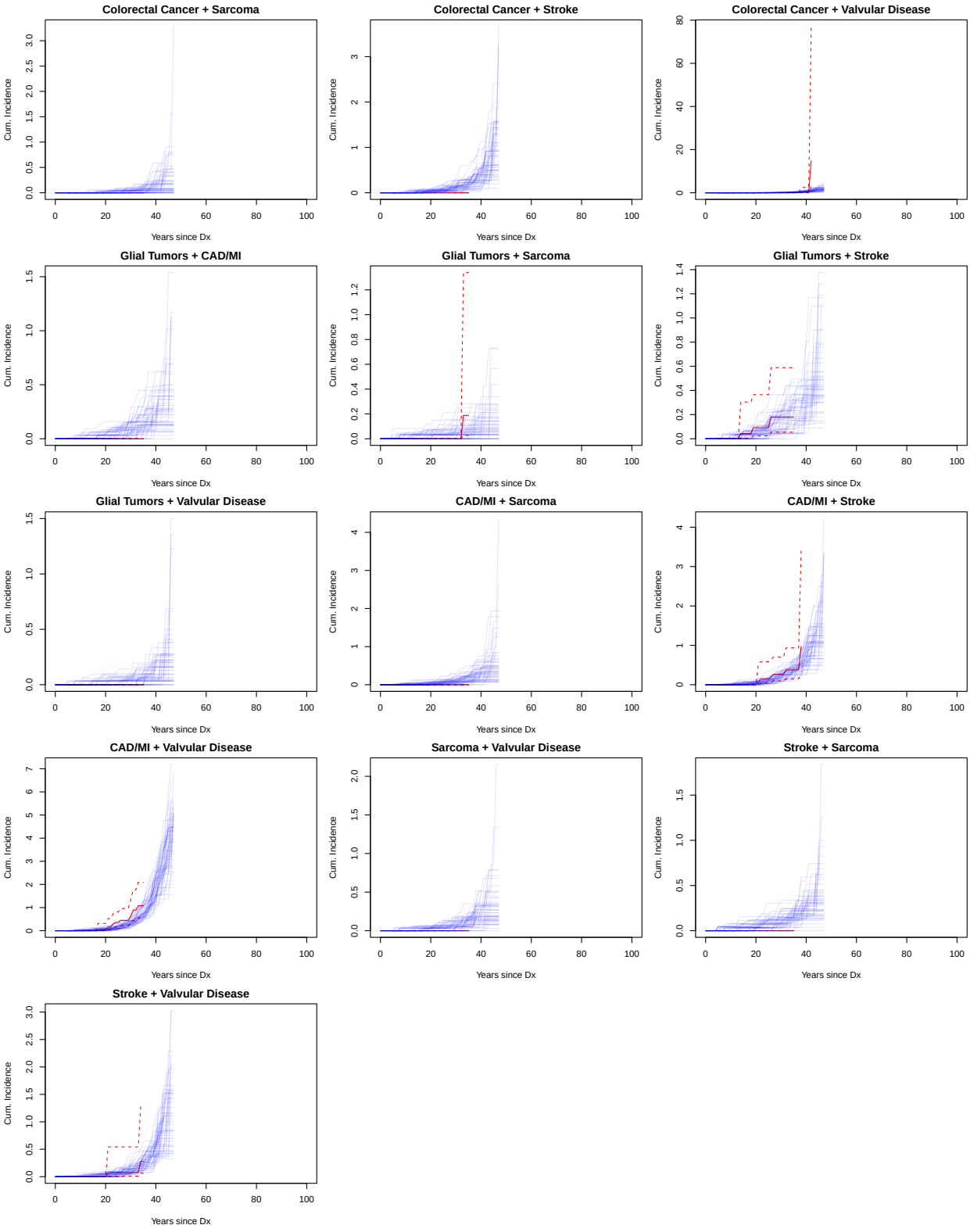
4.3.4.39 Alk8000_11999



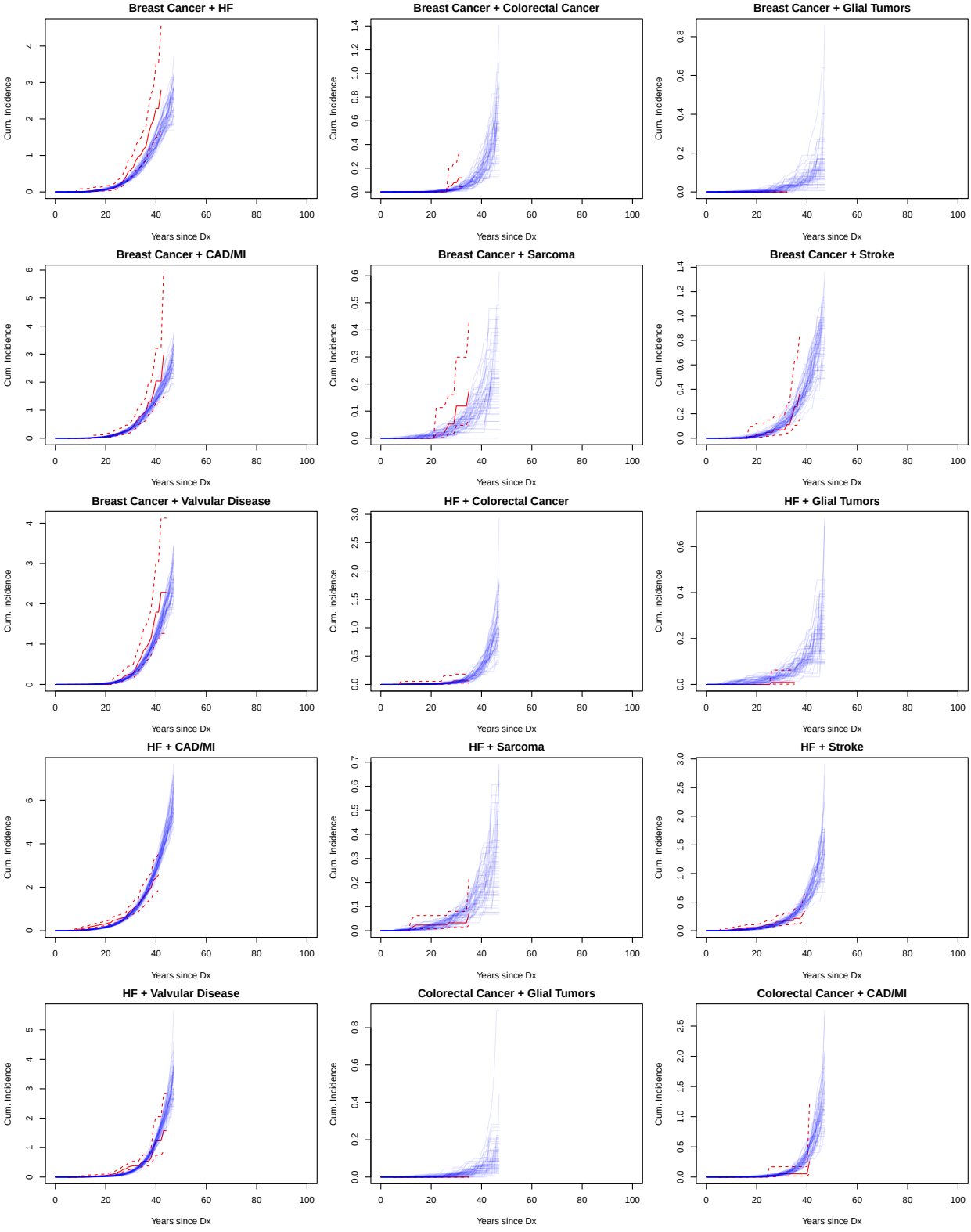

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

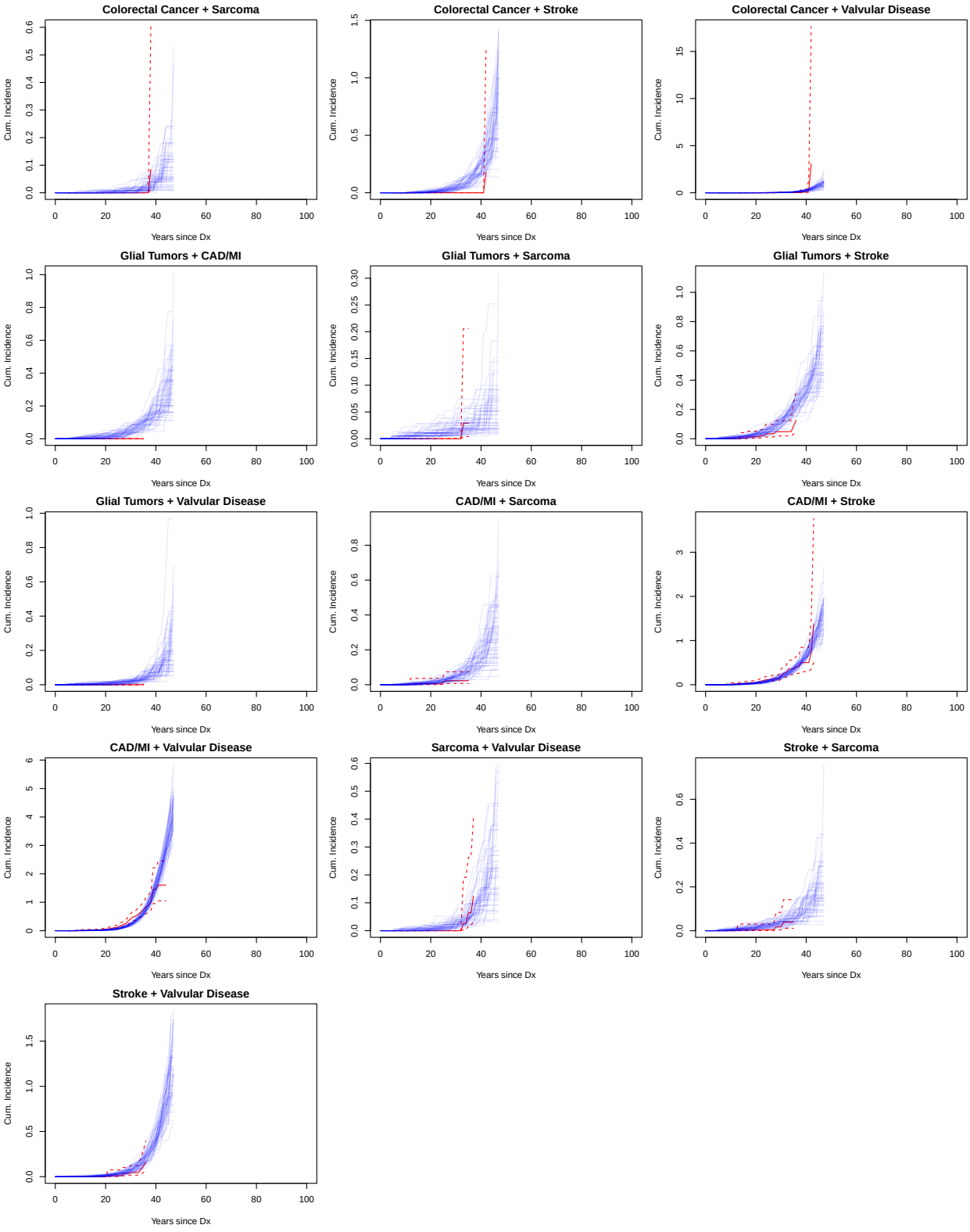
4.3.4.40 Alk12000+



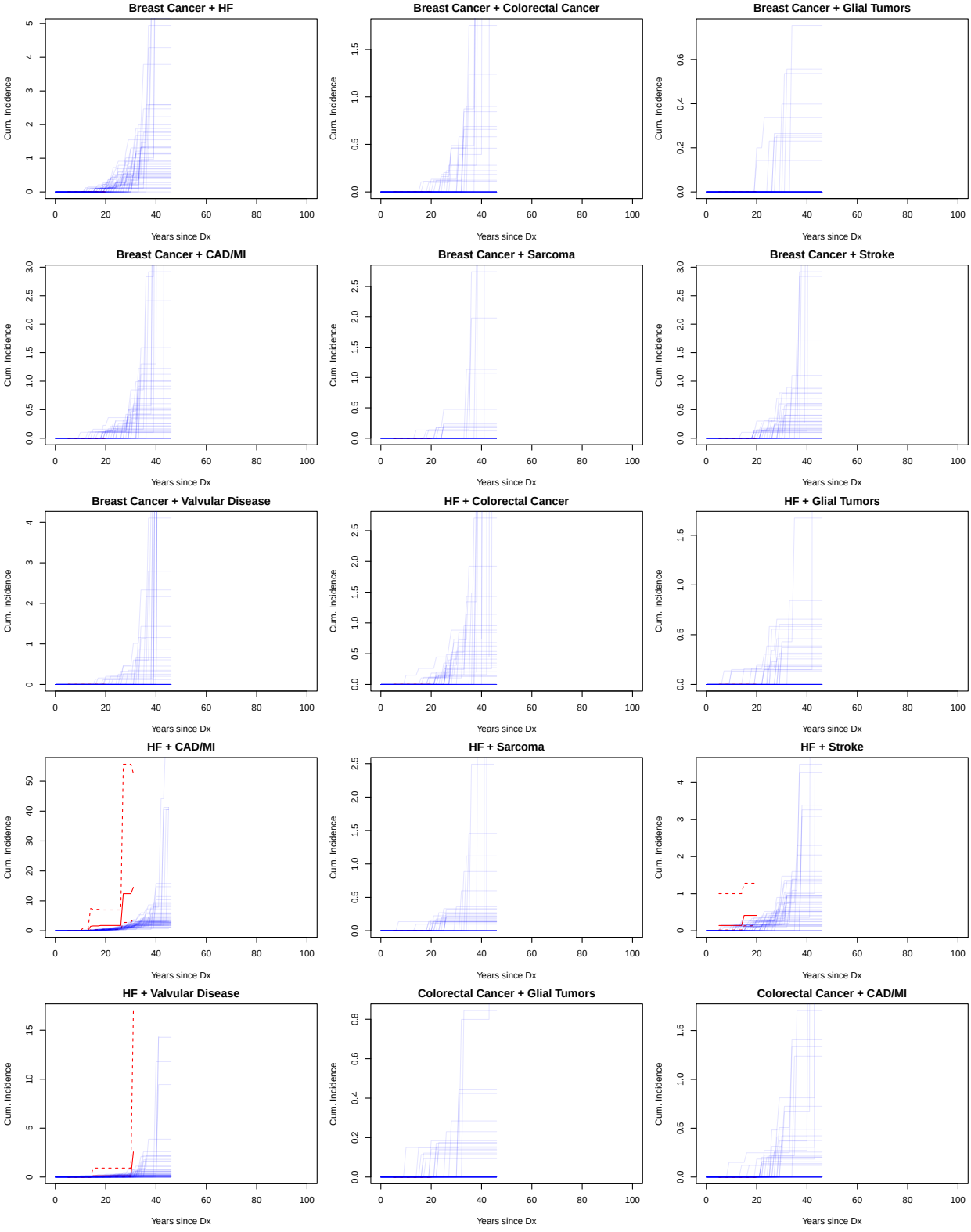

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

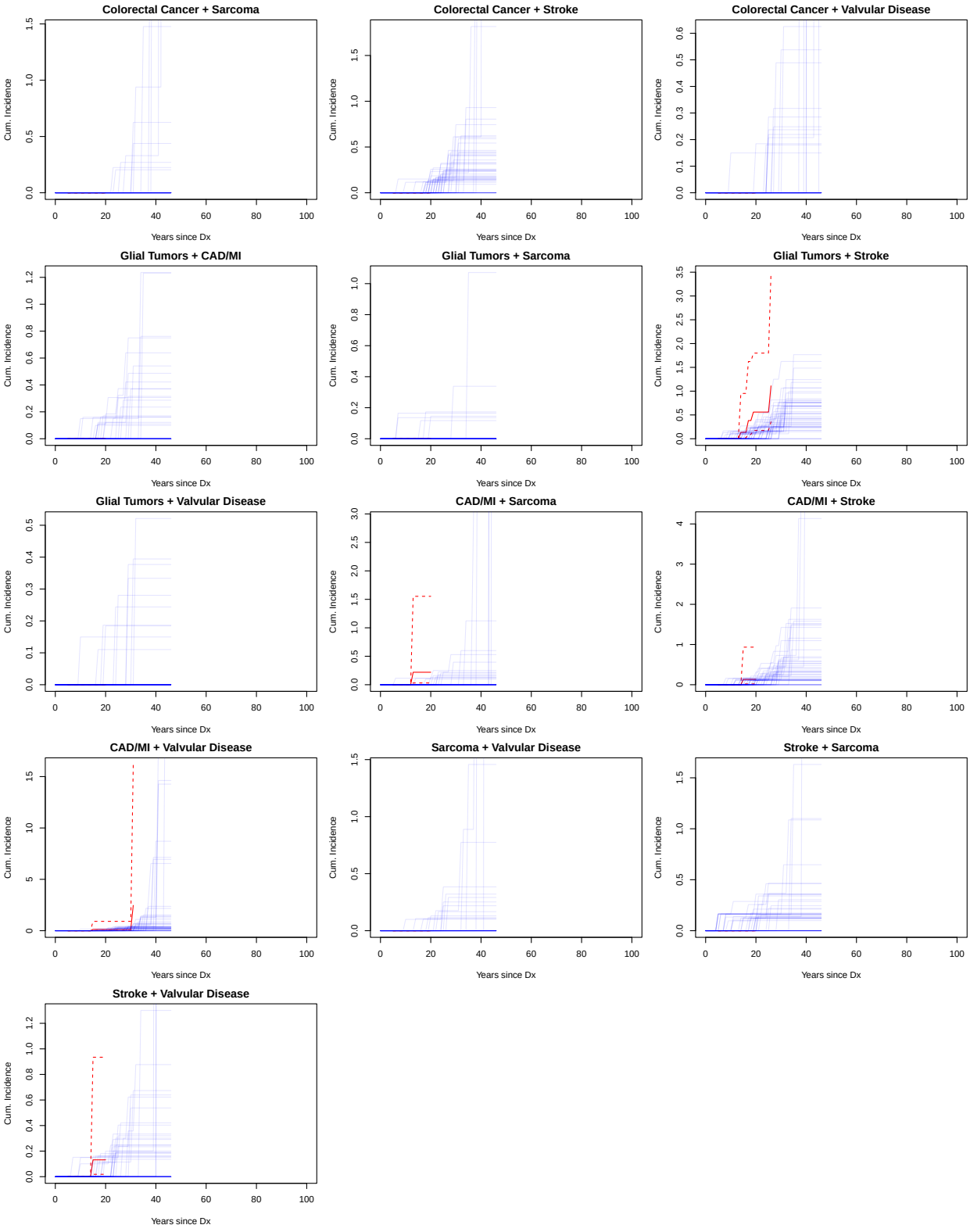
4.3.4.41 CispNone



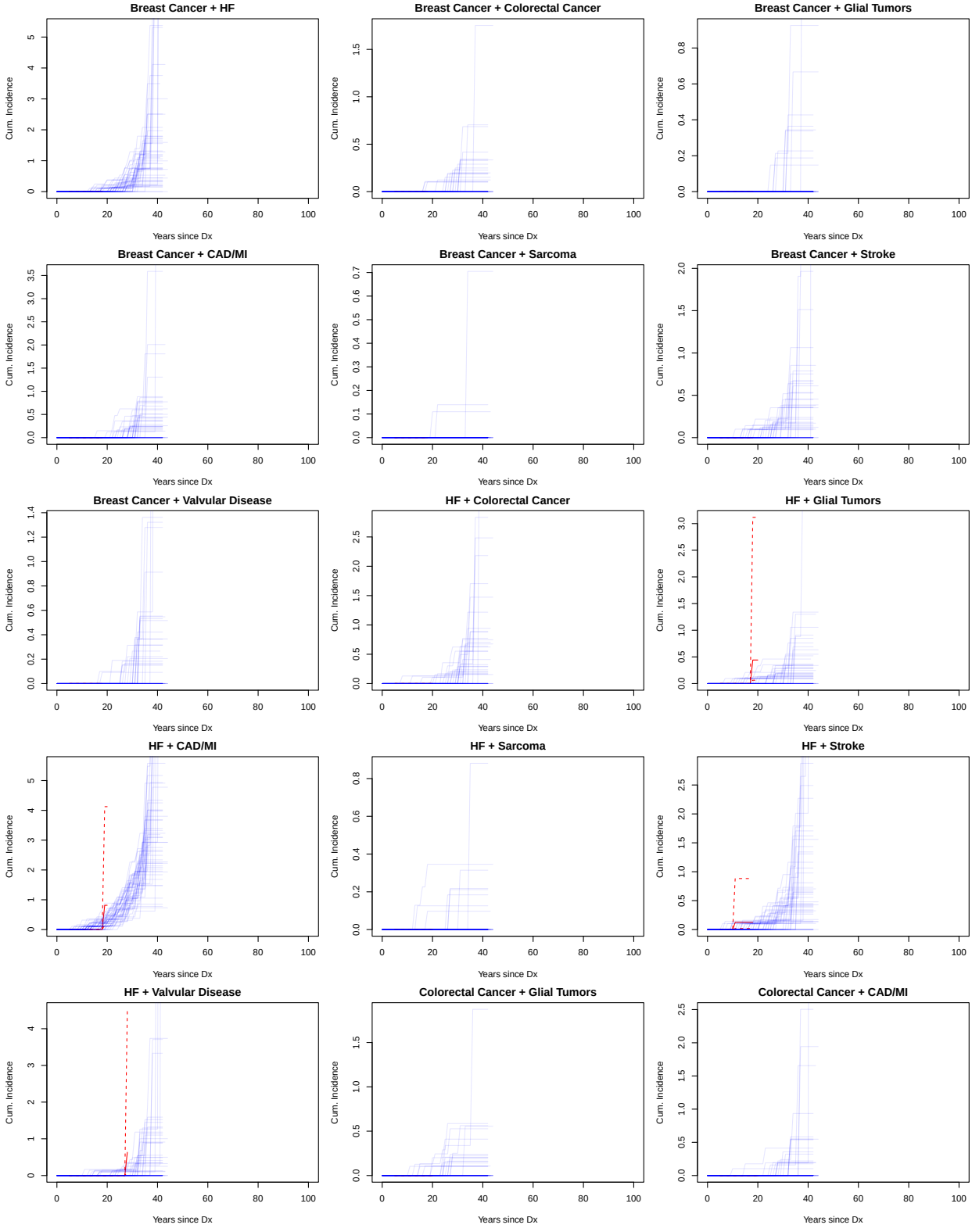

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

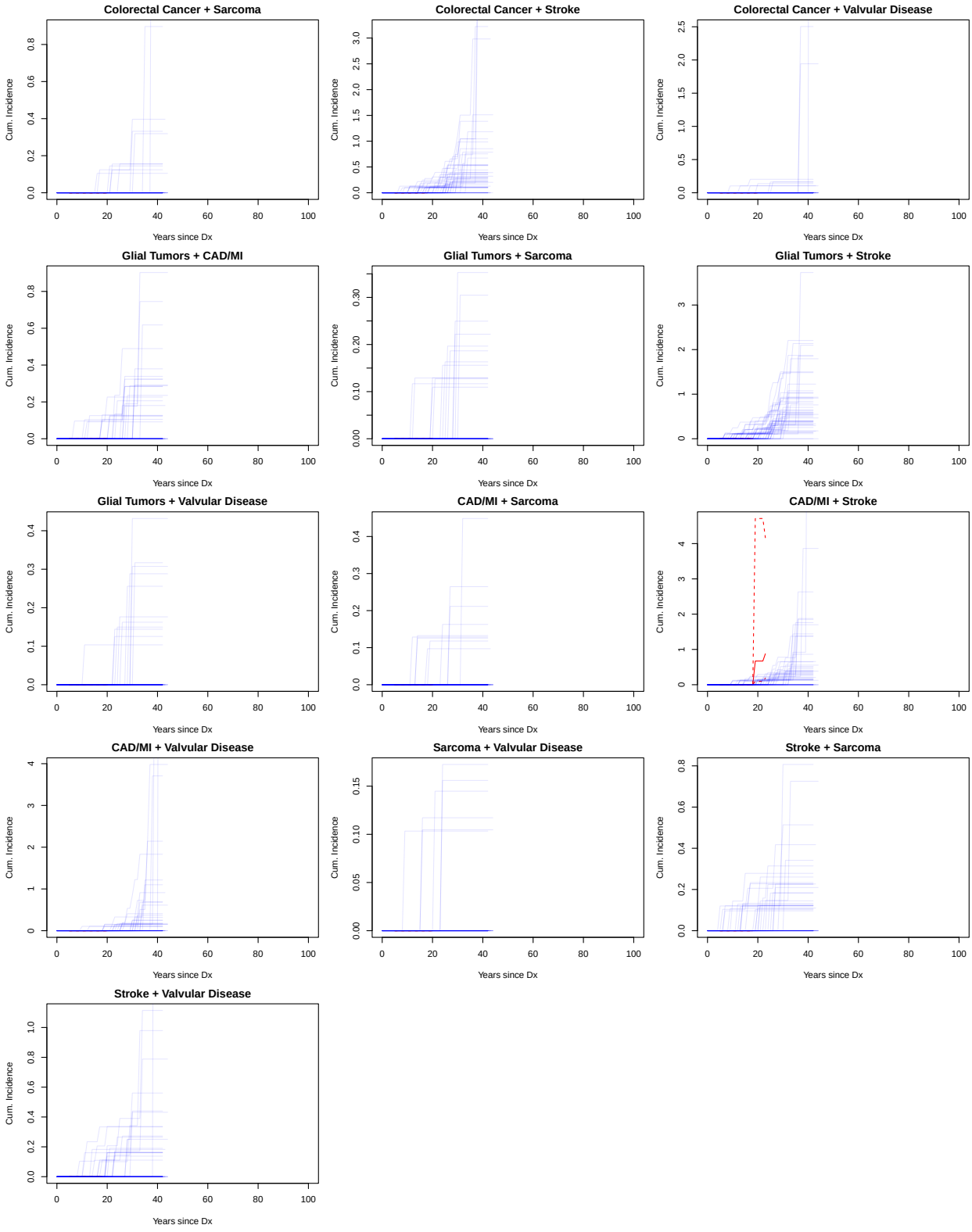
4.3.4.42 Cisp<400



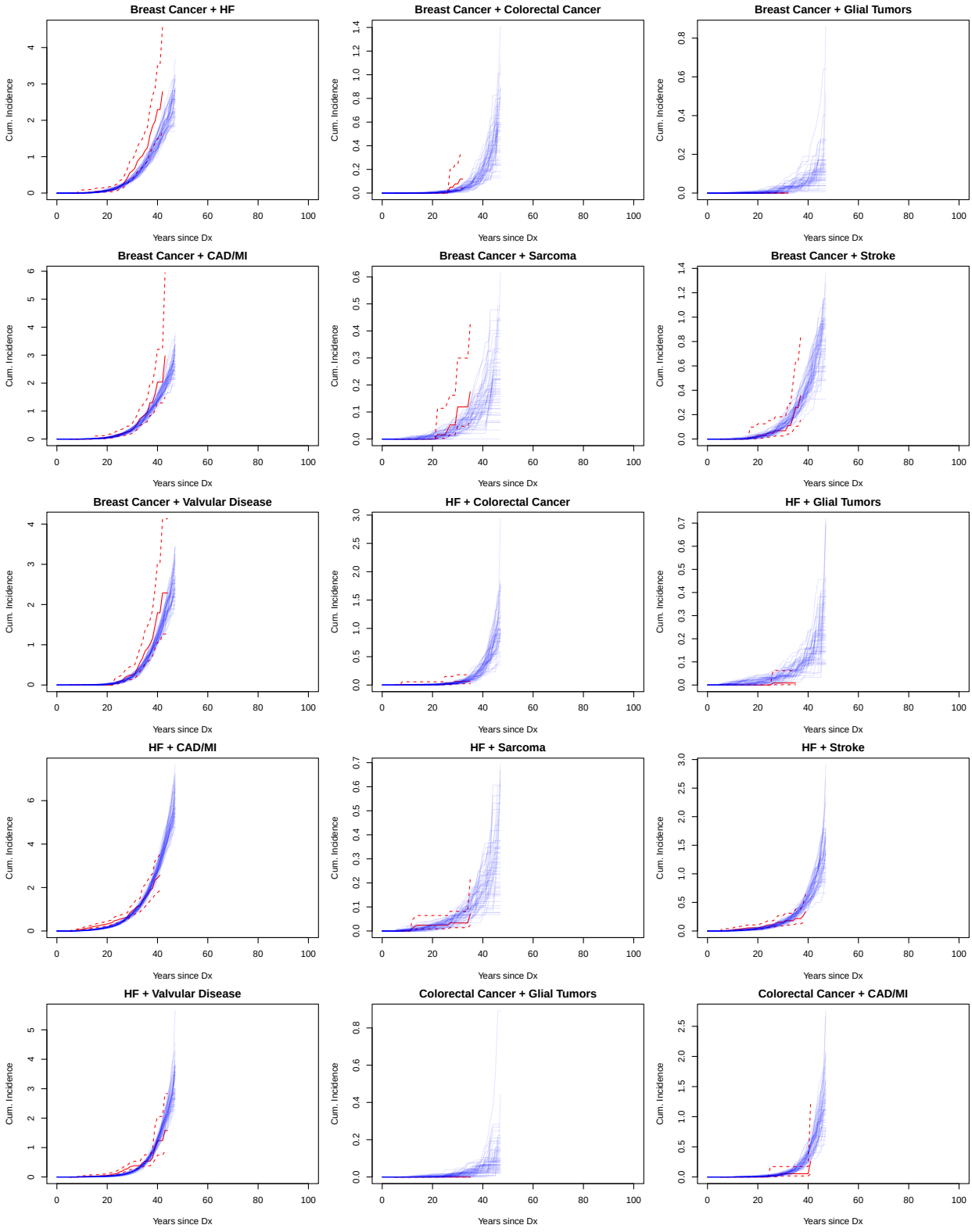

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

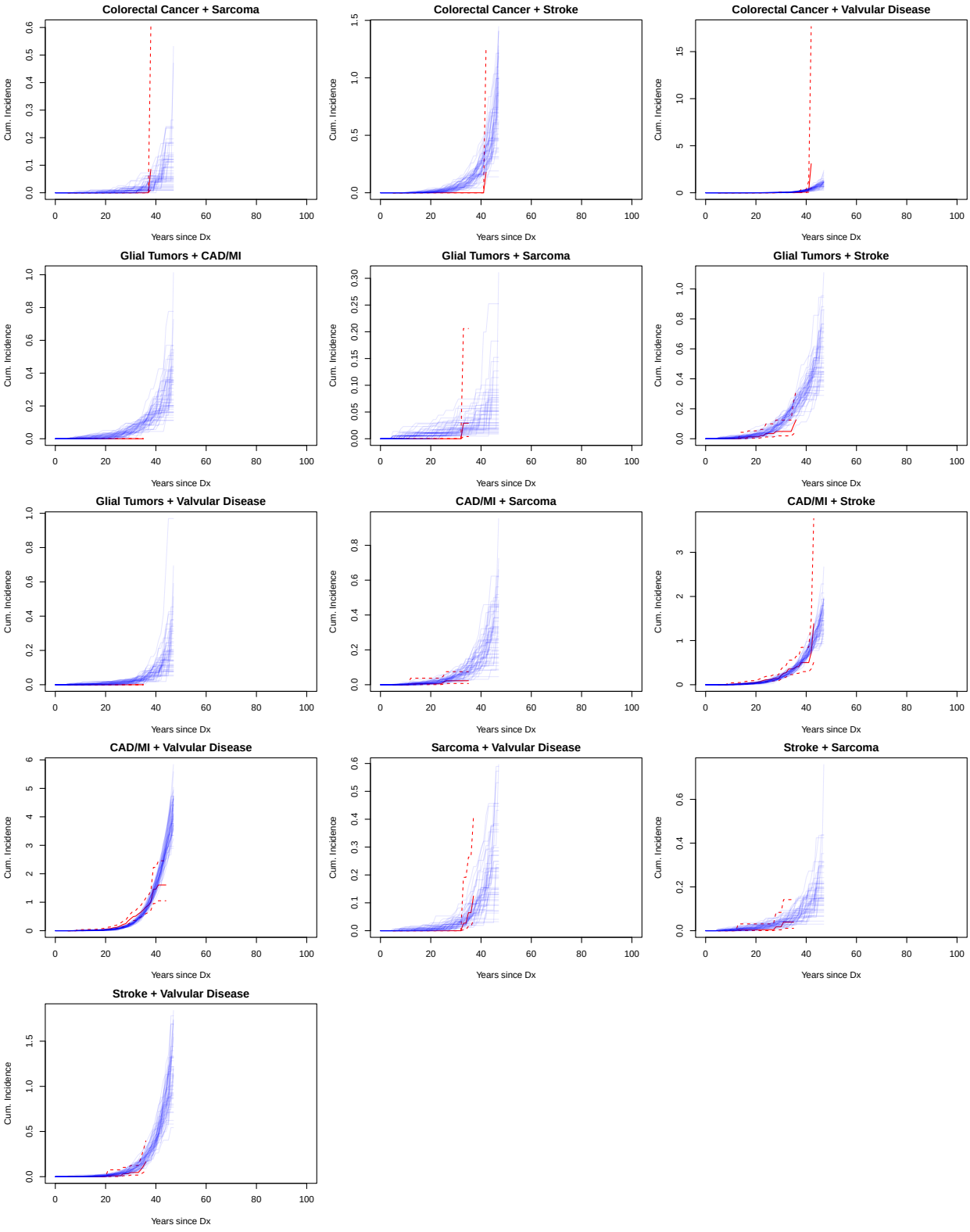
4.3.4.43 Cisp400+



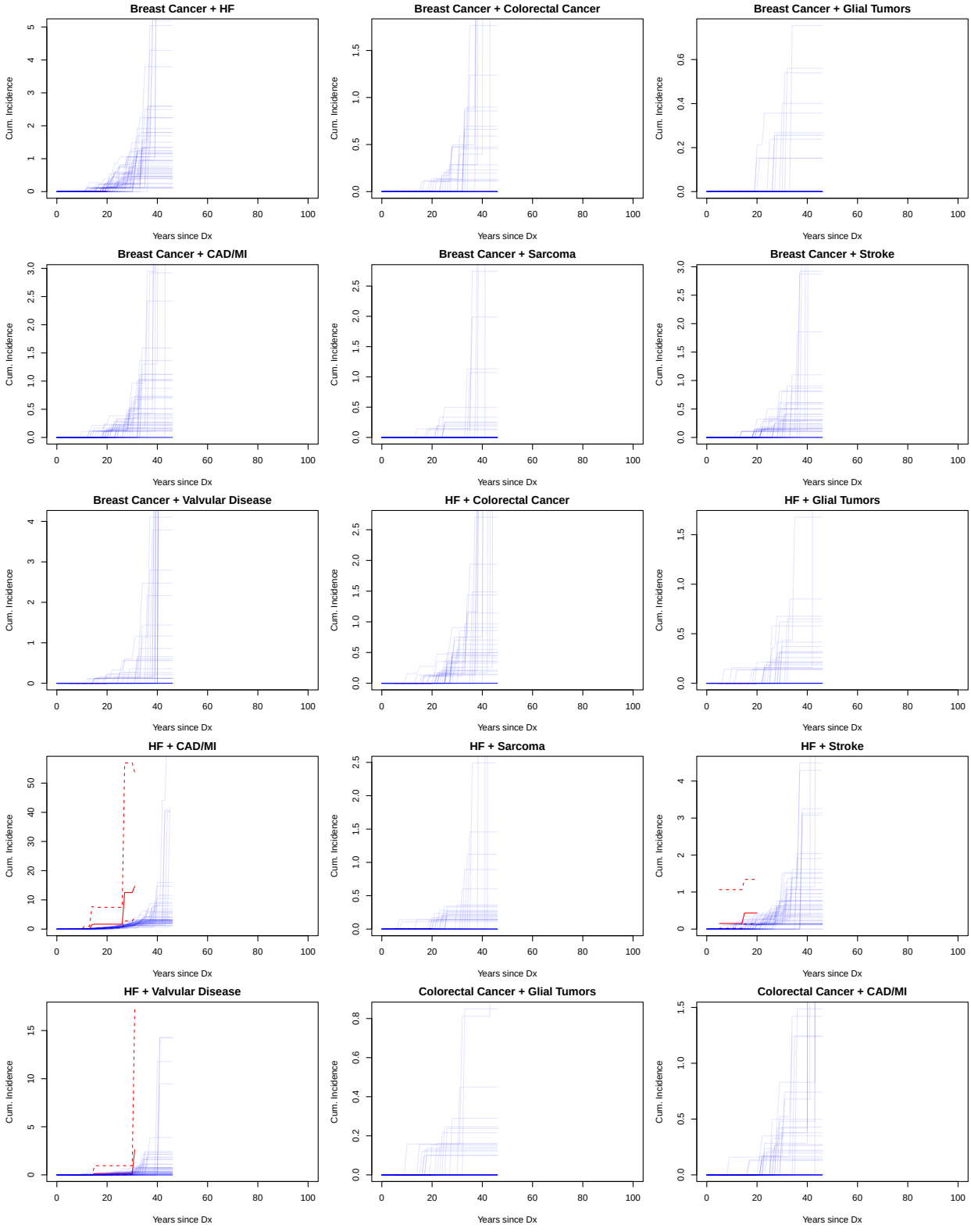

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

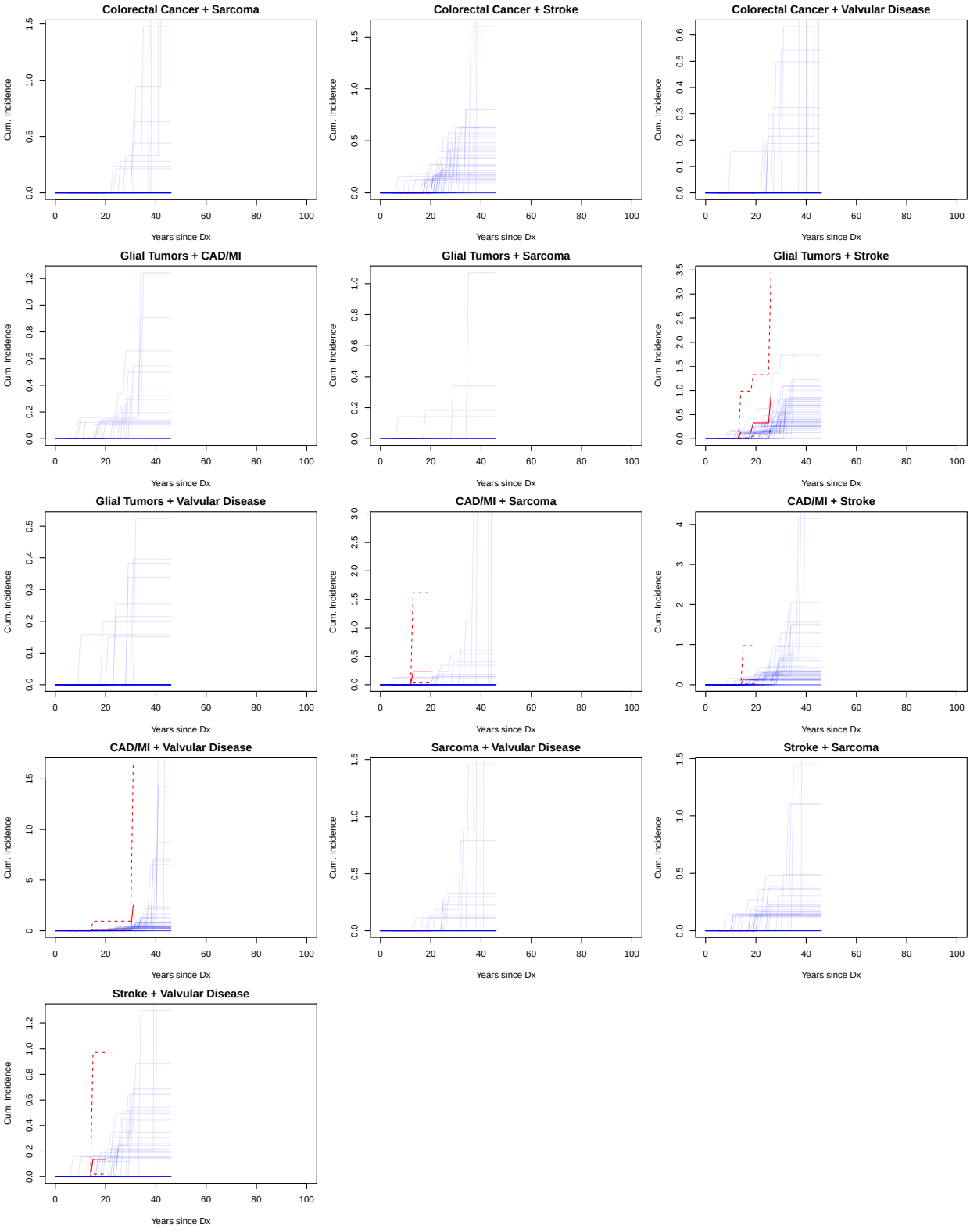
4.3.4.44 PlatNone



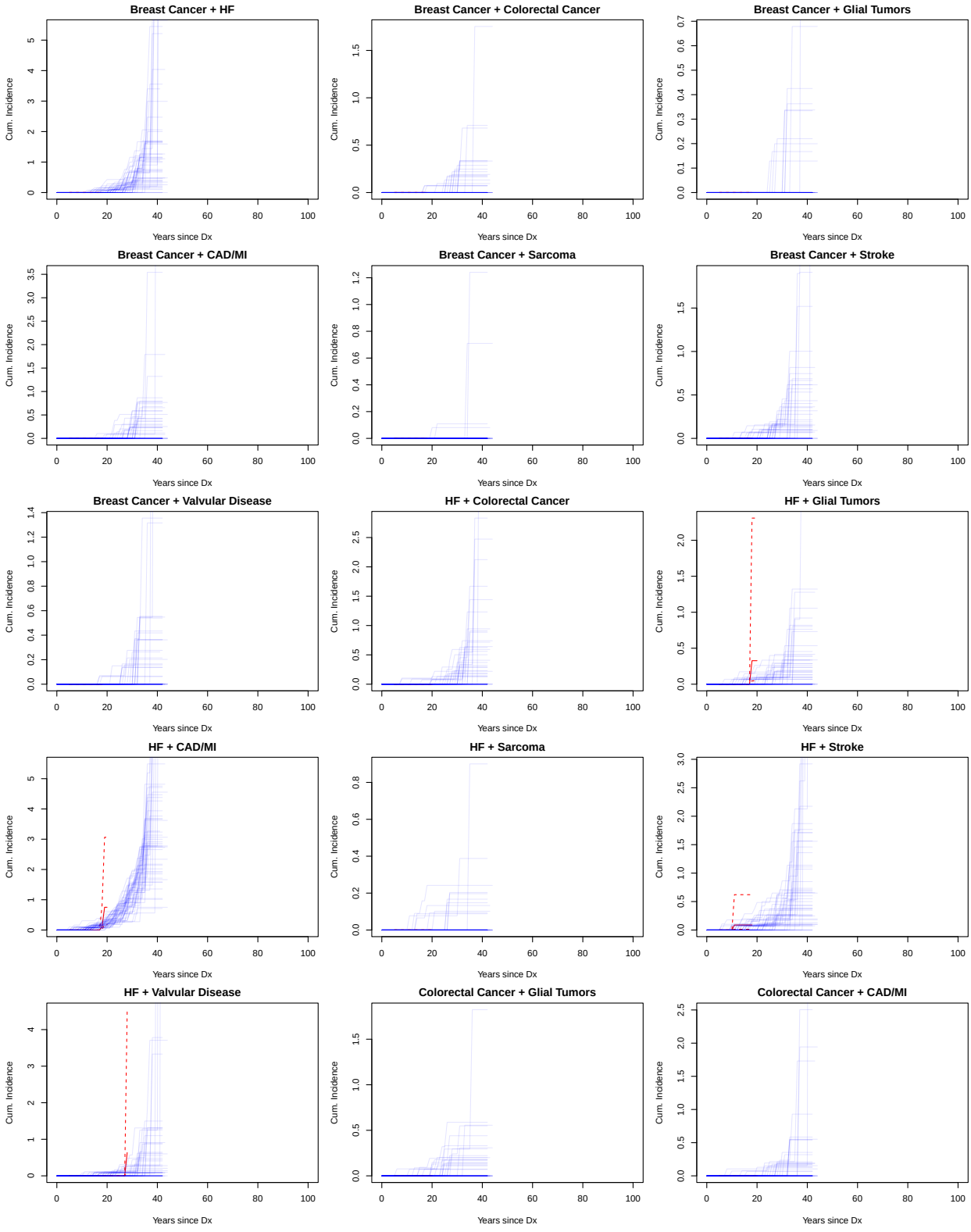

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

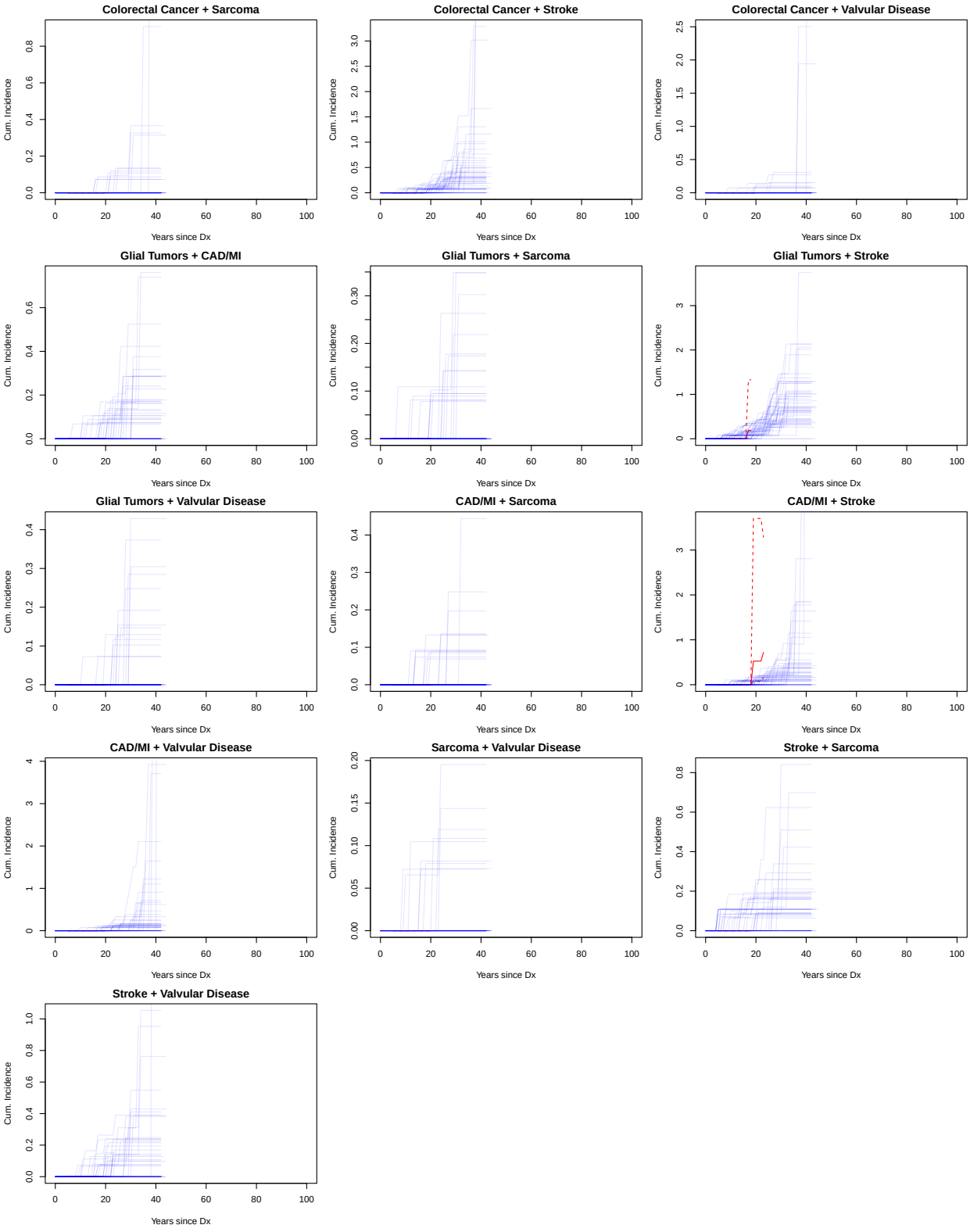
4.3.4.45 Plat<400



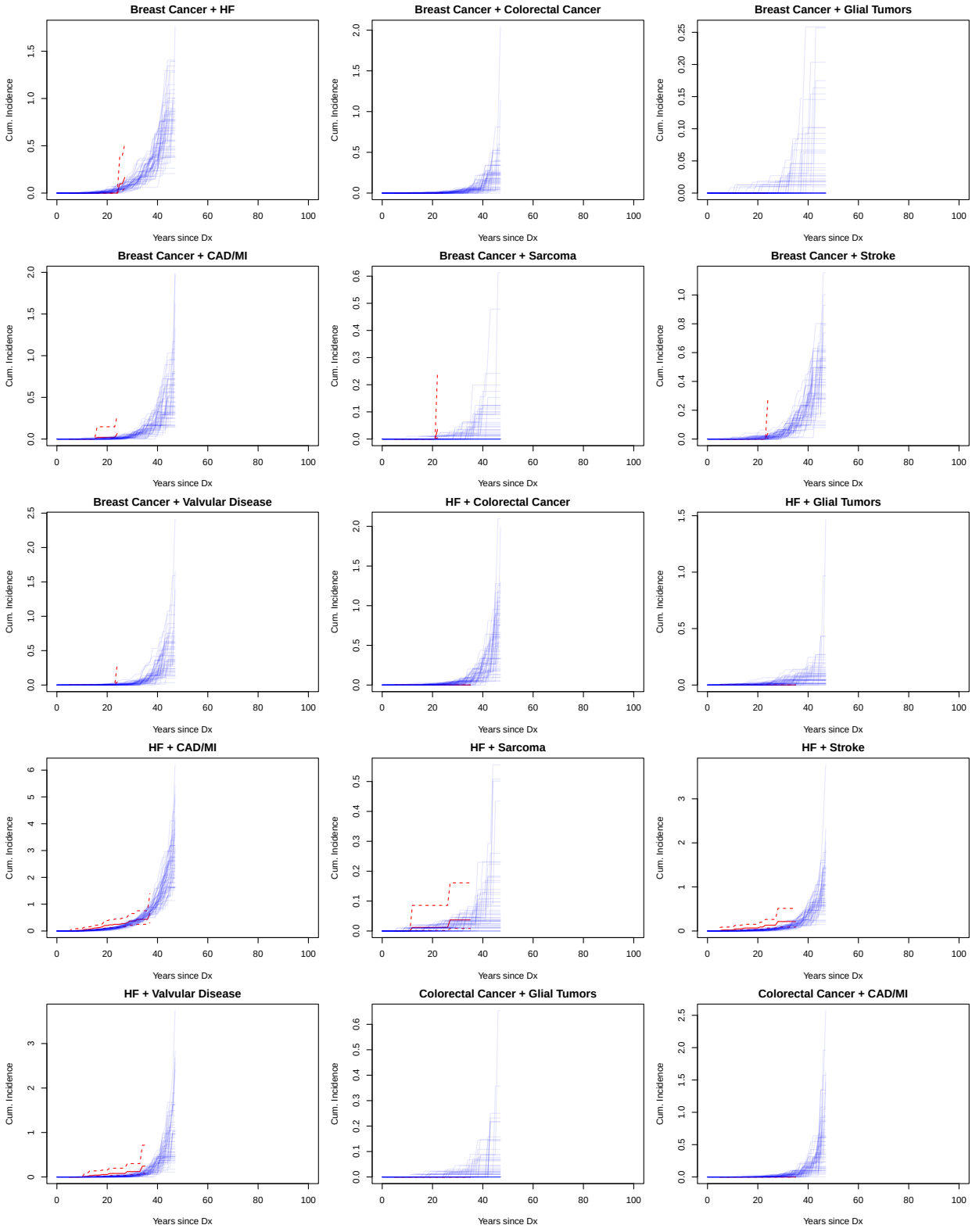

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

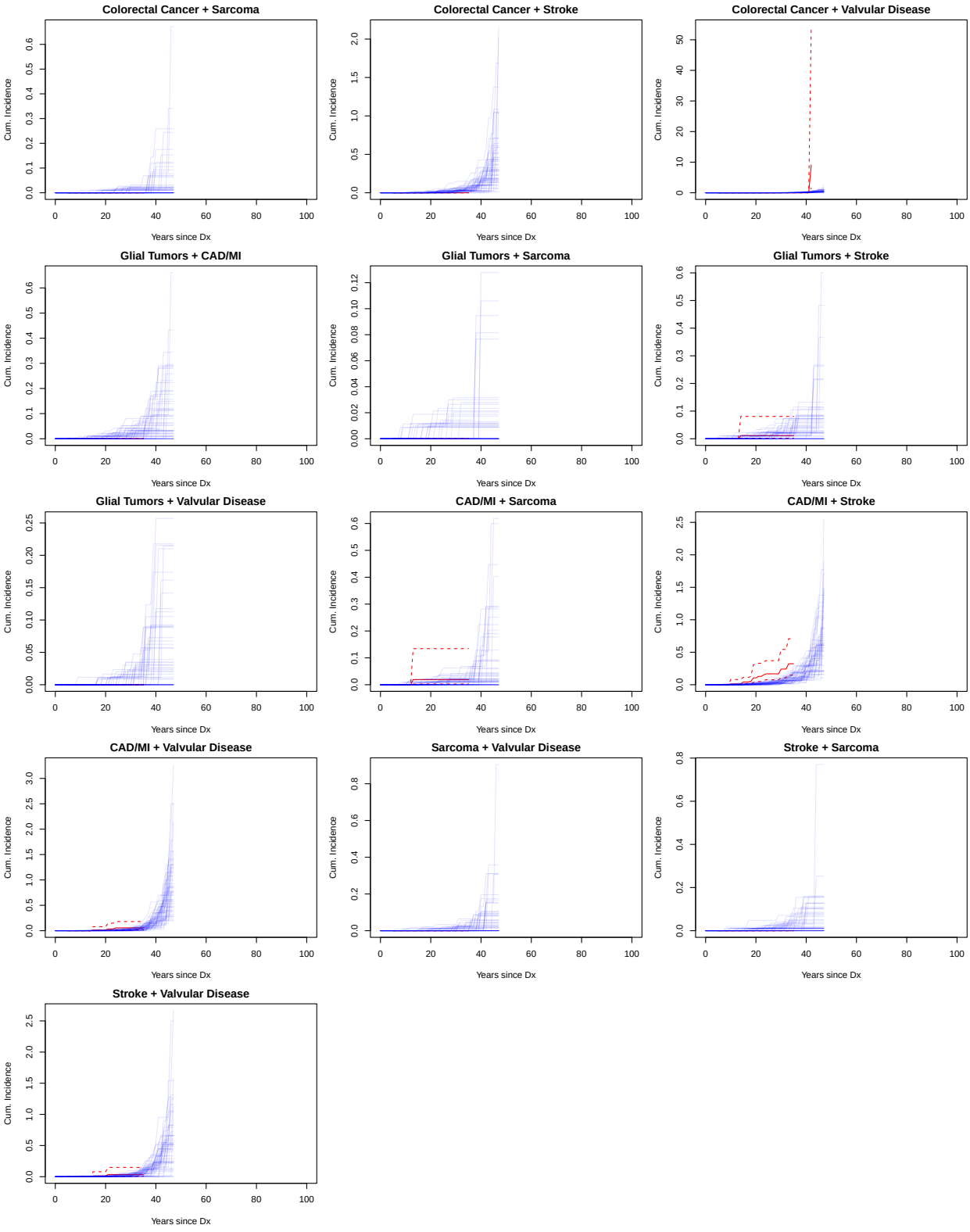
4.3.4.46 Plat400+



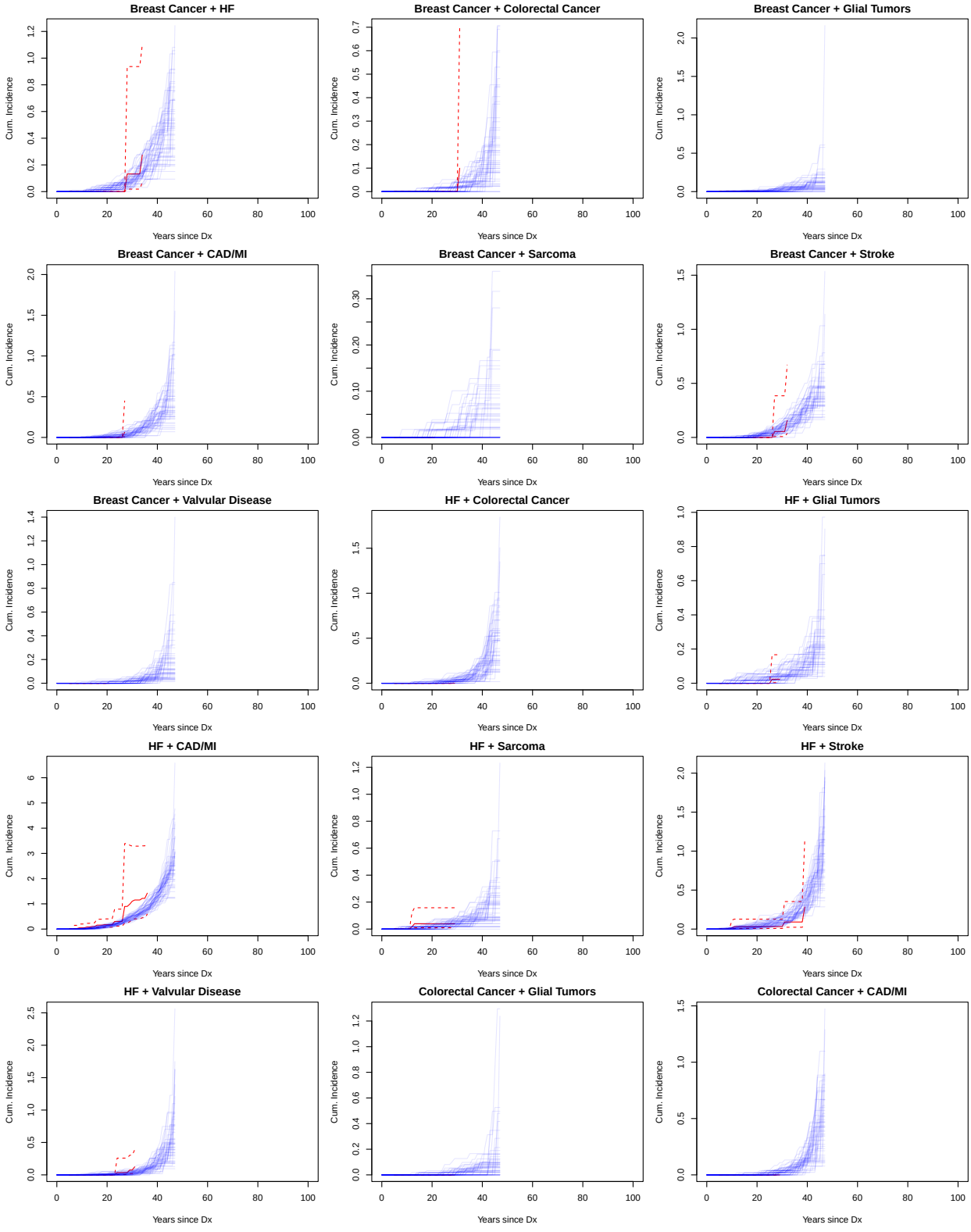

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

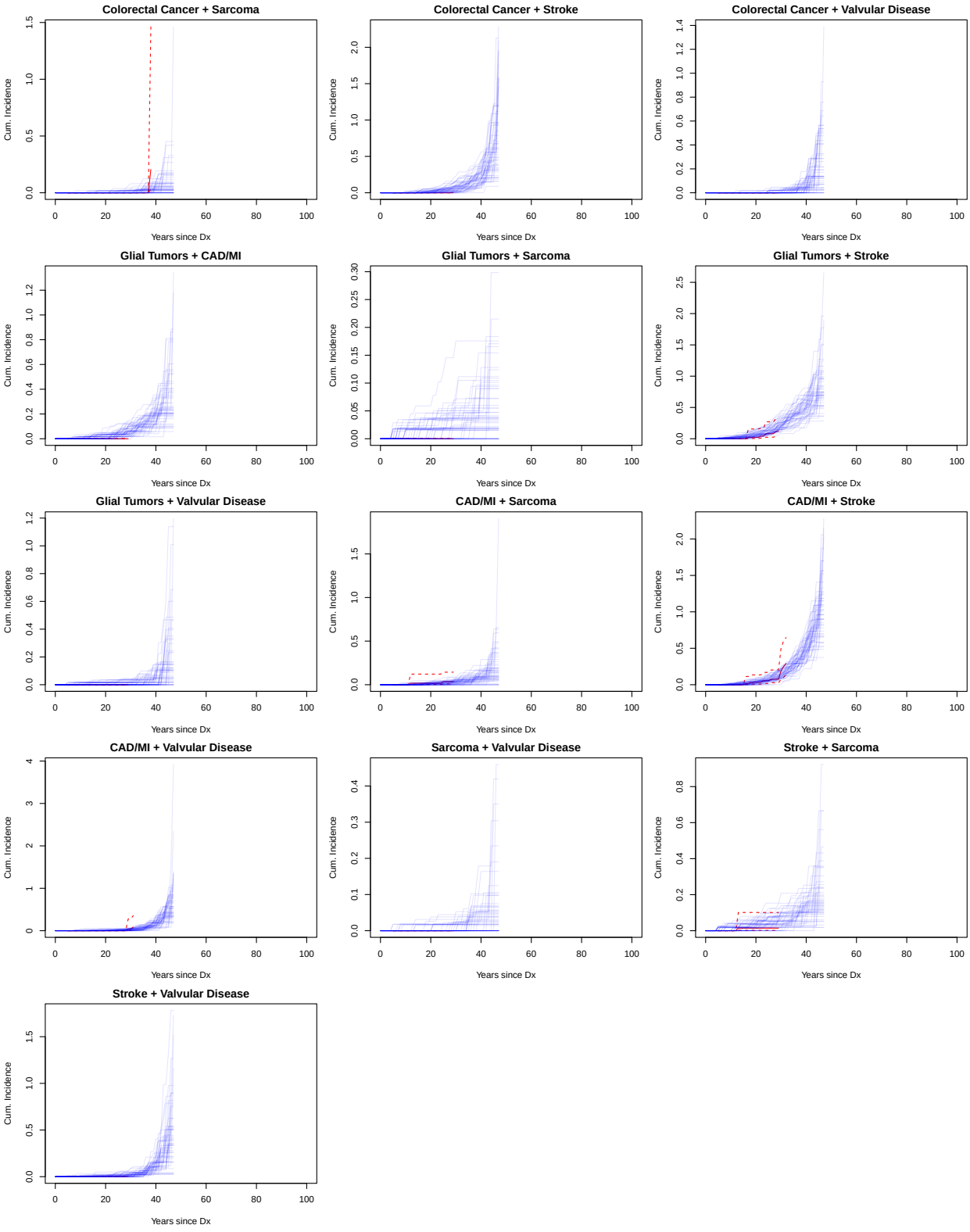
4.3.4.47 ChestNone



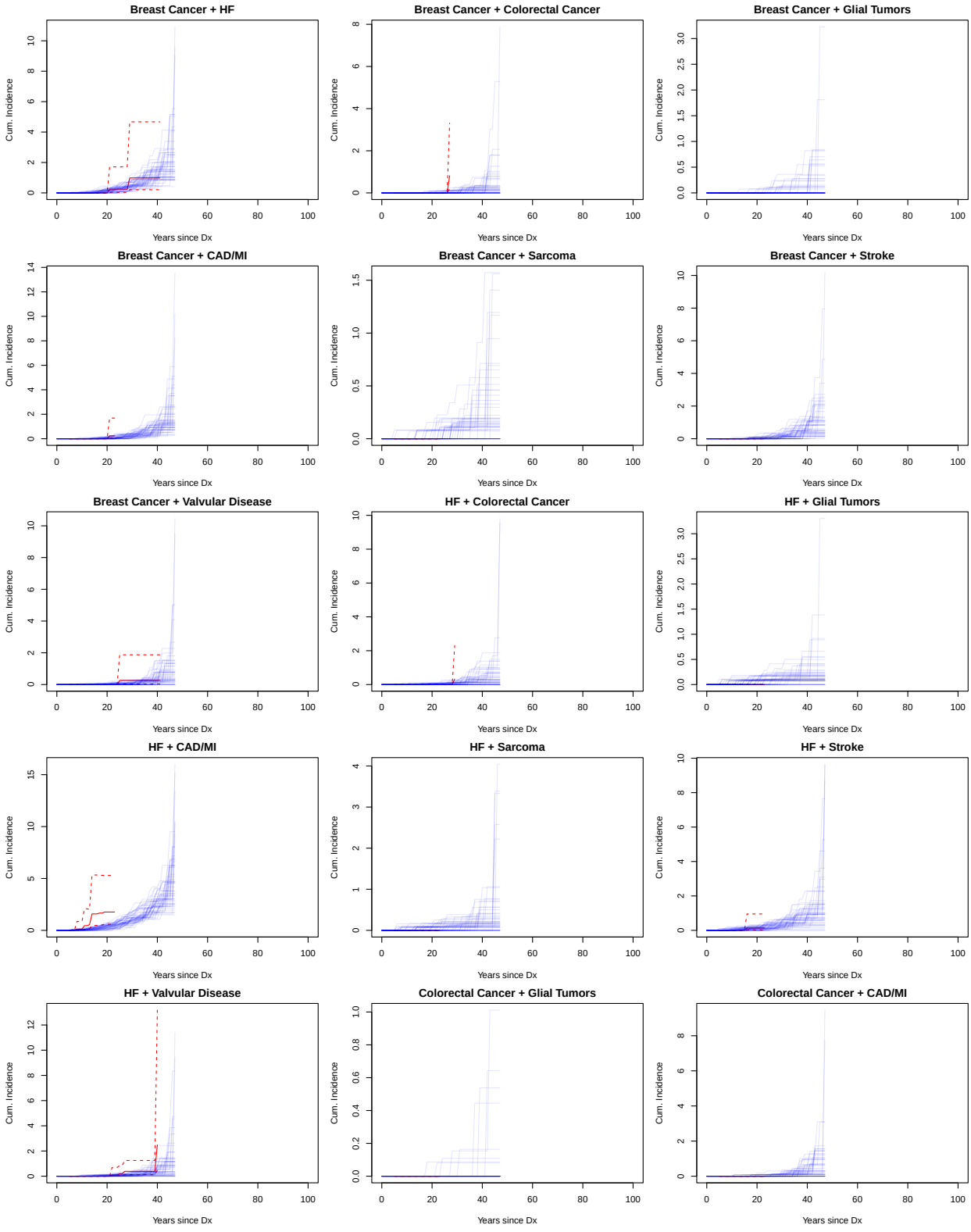

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

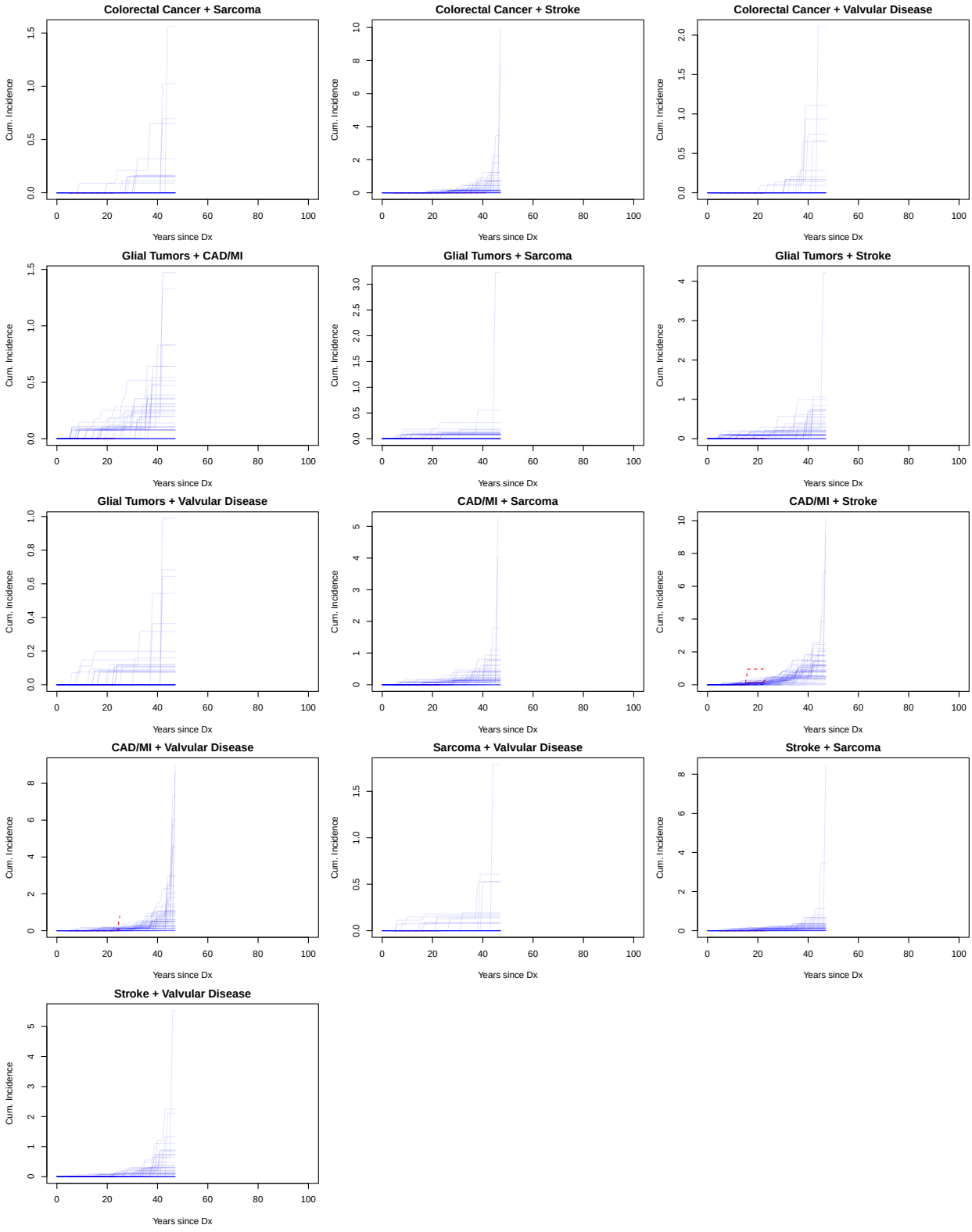
4.3.4.48 Chest<10



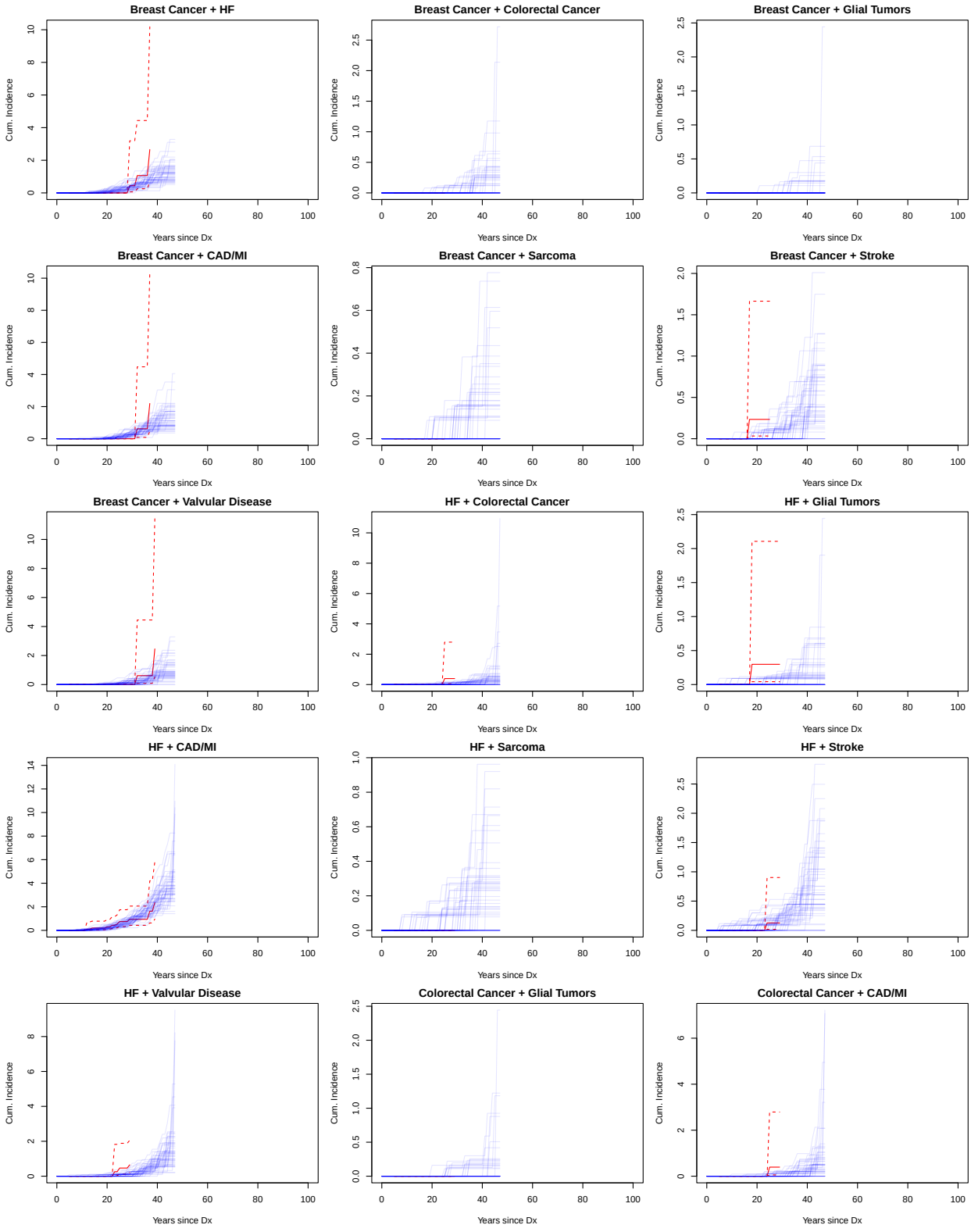

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

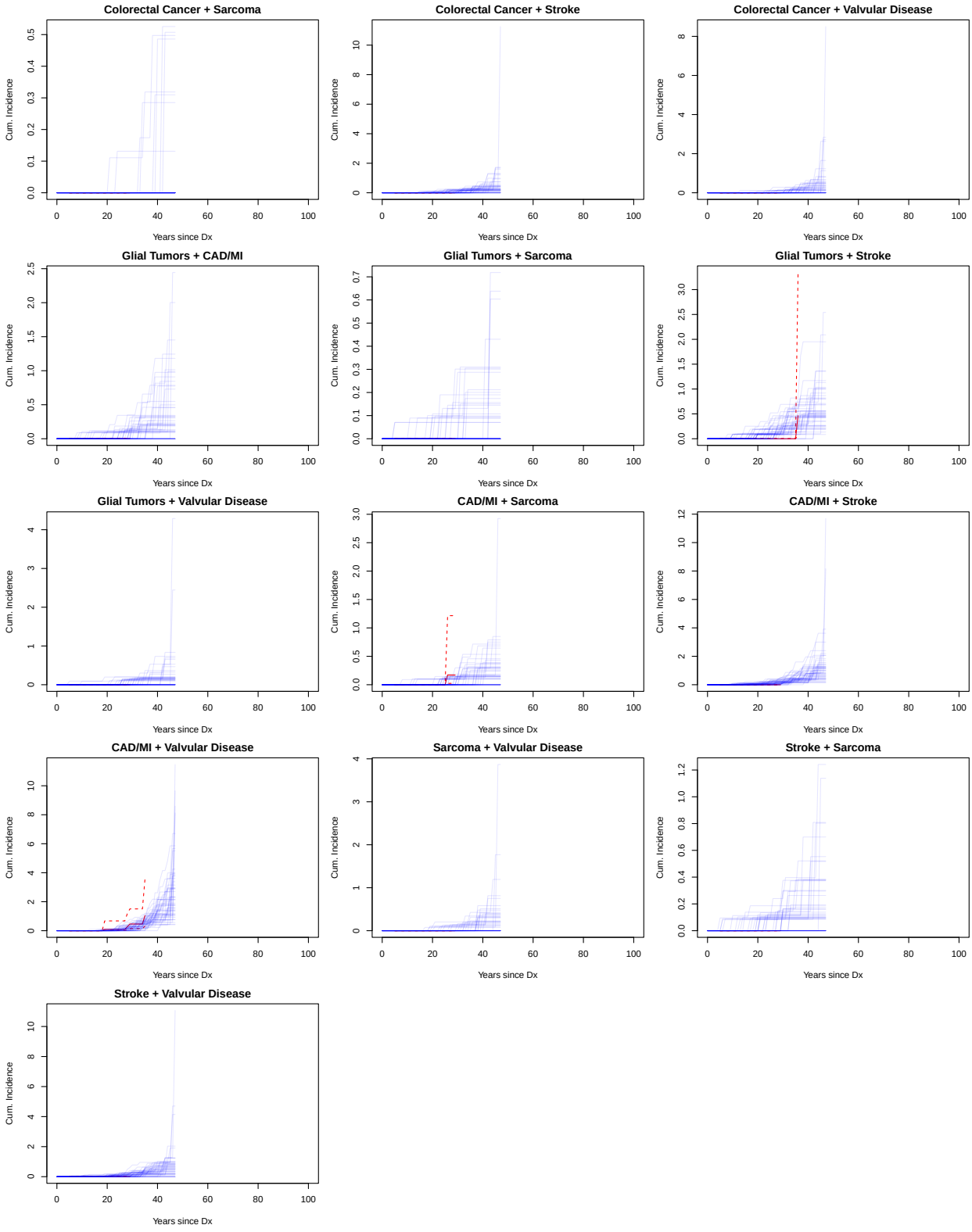
4.3.4.49 Chest10_19



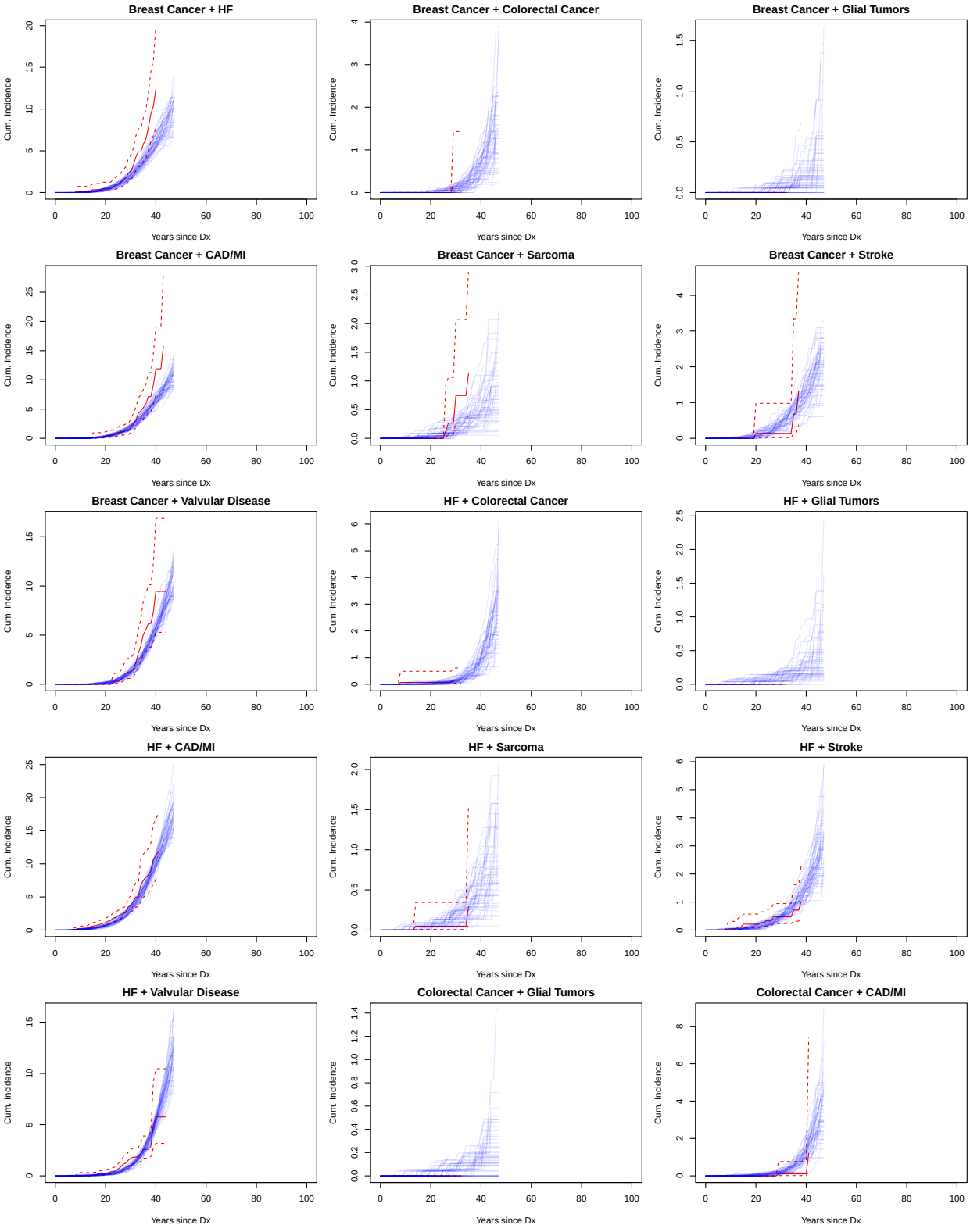

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

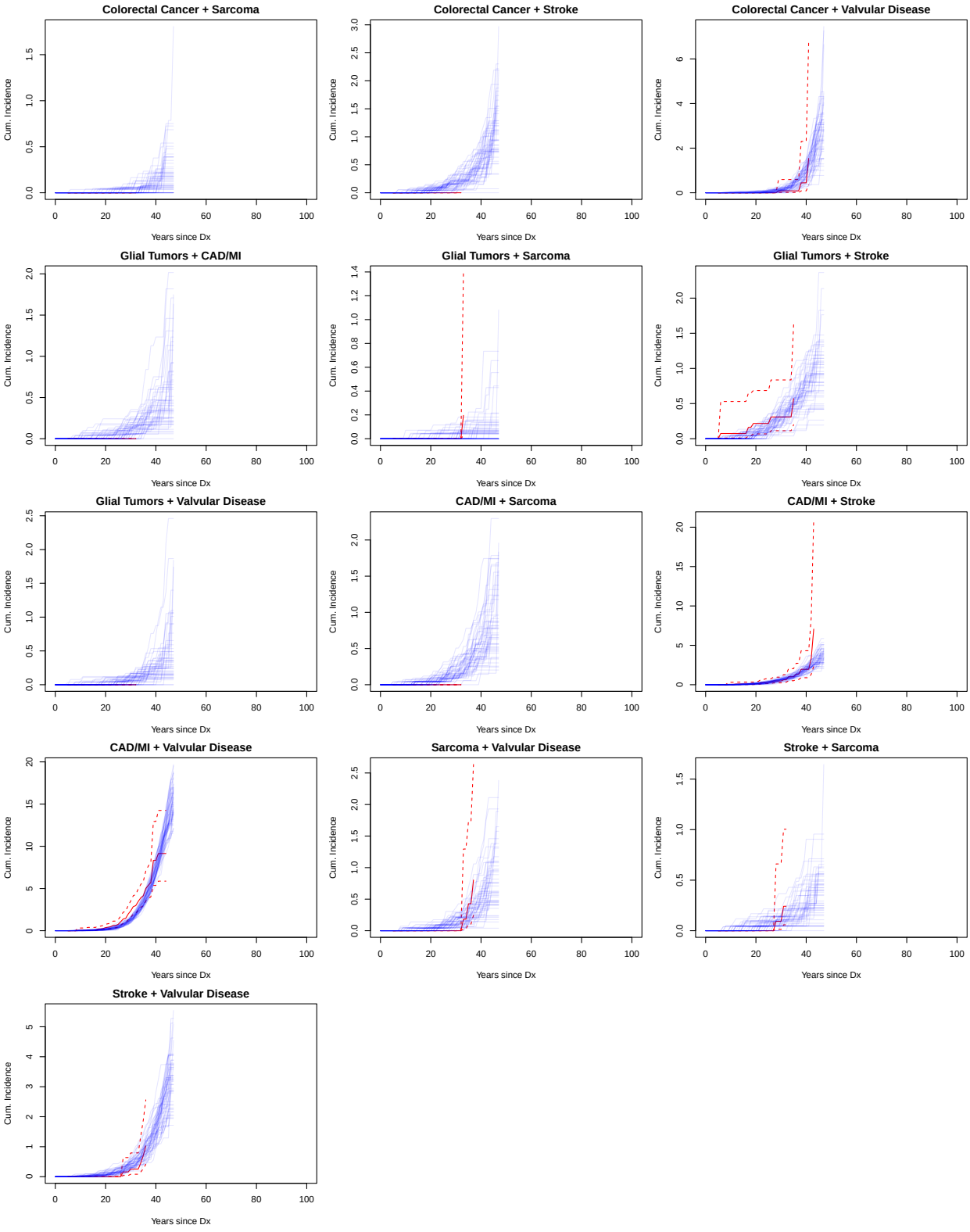
4.3.4.50 Chest20_29



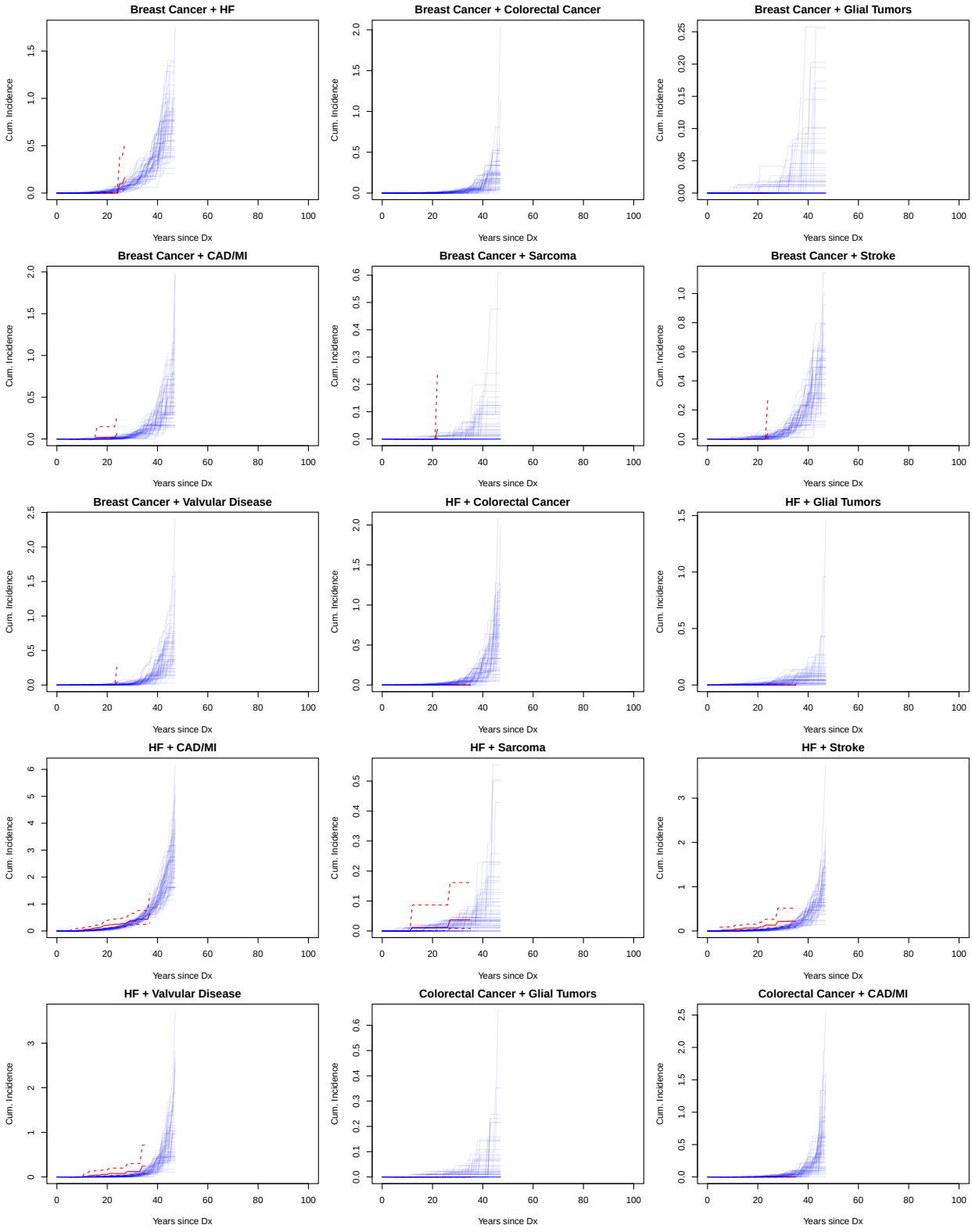

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

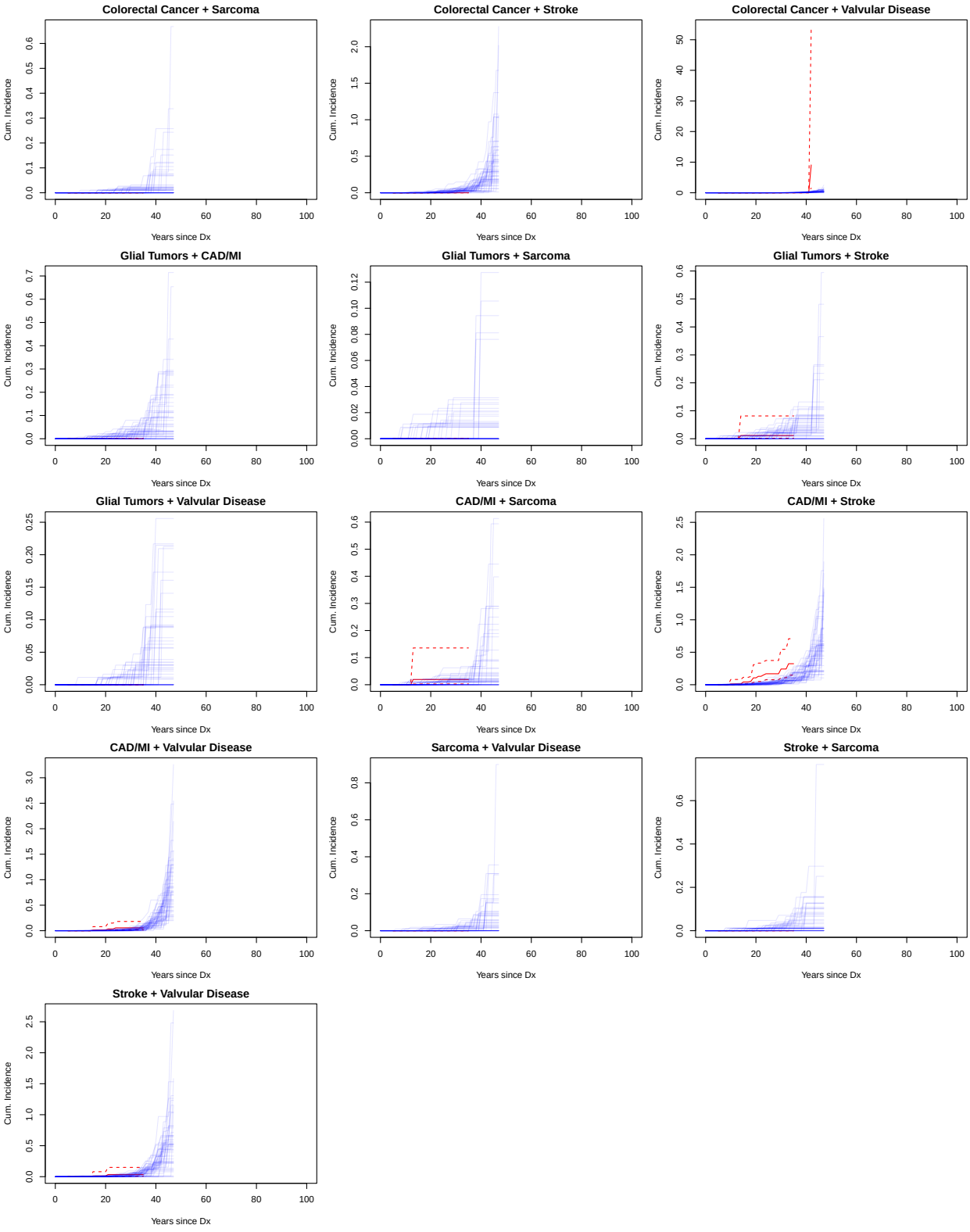
4.3.4.51 Chest30+



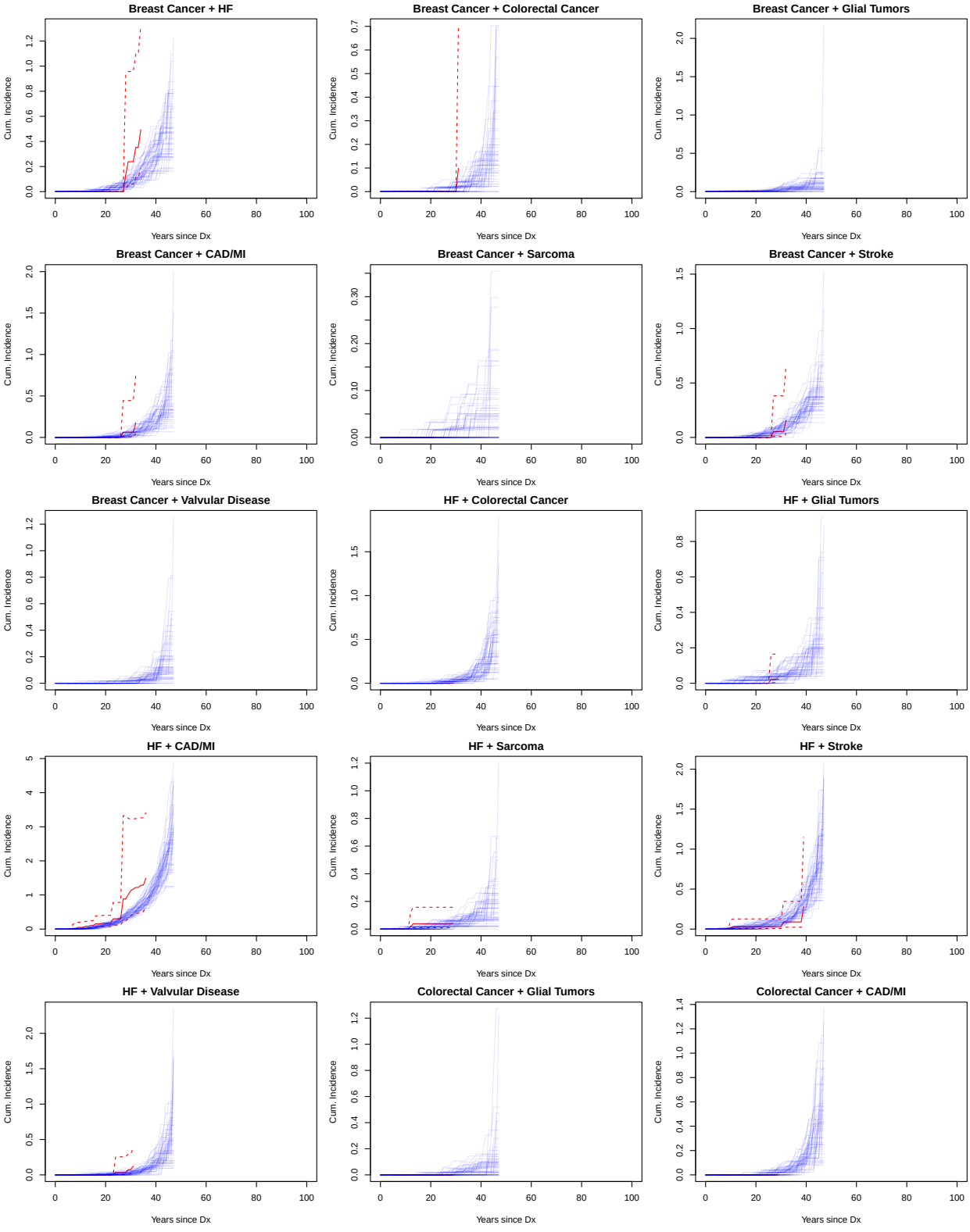

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

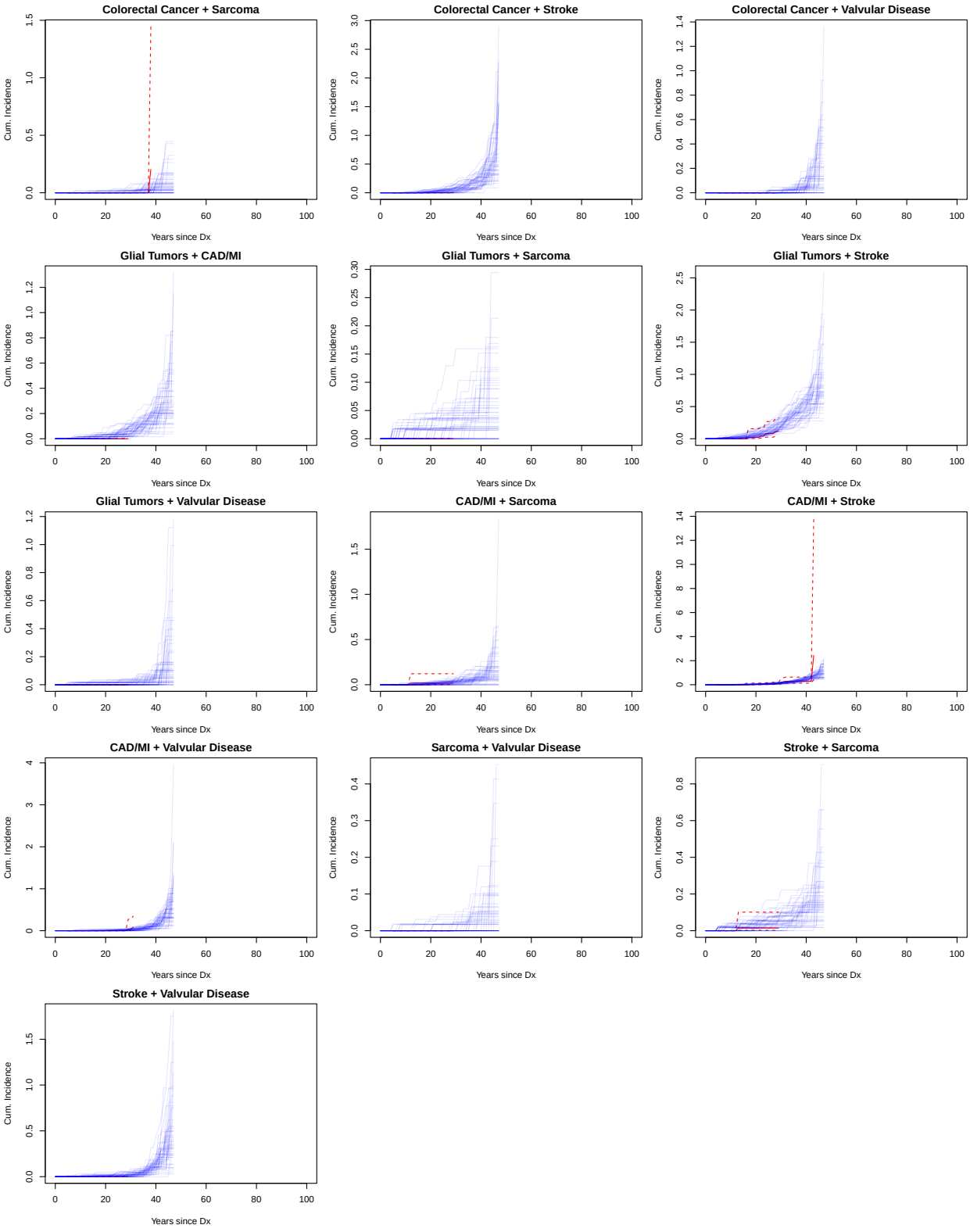
4.3.4.52 HeartNone



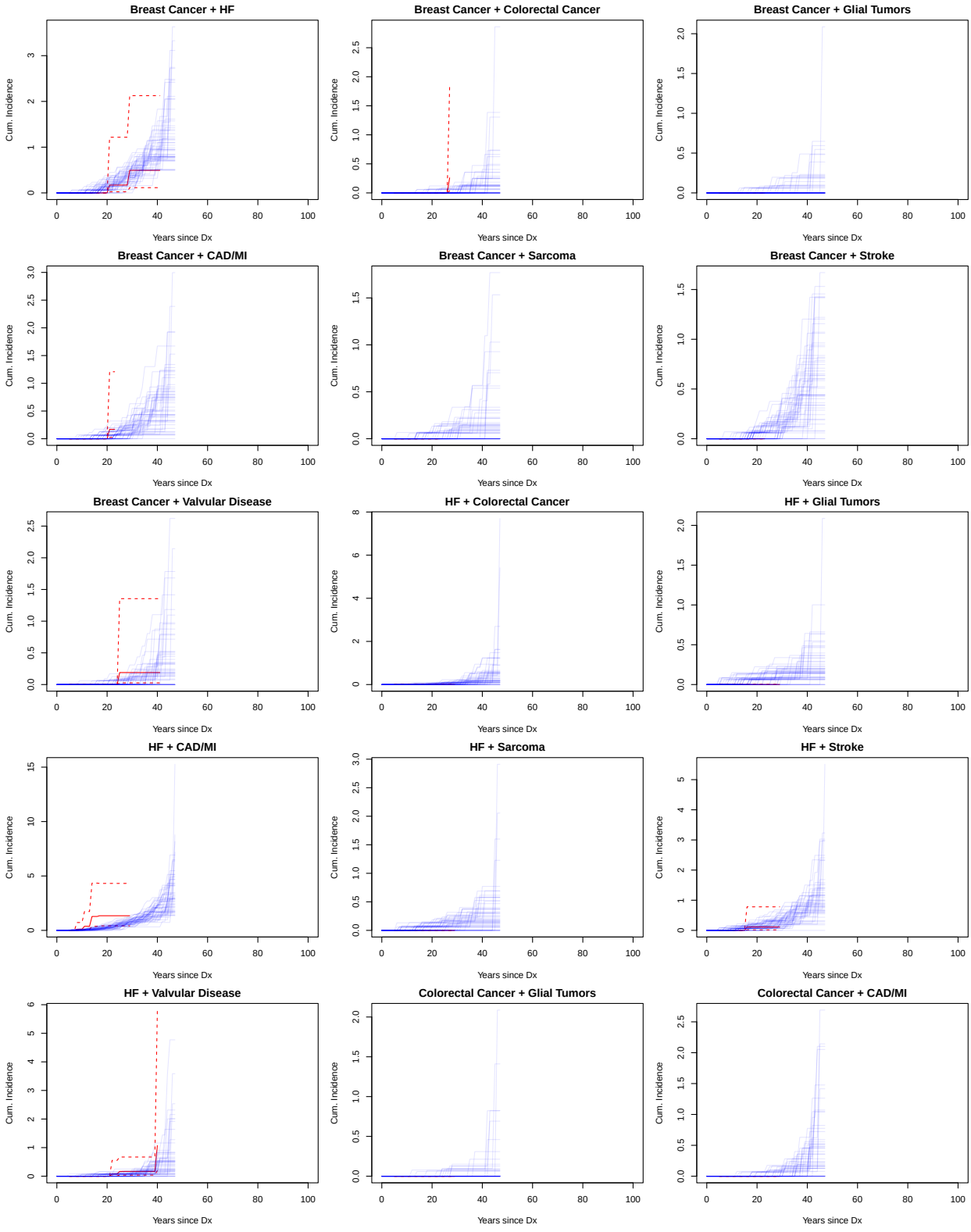

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

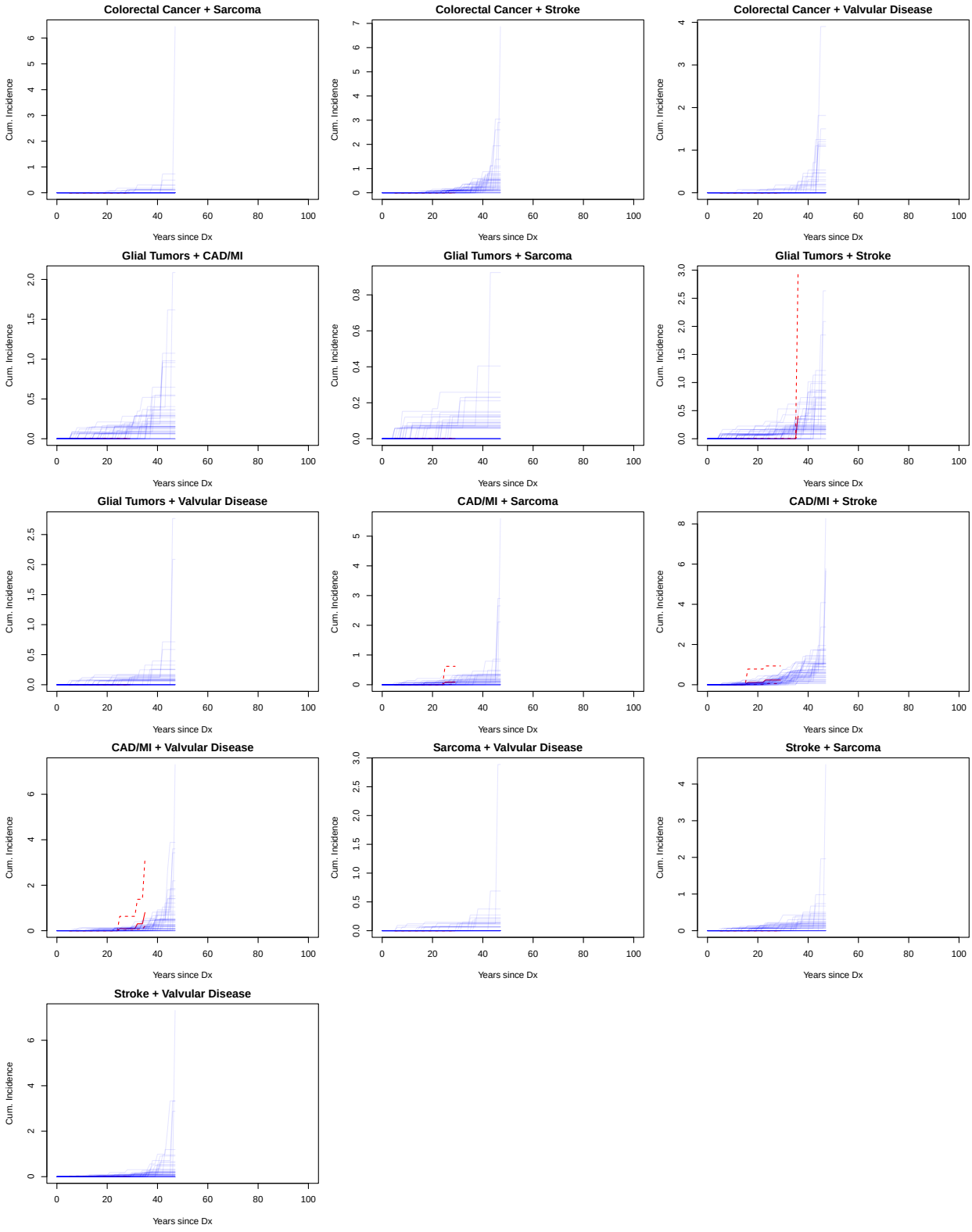
4.3.4.53 Heart<5



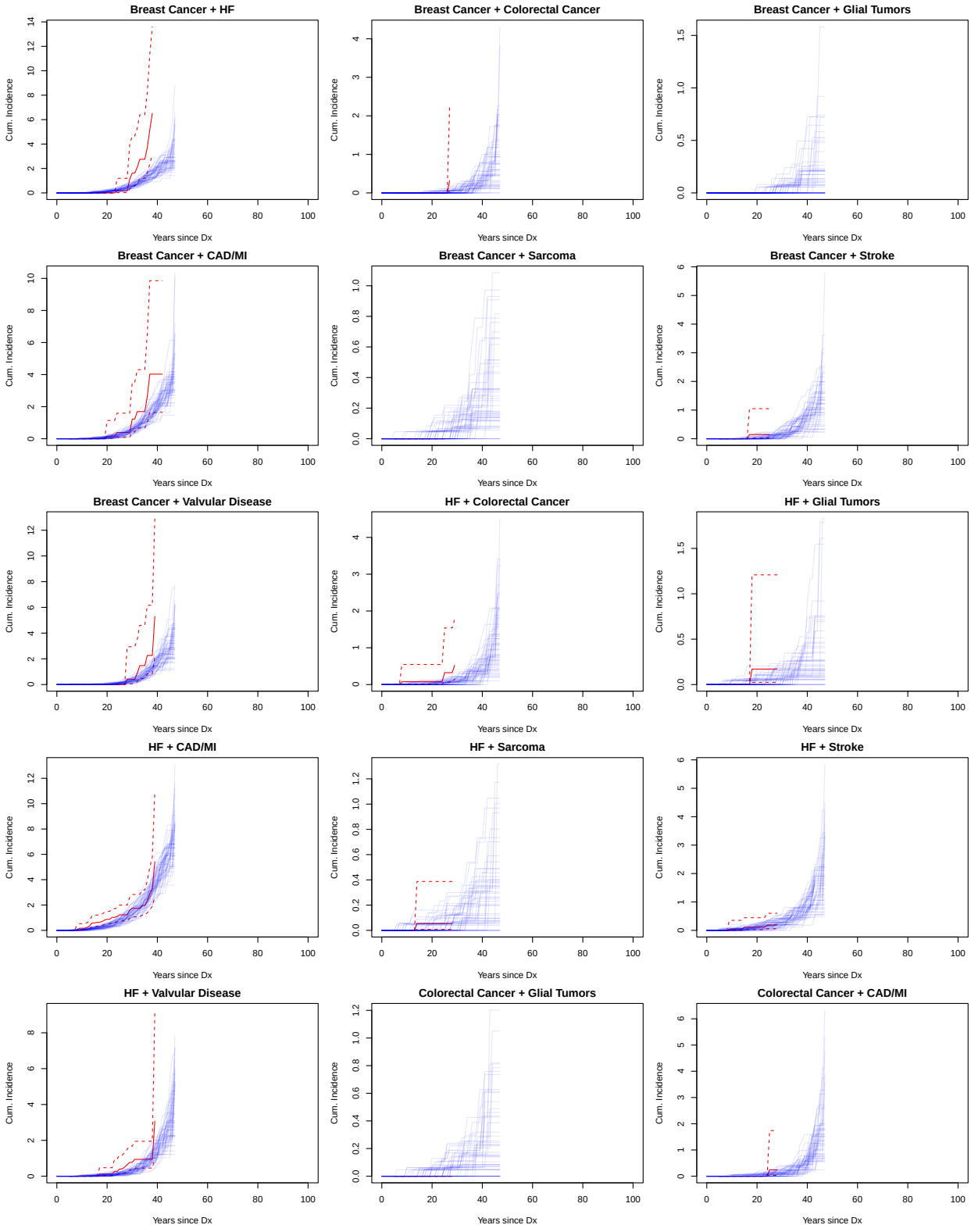

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

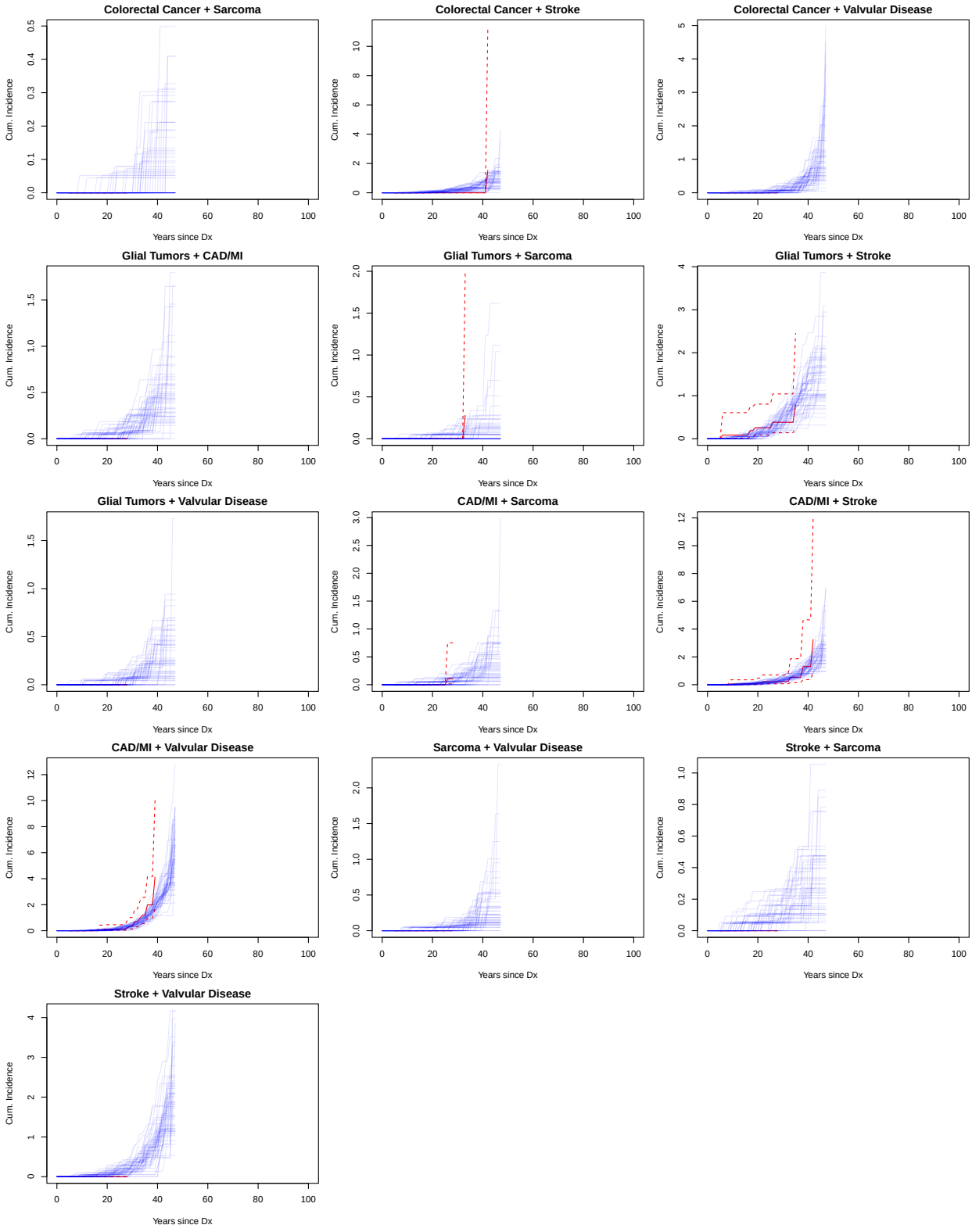
4.3.4.54 Heart5_14



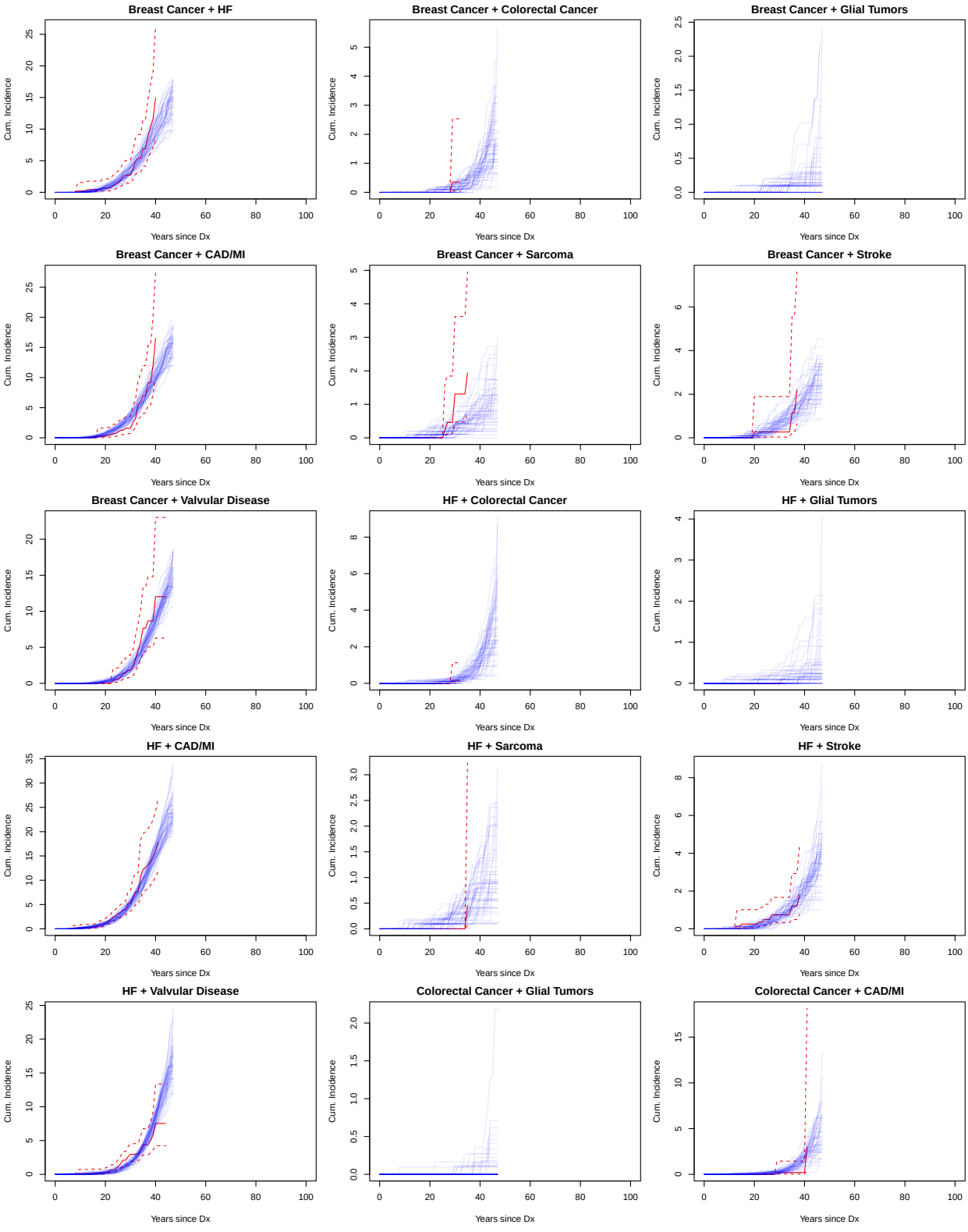

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

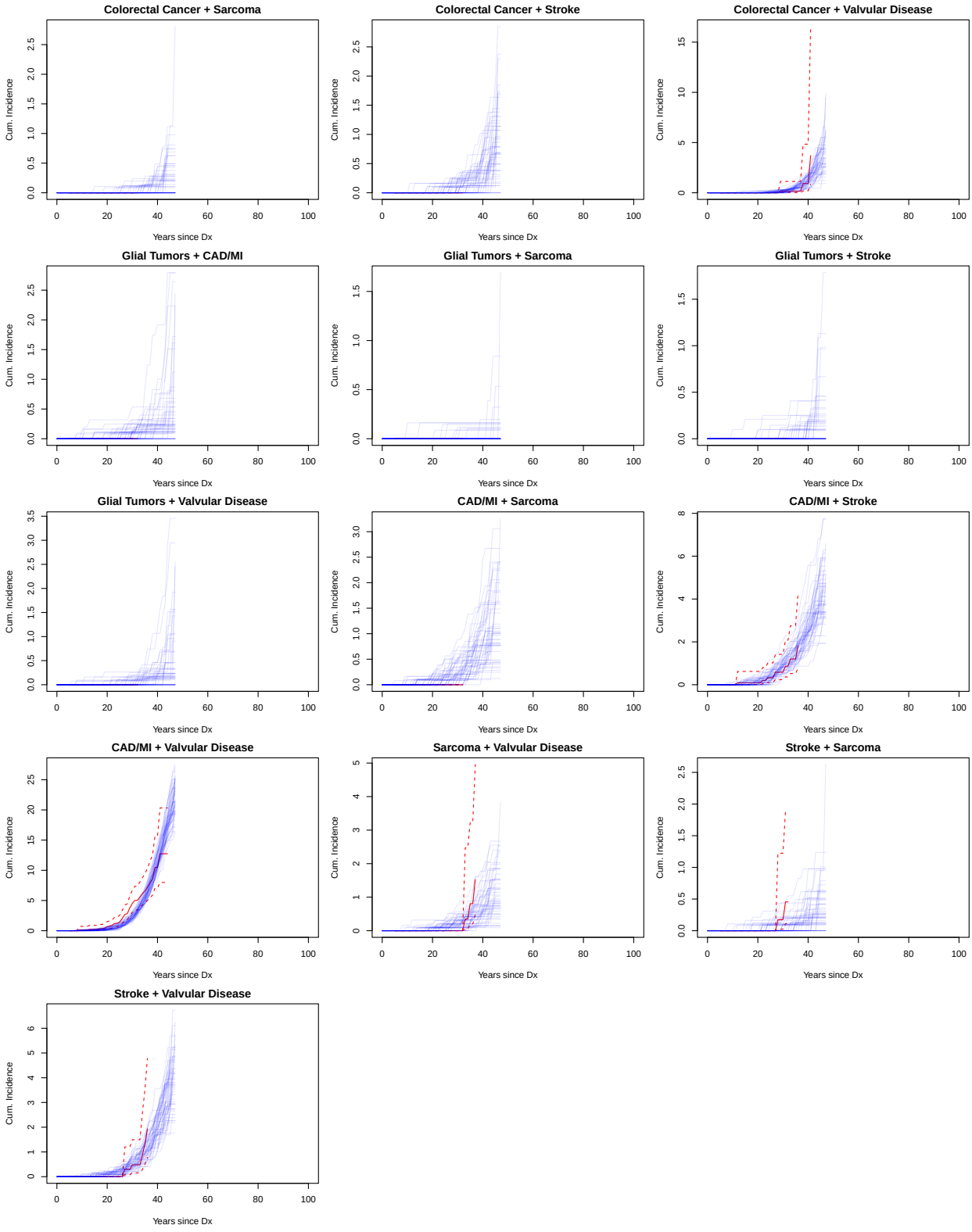
4.3.4.55 Heart15_34



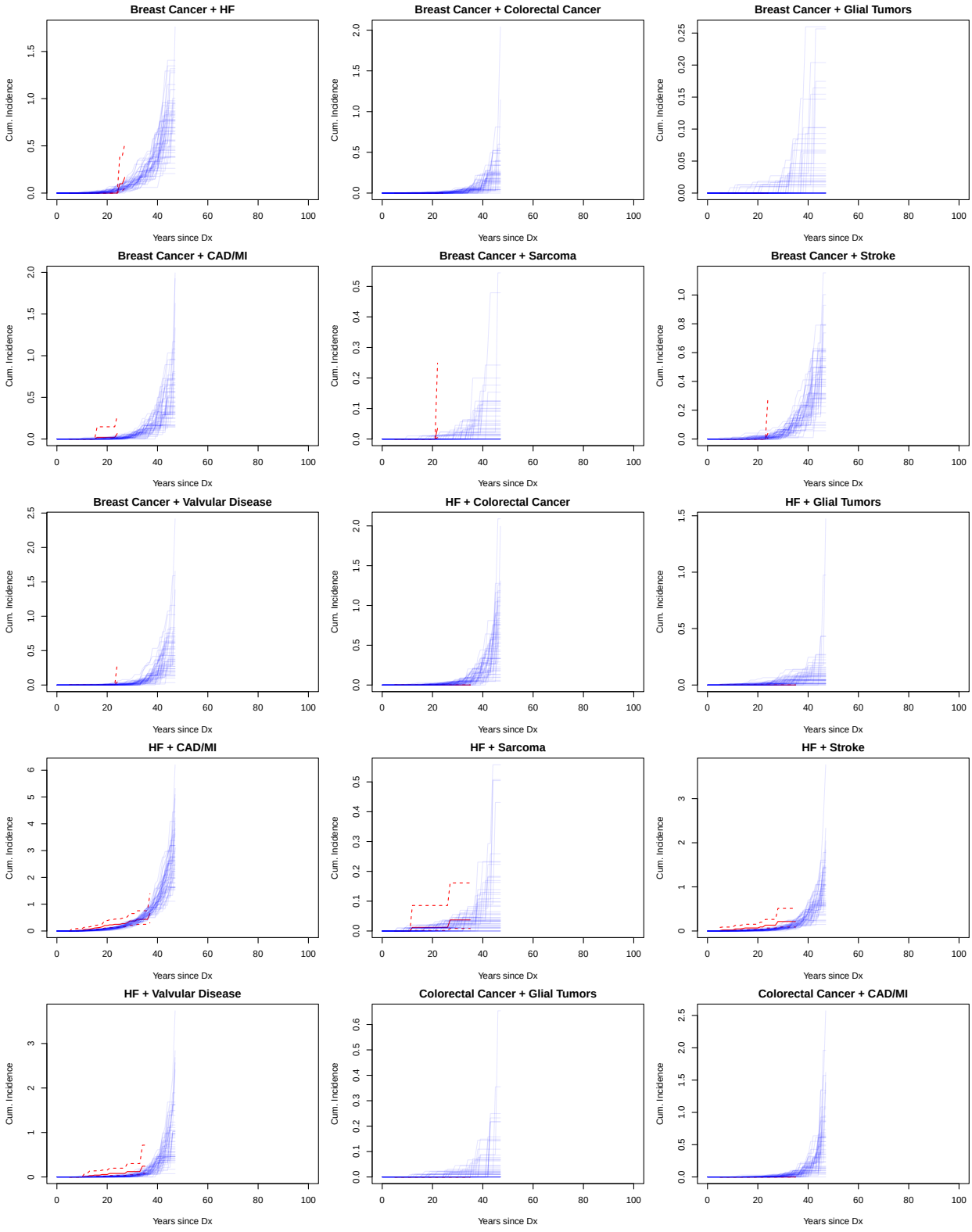

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

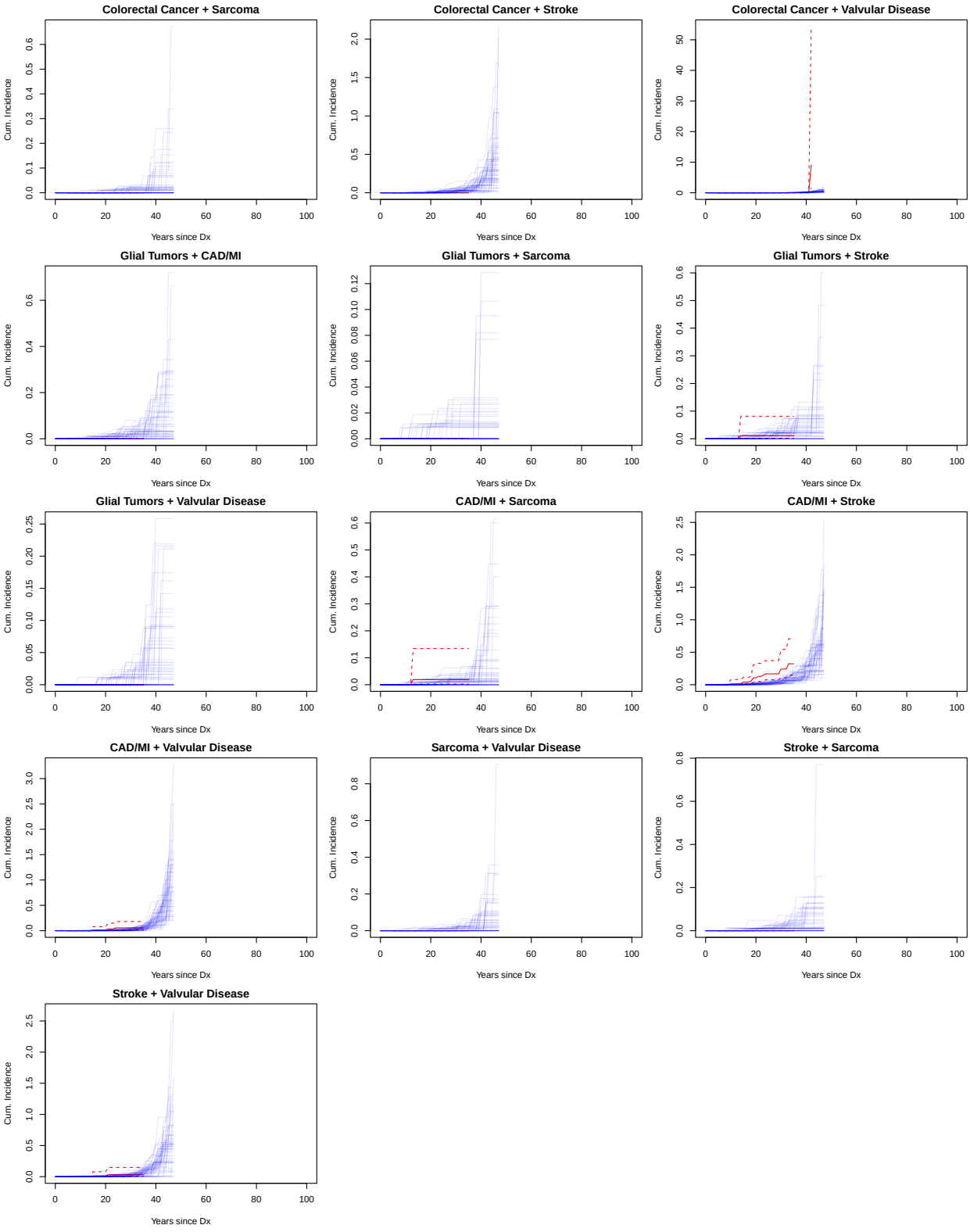
4.3.4.56 Heart35+



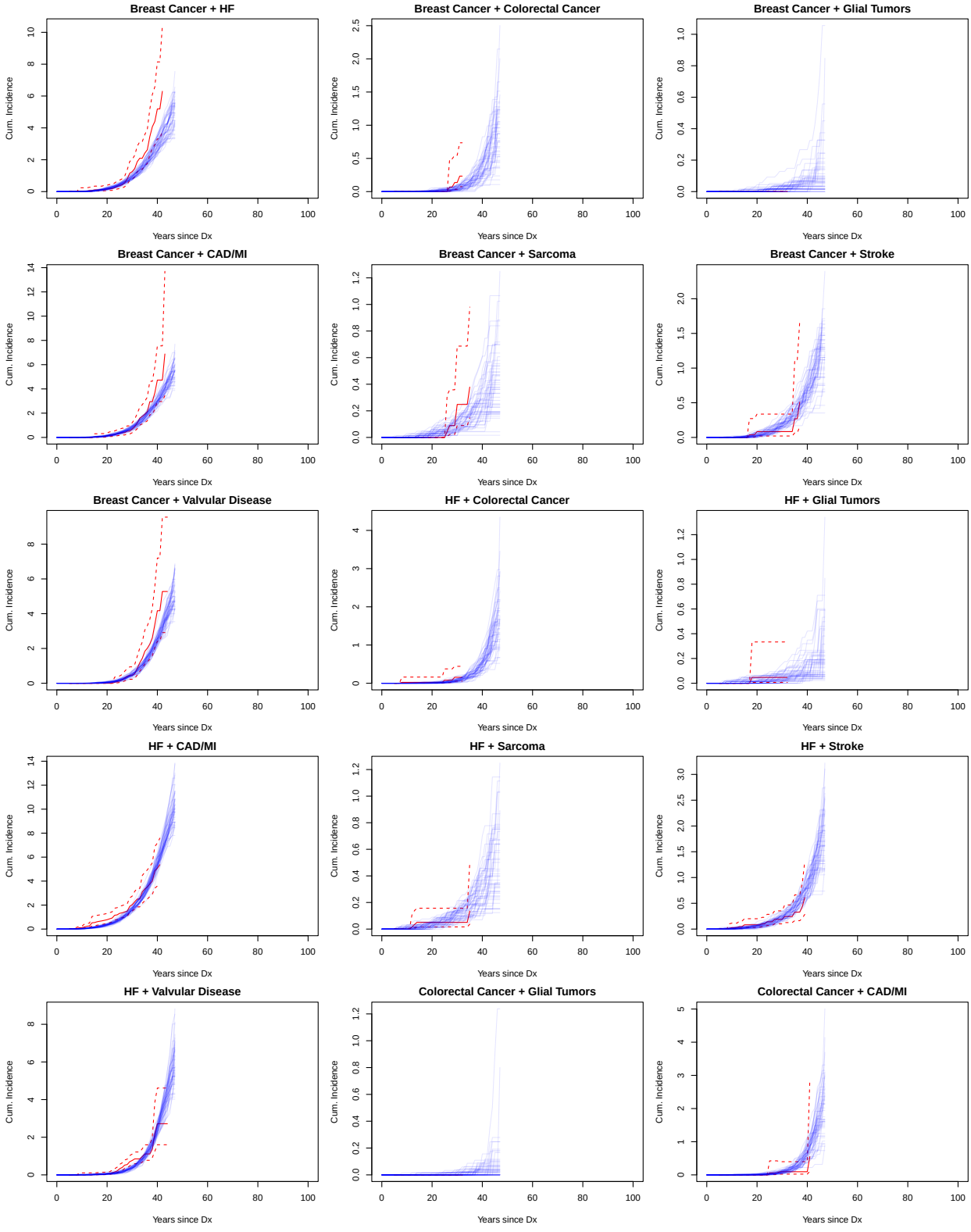

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

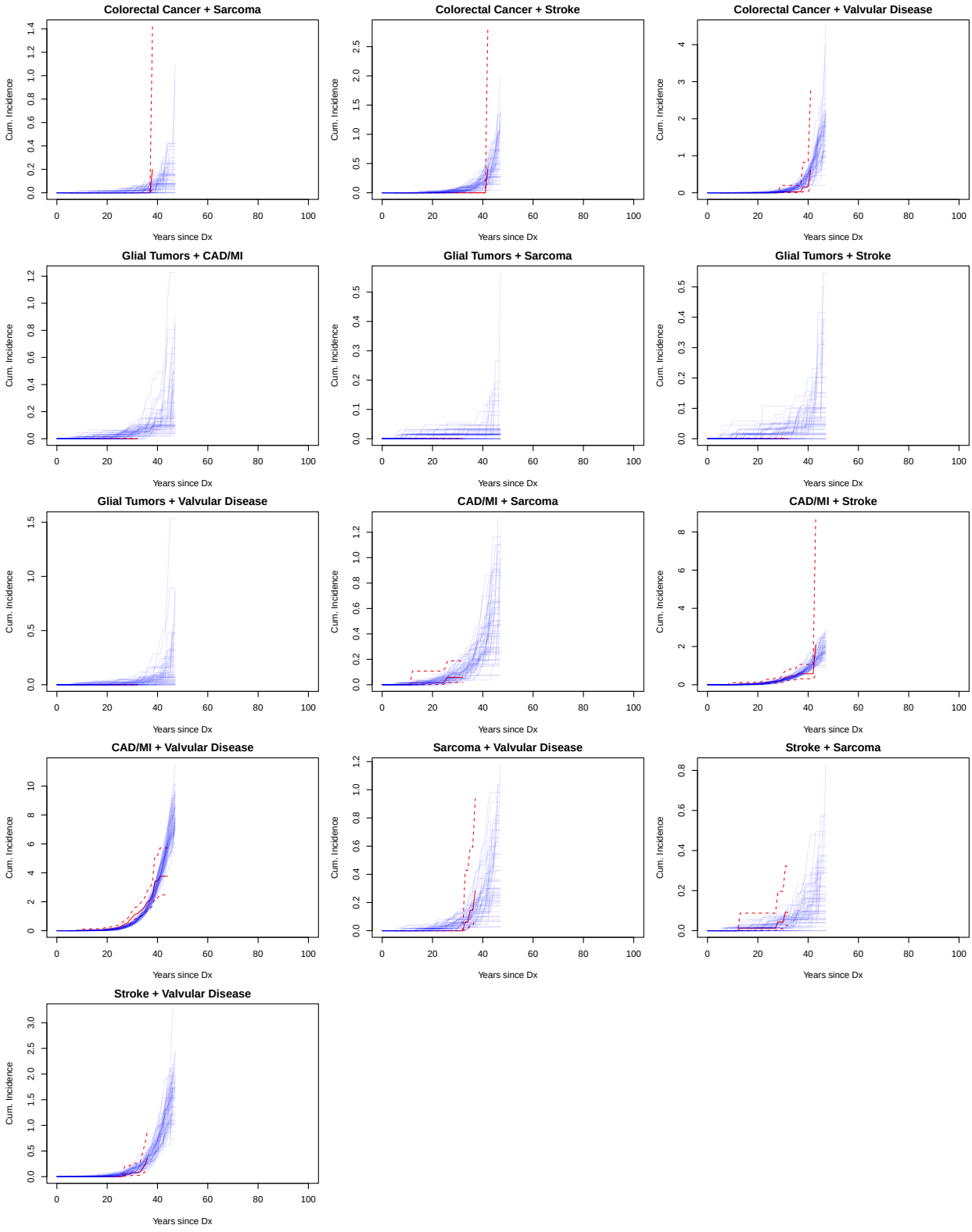
4.3.4.57 CRTNone



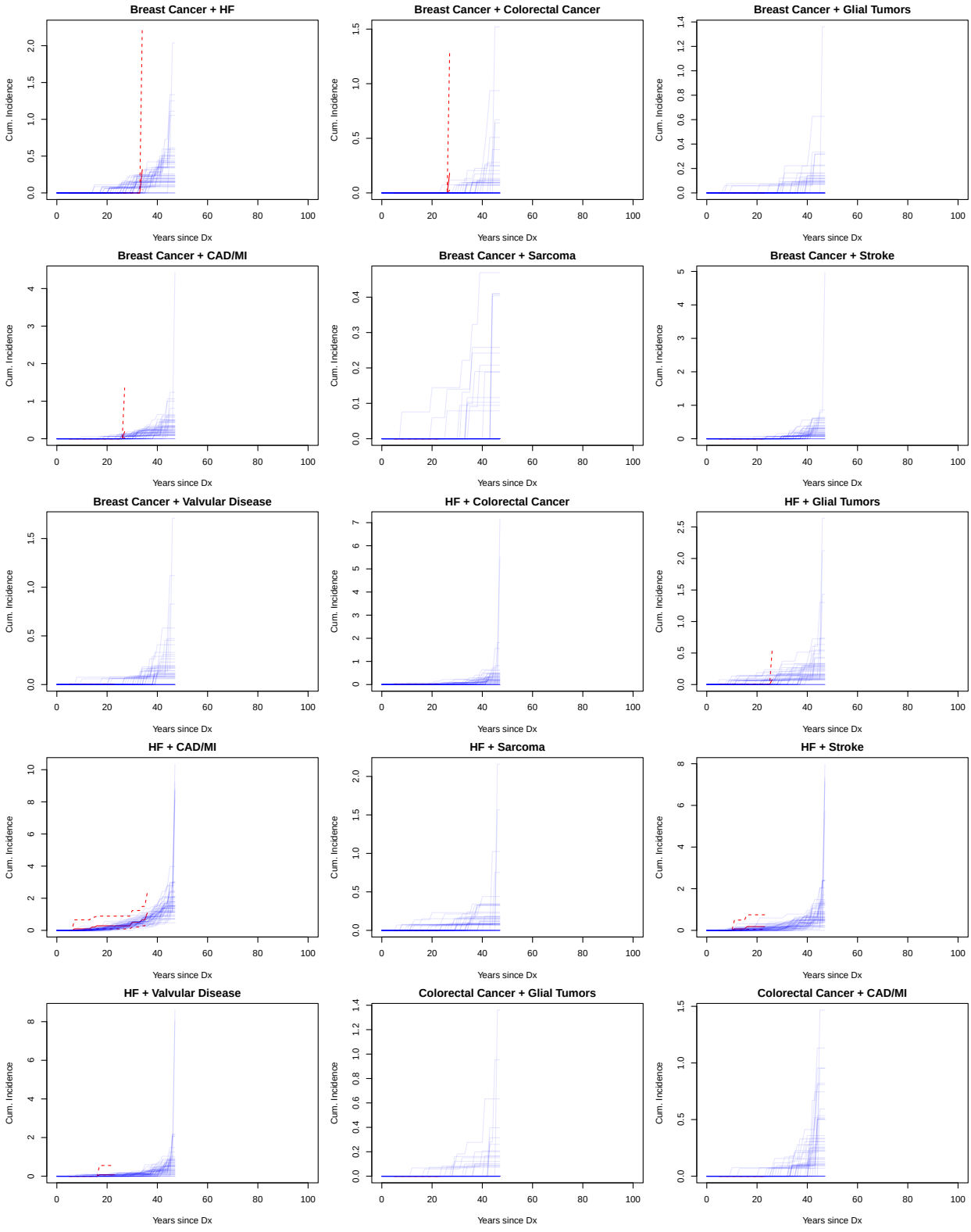

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

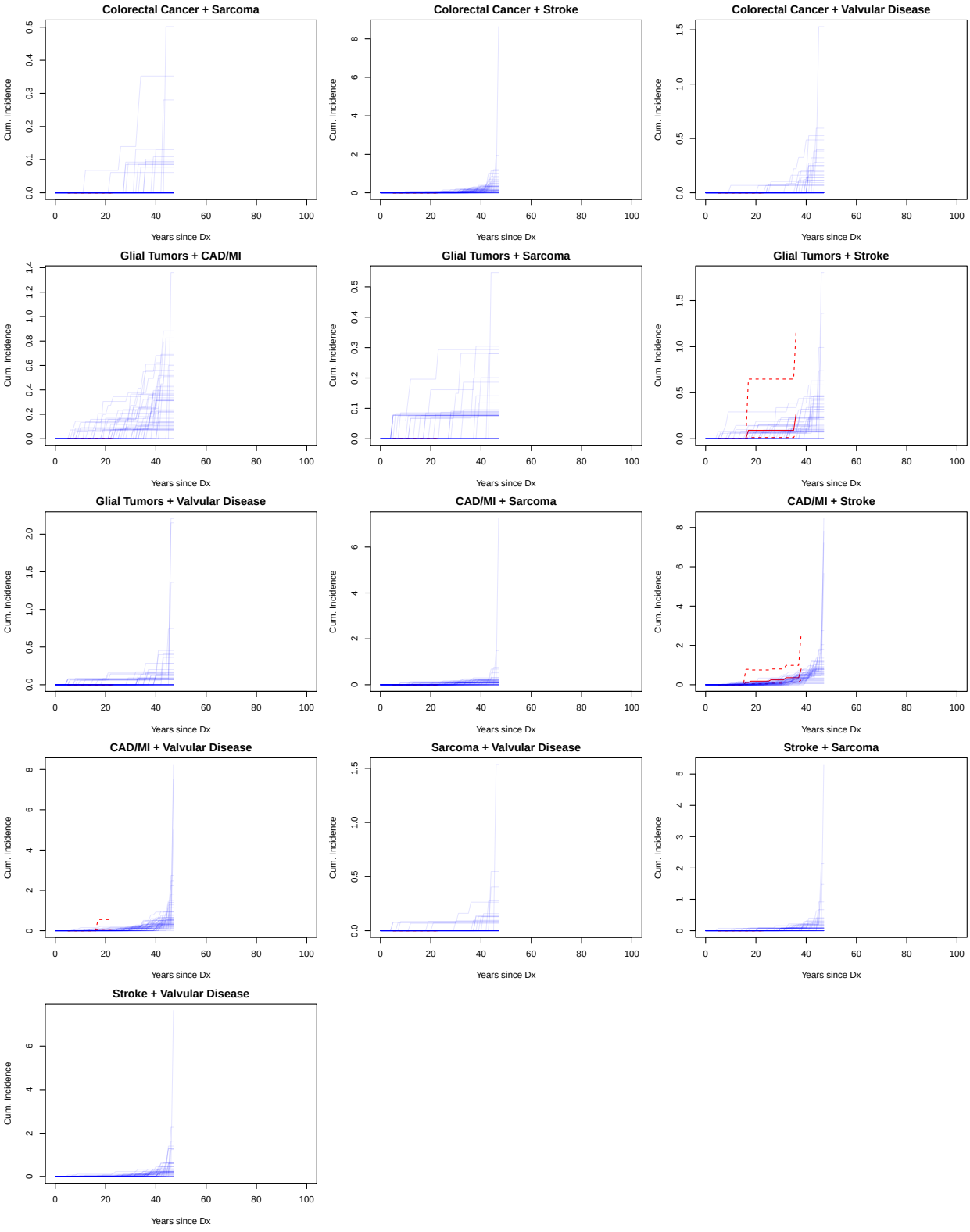
4.3.4.58 CRT<20


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

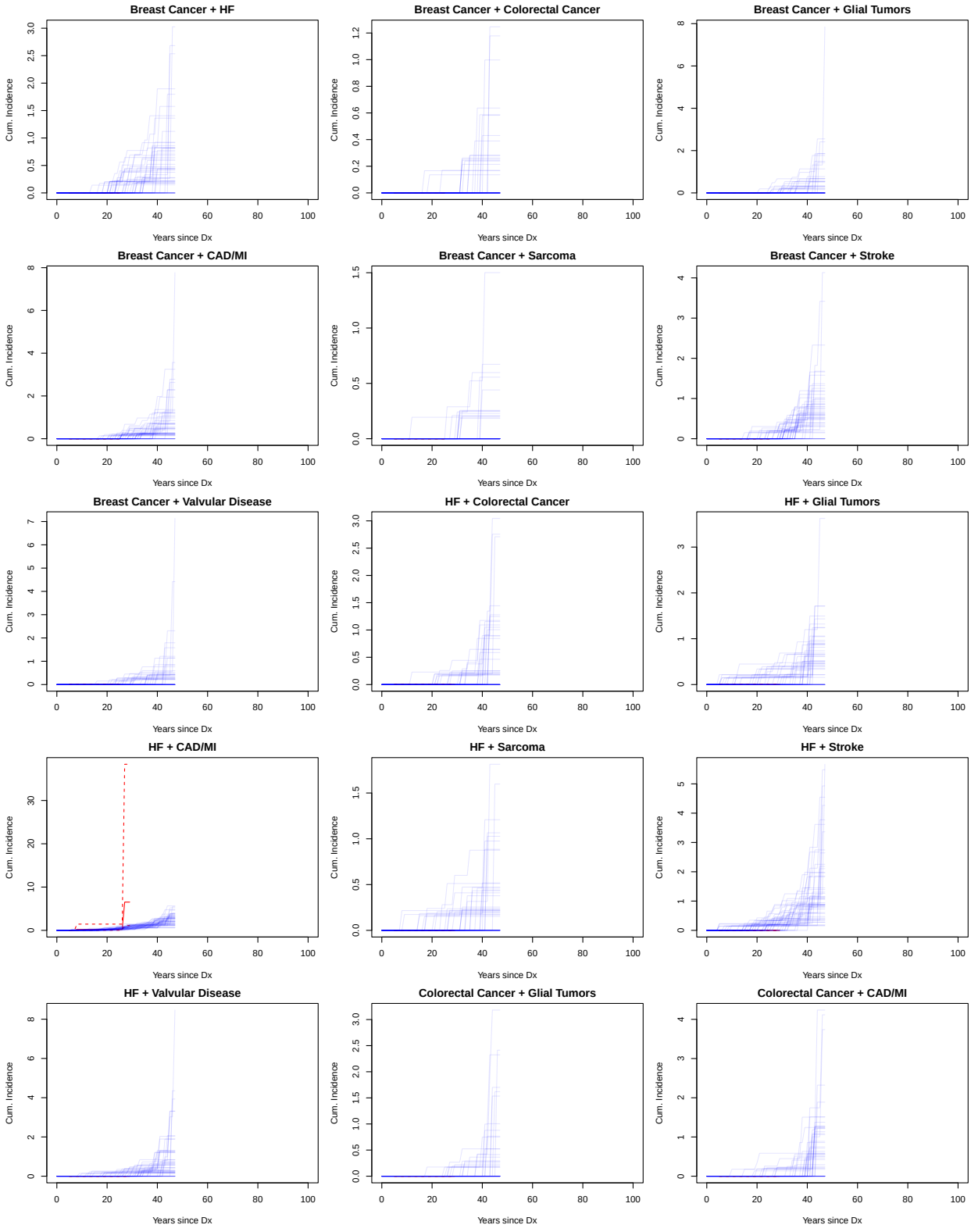

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

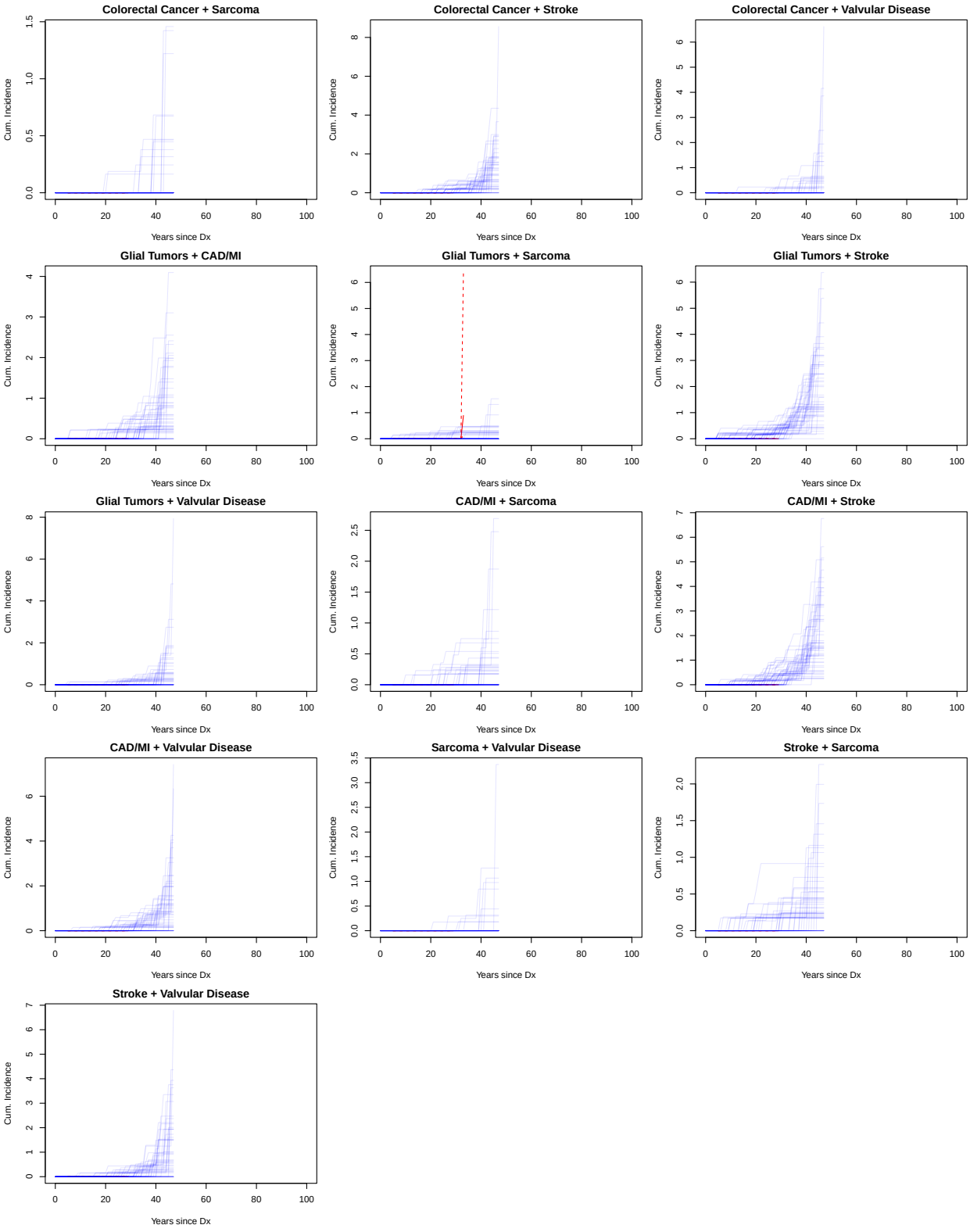
4.3.4.59 CRT20_29



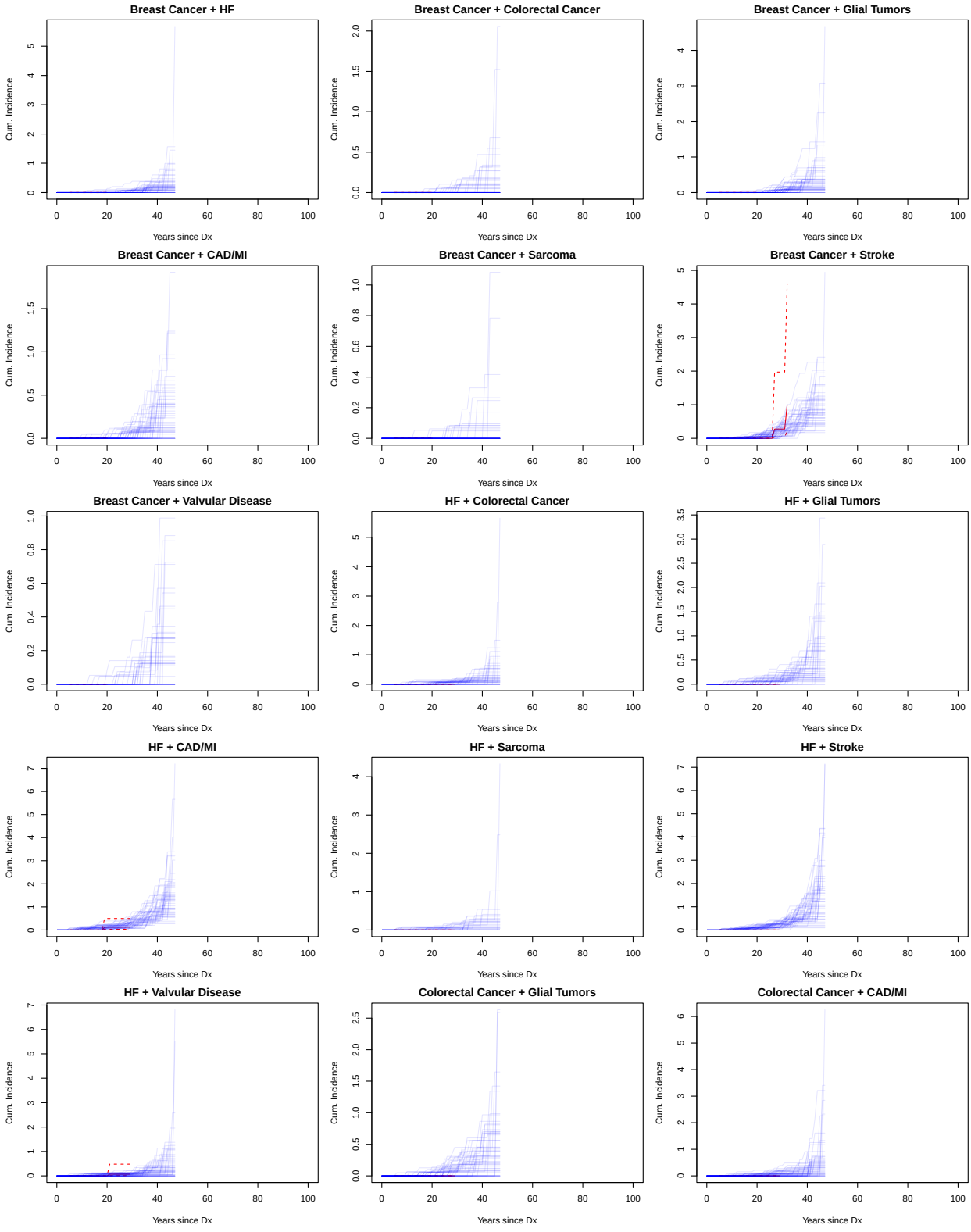

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

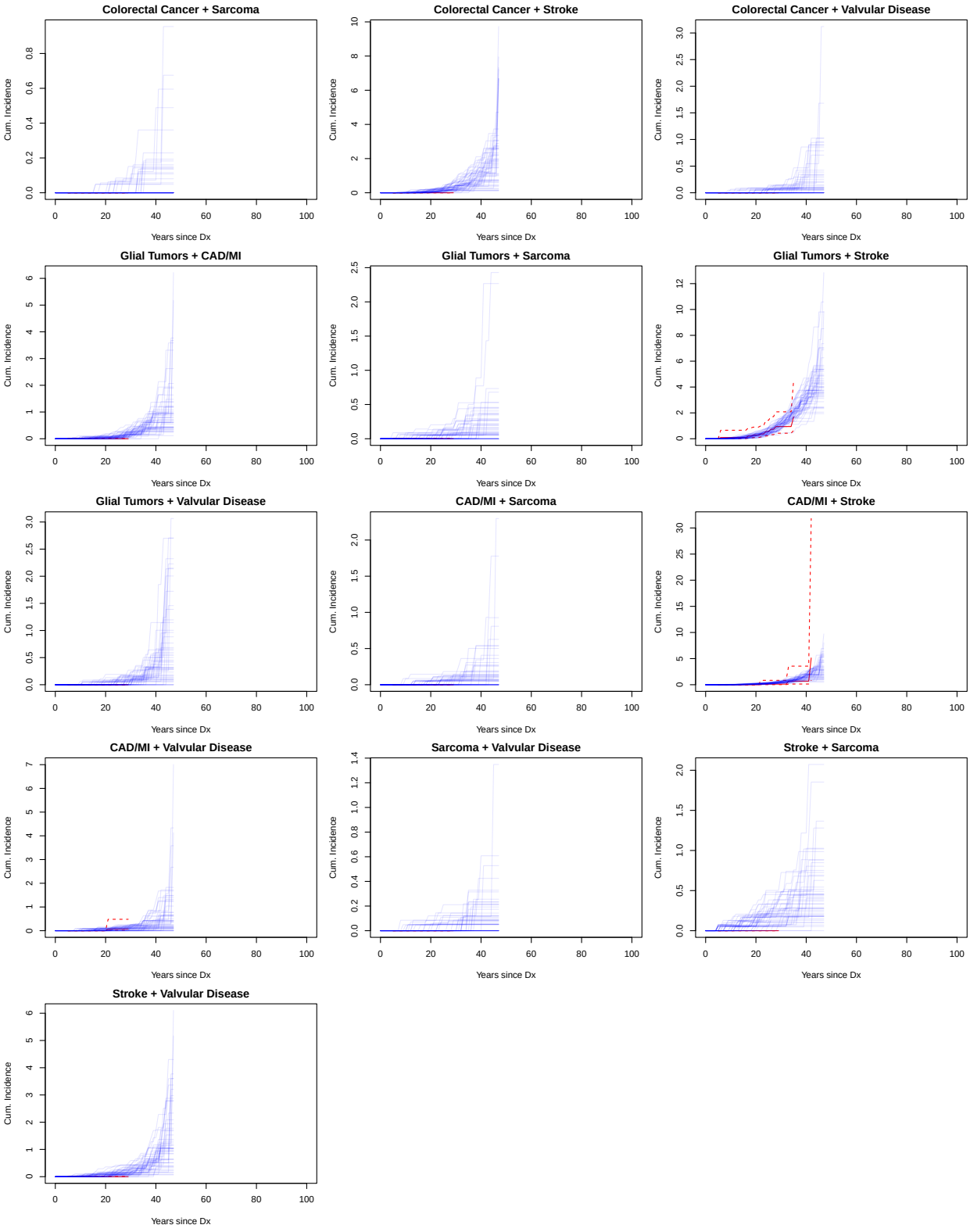
4.3.4.60 CRT30_49



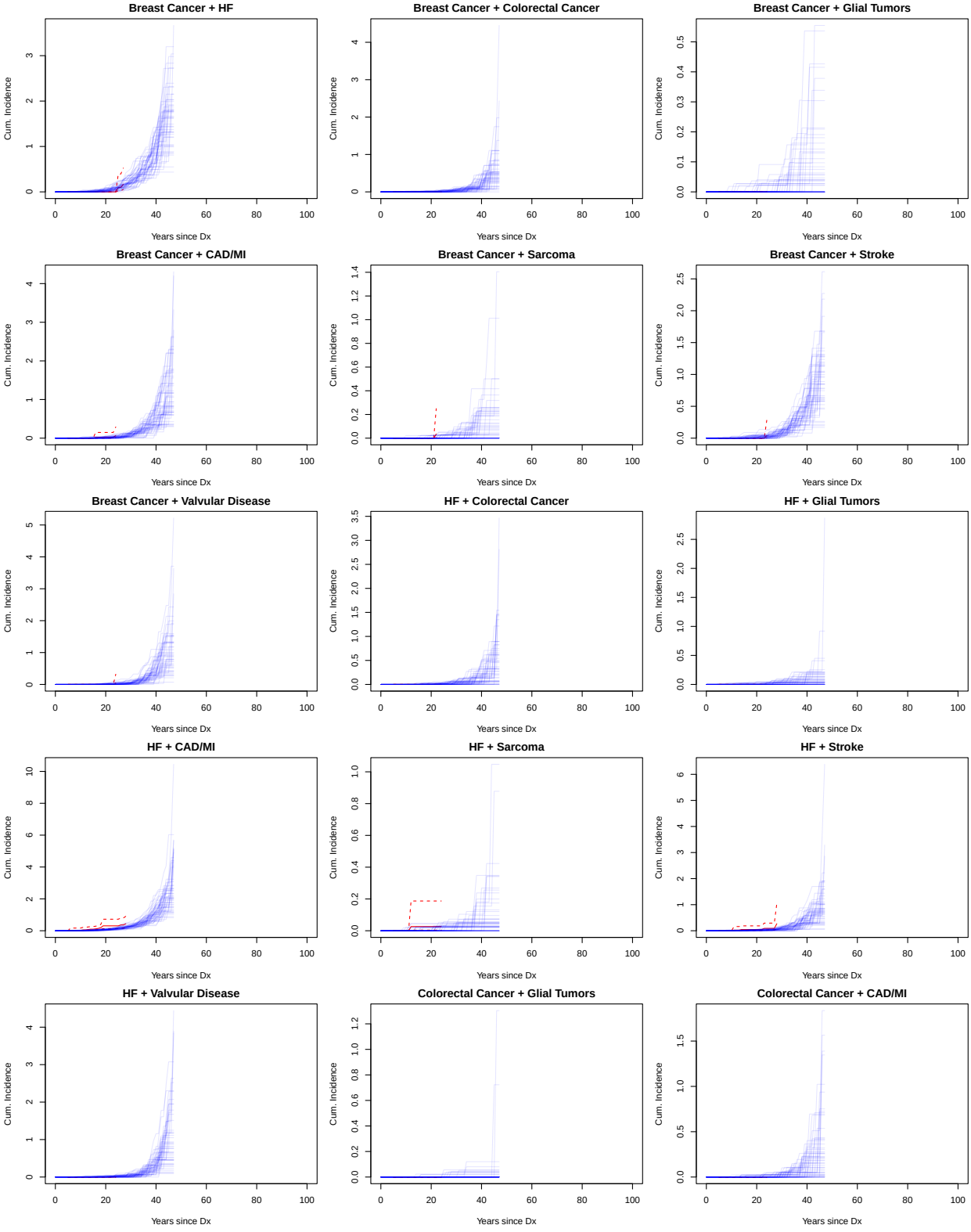

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

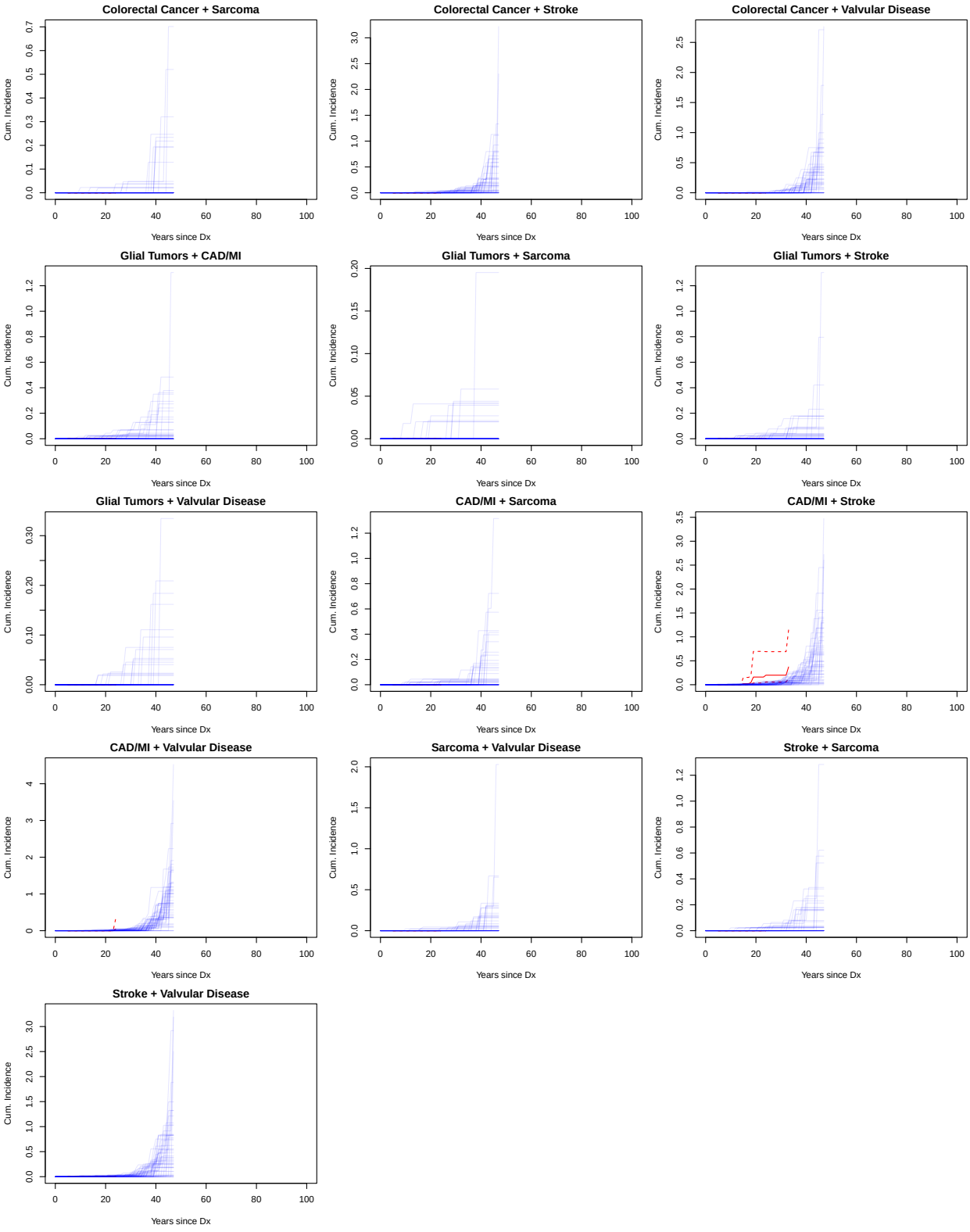
4.3.4.61 CRT50+


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

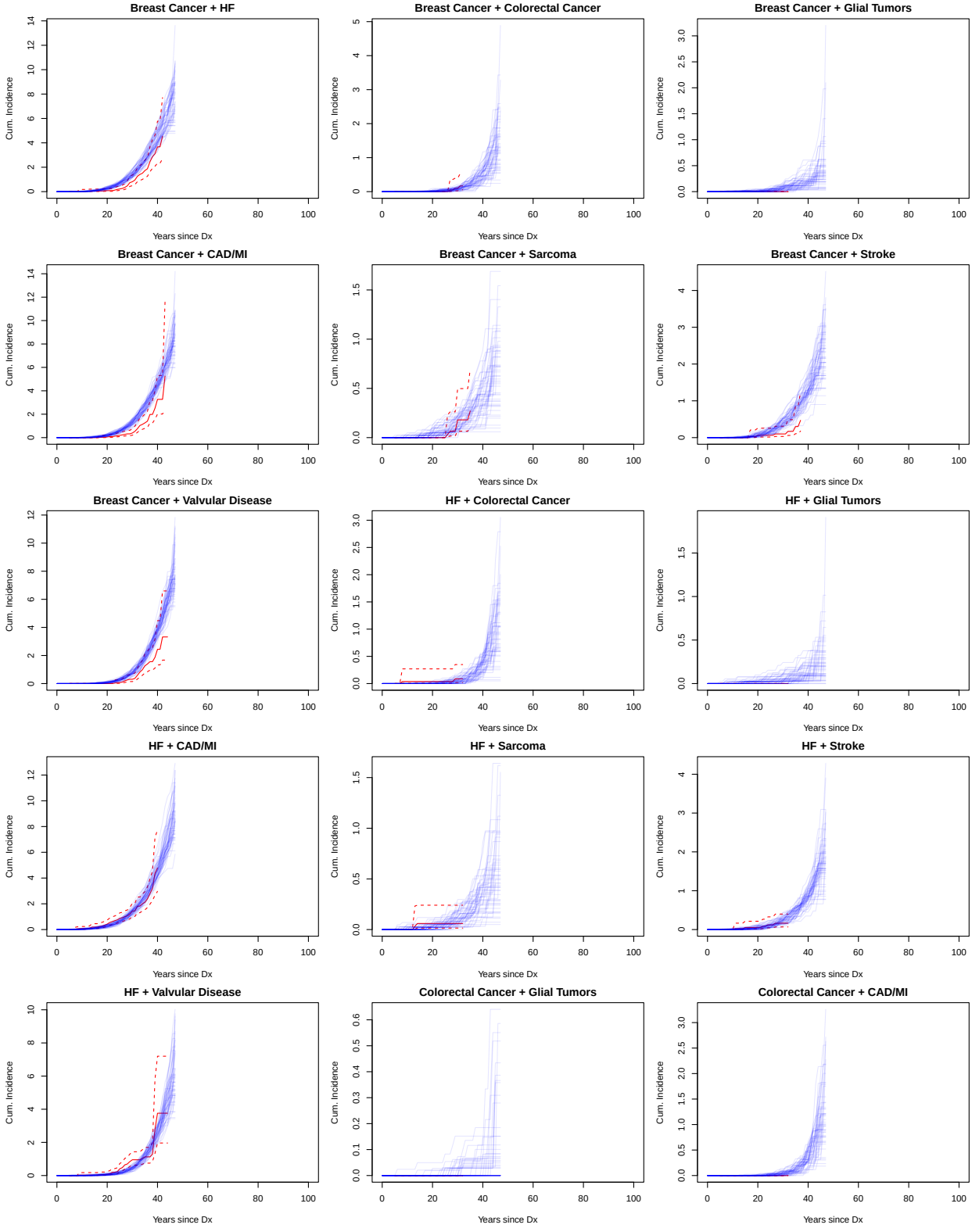

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

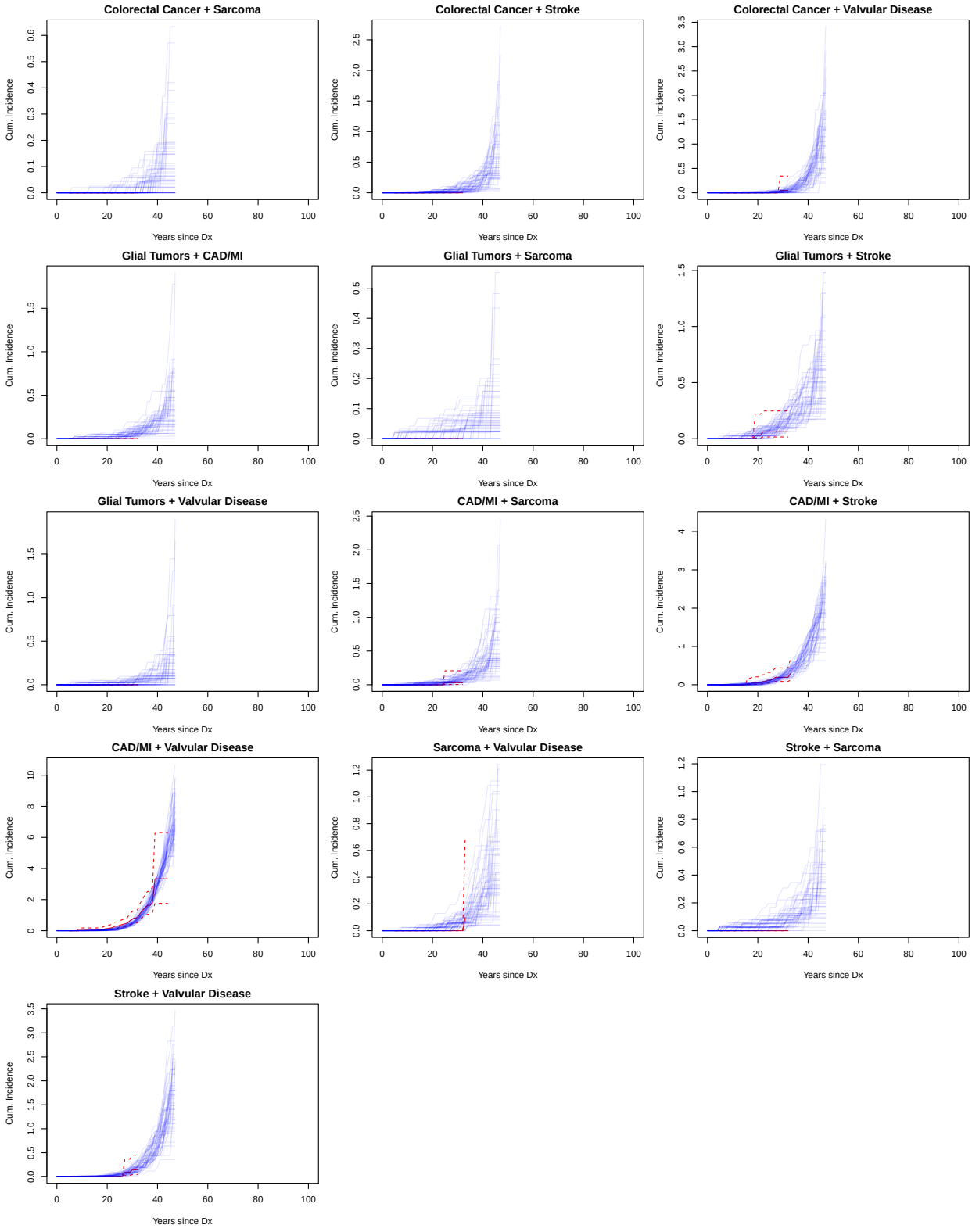
4.3.4.62 OvaryNone



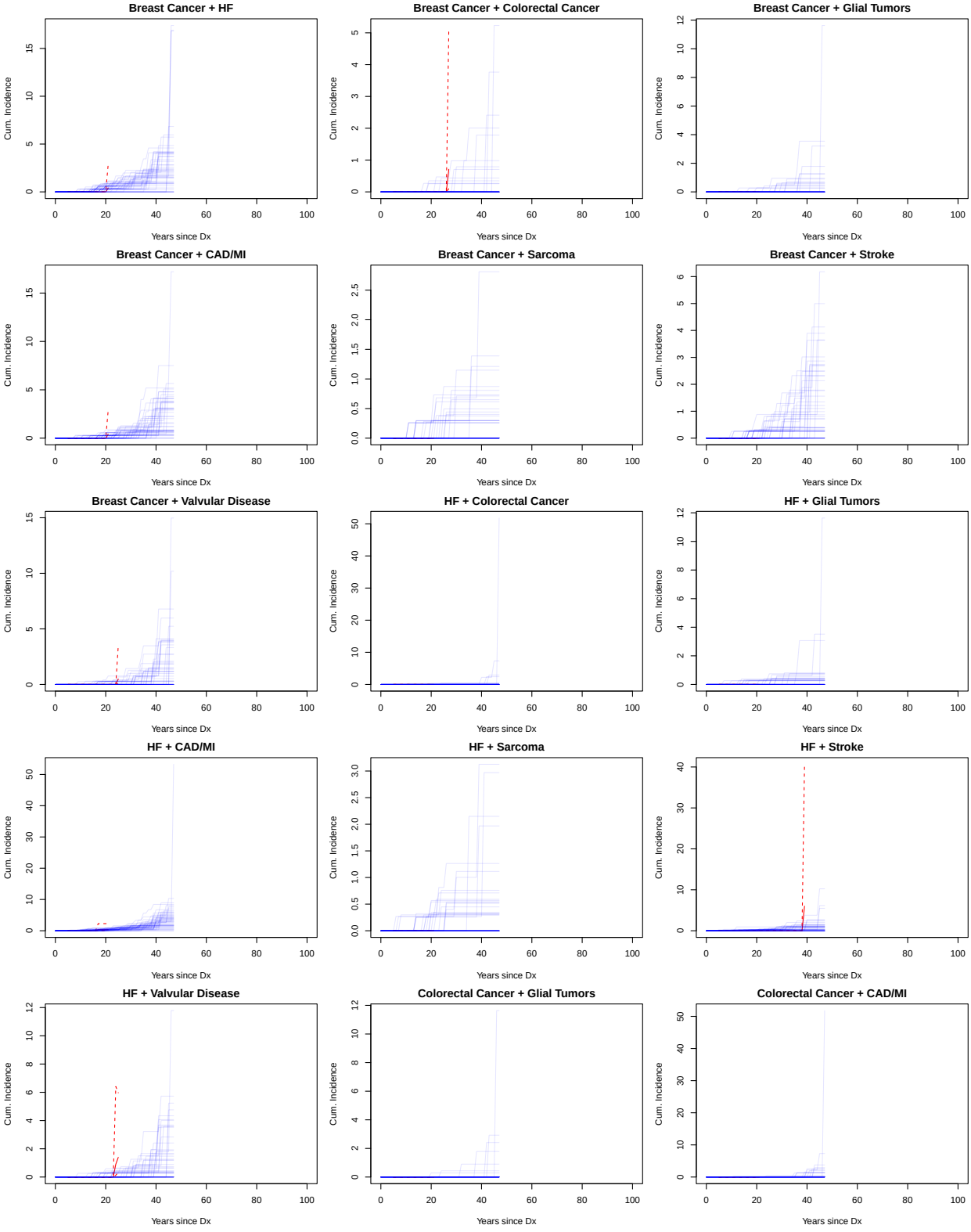

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

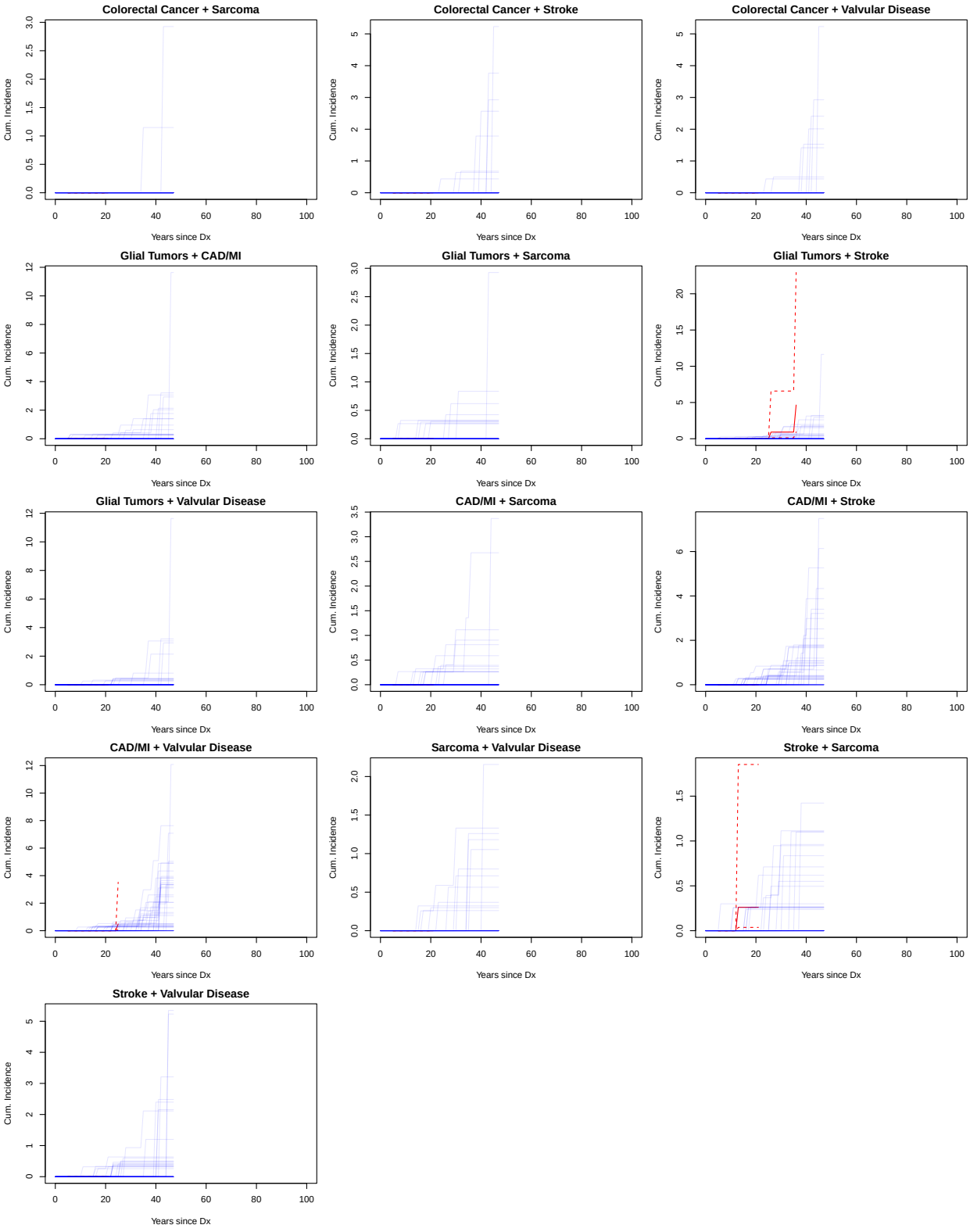
4.3.4.63 Ovary<10




Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

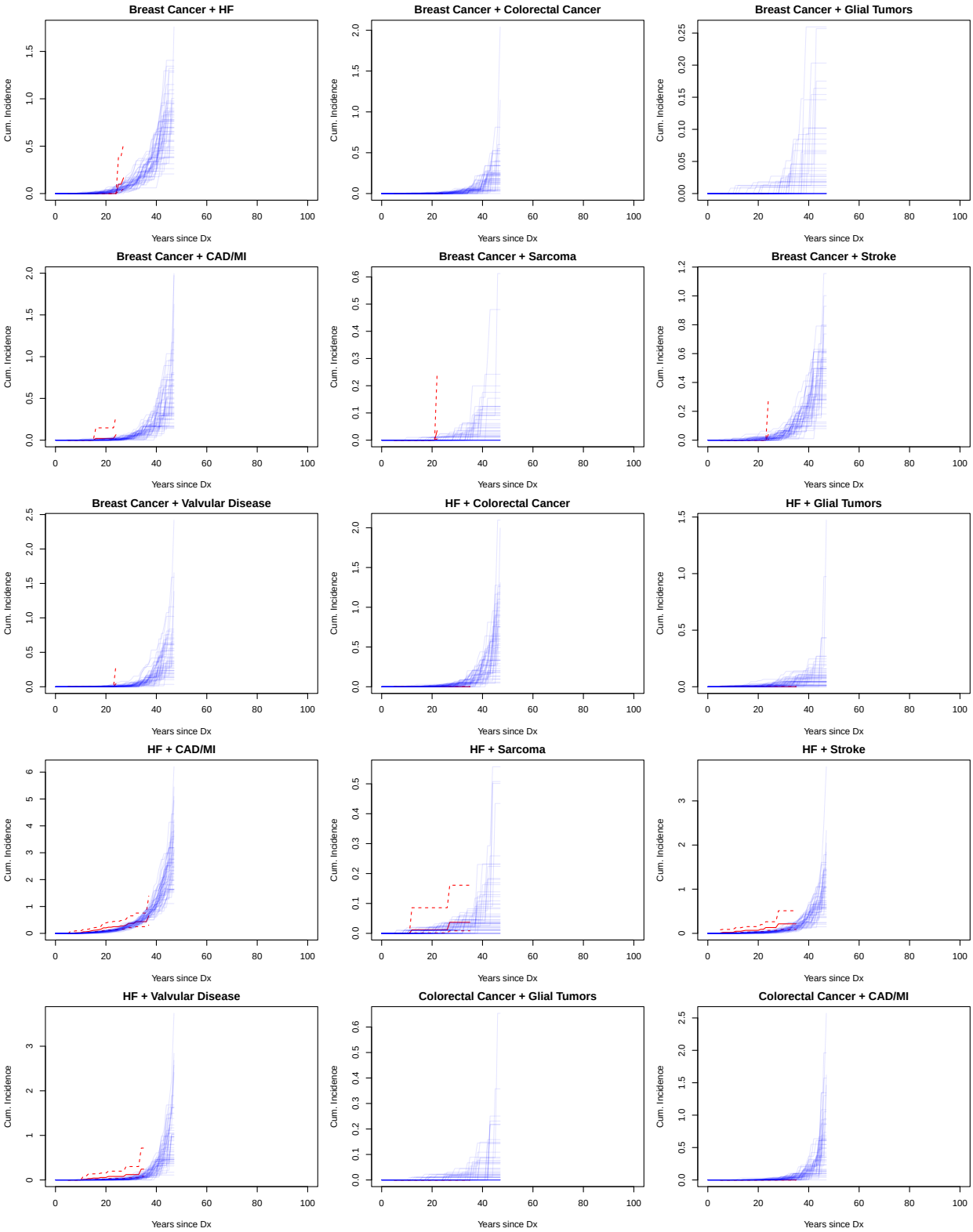
4.3.4.64 Ovary10-19

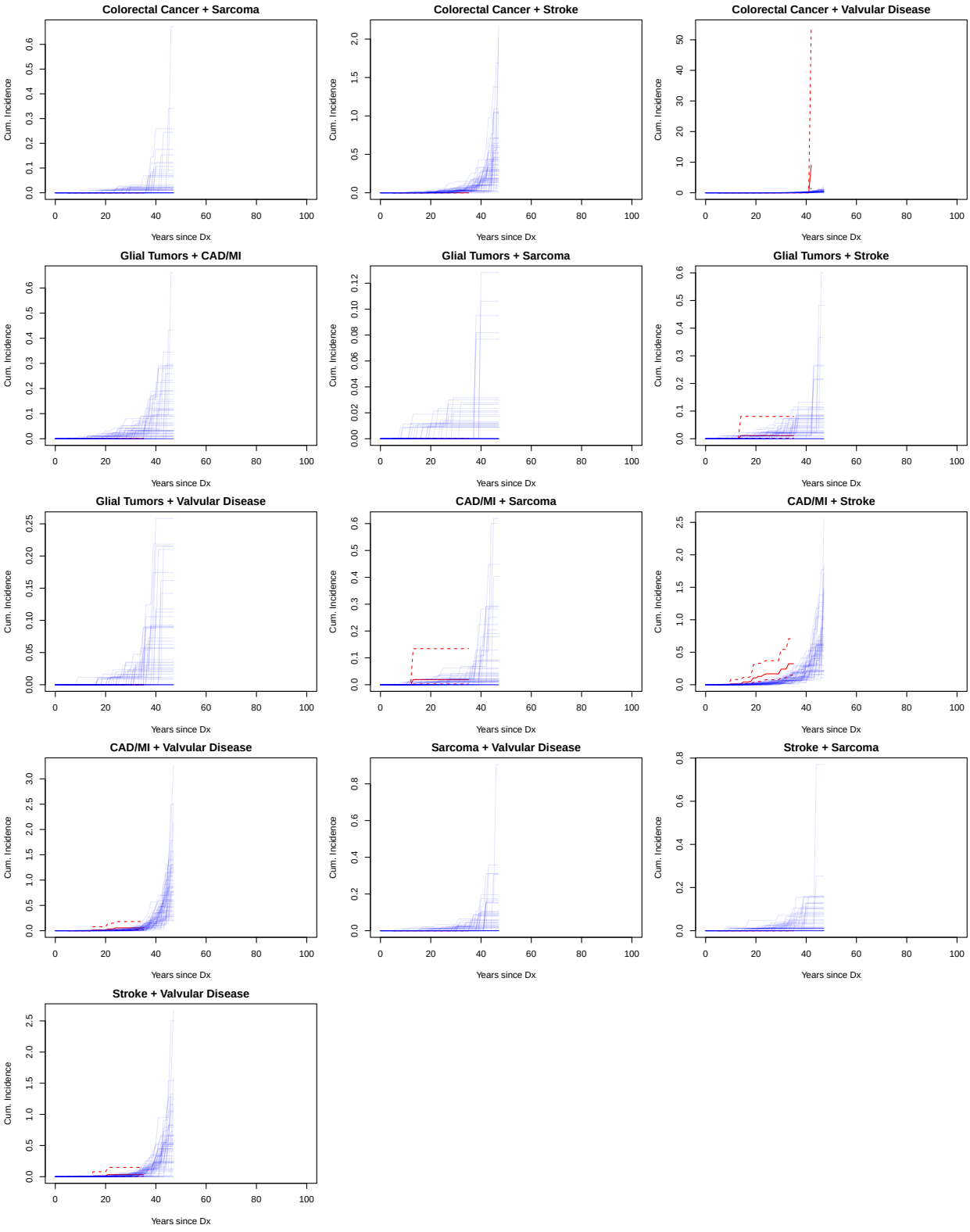



Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

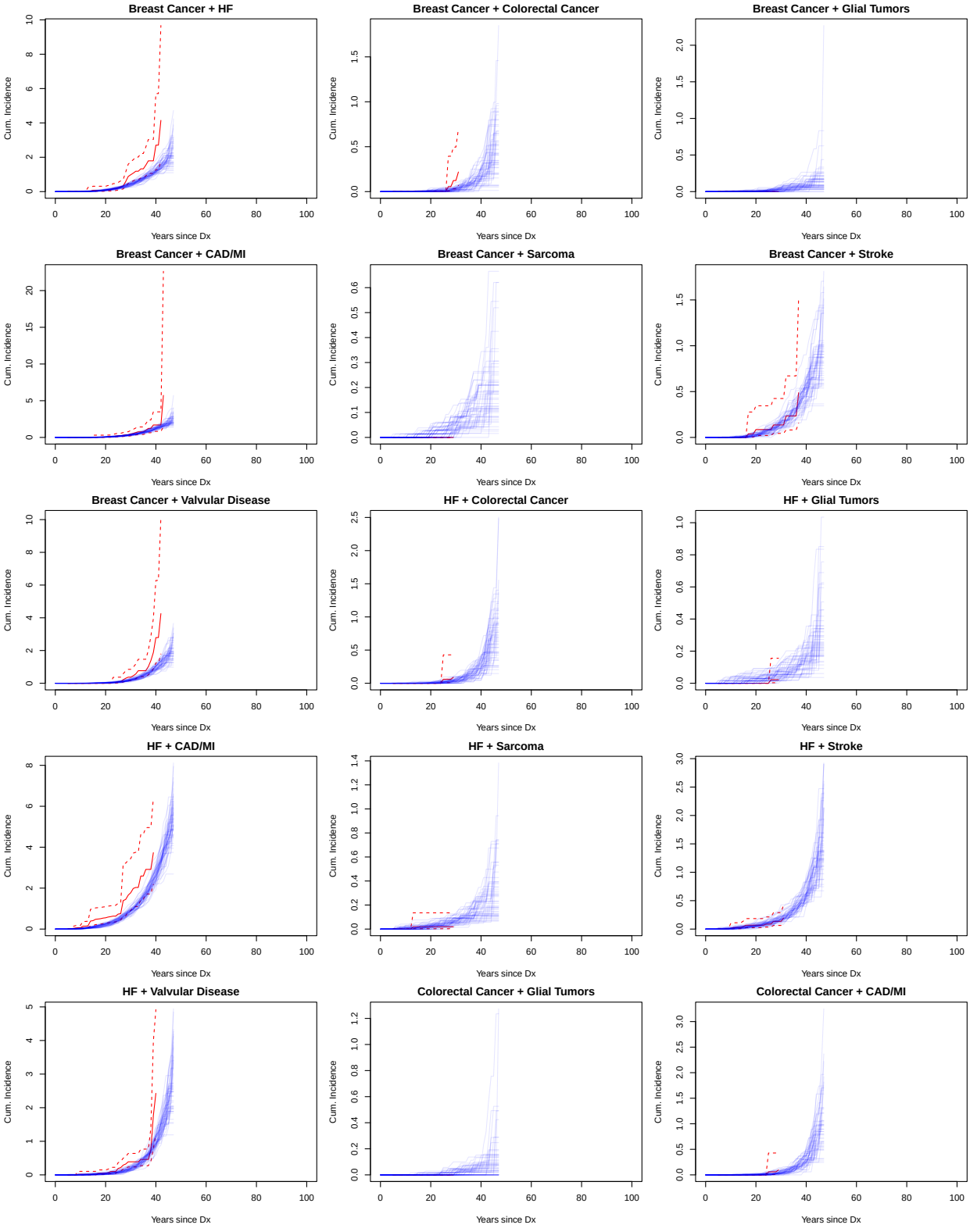
4.3.4.65 Ovary20+

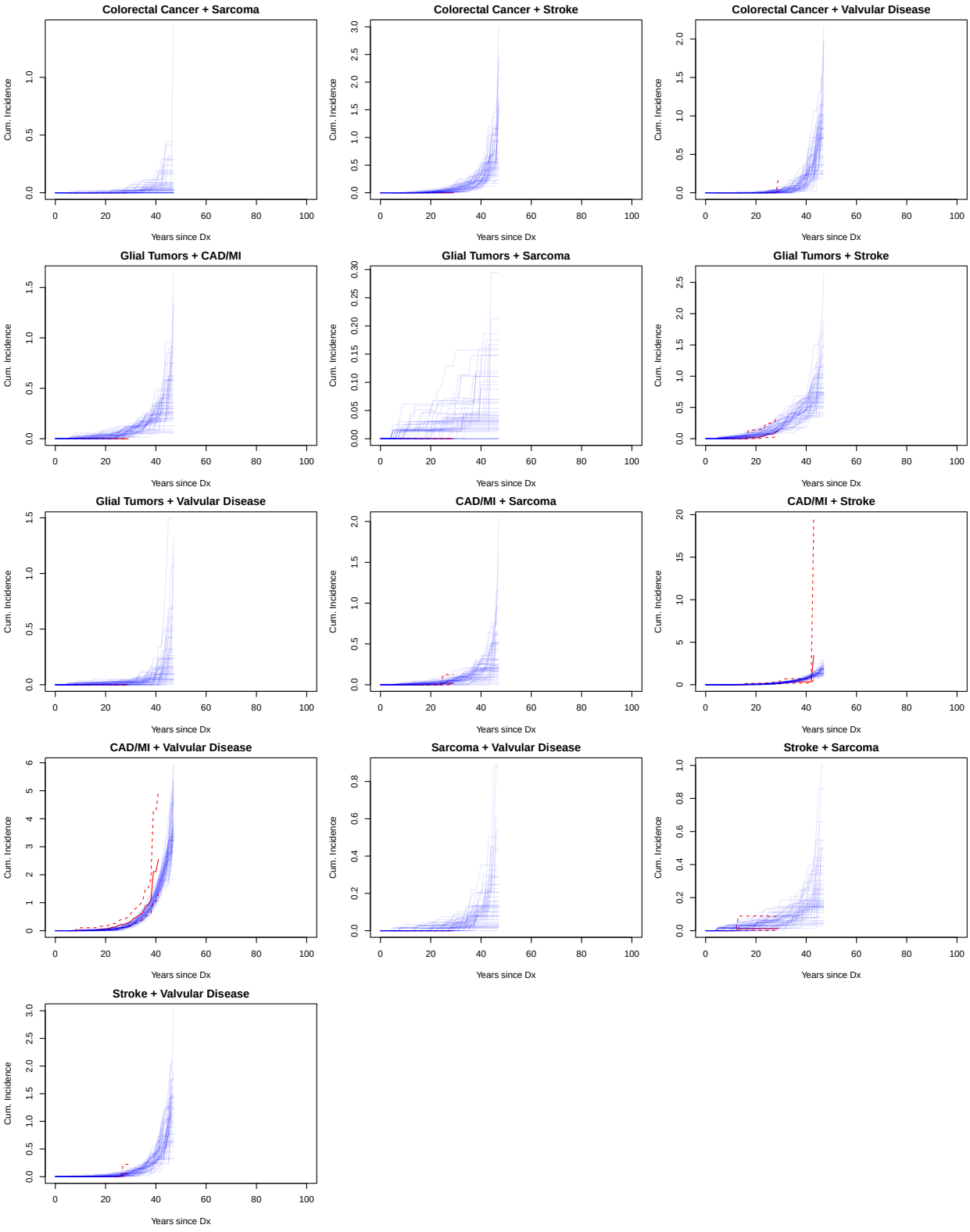
4.3.4.66 AbdPelNone



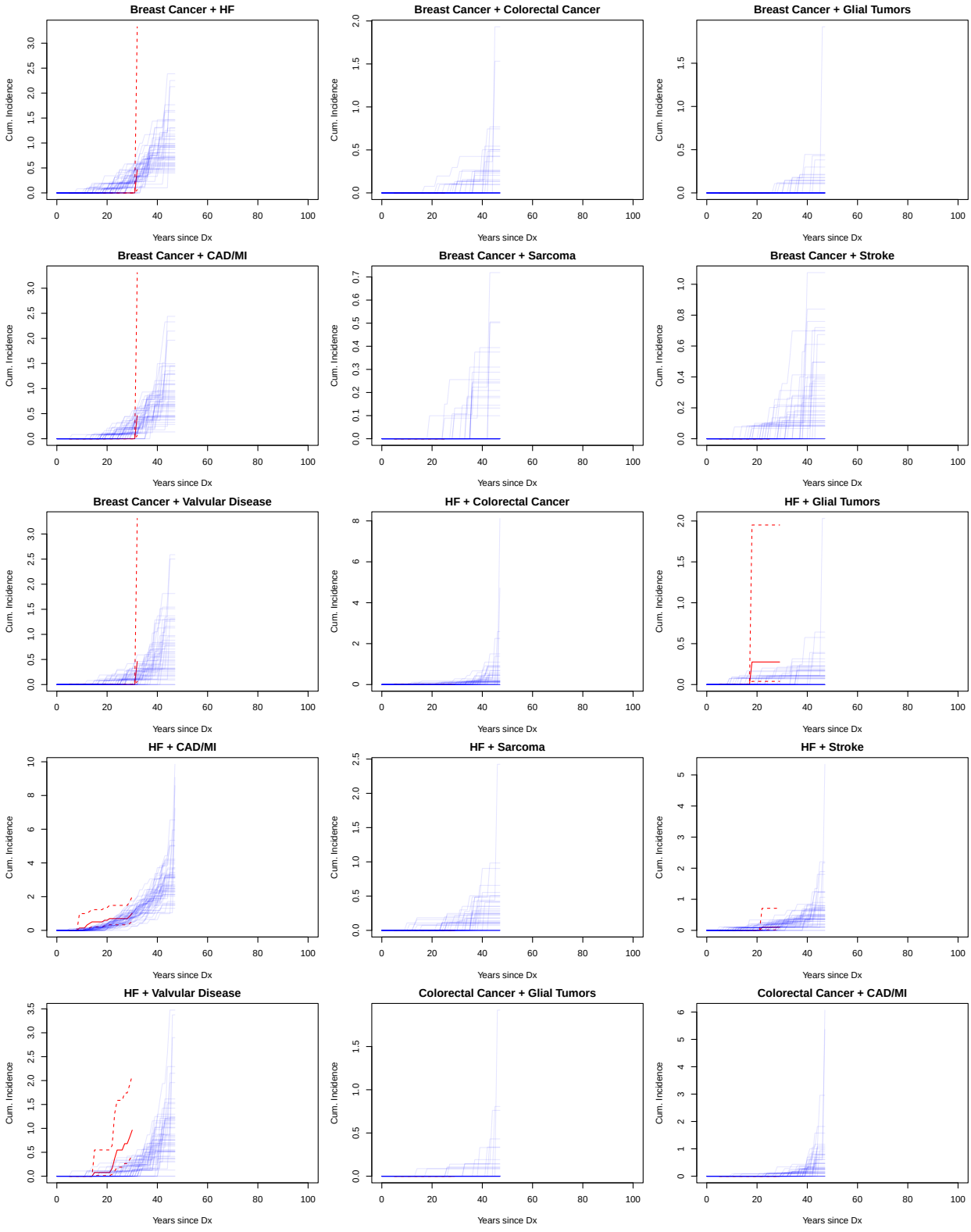

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

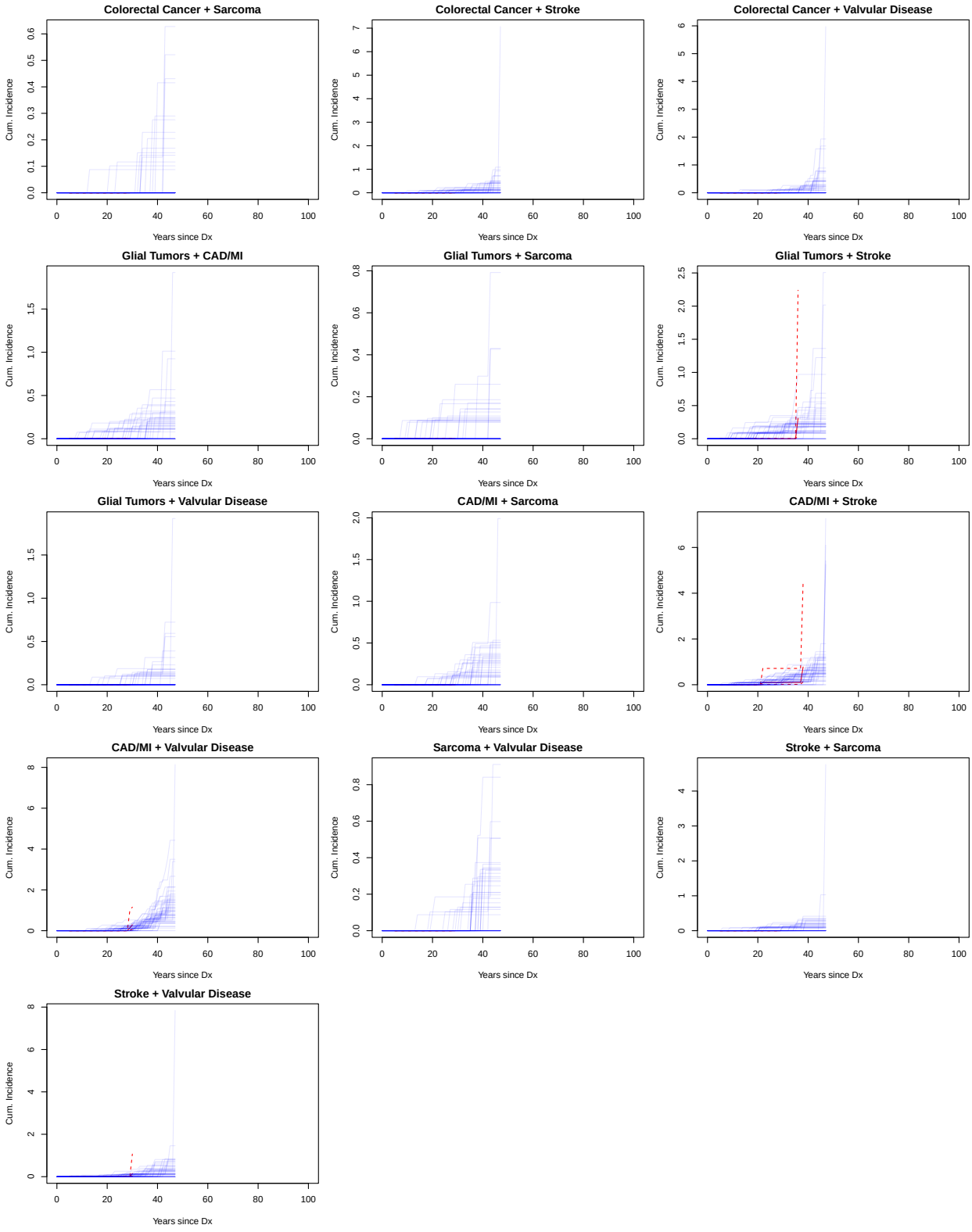
4.3.4.67 AbdPel<15



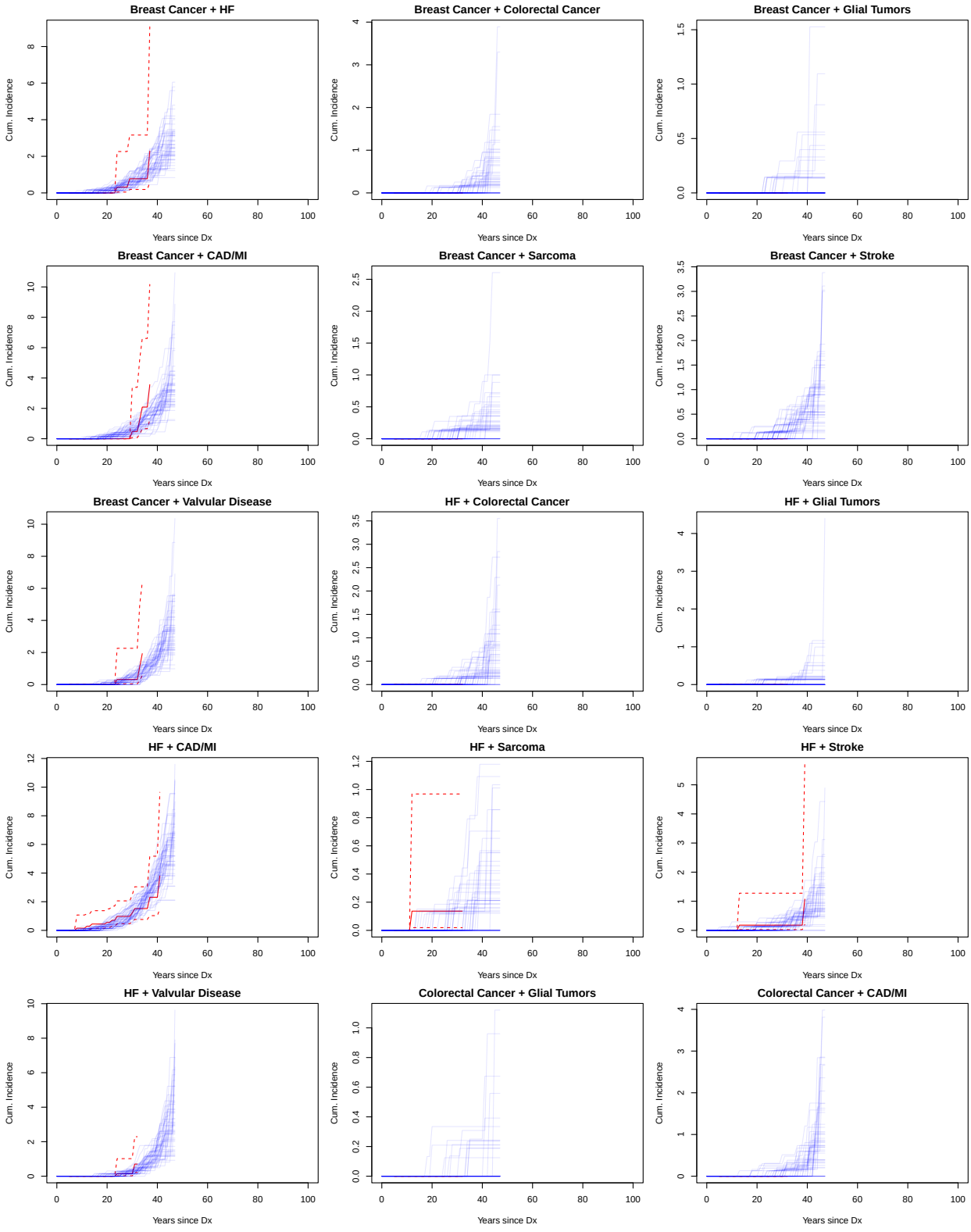

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

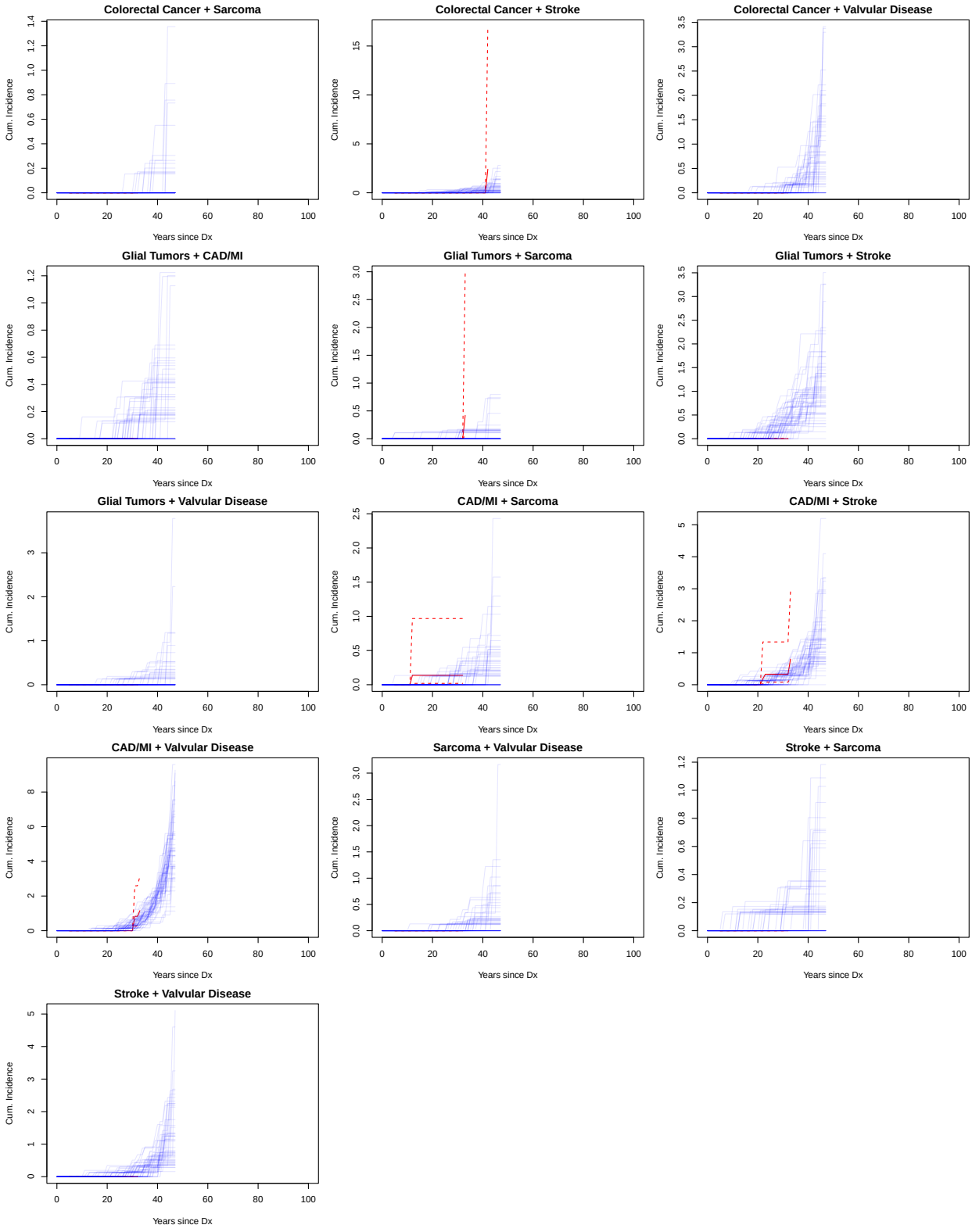
4.3.4.68 AbdPel15_24



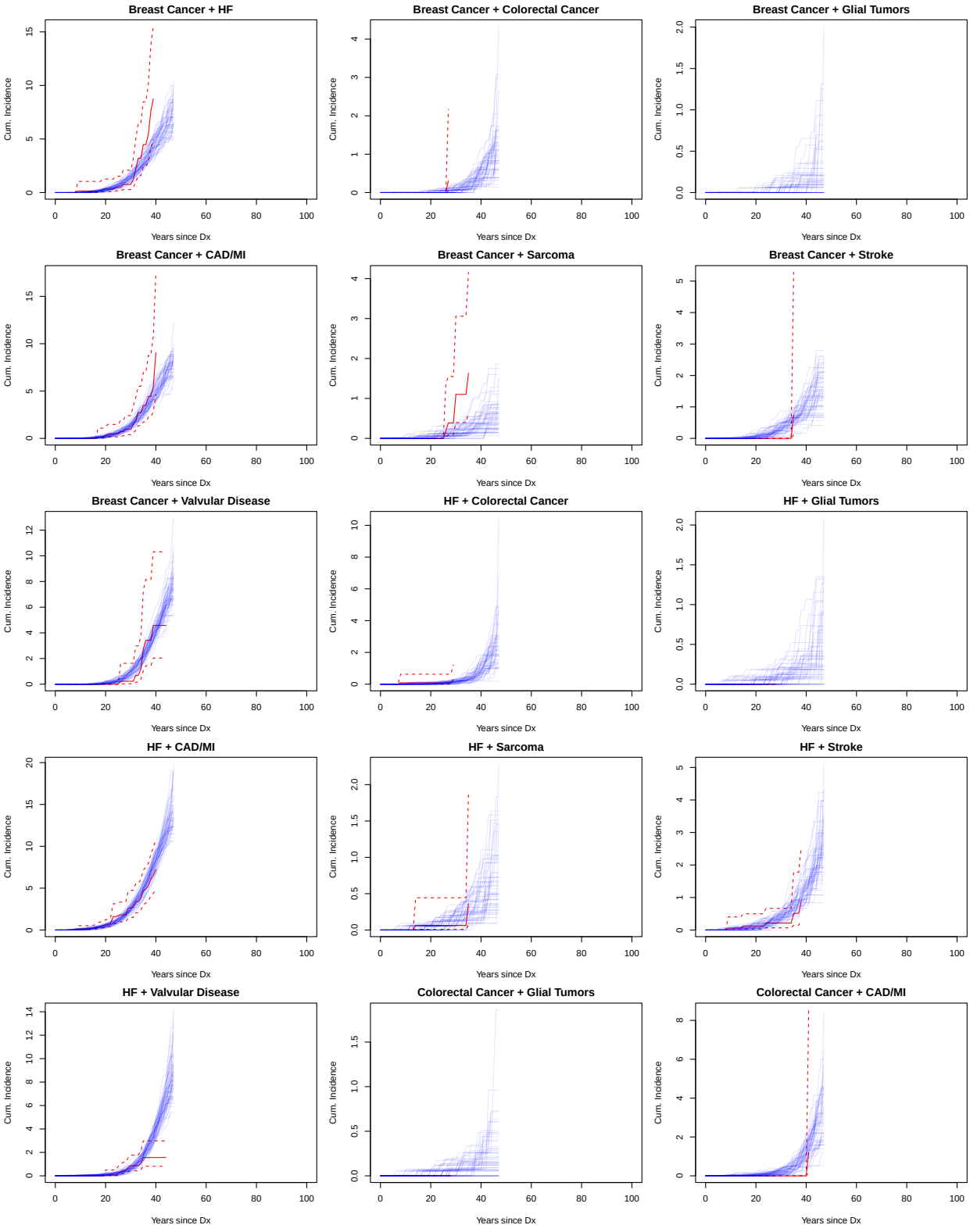

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

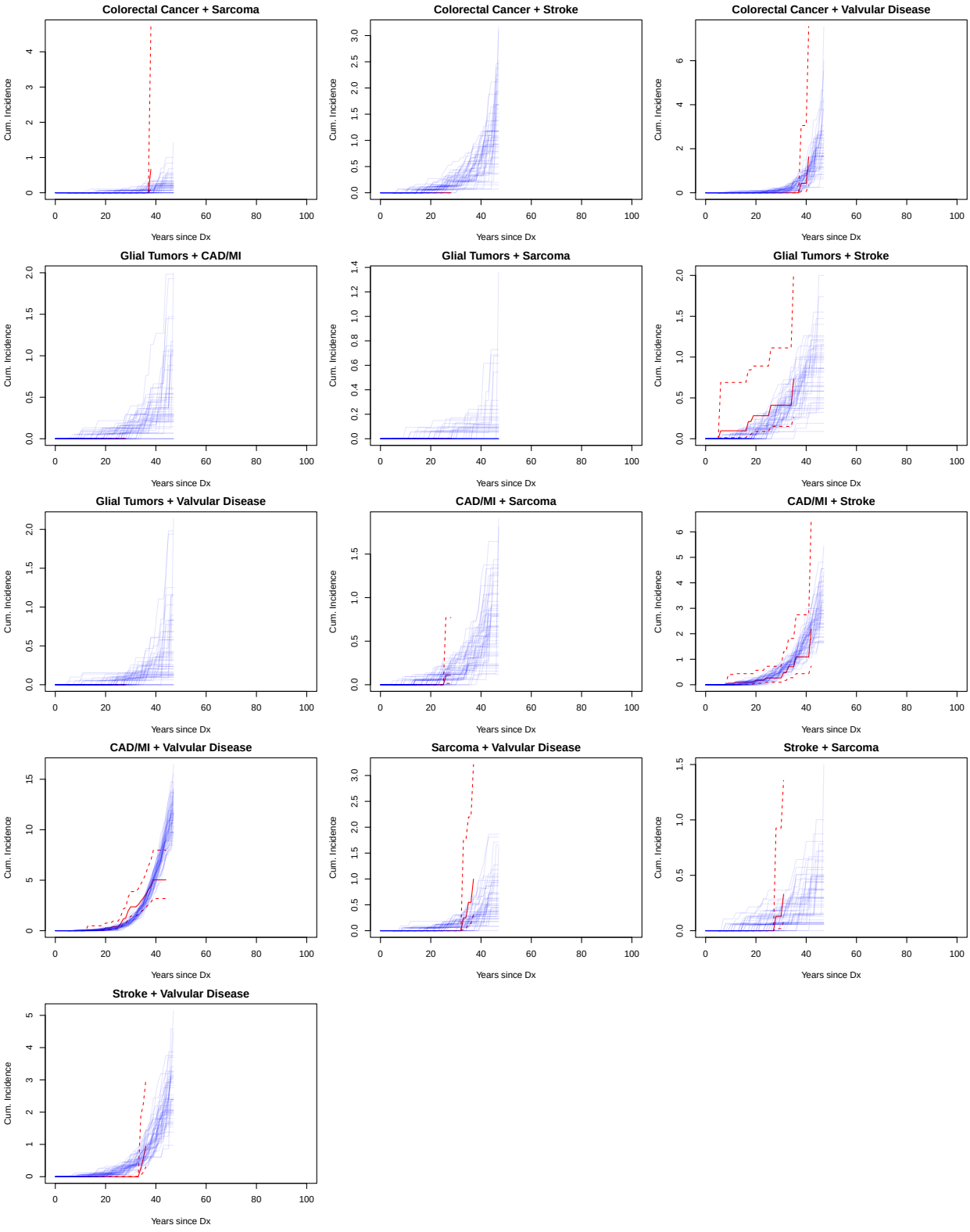
4.3.4.69 AbdPel25_34



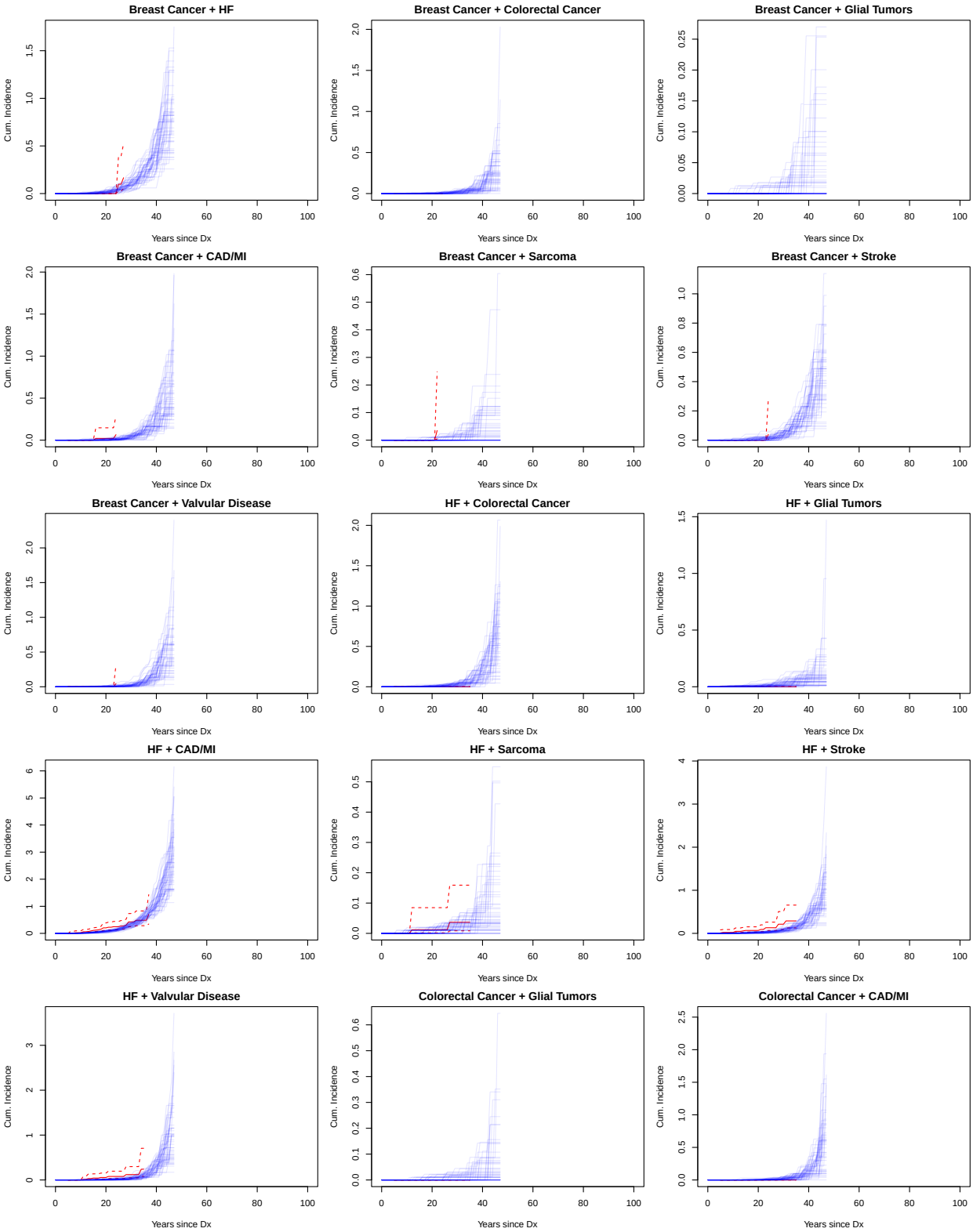

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

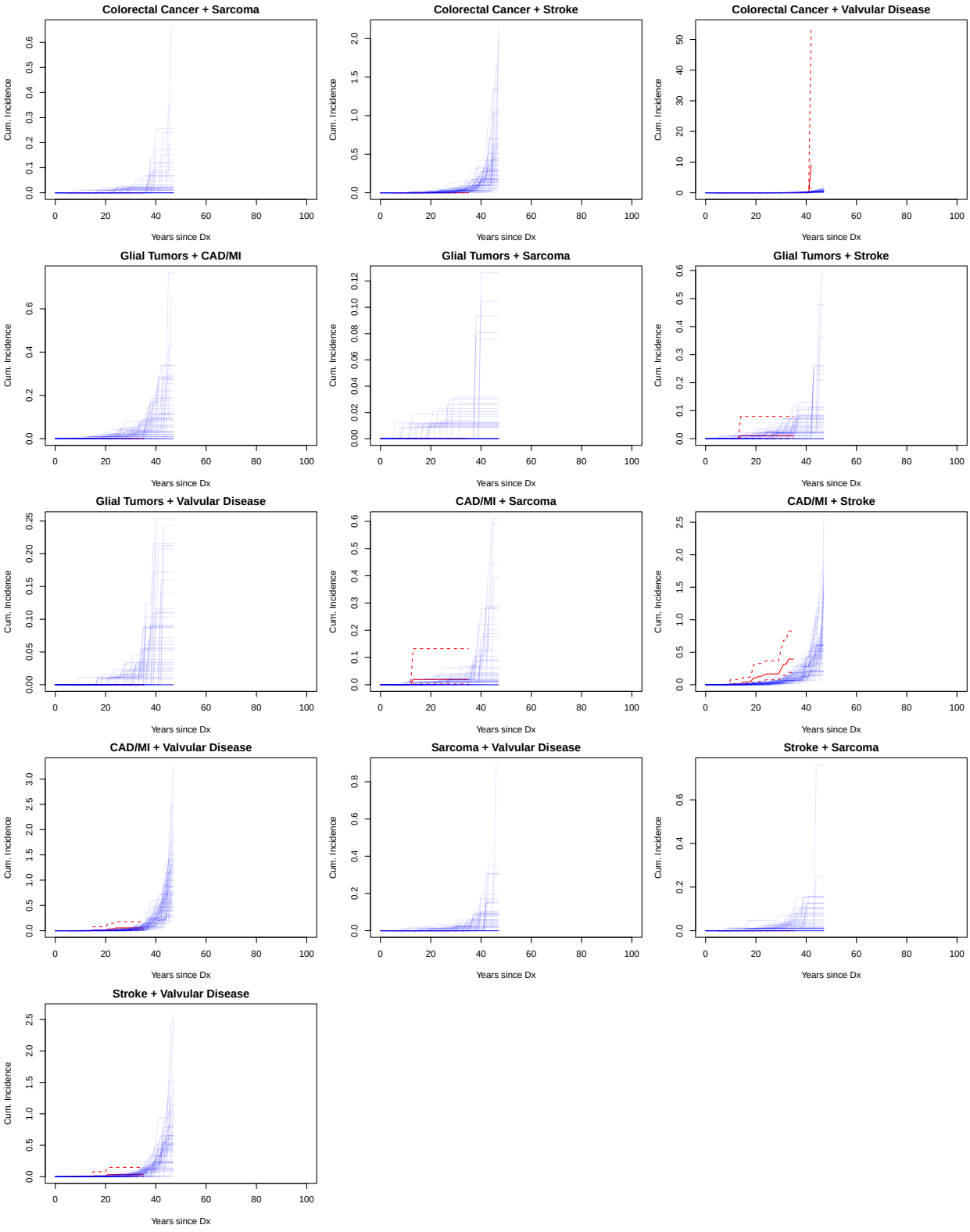
4.3.4.70 AbdPel35+



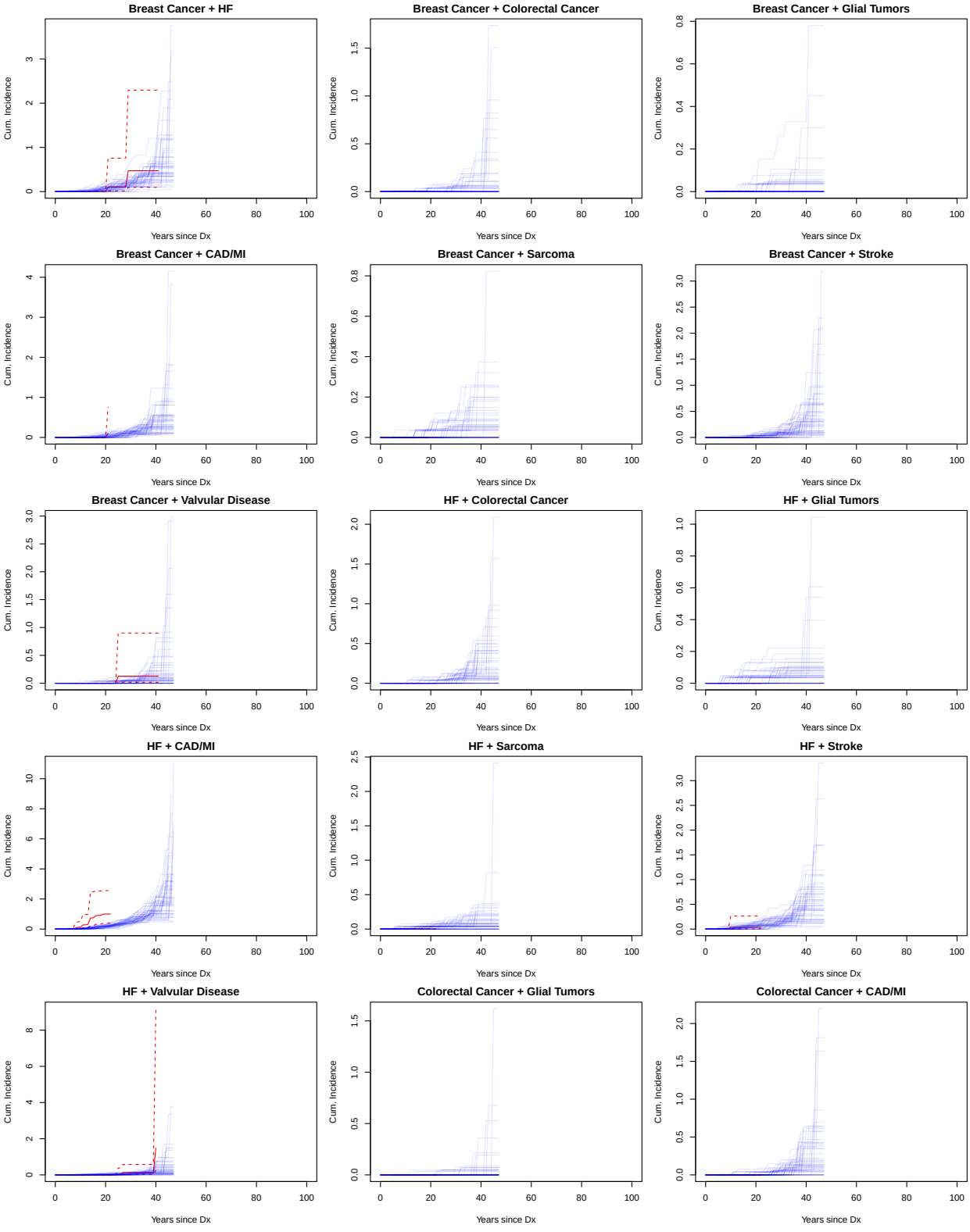

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

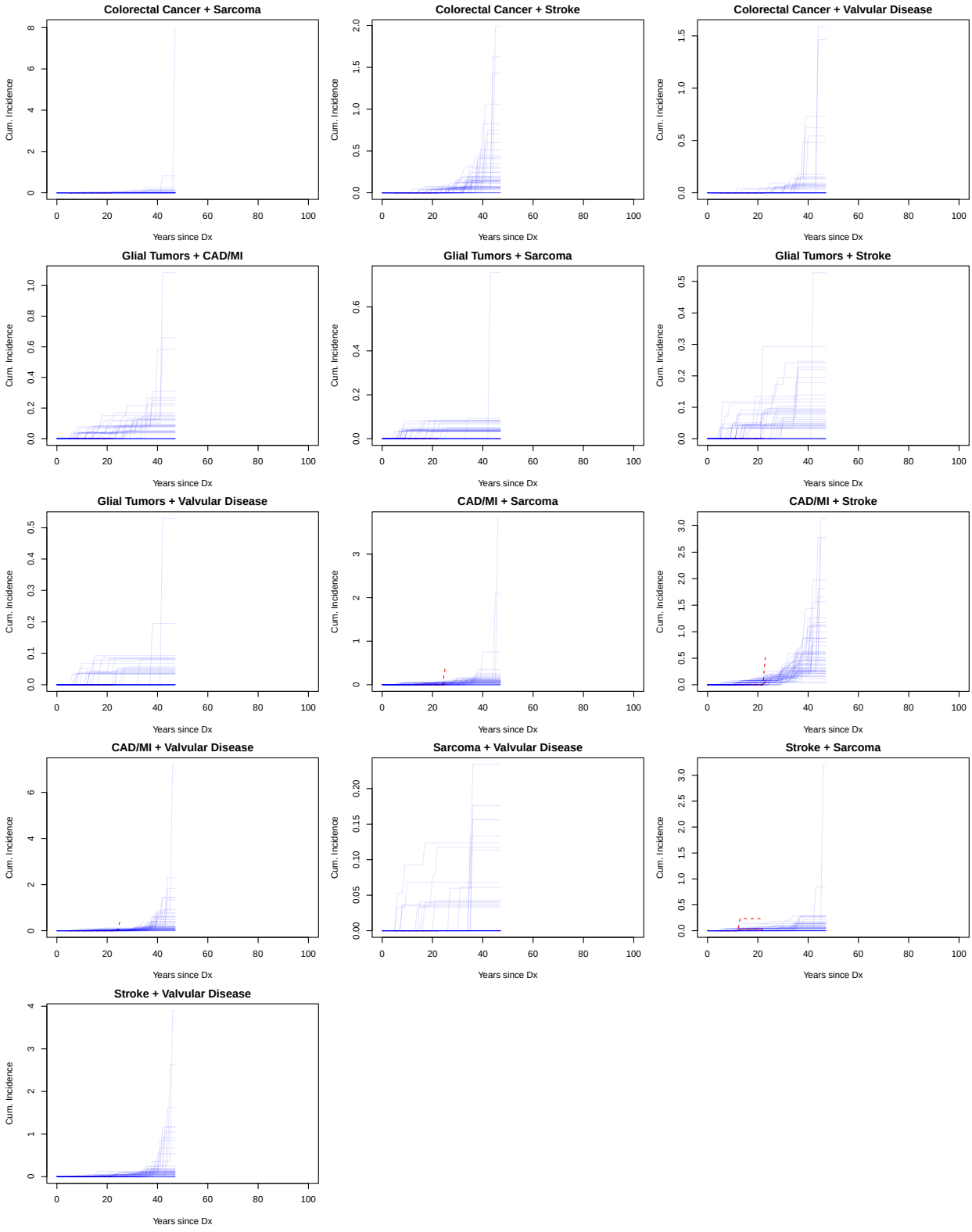
4.3.4.71 MaxRTNone



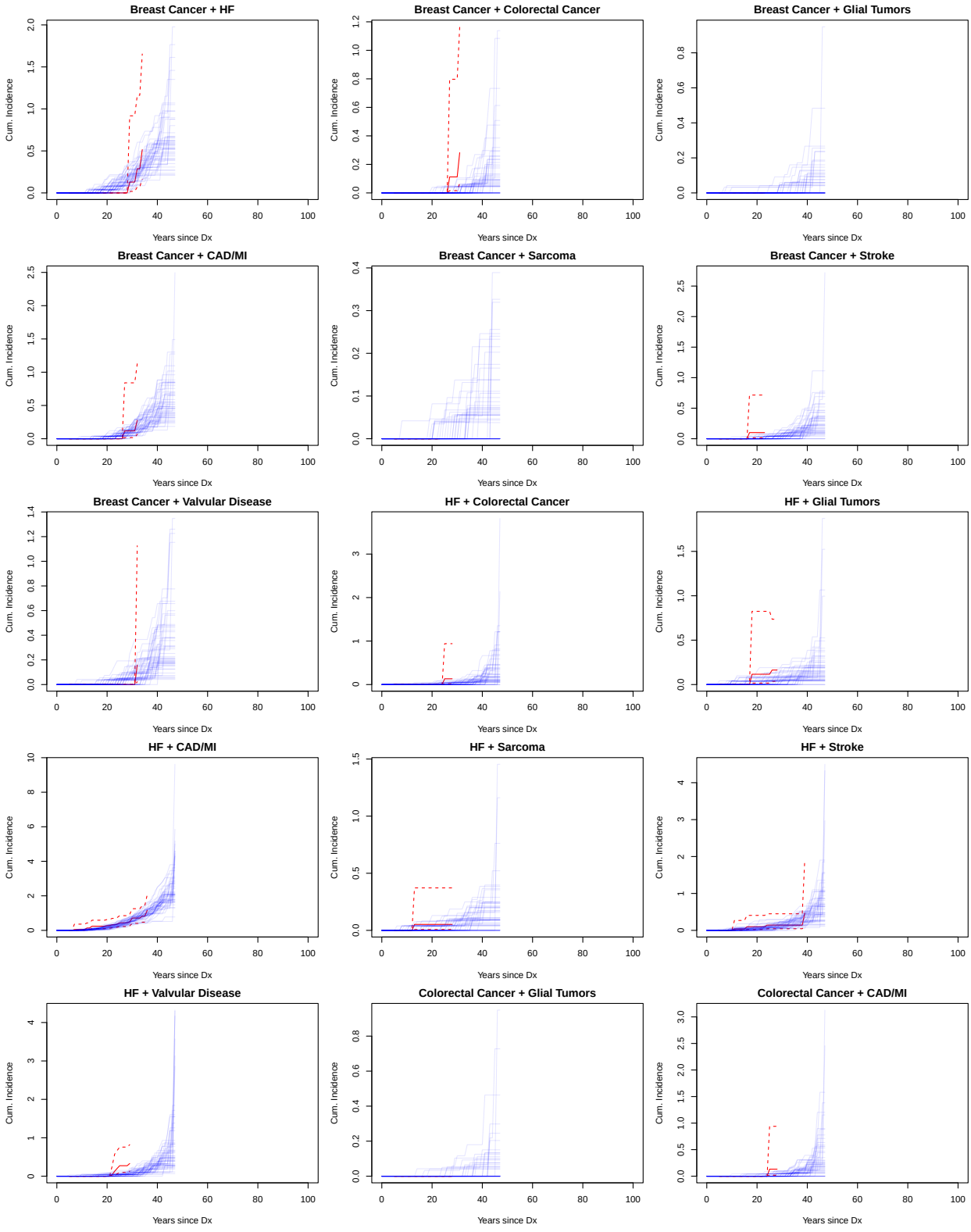

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

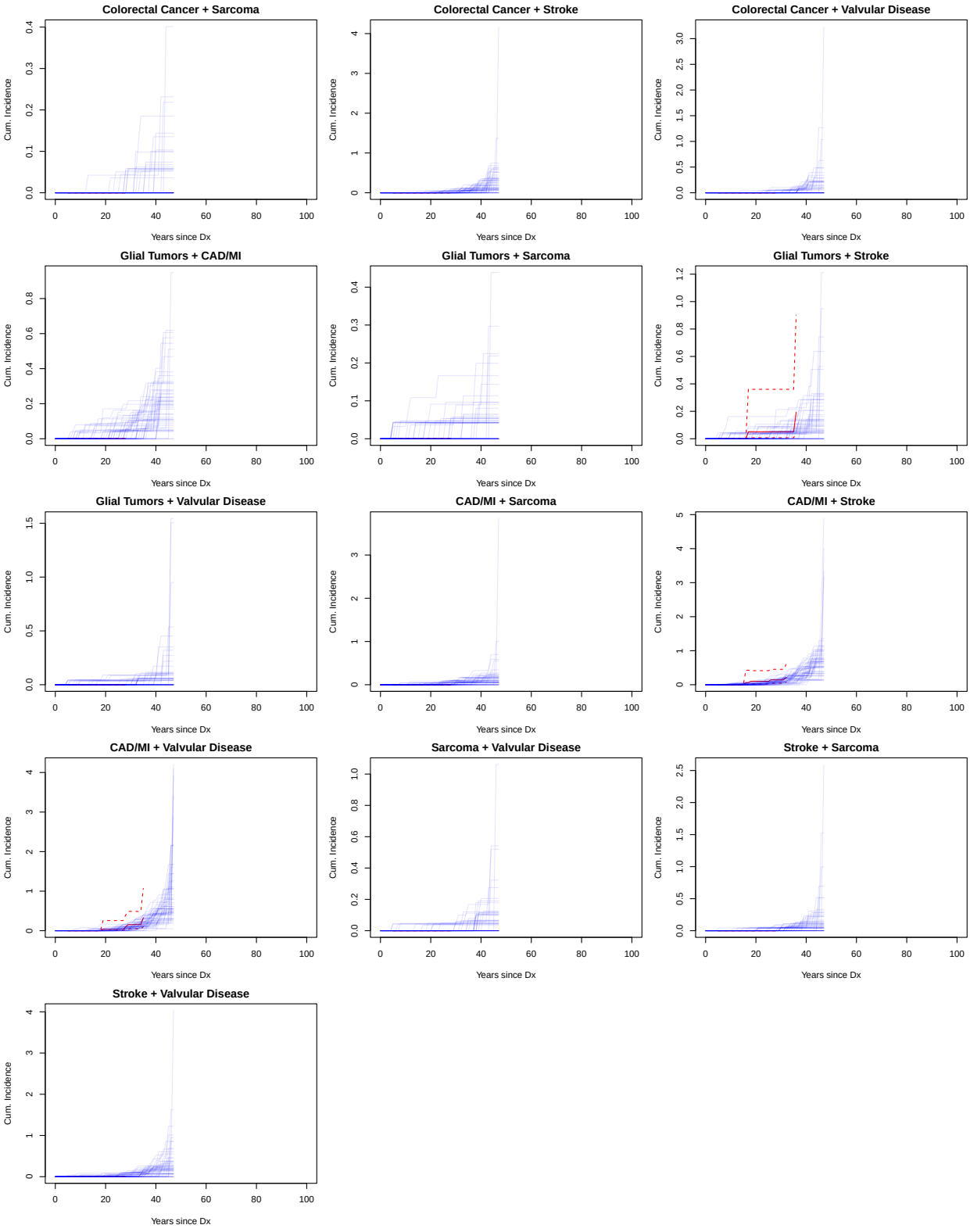
4.3.4.72 MaxRT<20



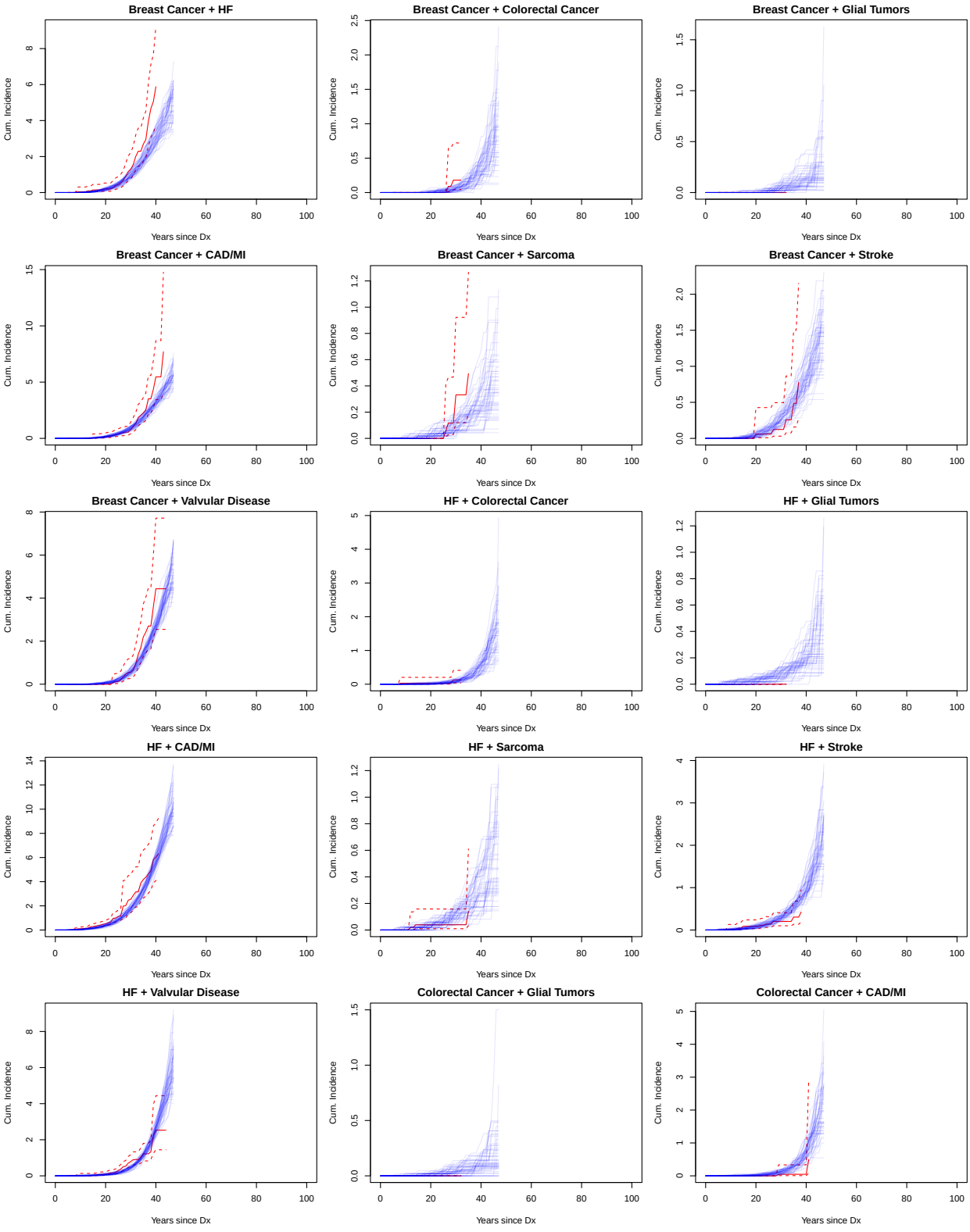

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

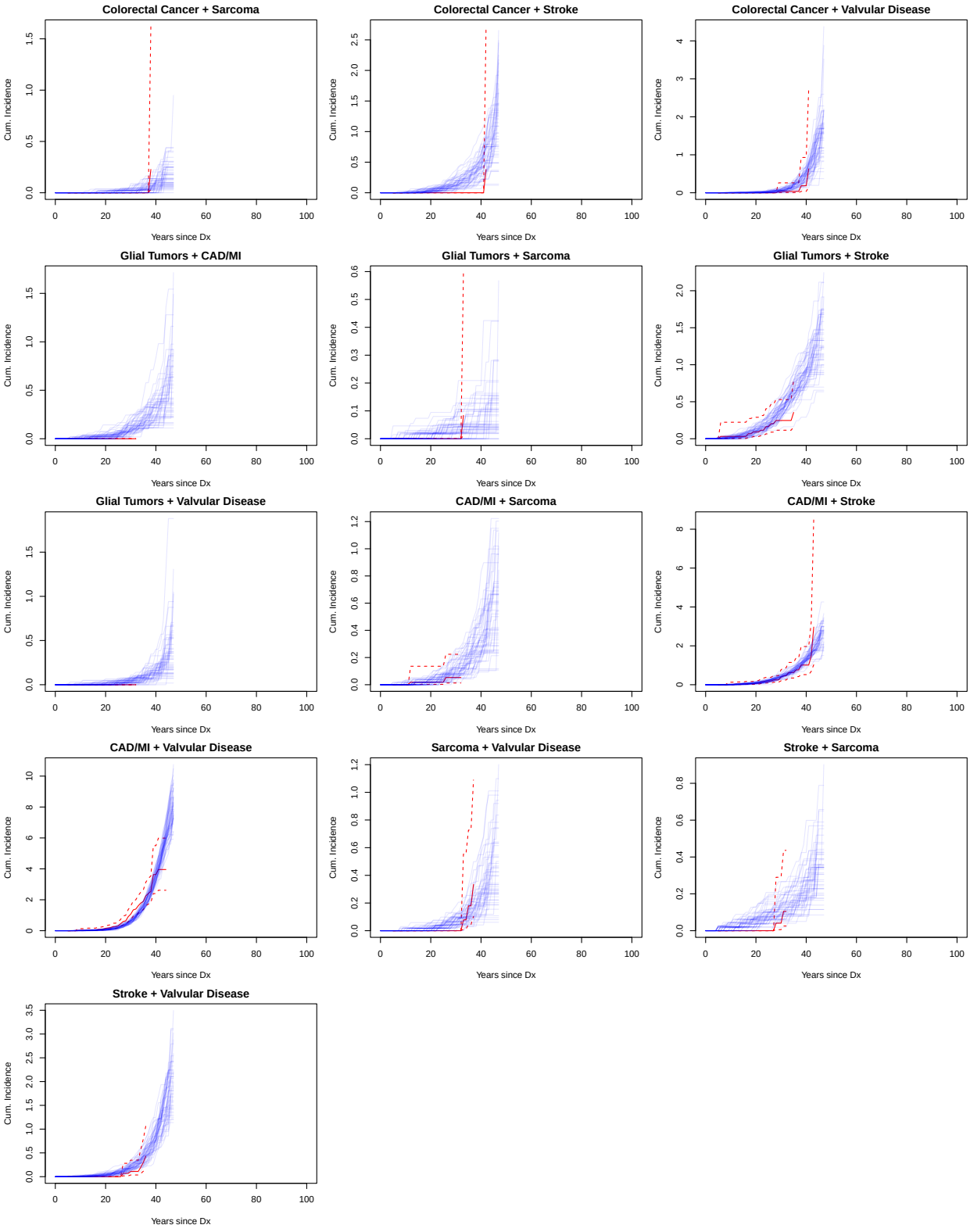
4.3.4.73 MaxRT20_29



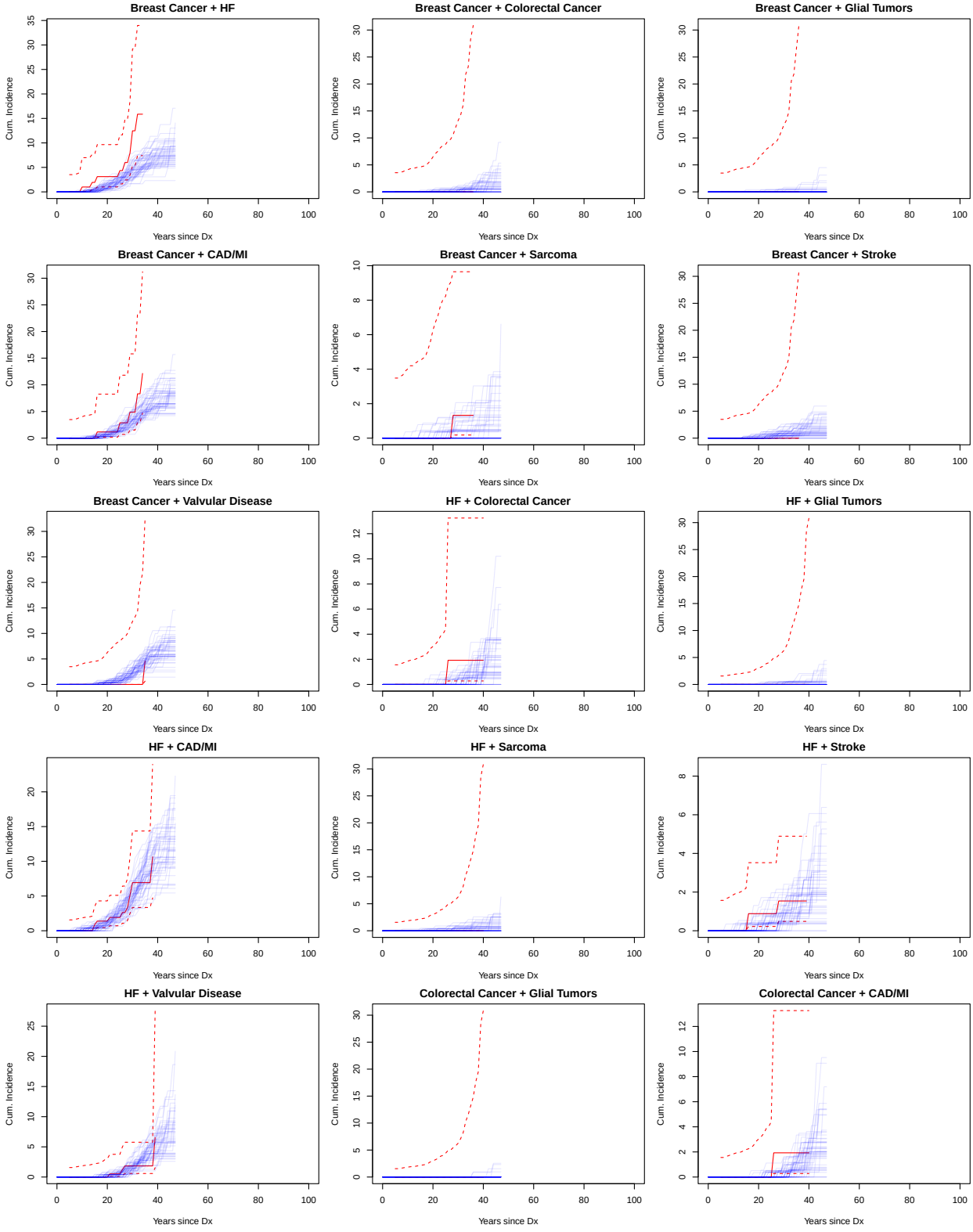

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

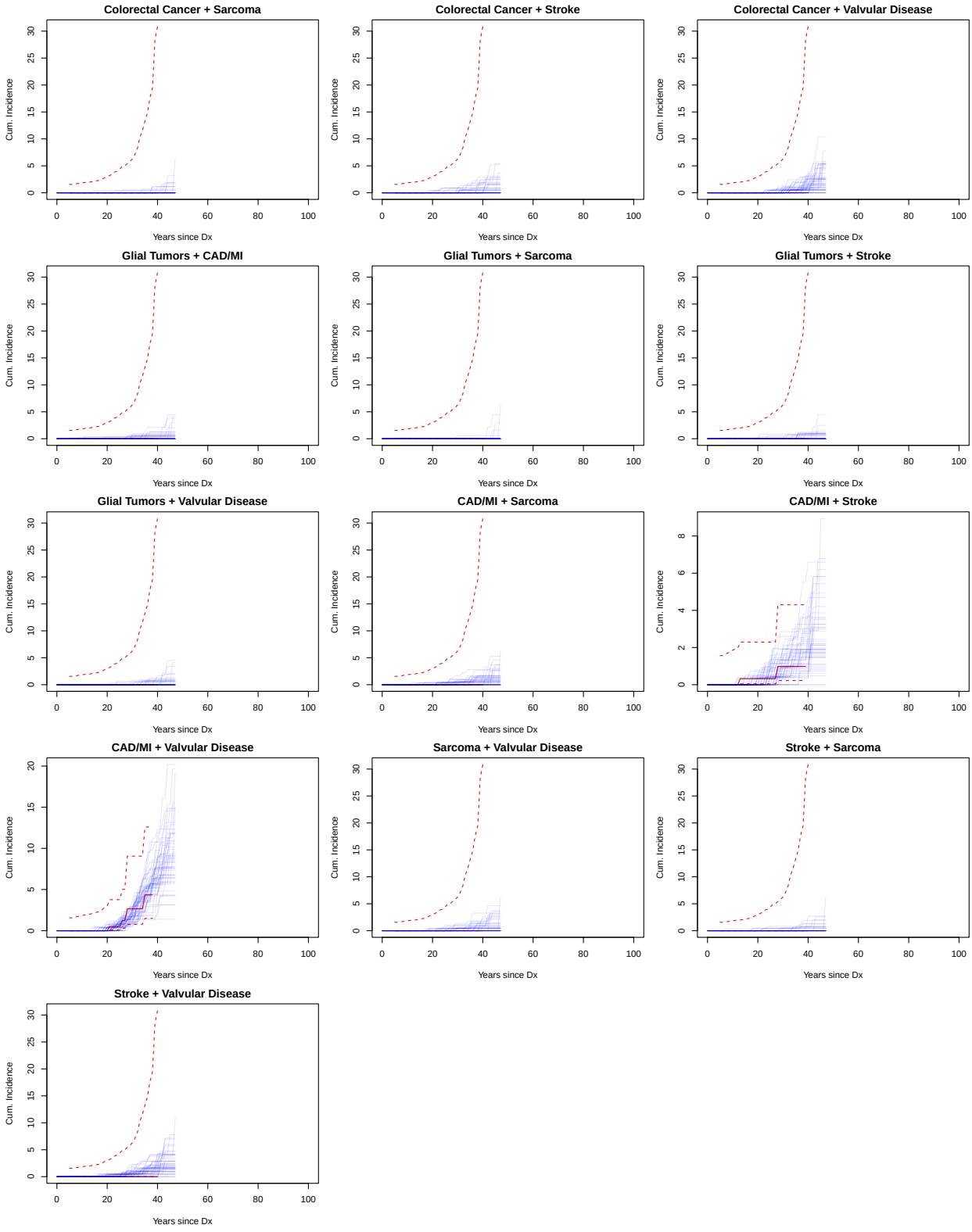
4.3.4.74 MaxRT30+



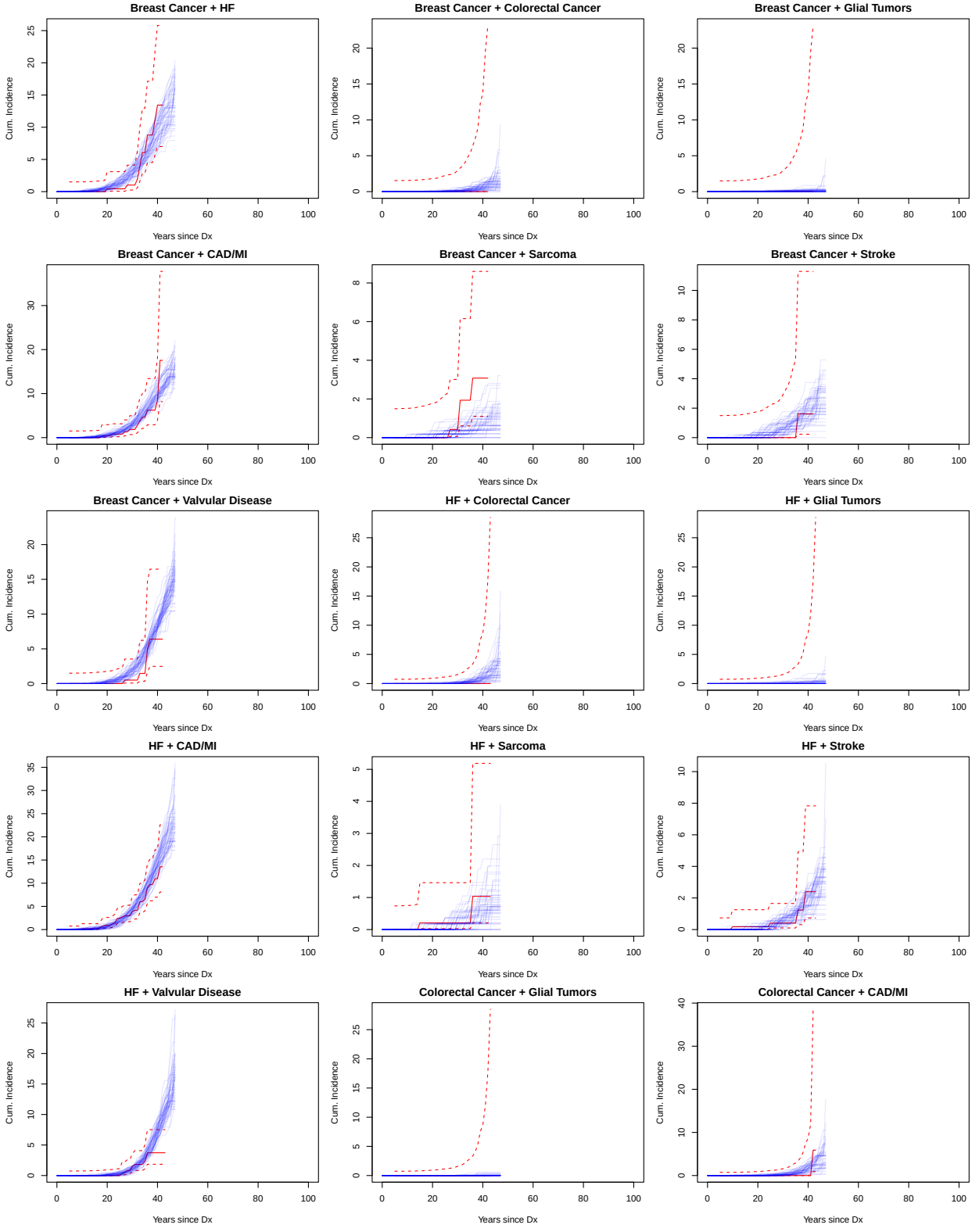

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

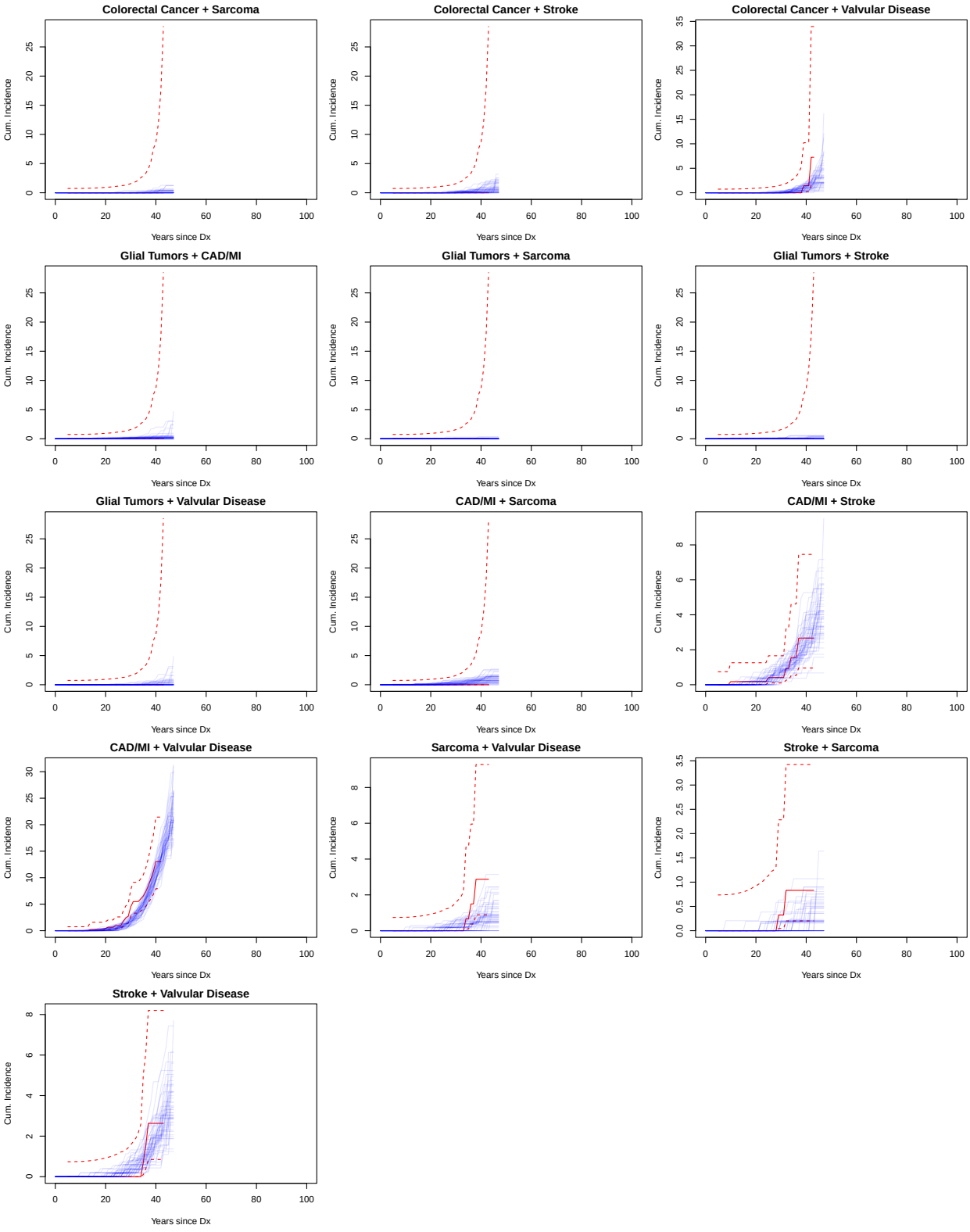
4.3.4.75 HL grp: Salvage



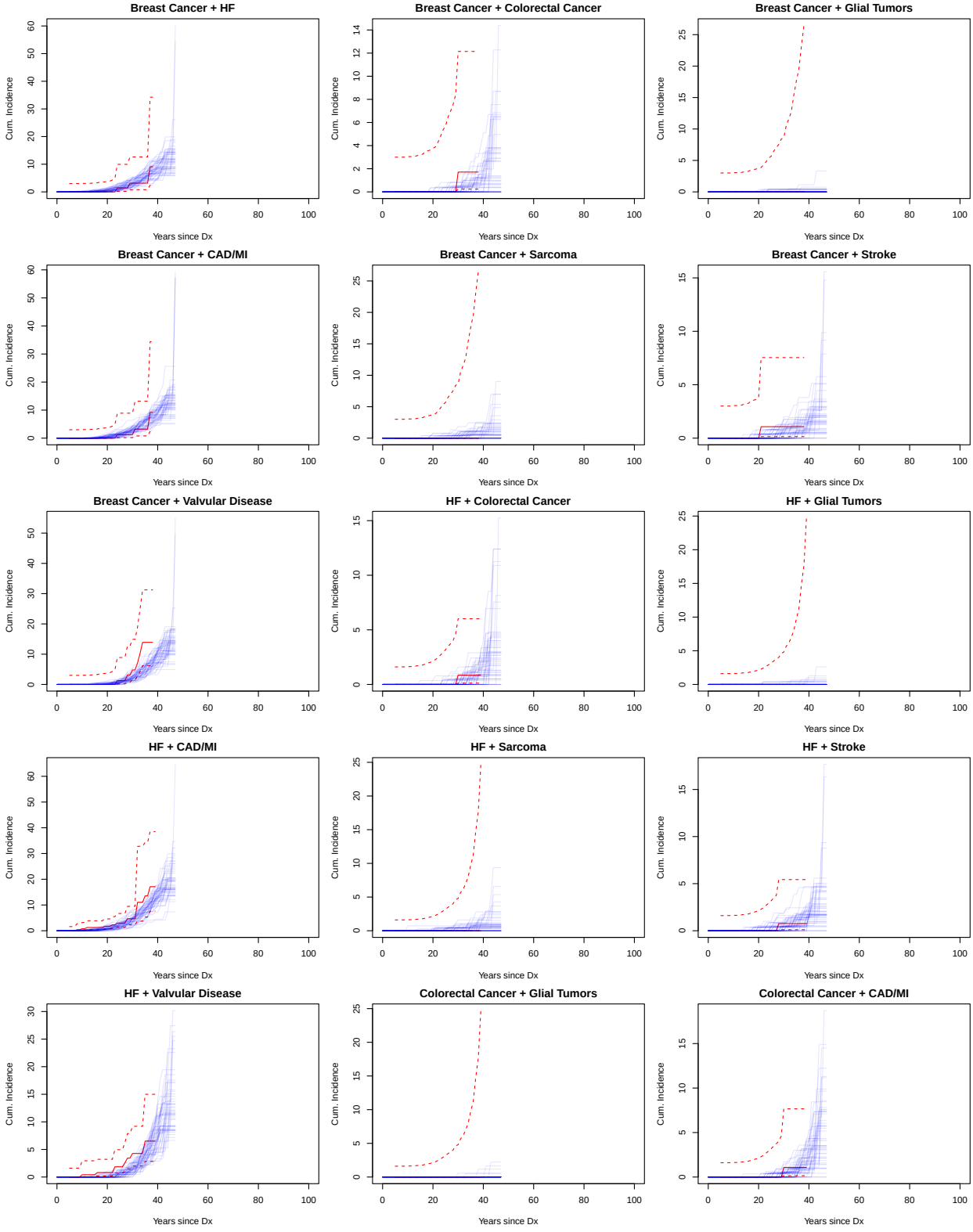

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

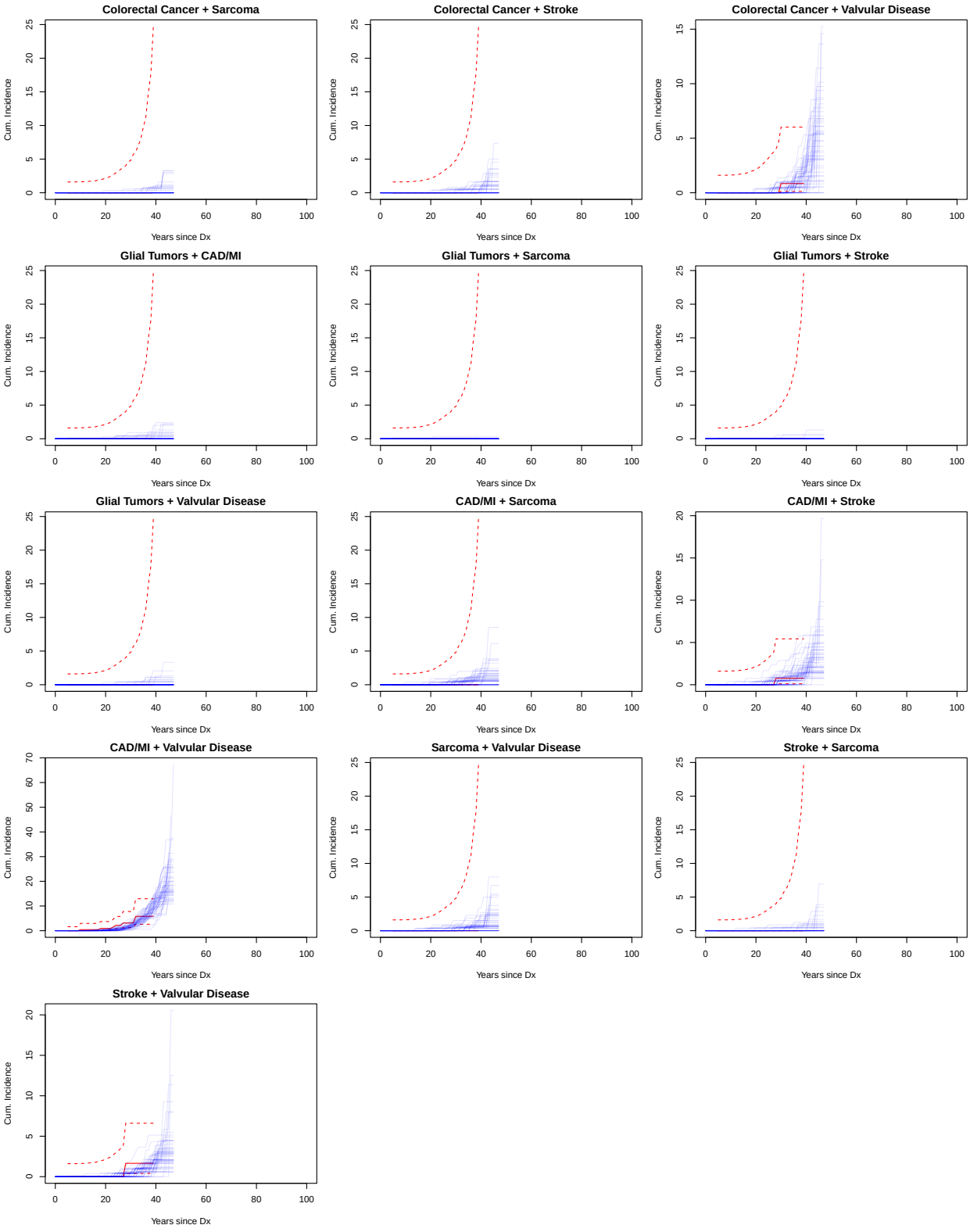
4.3.4.76 HL grp: Extended



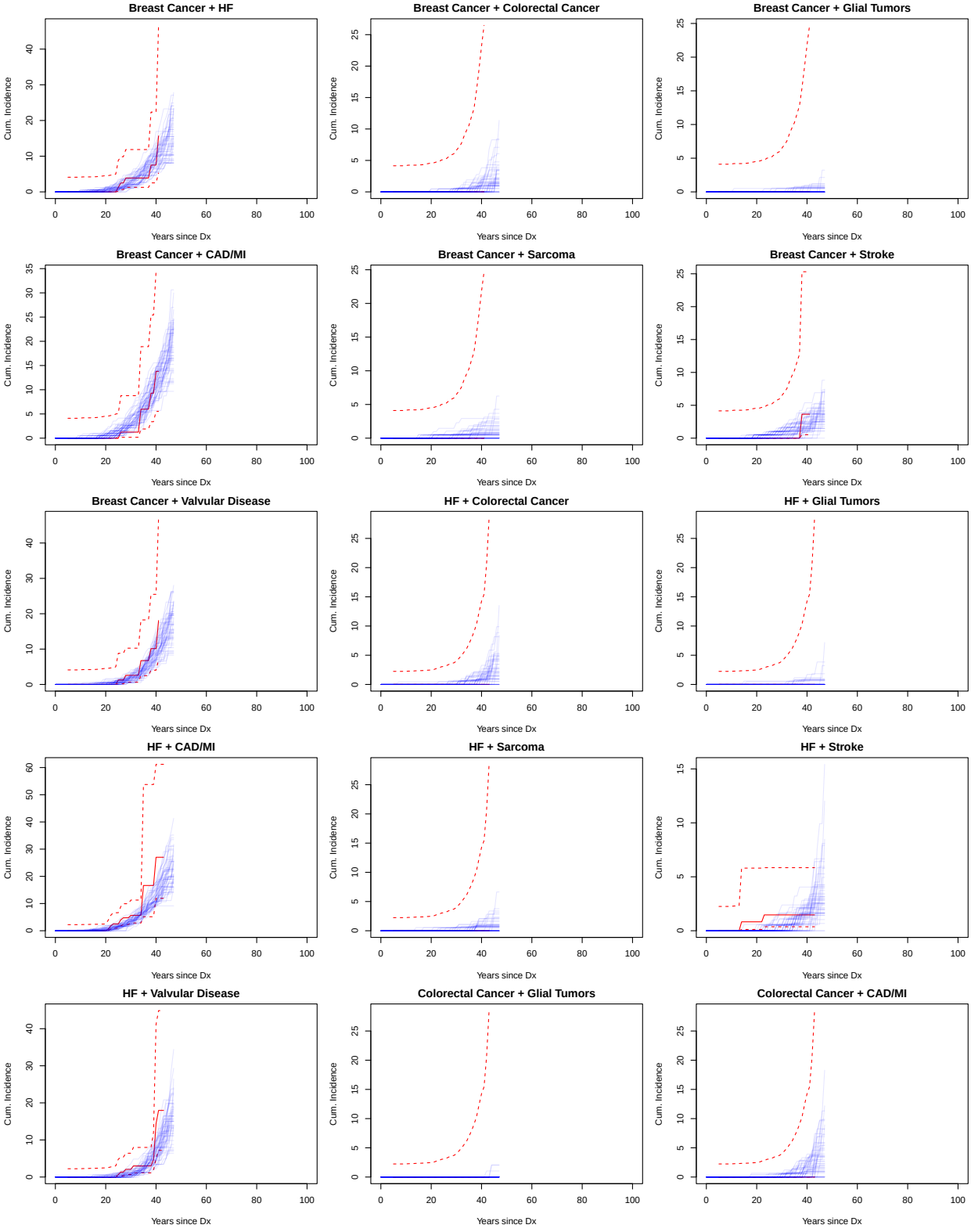

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

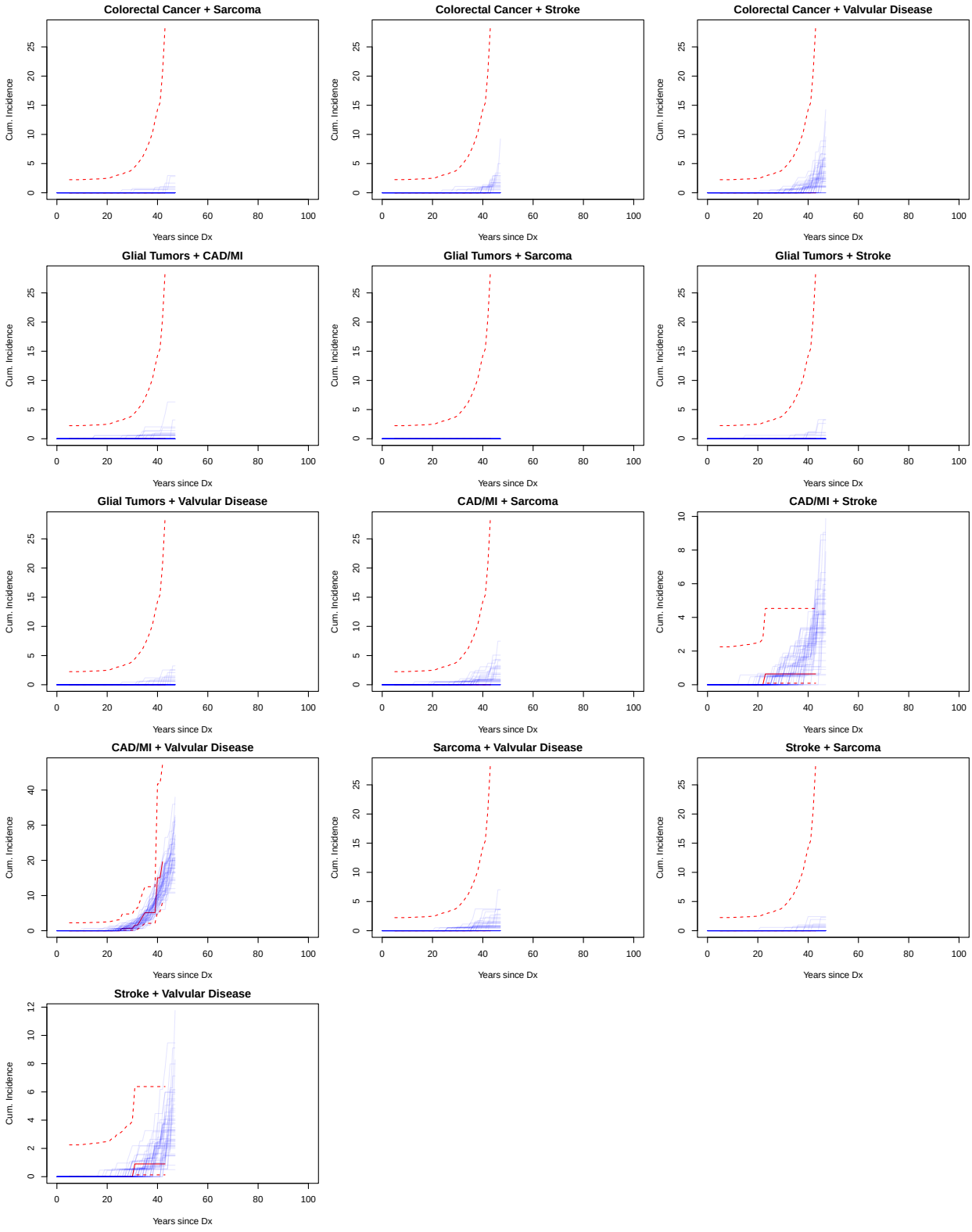
4.3.4.77 HL grp: Chest RT>=35 plus chemo



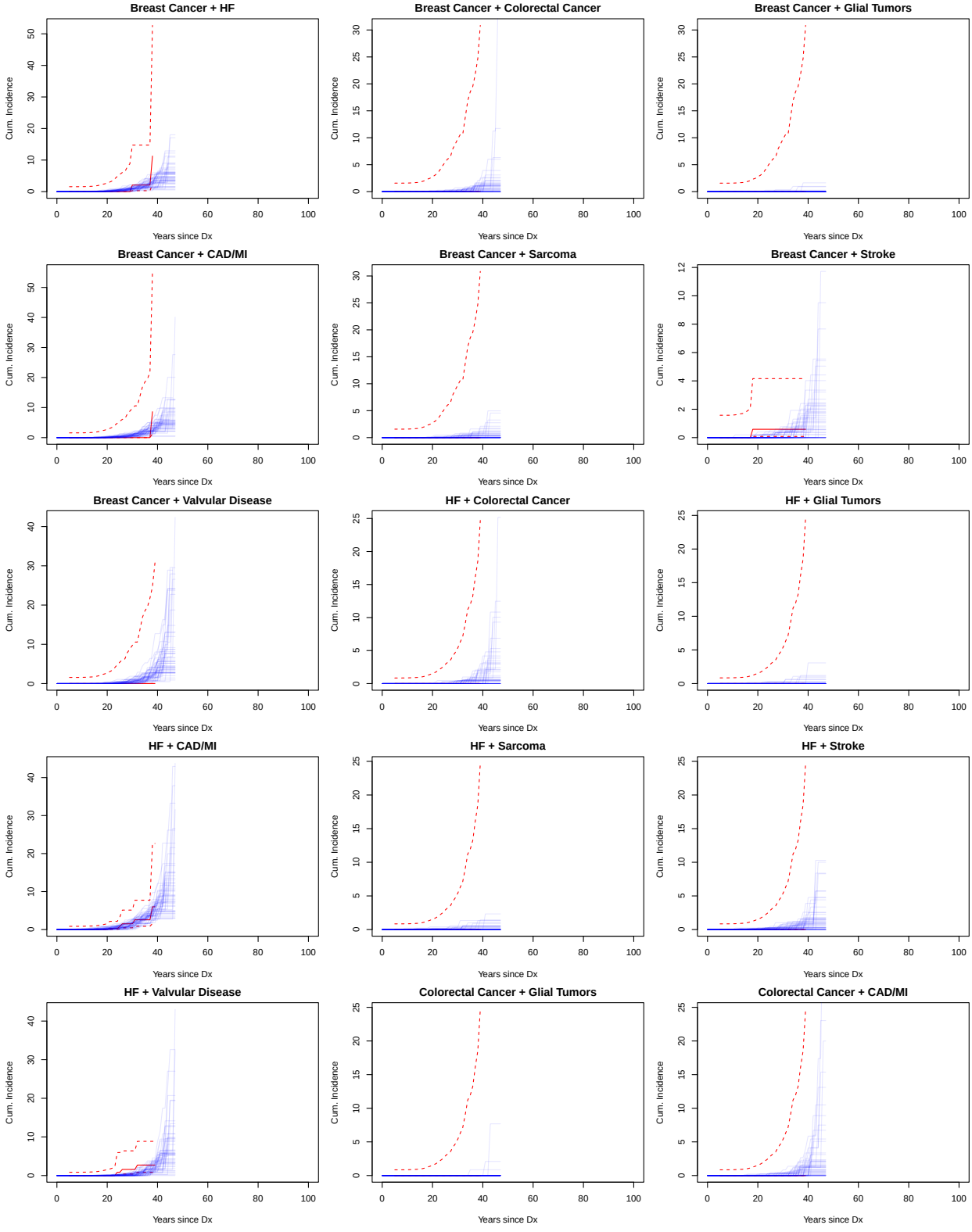

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

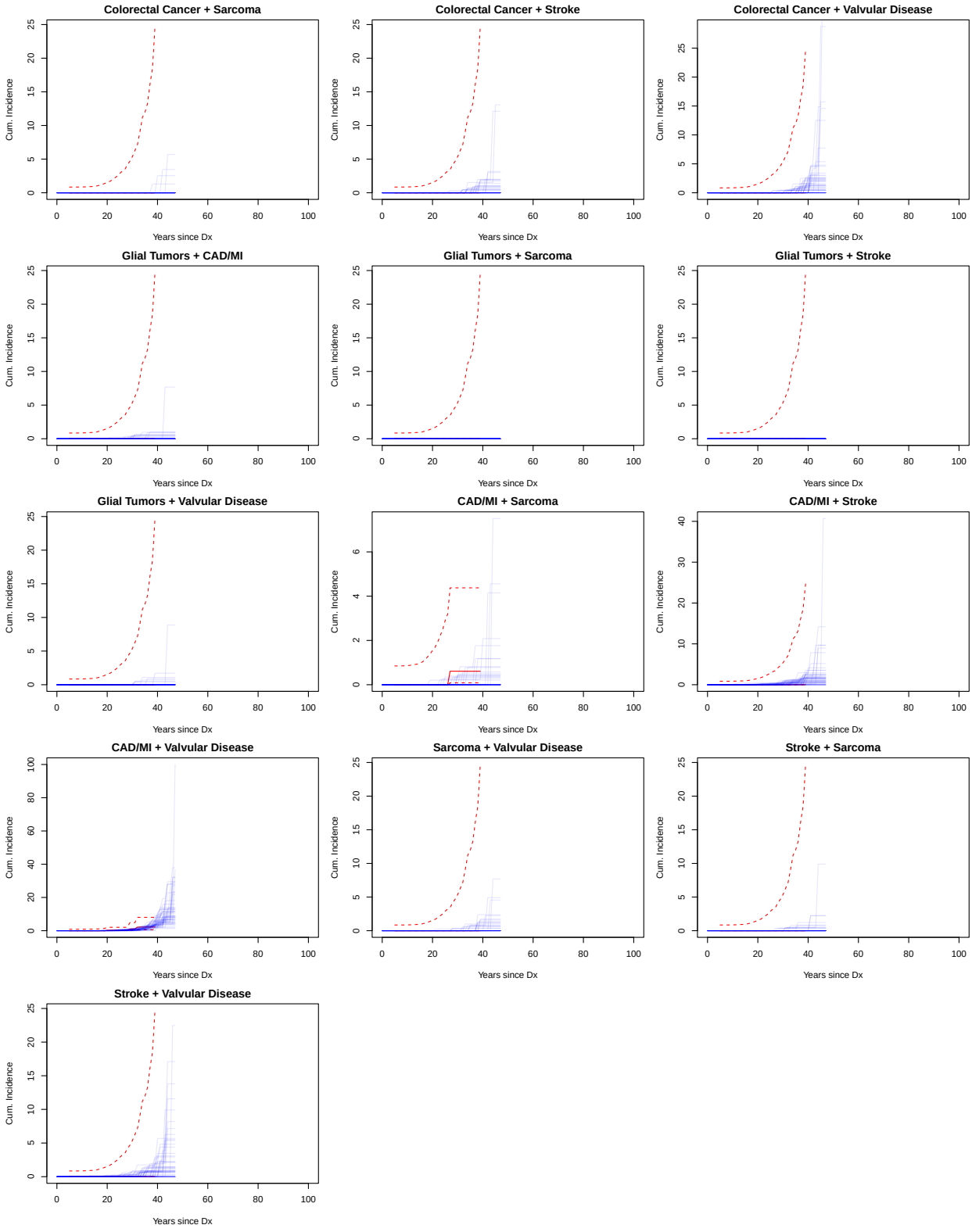
4.3.4.78 HL grp: Chest RT>=35 no chemo



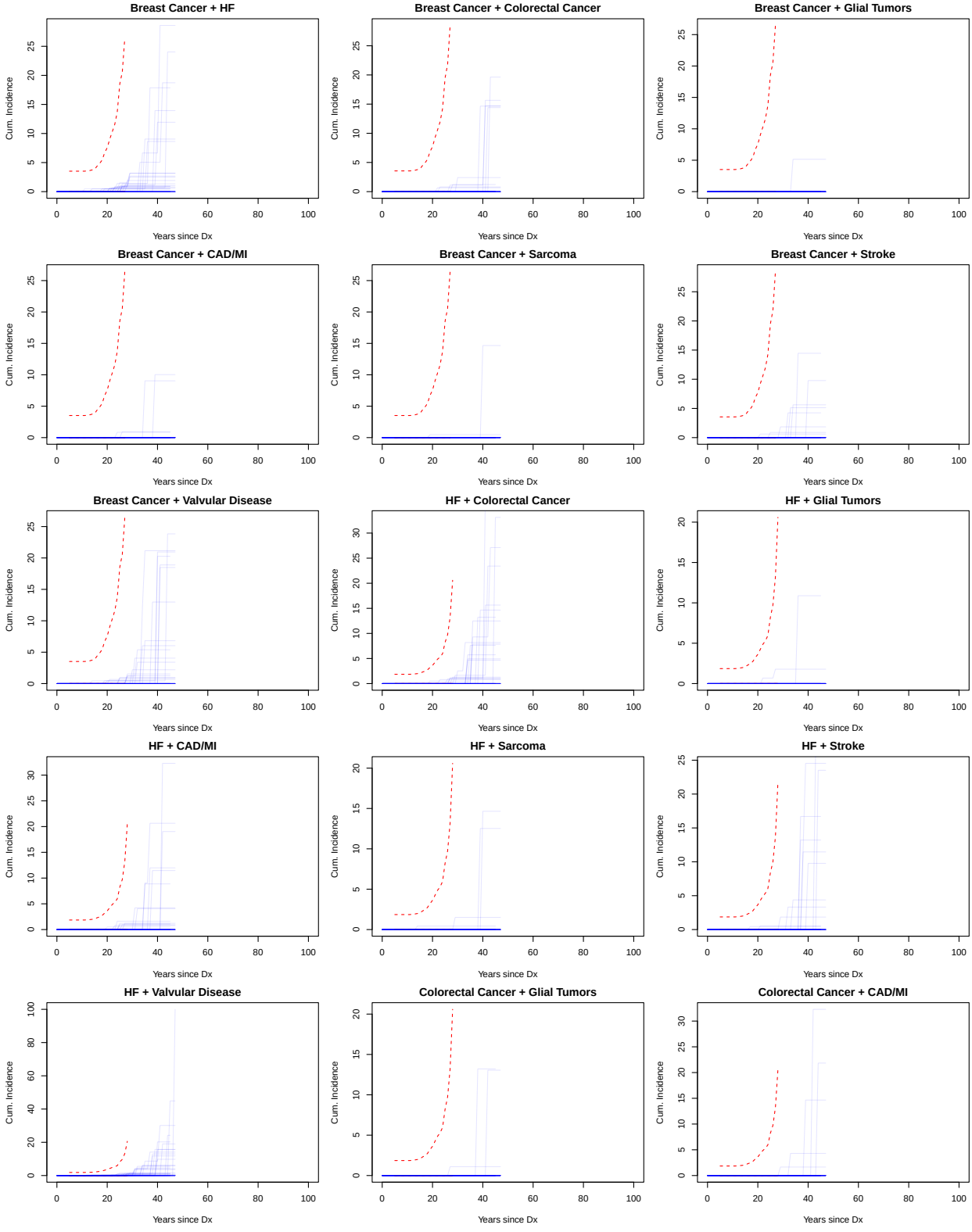

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

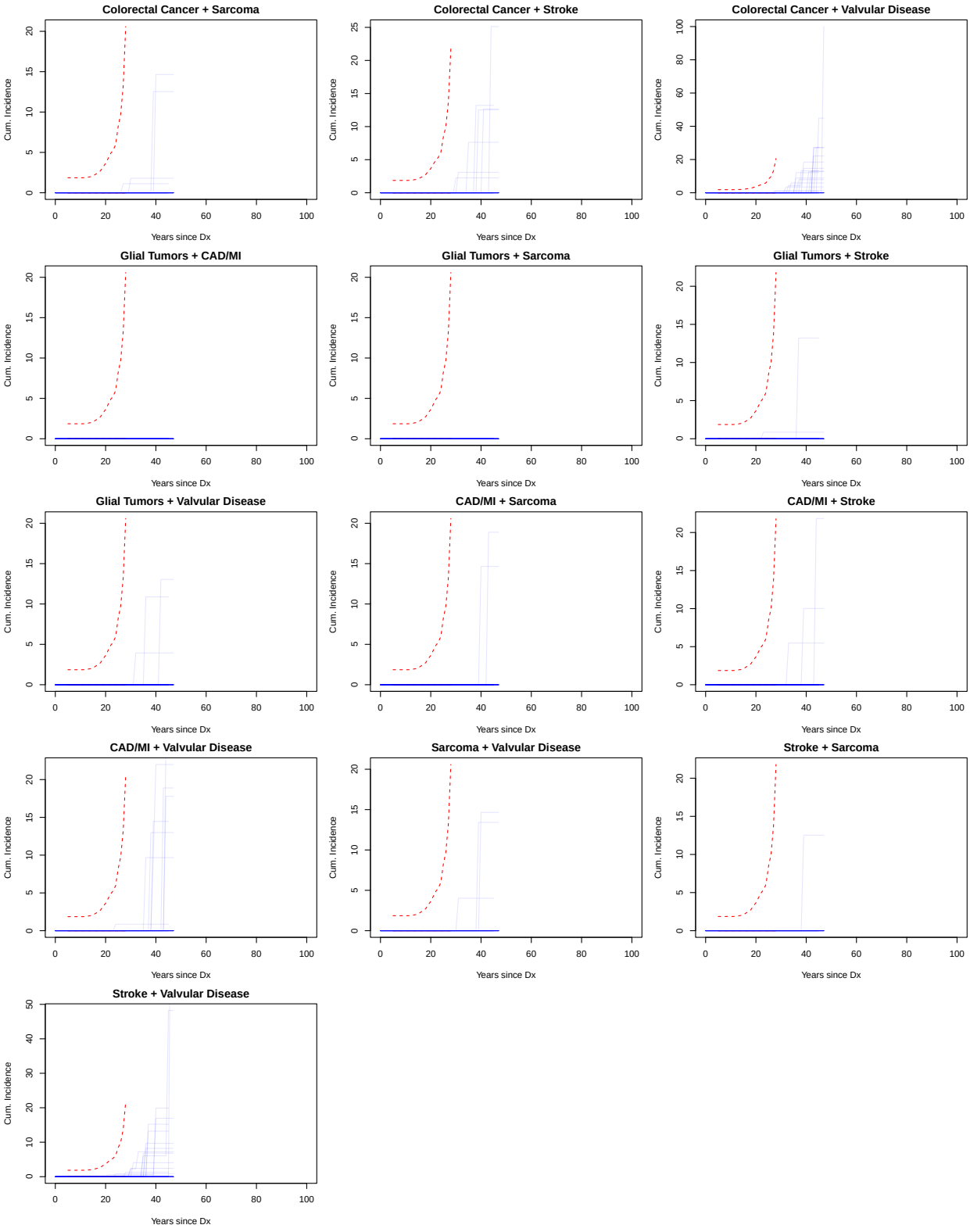
4.3.4.79 HL grp: Chest RT<35 plus chemo



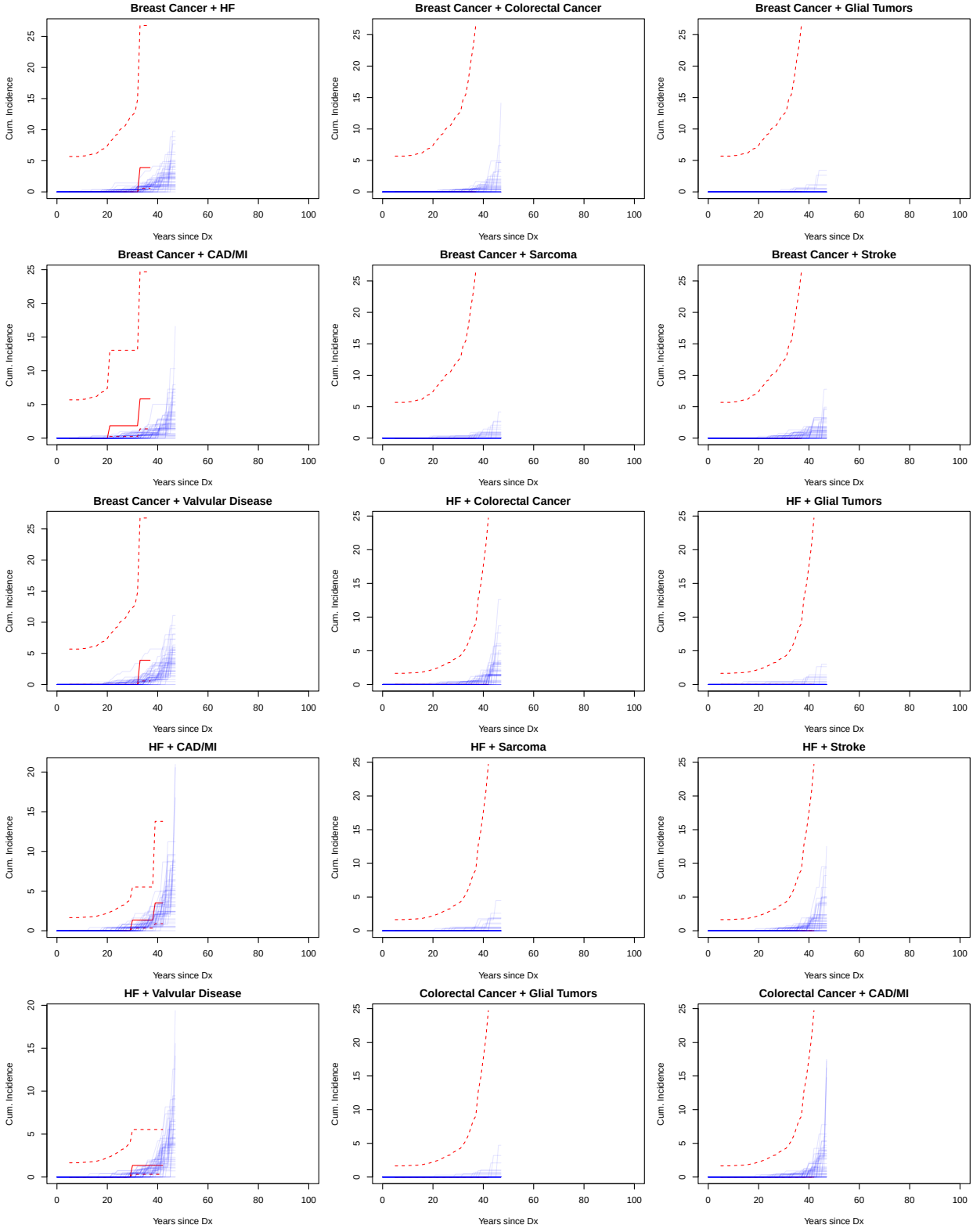

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

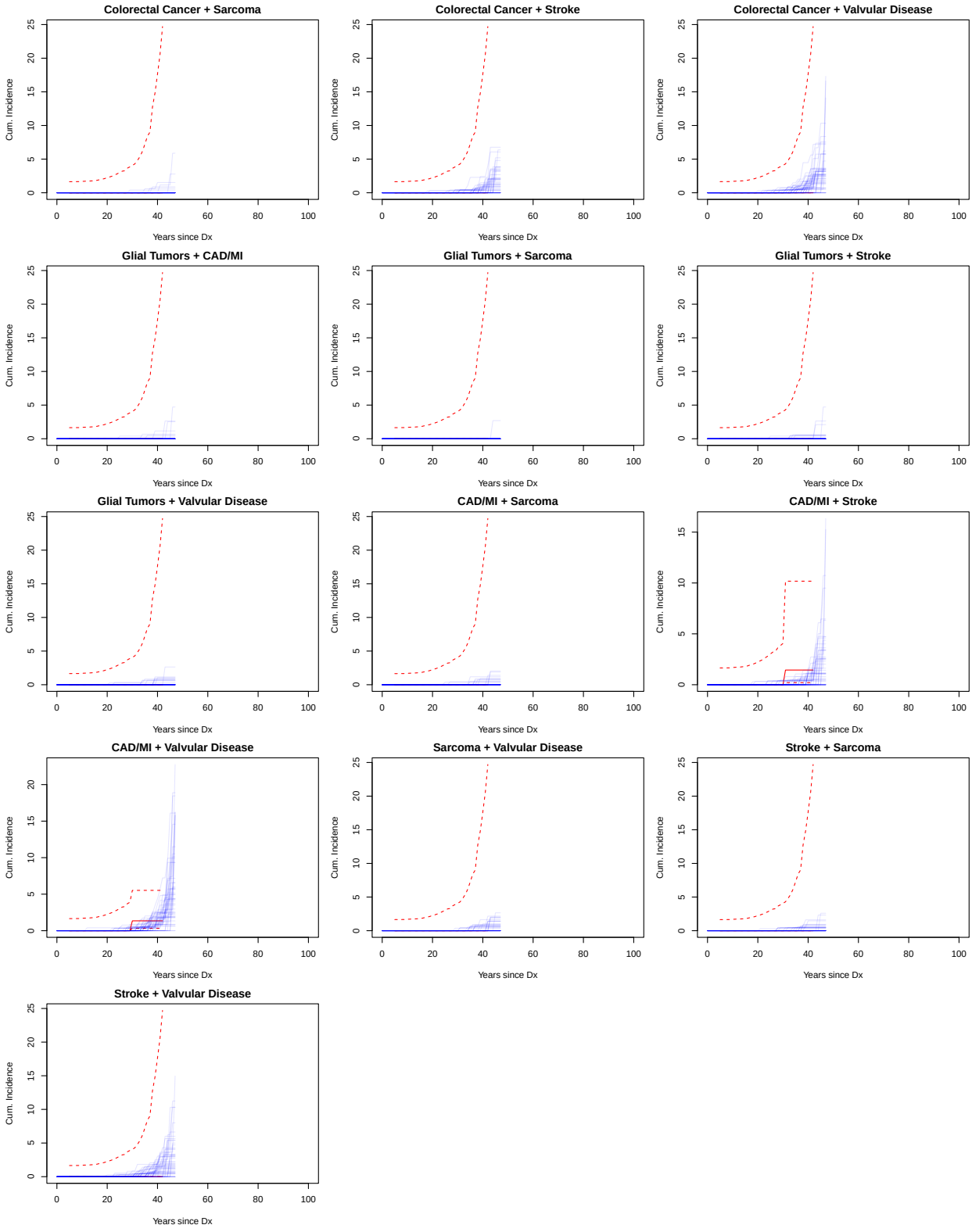
4.3.4.80 HL grp: Chemo without chest RT



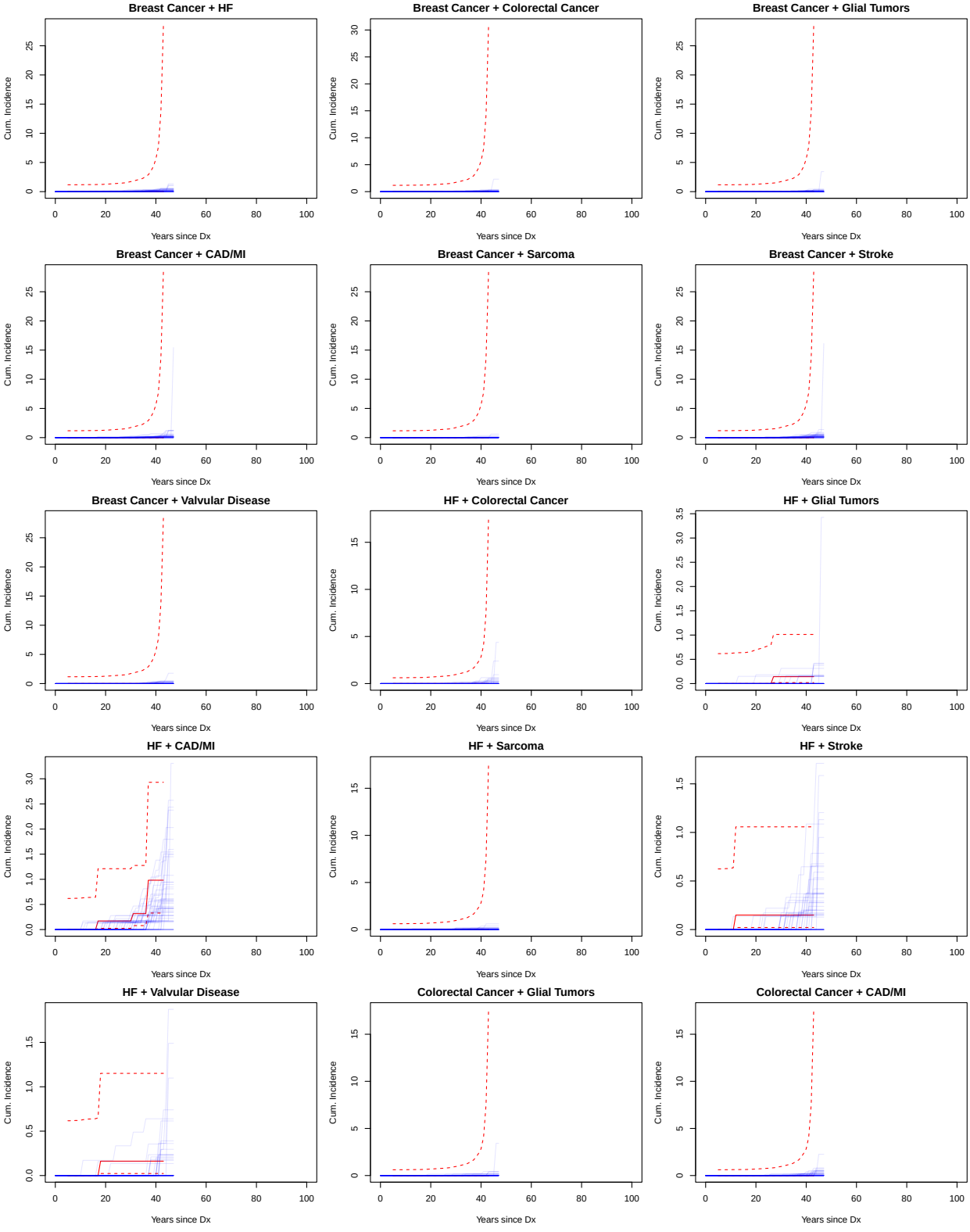

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

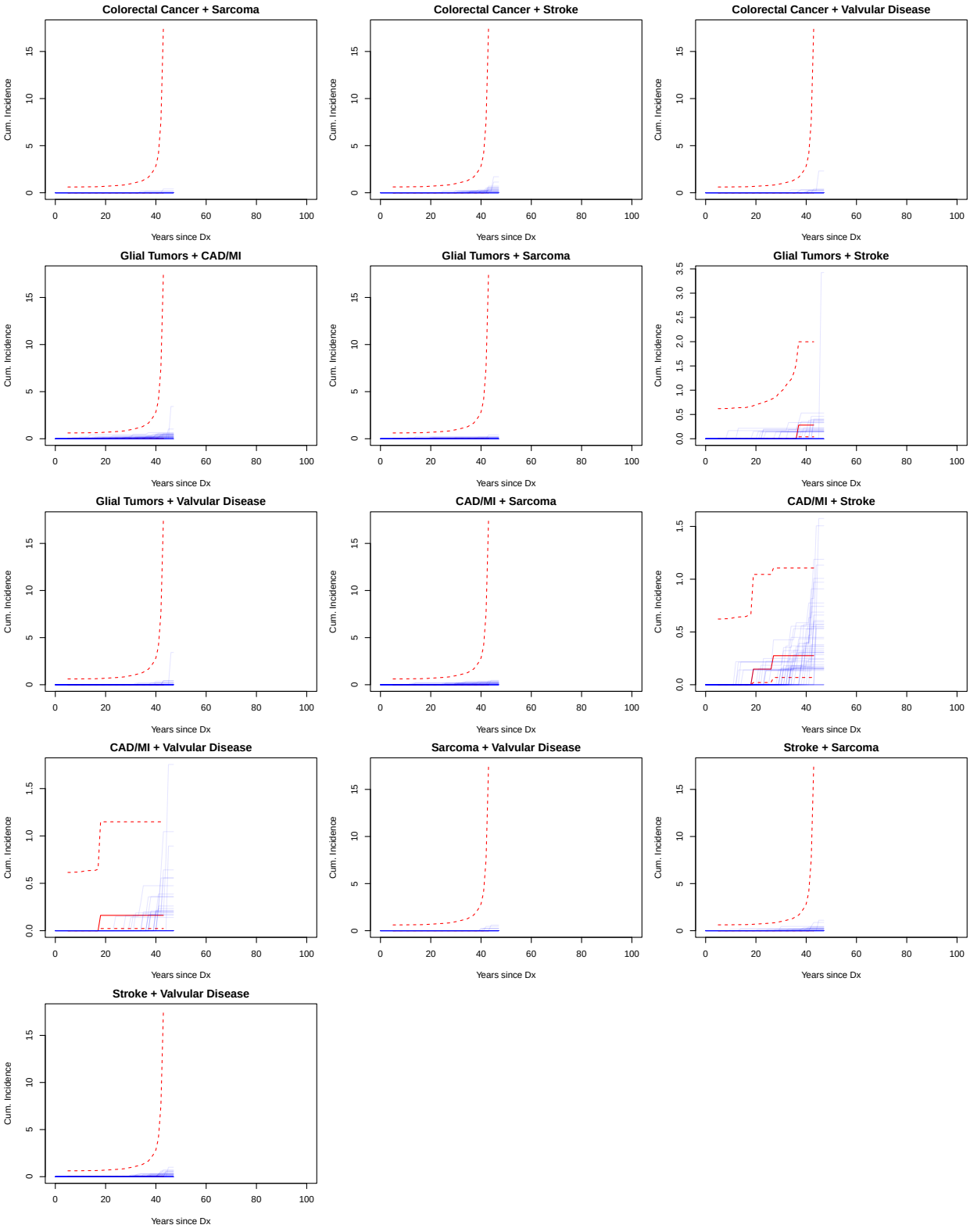
4.3.4.81 HL grp: Other



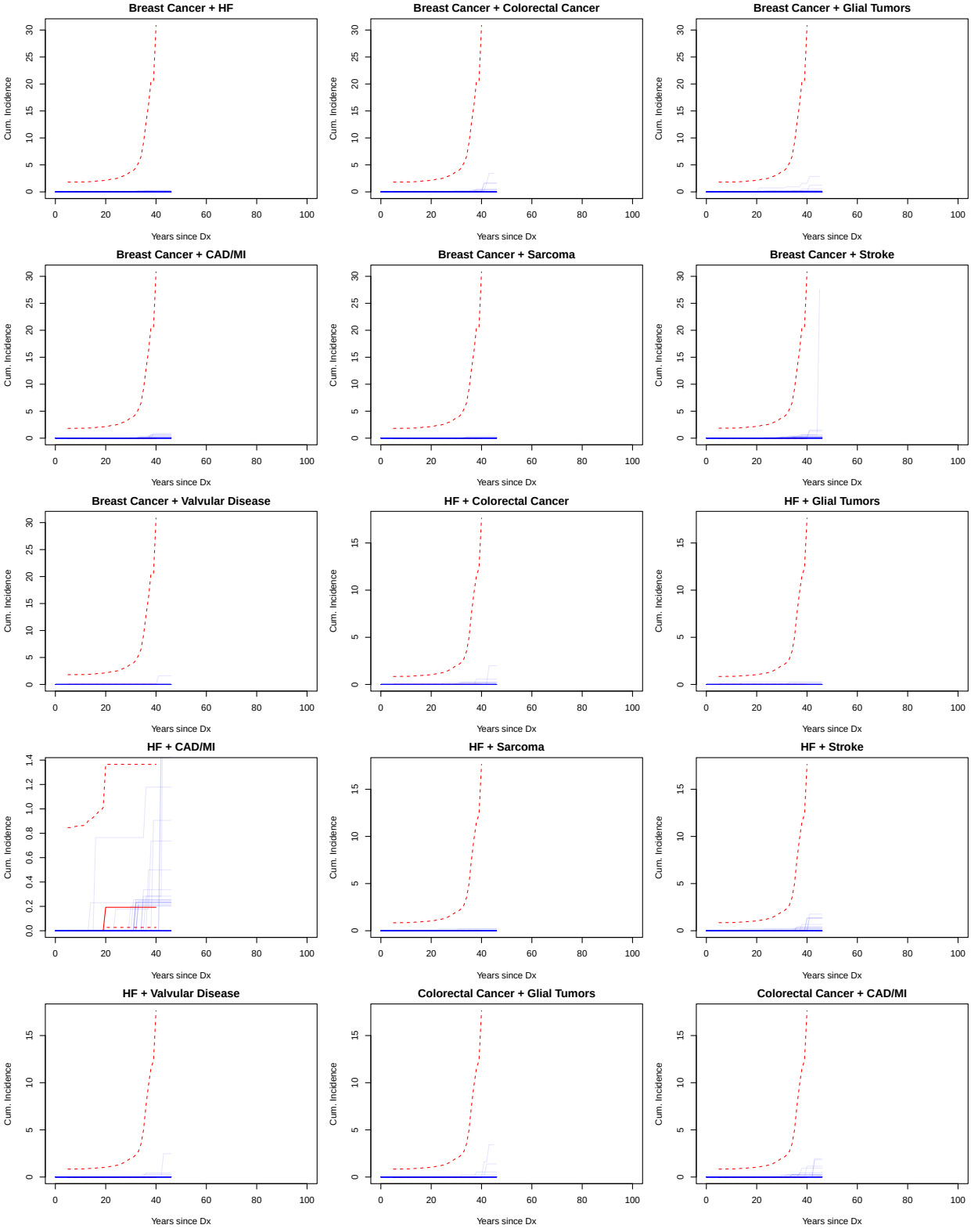

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

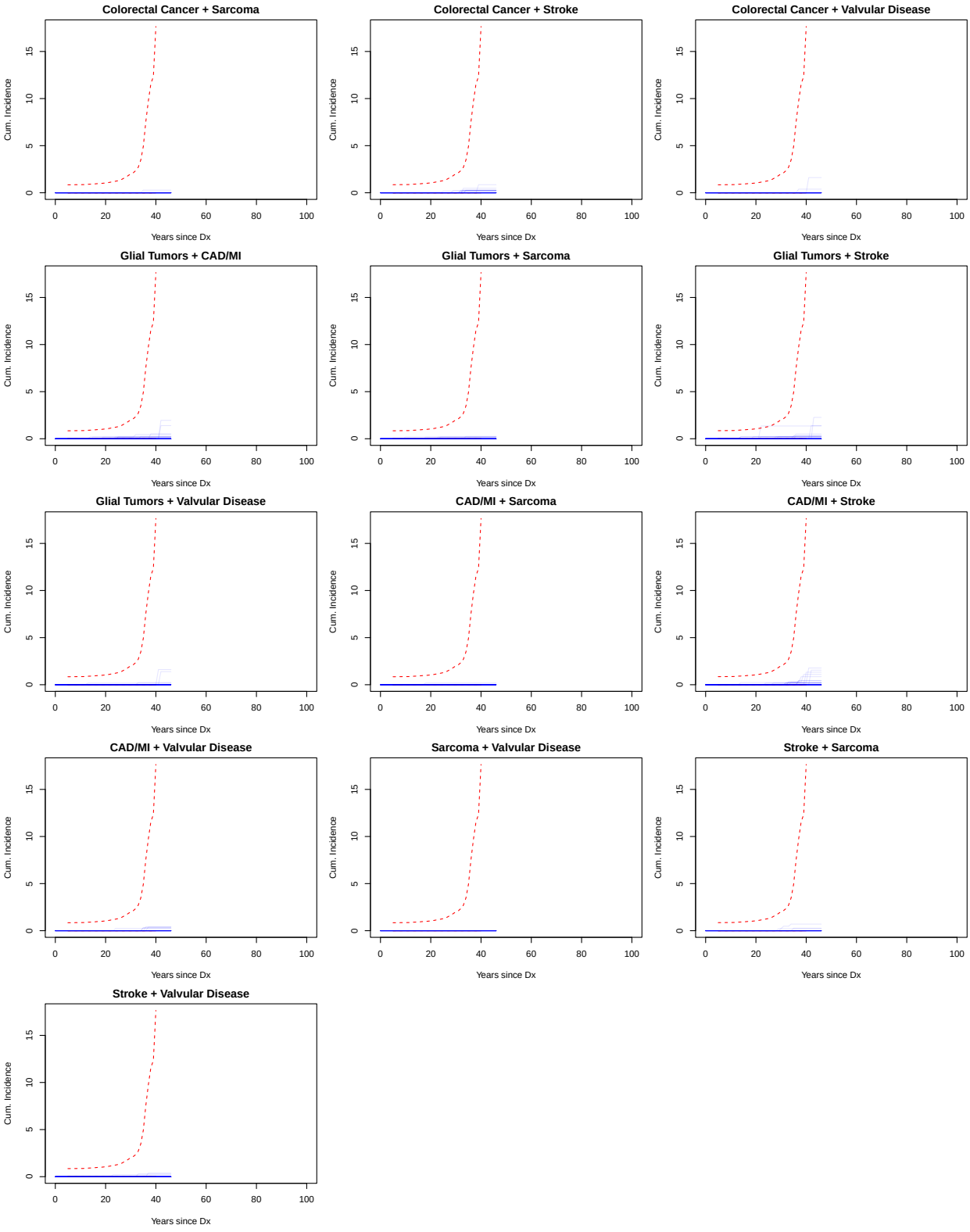
4.3.4.82 ALL grp: 1970s-like



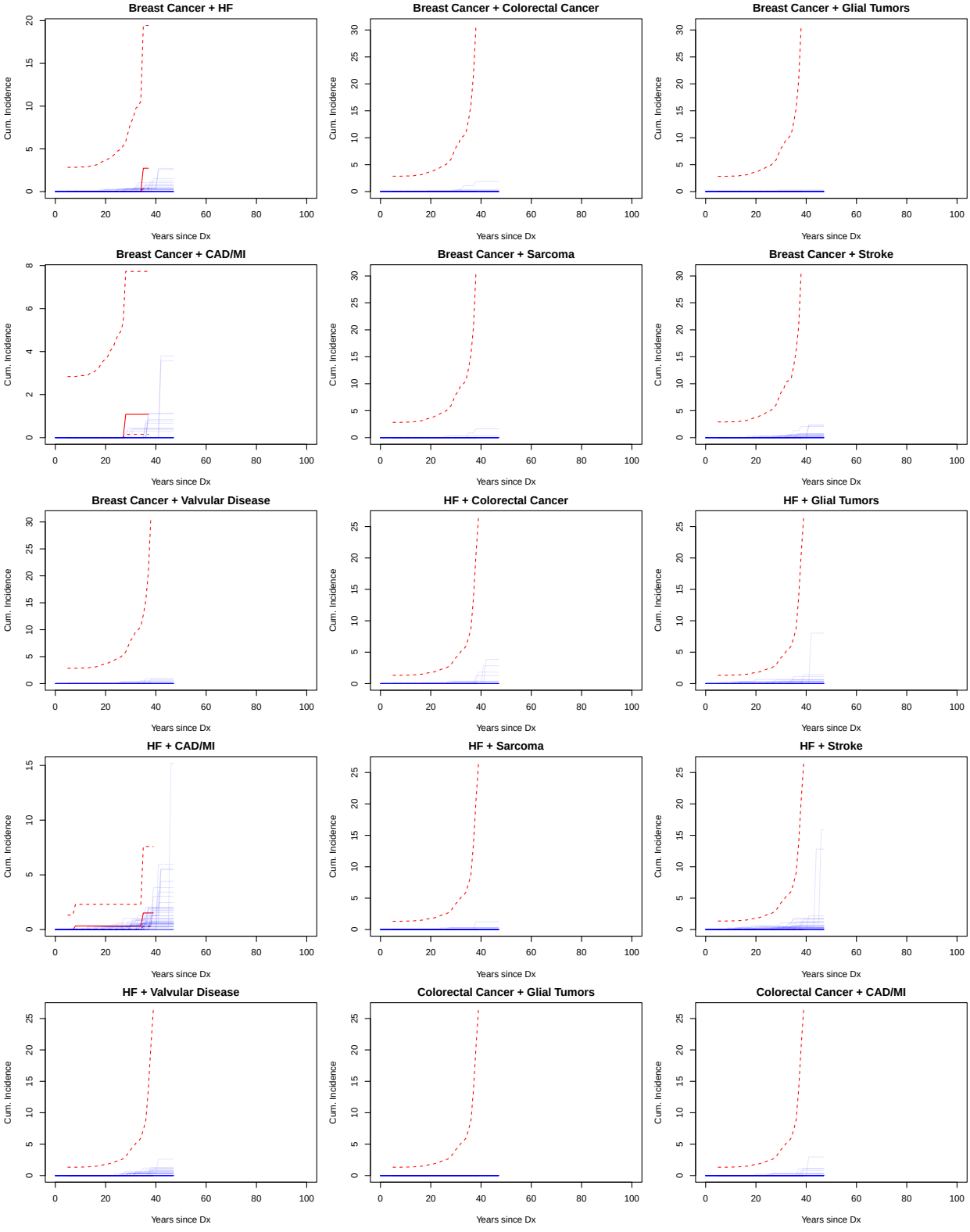

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

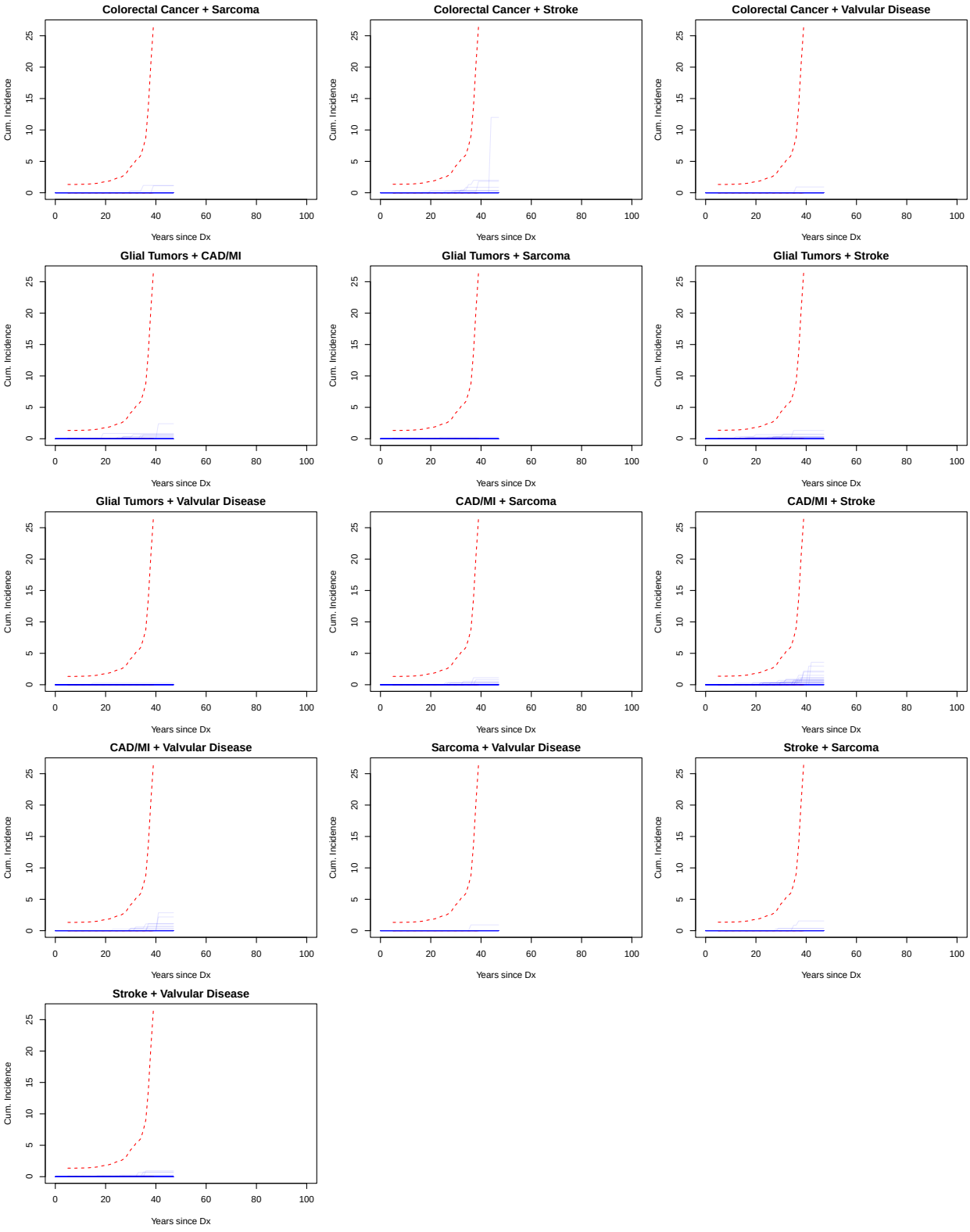
4.3.4.83 ALL grp: 1980s SR-like



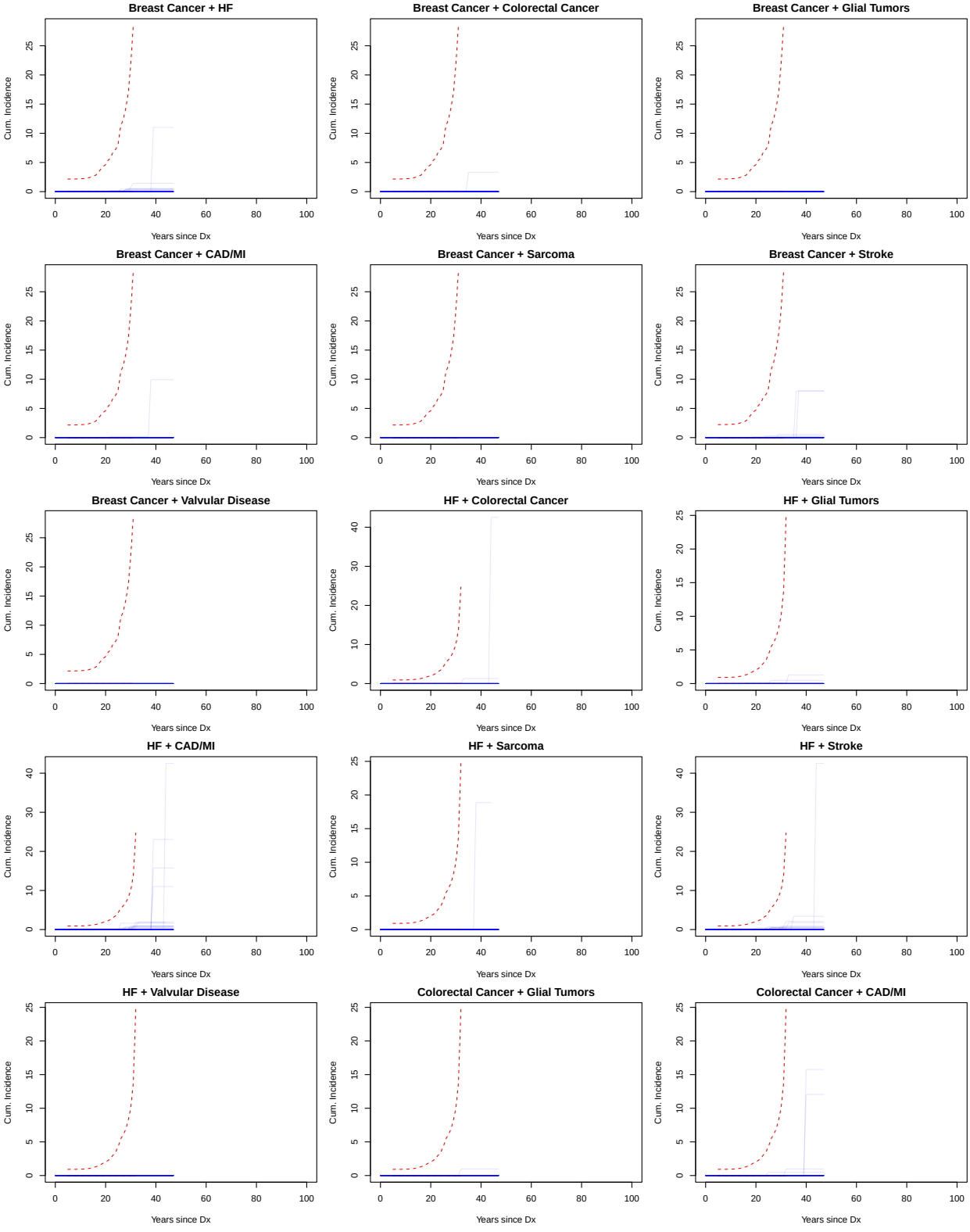

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx
0
5
10
15
0
20
40
60
80
100

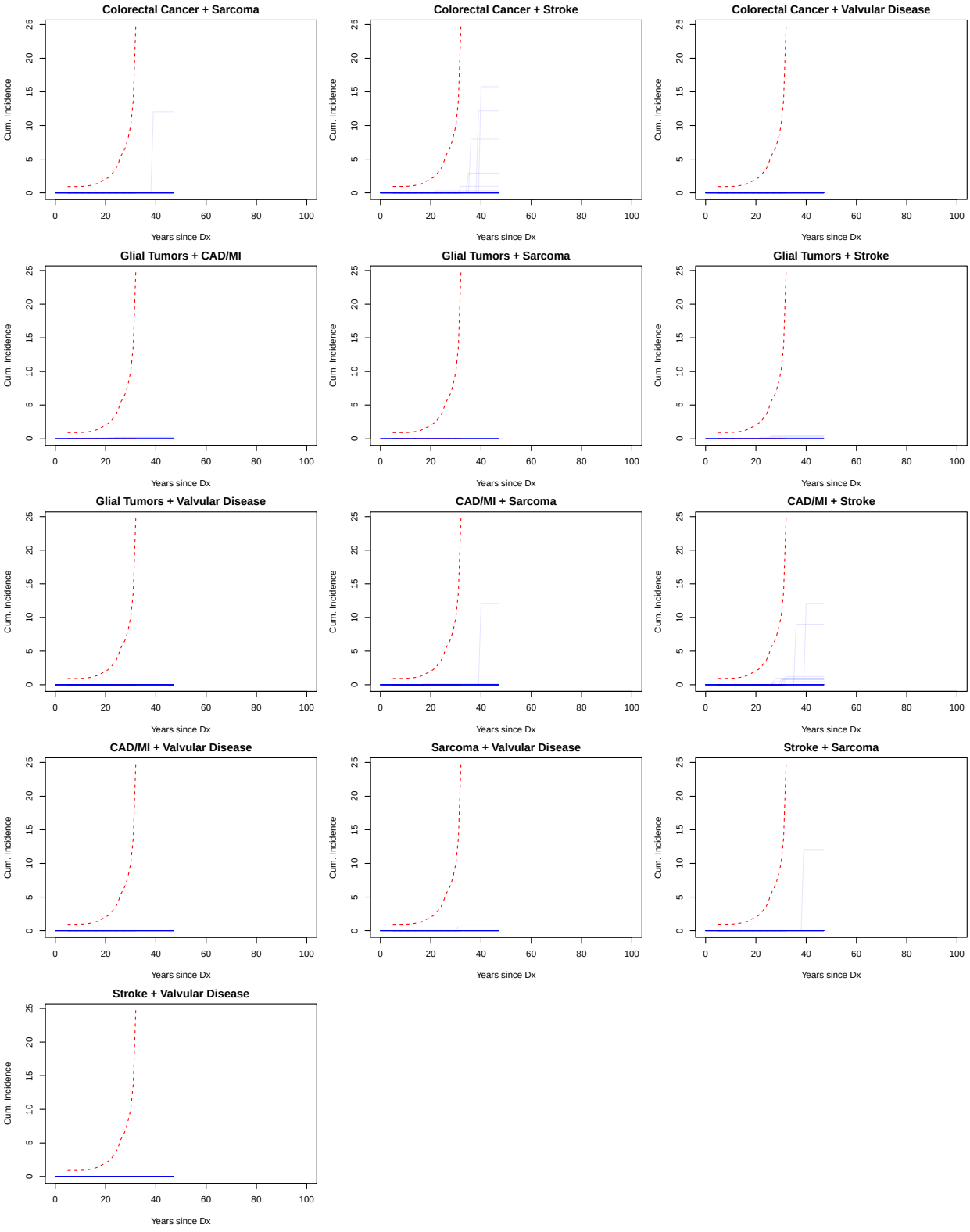
4.3.4.84 ALL grp: 1980s HR-like



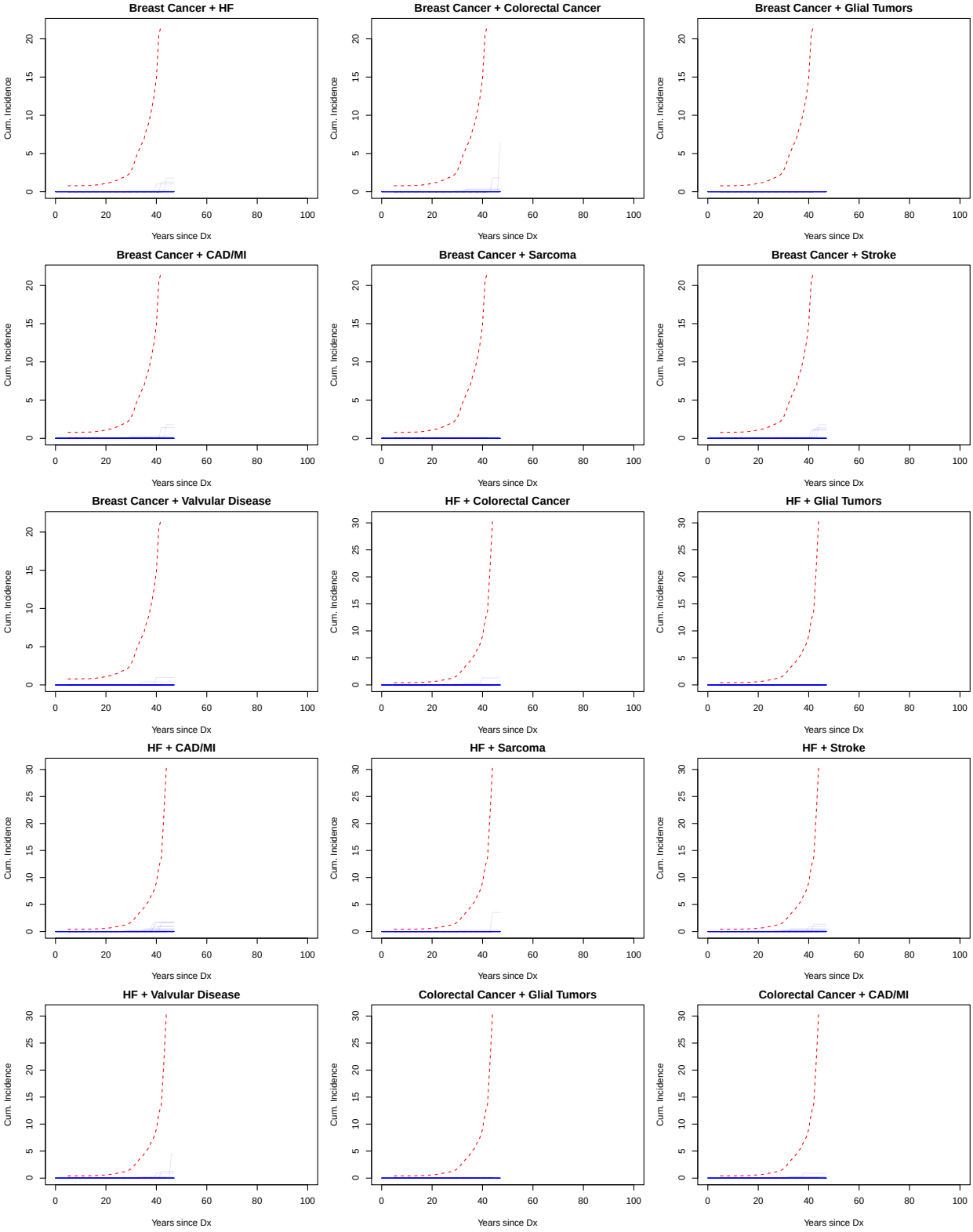

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx
0
5
10
15
20
25
0
20
40
60
80
100

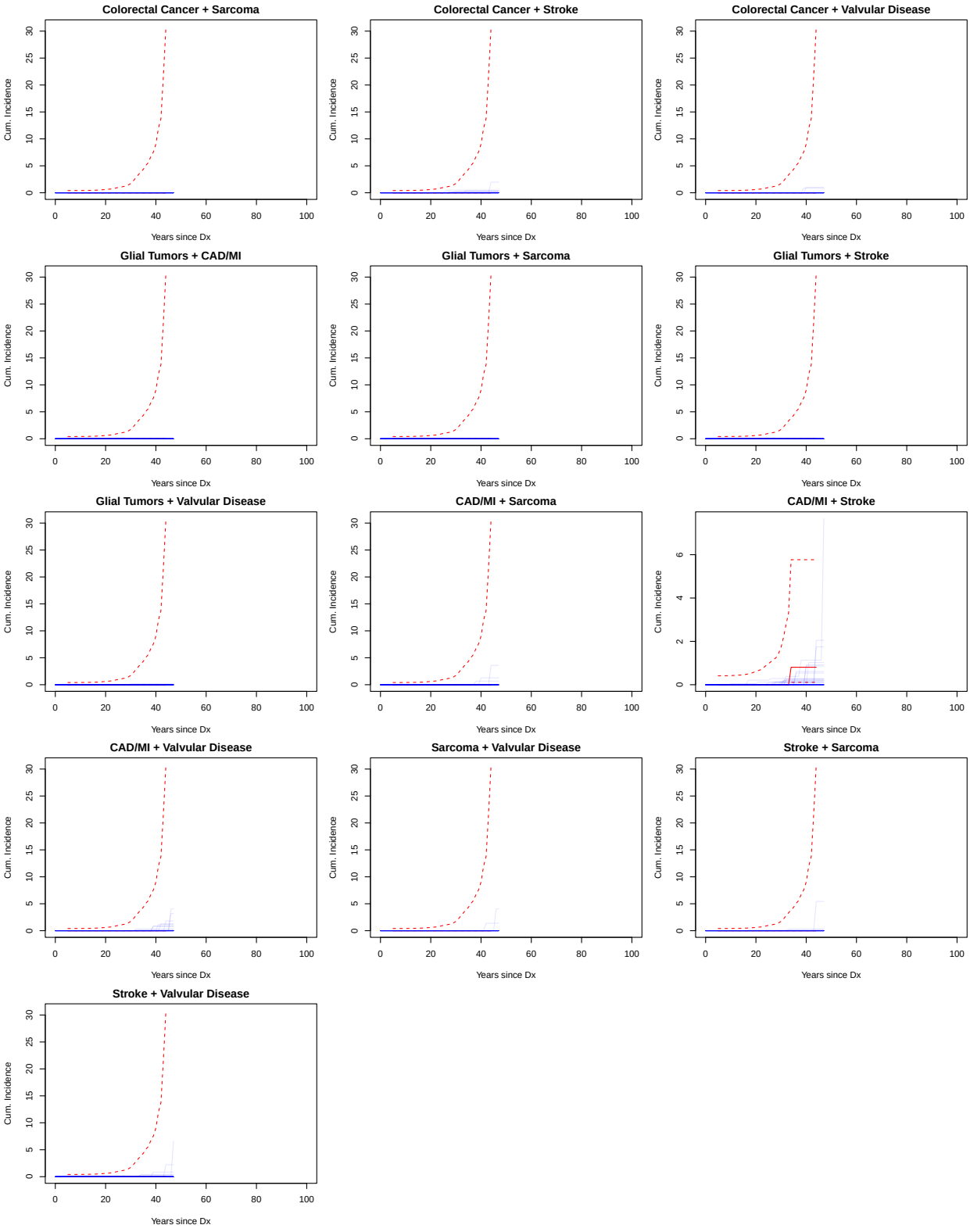
4.3.4.85 ALL grp: 1990s HR-like



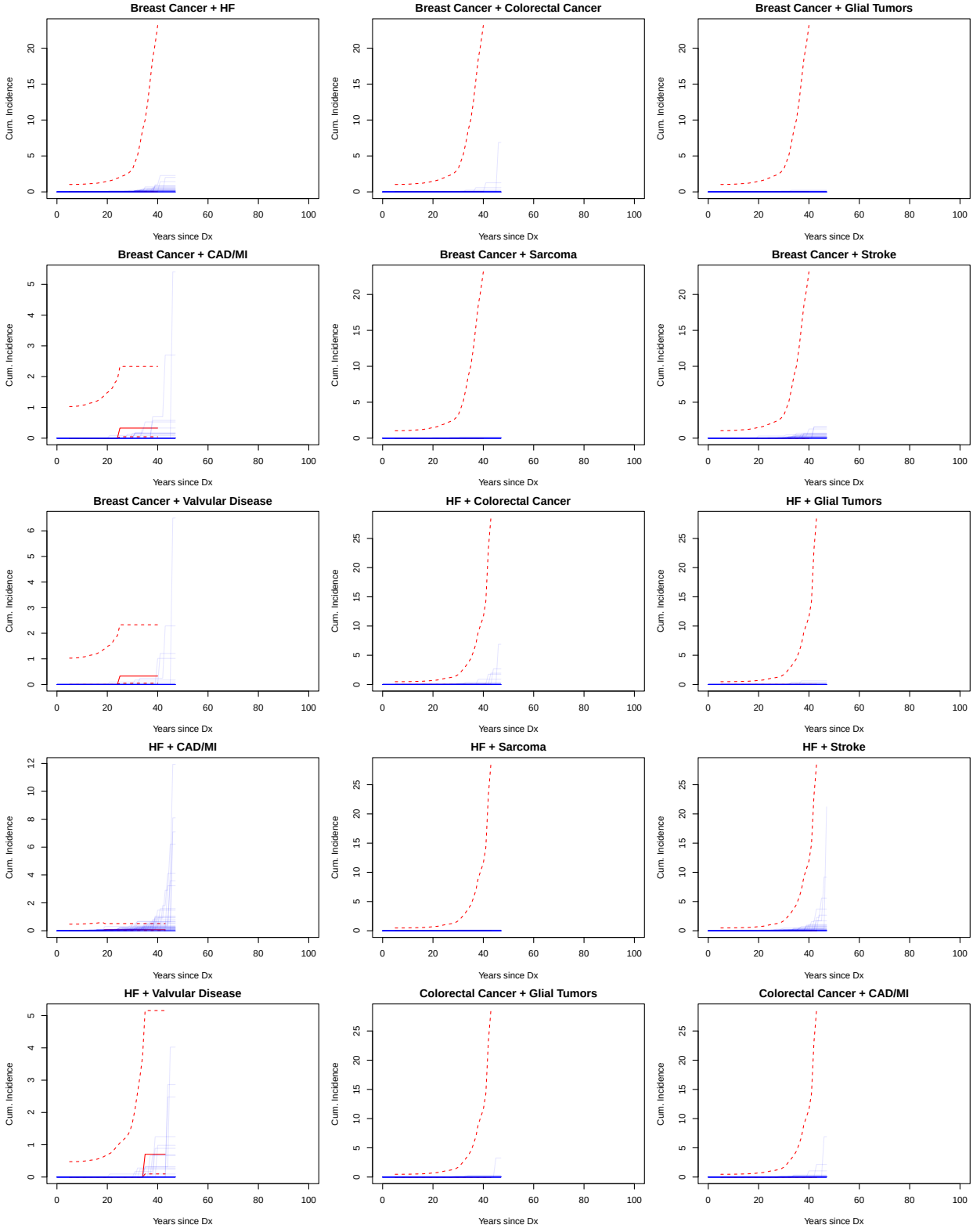

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx
0
5
10
15
20
25
0
20
40
60
80
100

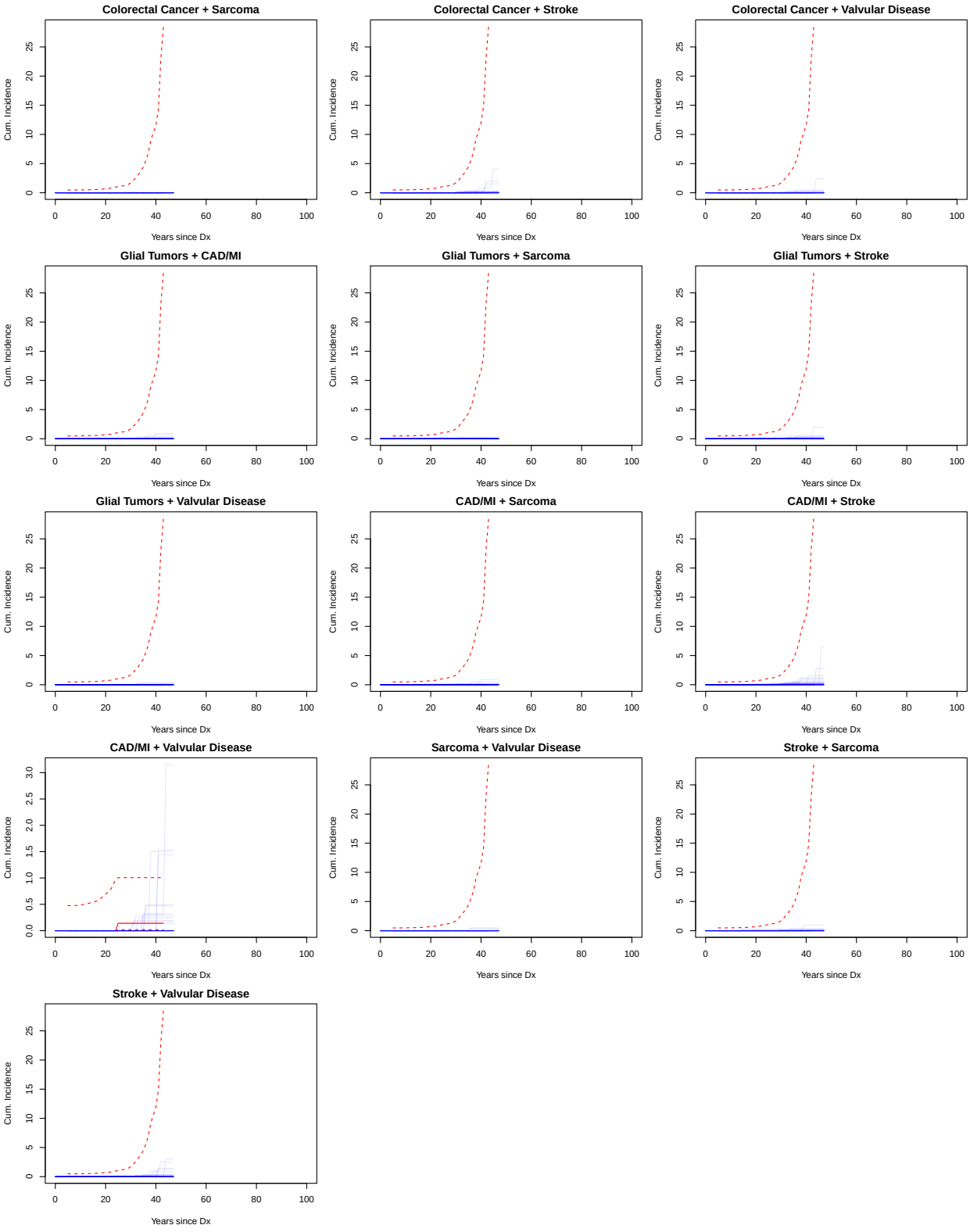
4.3.4.86 ALL grp: 1990s SR/Essig



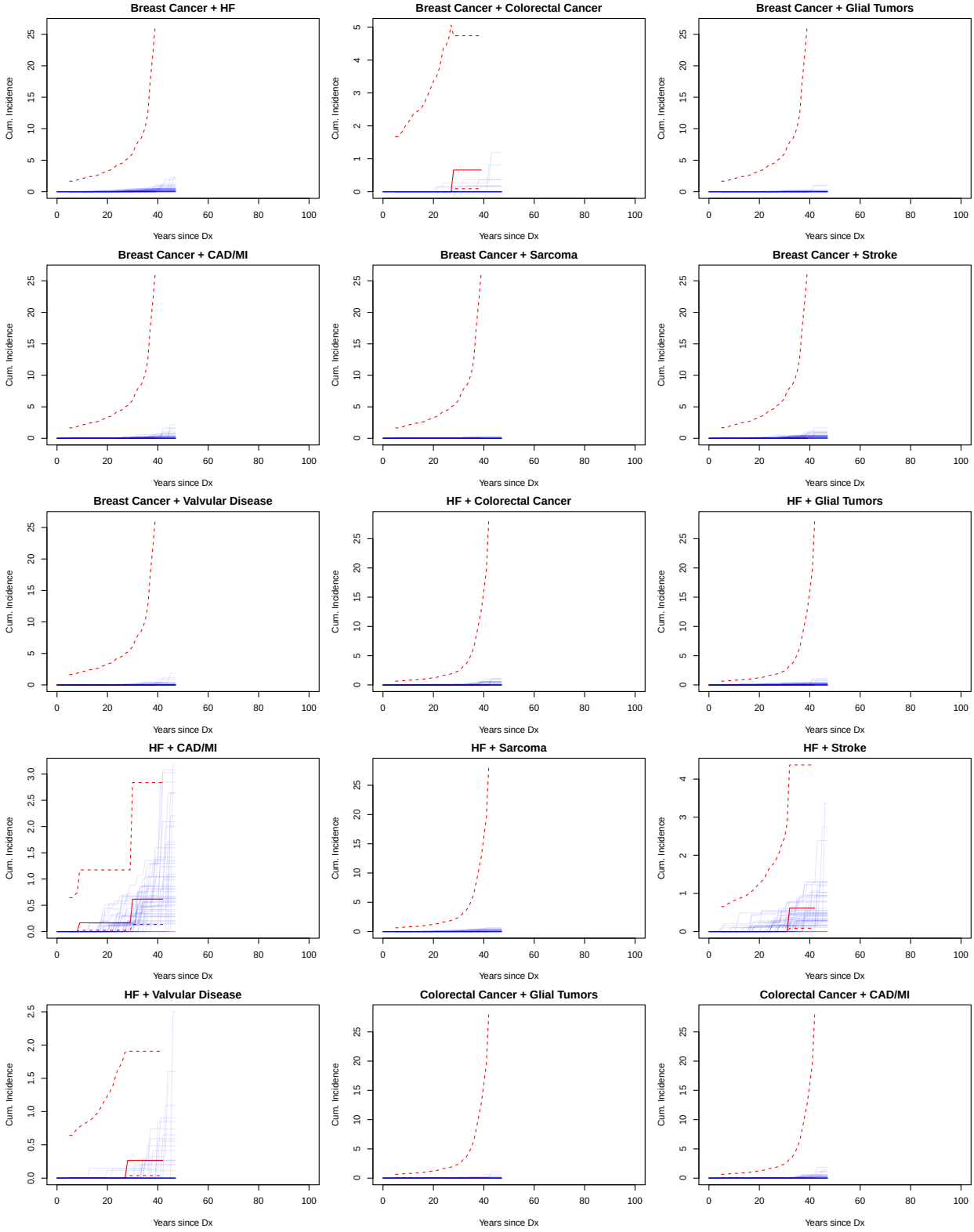

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

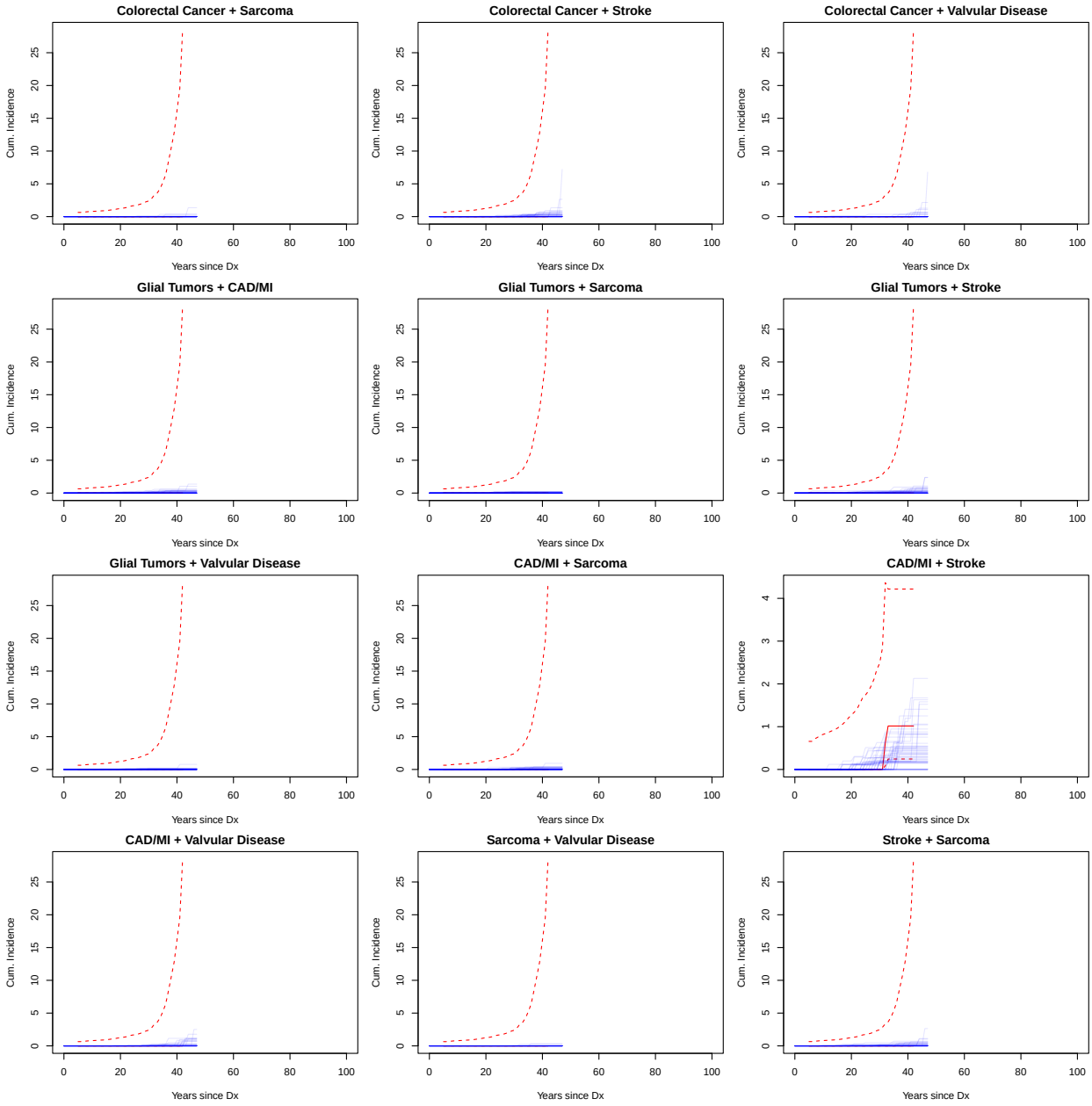
4.3.4.87 ALL grp: Other

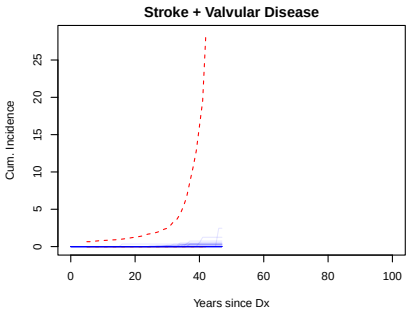



Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

4.3.4.88 ALL grp: Relapse/Transplant

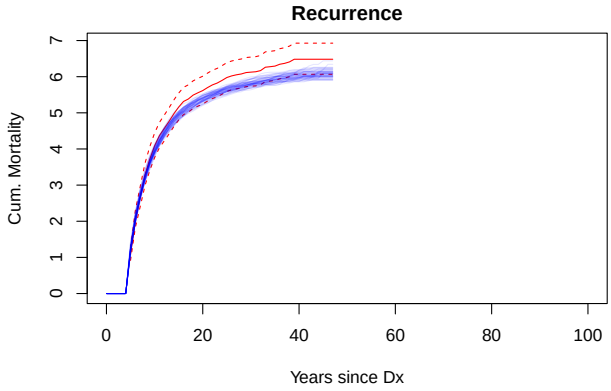


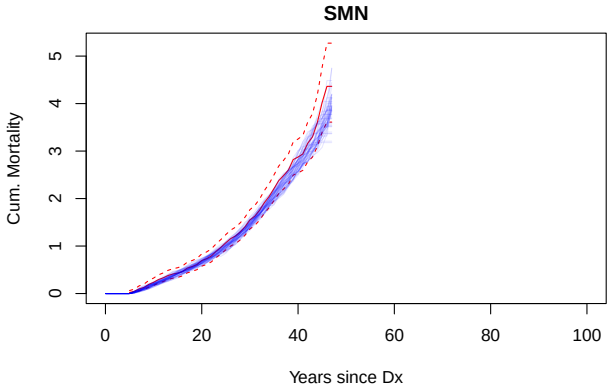

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Cum. Incidence
Years since Dx

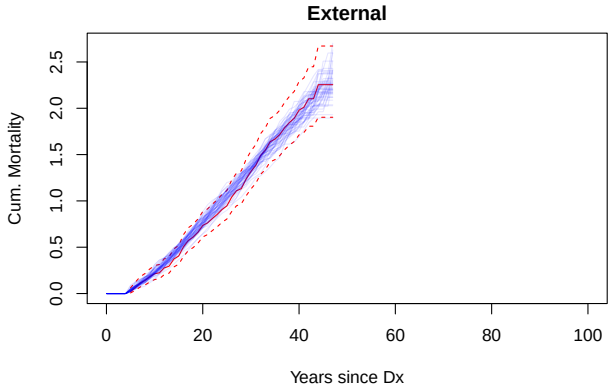

Stroke + Valvular Disease
Cum. Incidence
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx

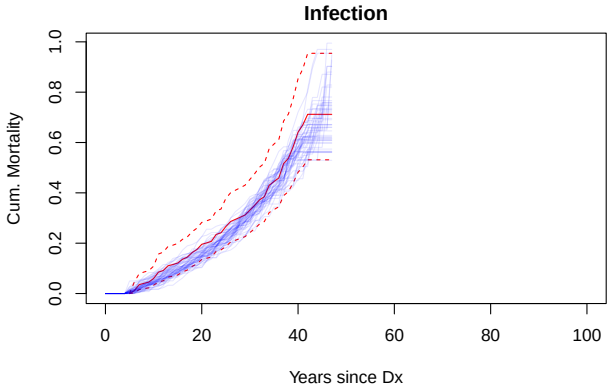
4.3.5 Cumulative Mortality

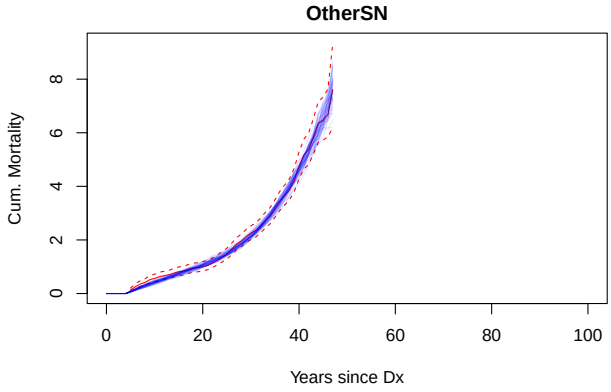
4.3.5.1 Overall

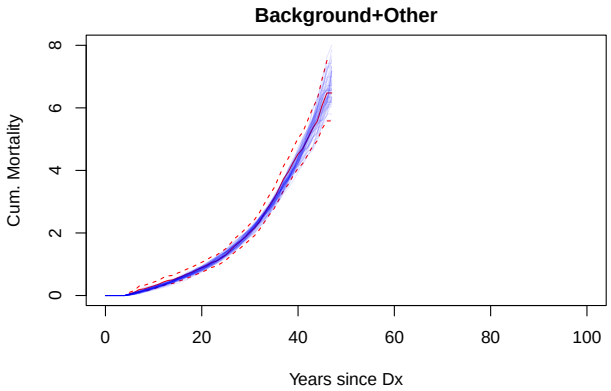




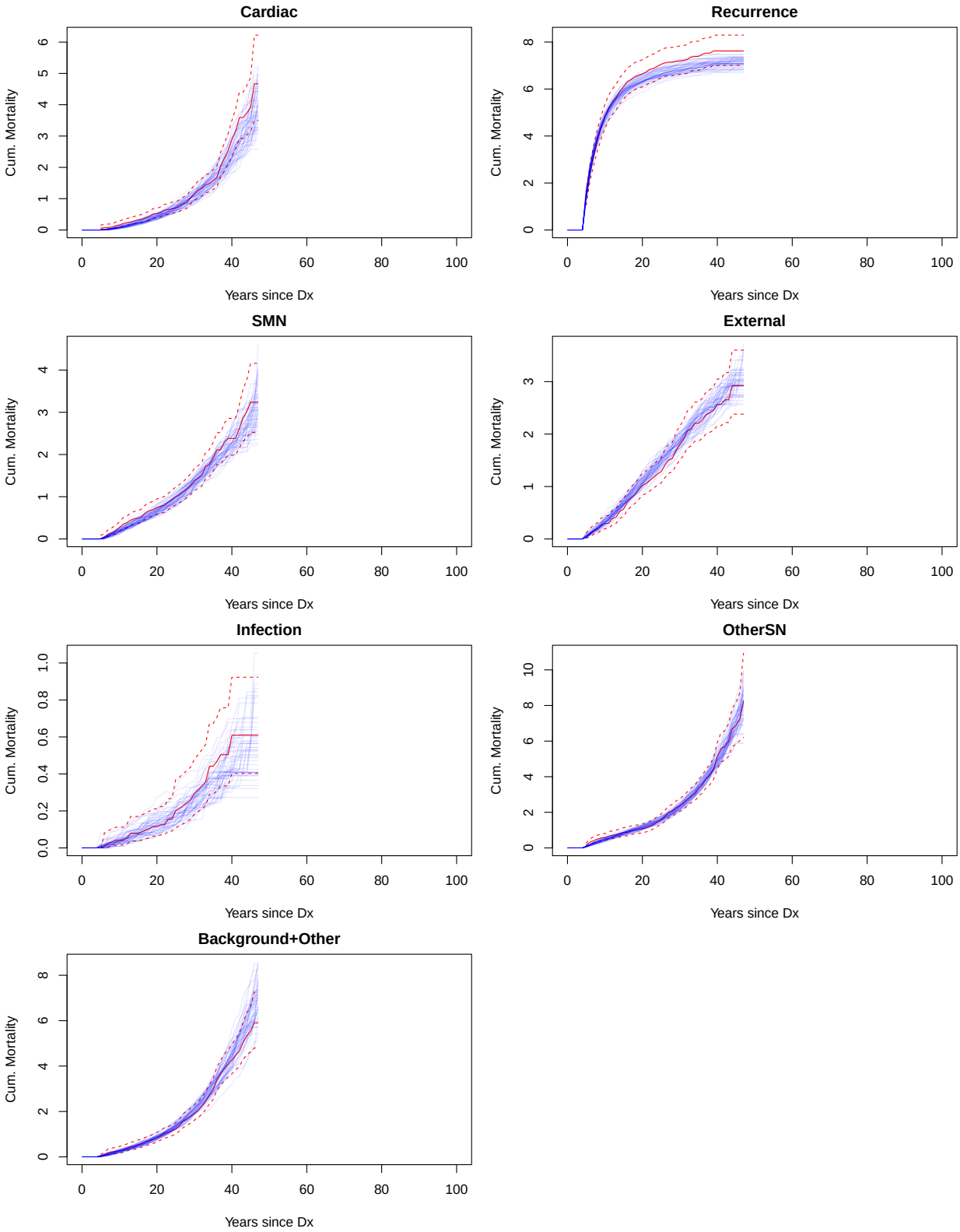




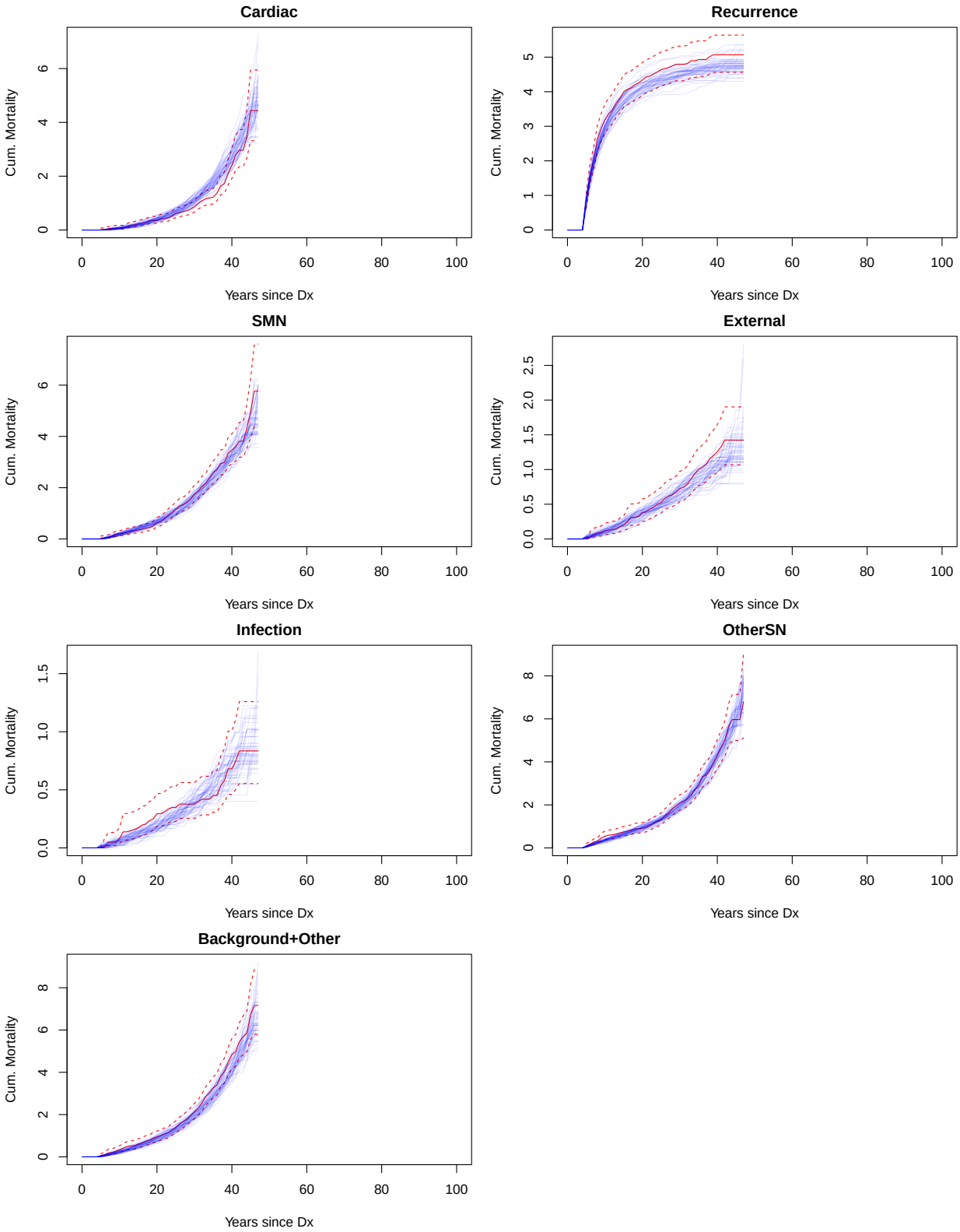




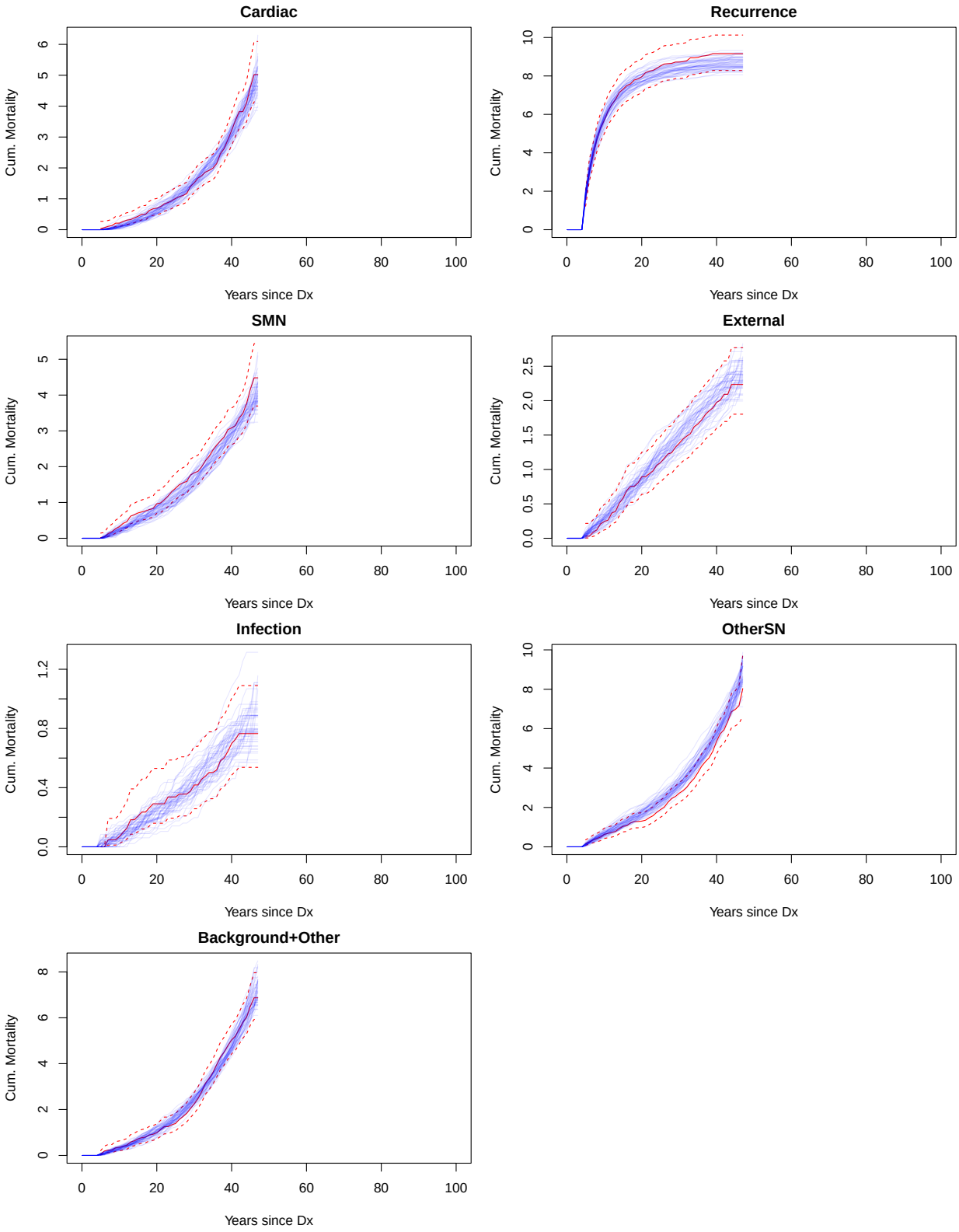
4.3.5.2 Male


Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

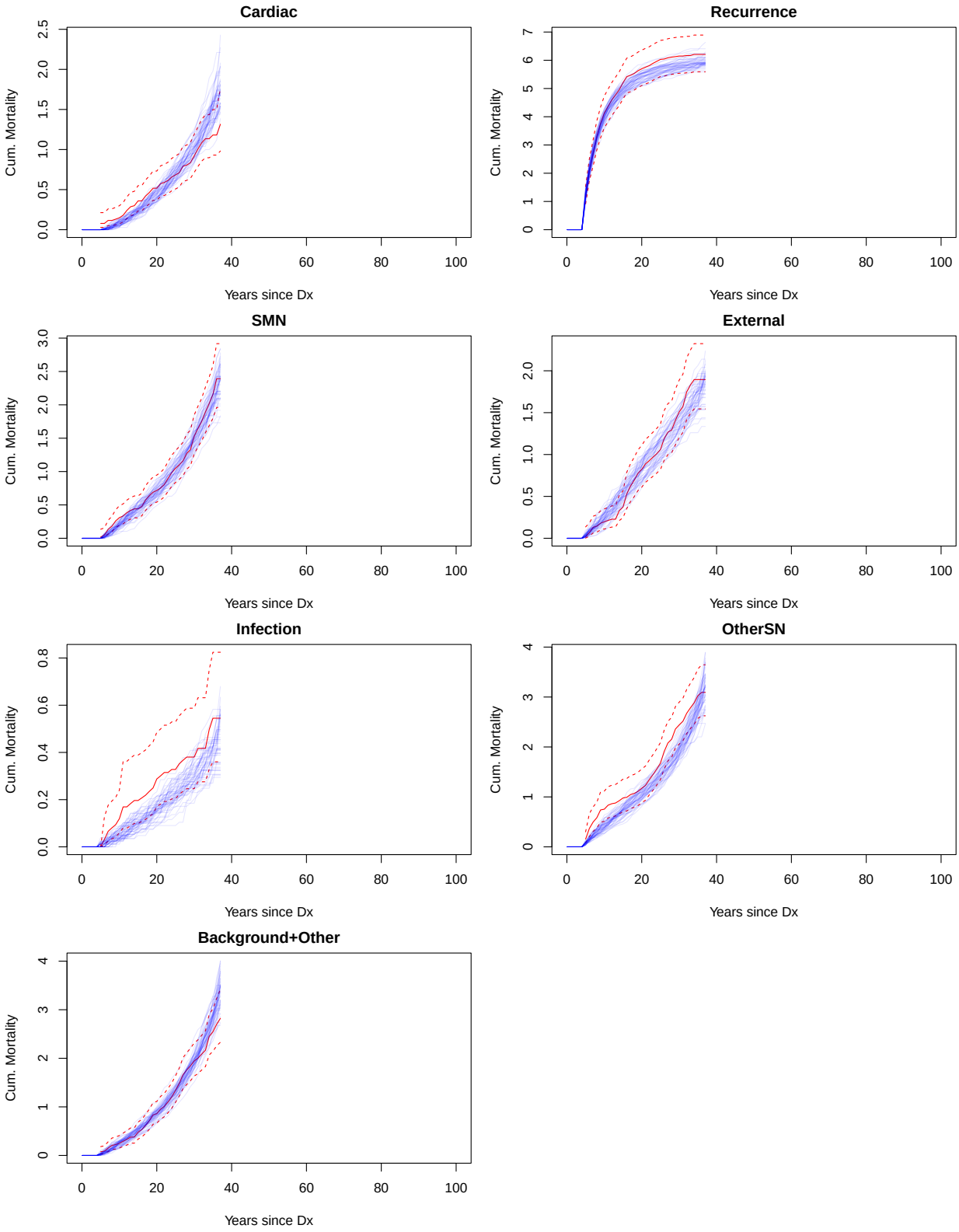
4.3.5.3 Female


Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

4.3.5.4 1970s

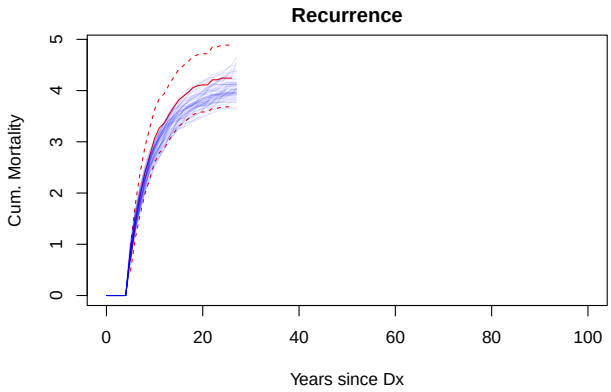

Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

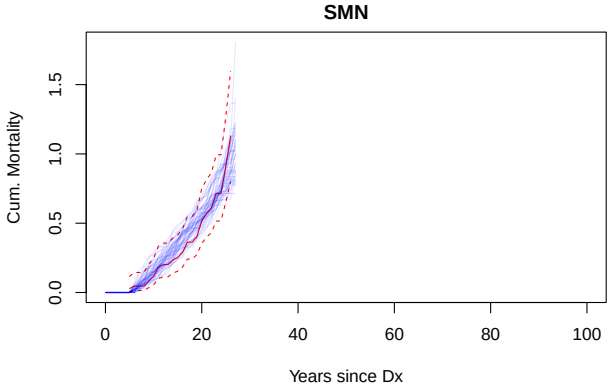
4.3.5.5 1980s

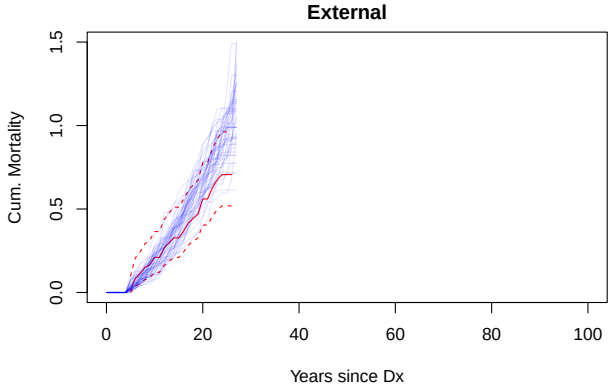

Cardiac
Cum. Mortality
Years since Dx
Recurrence
Cum. Mortality
Years since Dx
SMN
Cum. Mortality
Years since Dx
External
Cum. Mortality
Years since Dx
Infection
Cum. Mortality
Years since Dx
OtherSN
Cum. Mortality
Years since Dx
Background+Other
Cum. Mortality
Years since Dx

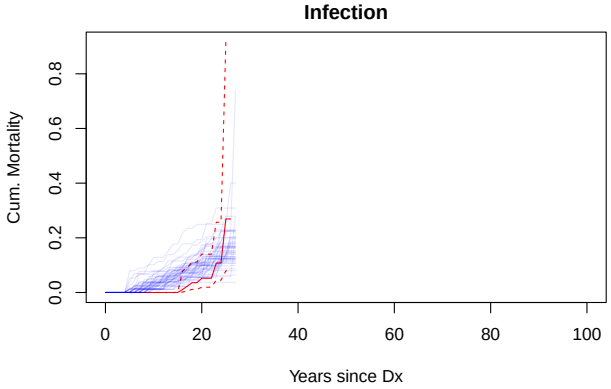
4.3.5.6 1990s

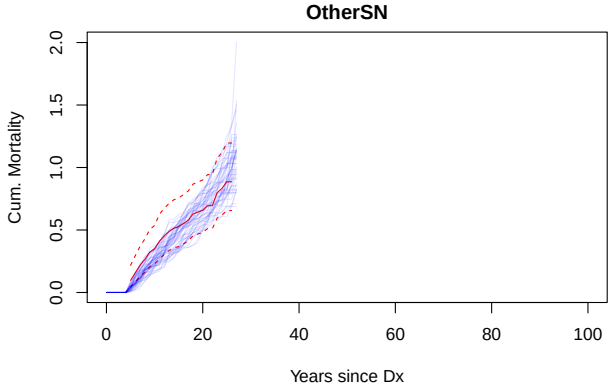
Cardiac
Cum. Mortality
0.0
0.2
0.4
0.6
0.8
0
20
40
60
80
100
Years since Dx

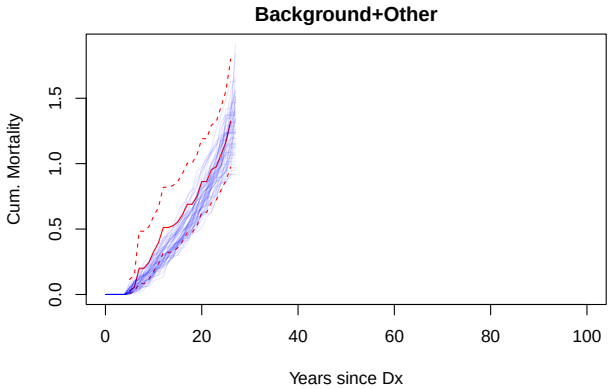

Recurrence
Cum. Mortality
0
1
2
3
4
5
0
20
40
60
80
100
Years since Dx


SMN
Cum. Mortality
0.0
0.5
1.0
1.5
0
20
40
60
80
100
Years since Dx

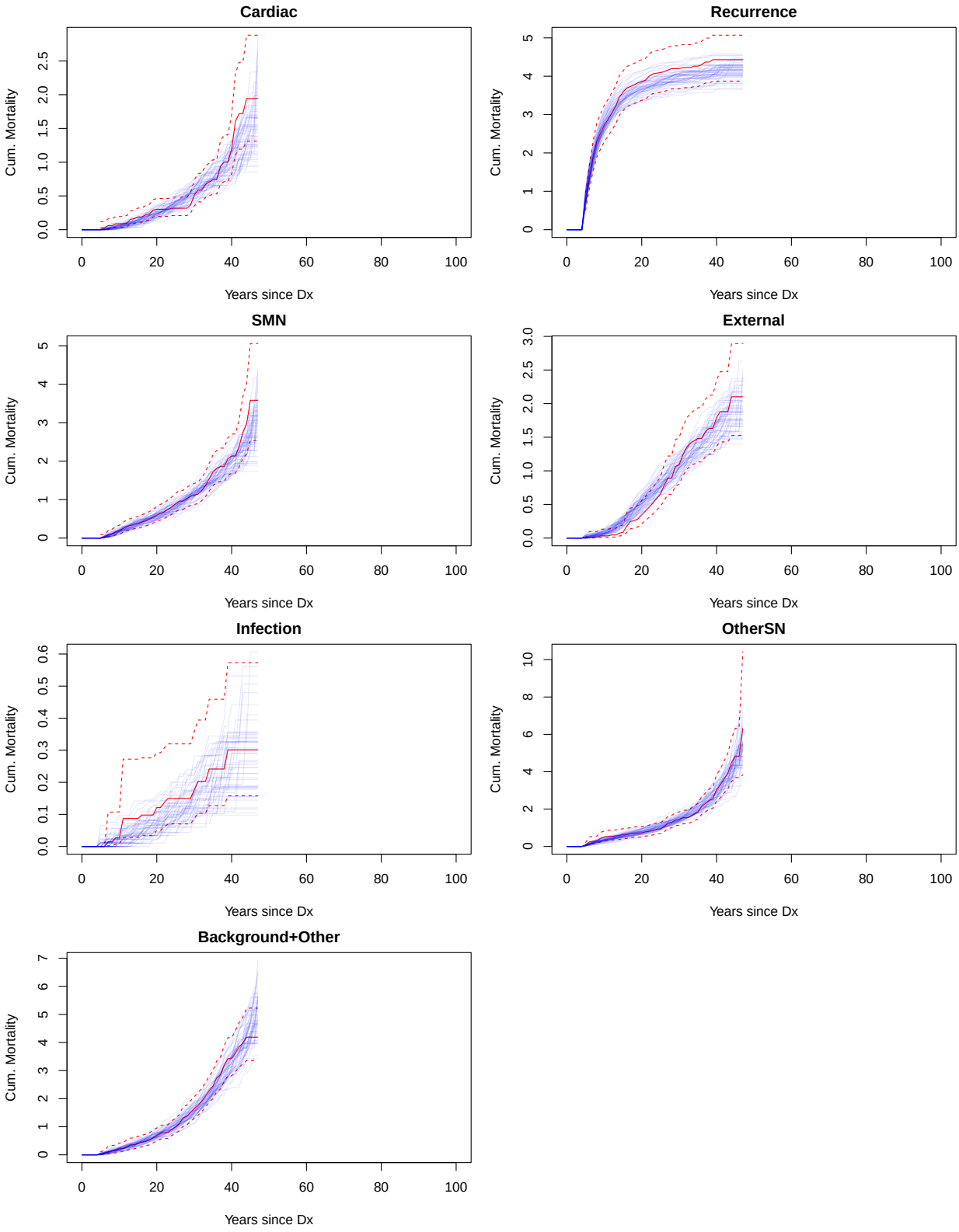

External
Cum. Mortality
0.0
0.5
1.0
1.5
0
20
40
60
80
100
Years since Dx


Infection
Cum. Mortality
0.0
0.2
0.4
0.6
0.8
0
20
40
60
80
100
Years since Dx

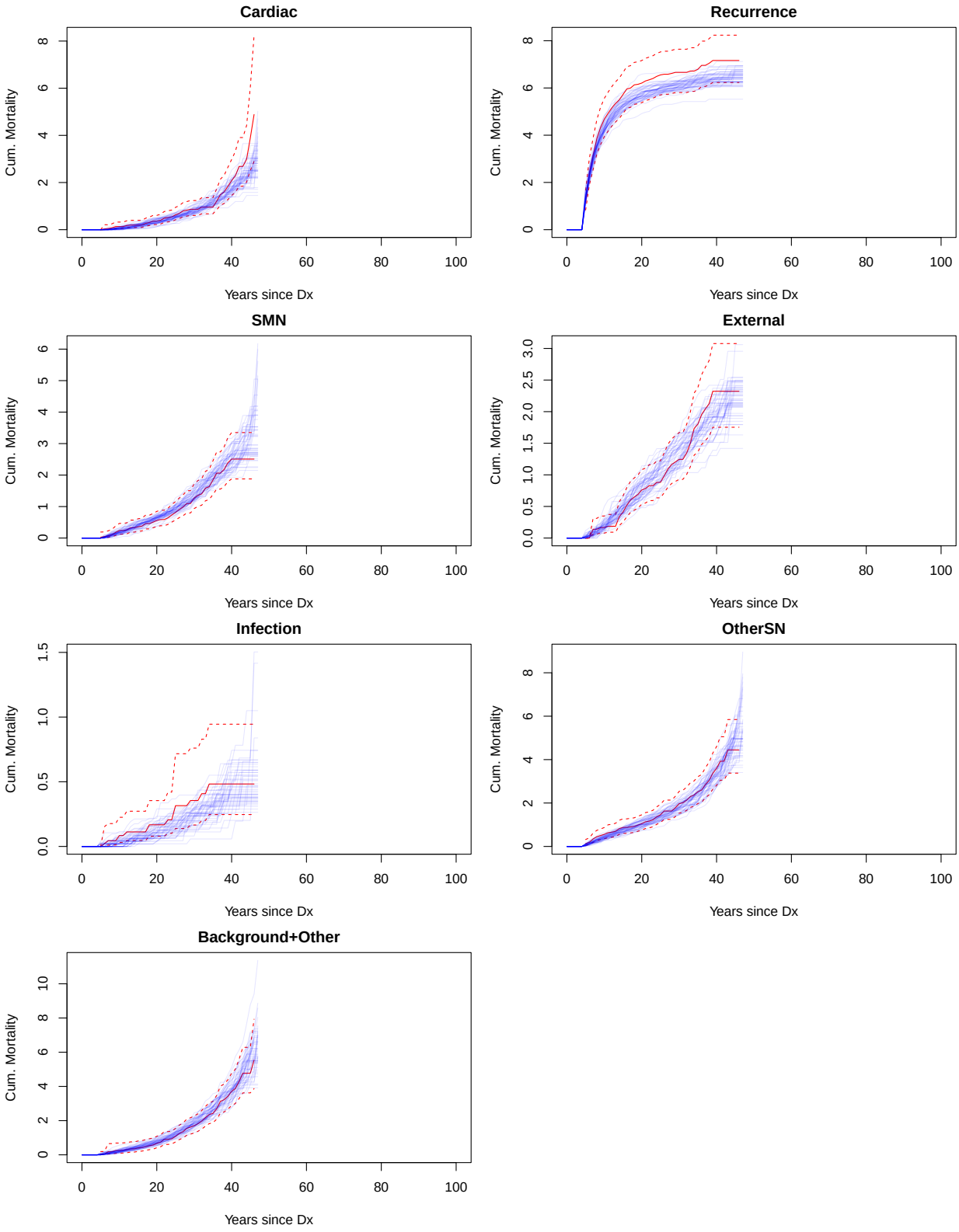

OtherSN
Cum. Mortality
0.0
0.5
1.0
1.5
2.0
0
20
40
60
80
100
Years since Dx


Background+Other
Cum. Mortality
0.0
0.5
1.0
1.5
0
20
40
60
80
100
Years since Dx

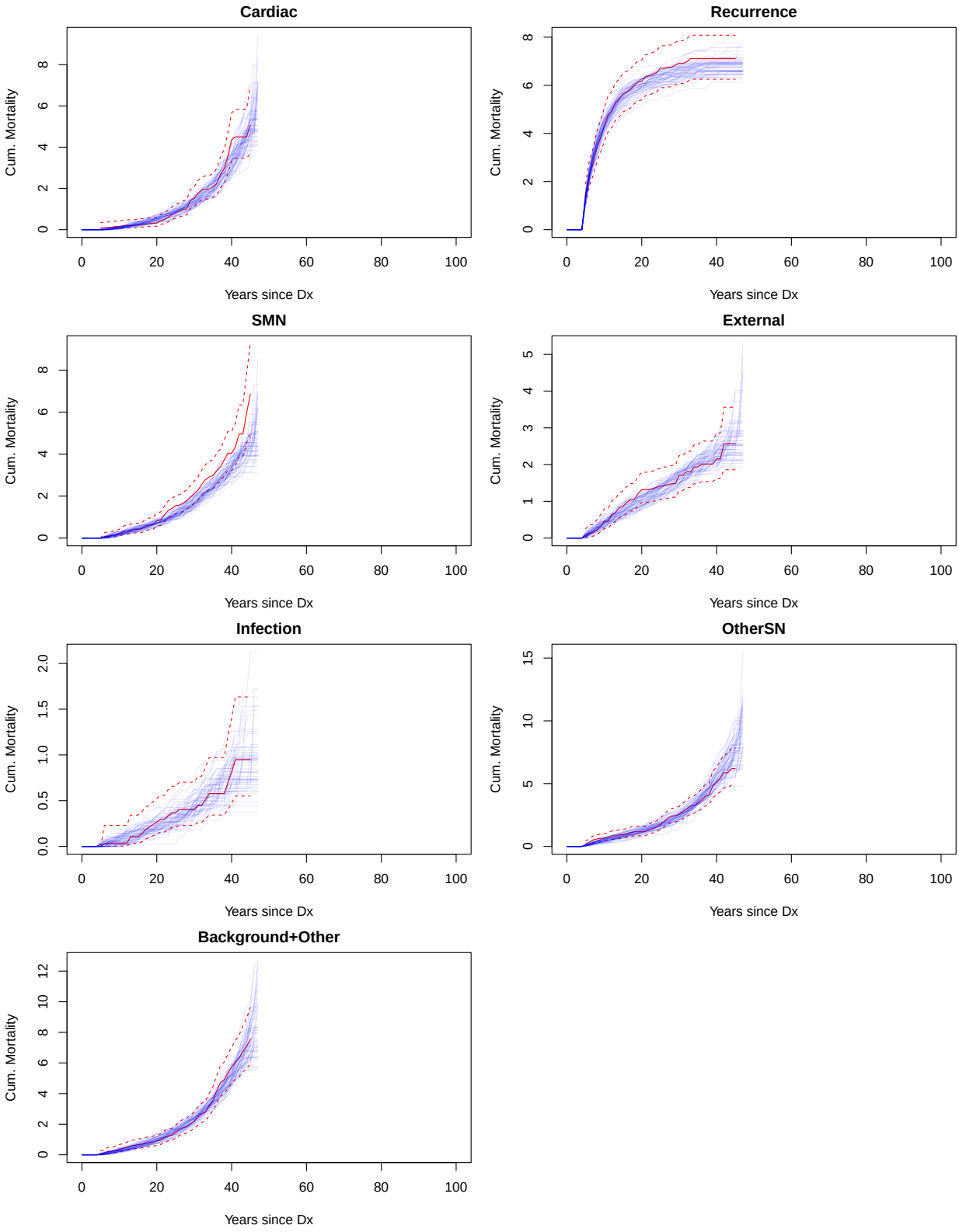
4.3.5.7 Age0-4


Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

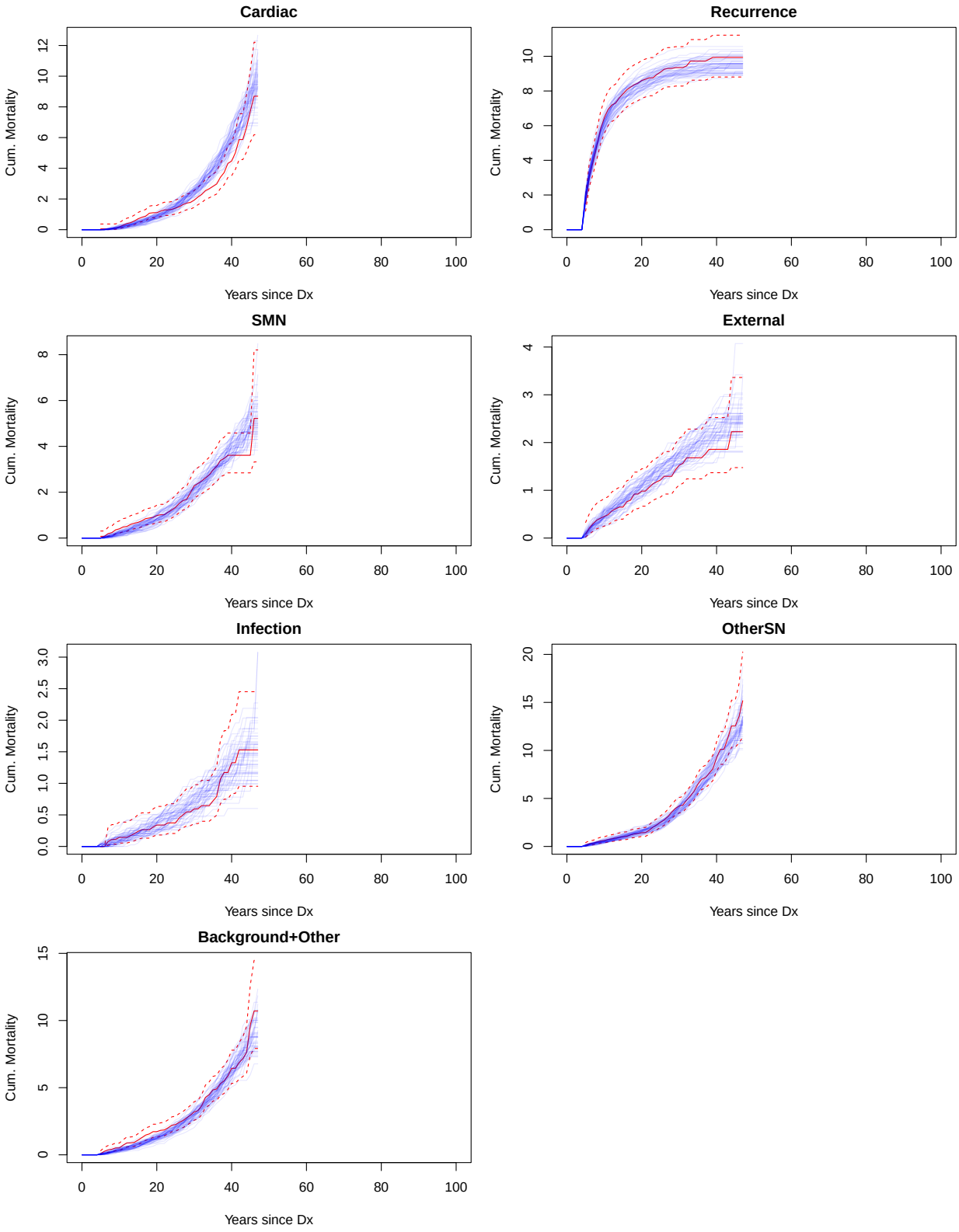
4.3.5.8 Age5-9


Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

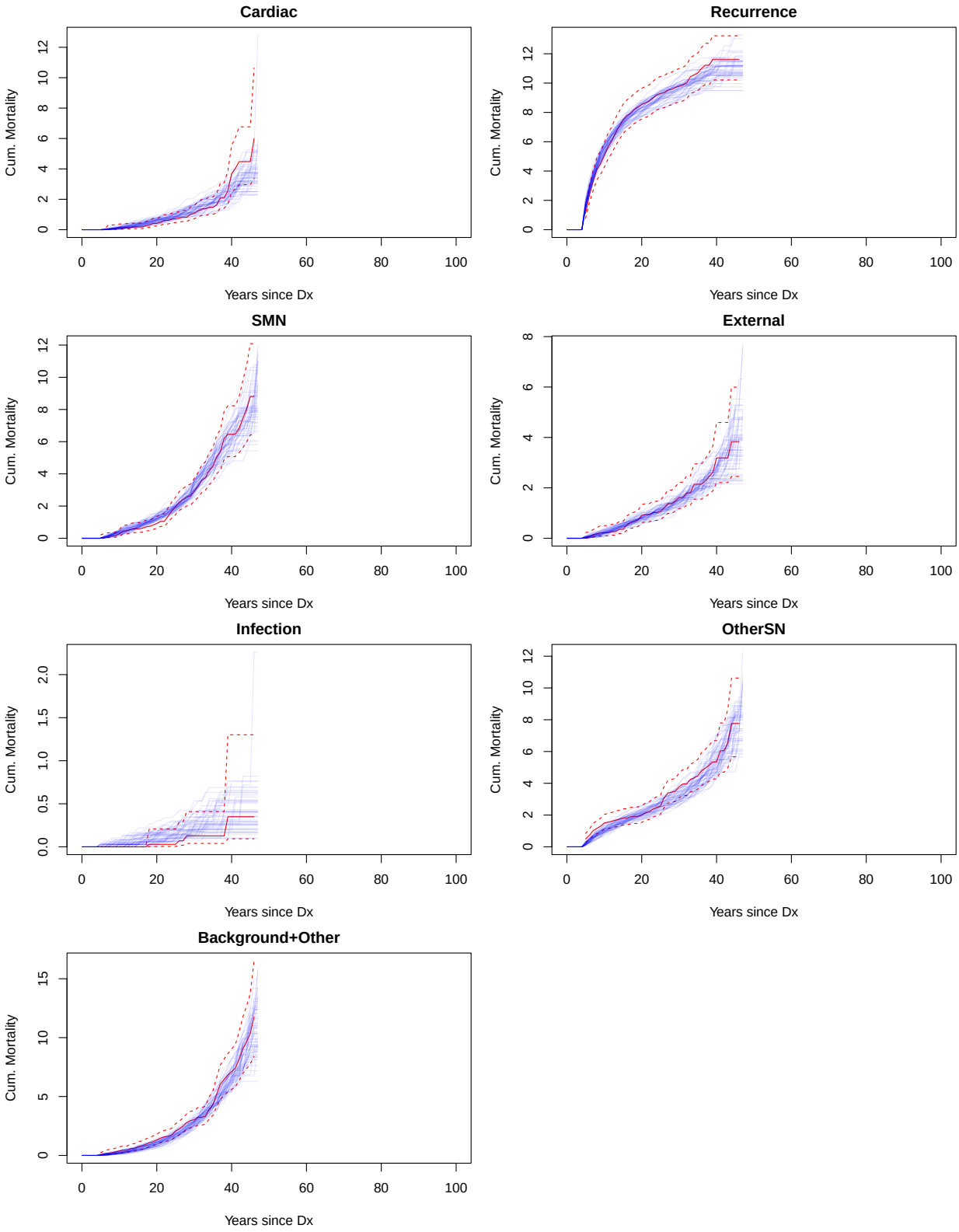
4.3.5.9 Age10-14



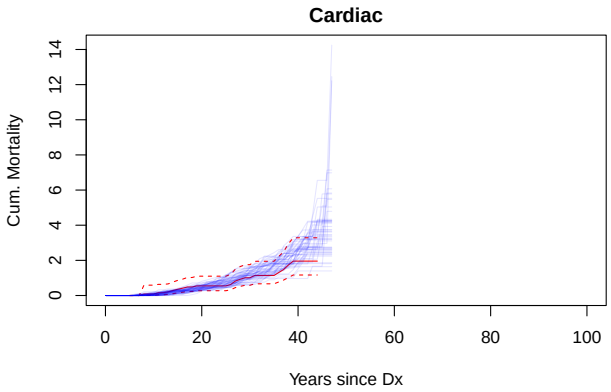
4.3.5.10 Age15-20

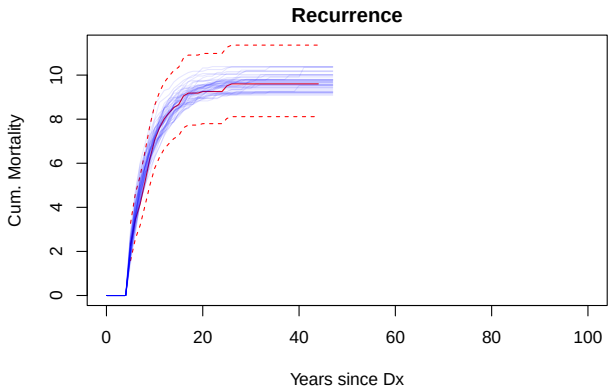


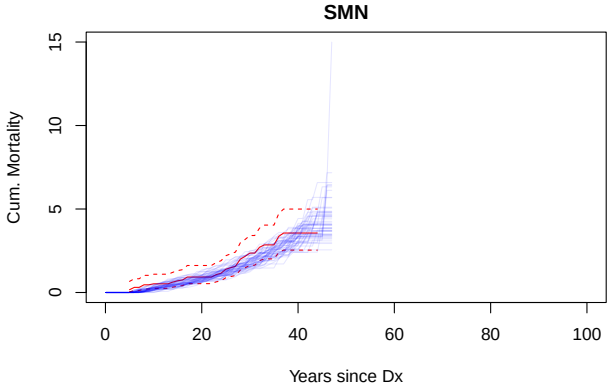
4.3.5.11 Brain

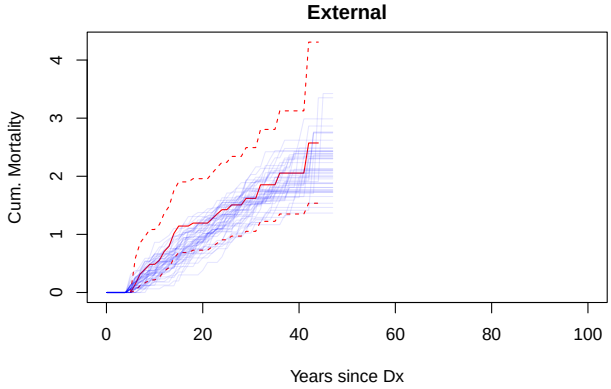

Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

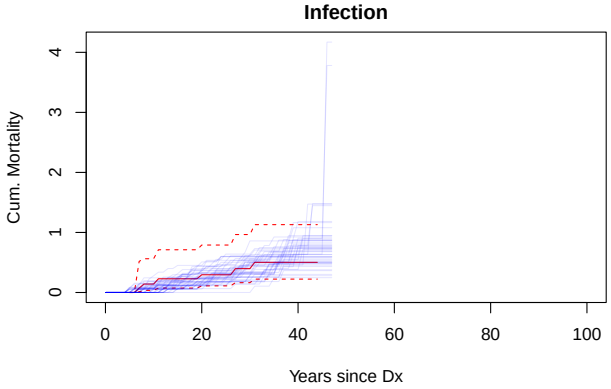
4.3.5.12 Bone

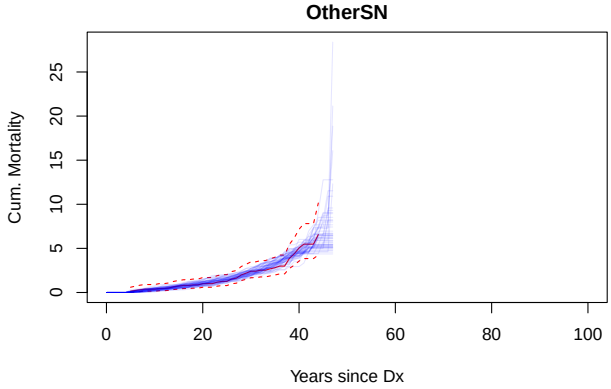

Cardiac
Cum. Mortality
0 2 4 6 8 10 12 14
0 20 40 60 80 100
Years since Dx

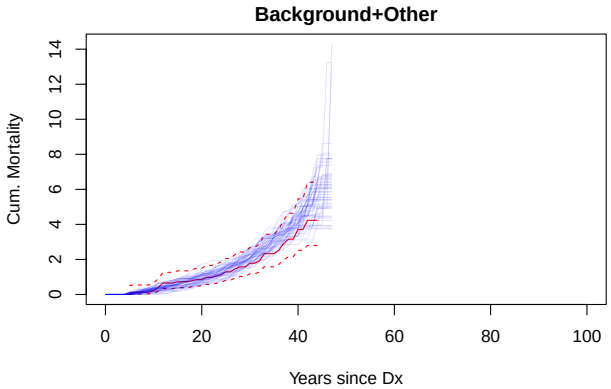

Recurrence
Cum. Mortality
0 2 4 6 8 10
0 20 40 60 80 100
Years since Dx


SMN
Cum. Mortality
0 5 10 15
0 20 40 60 80 100
Years since Dx

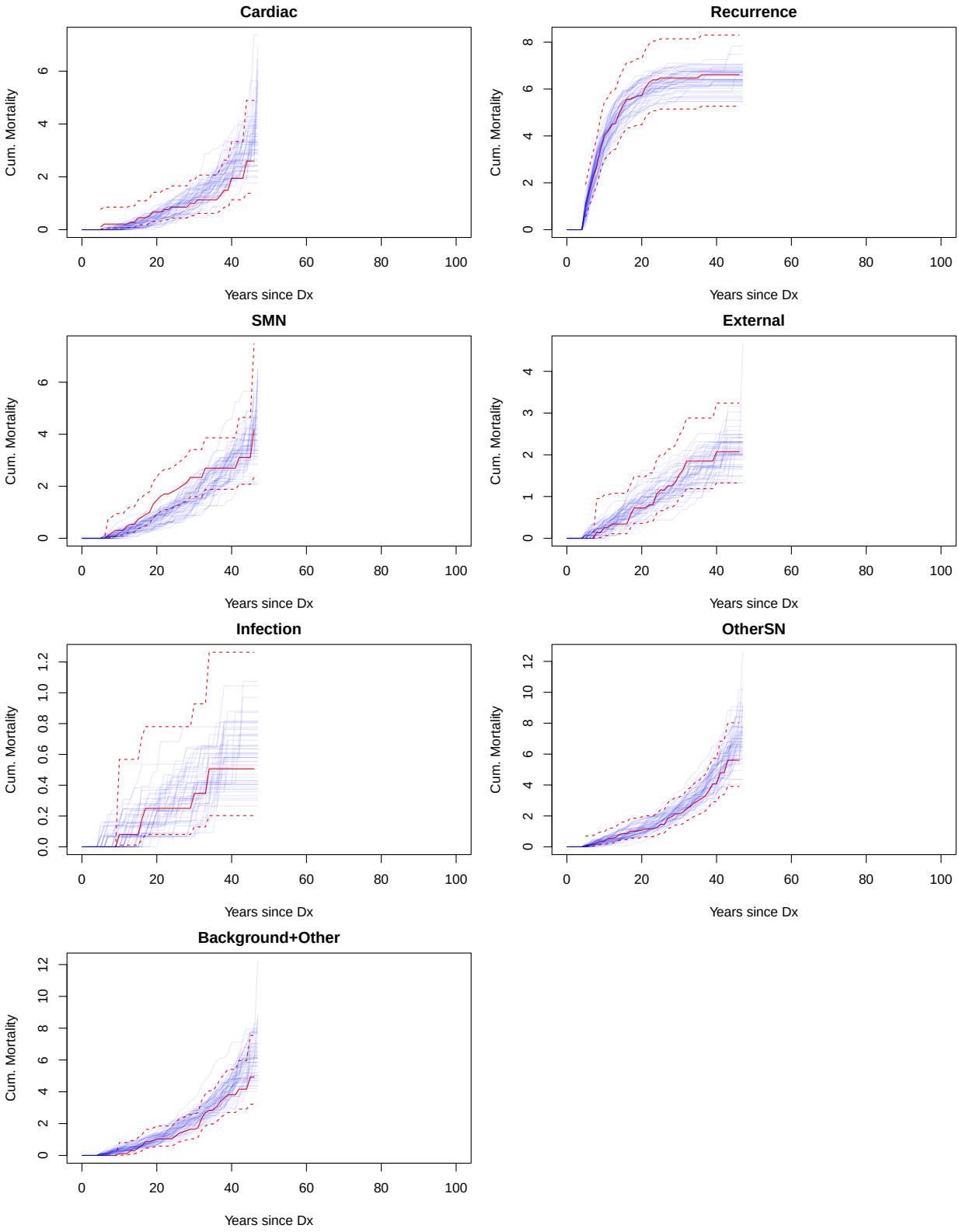

External
Cum. Mortality
0 1 2 3 4
0 20 40 60 80 100
Years since Dx


Infection
Cum. Mortality
0 1 2 3 4
0 20 40 60 80 100
Years since Dx

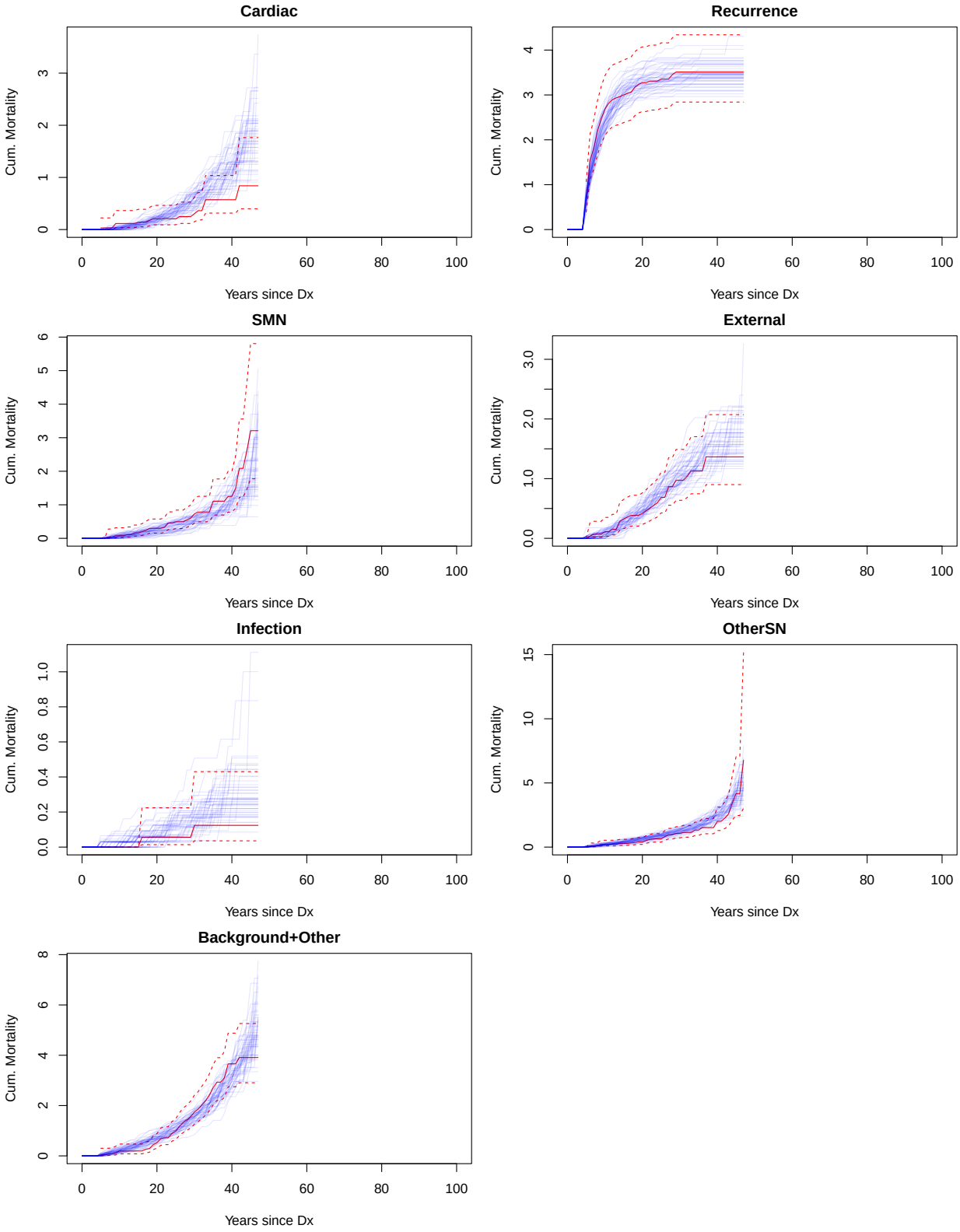

OtherSN
Cum. Mortality
0 5 10 15 20 25
0 20 40 60 80 100
Years since Dx


Background+Other
Cum. Mortality
0 2 4 6 8 10 12 14
0 20 40 60 80 100
Years since Dx

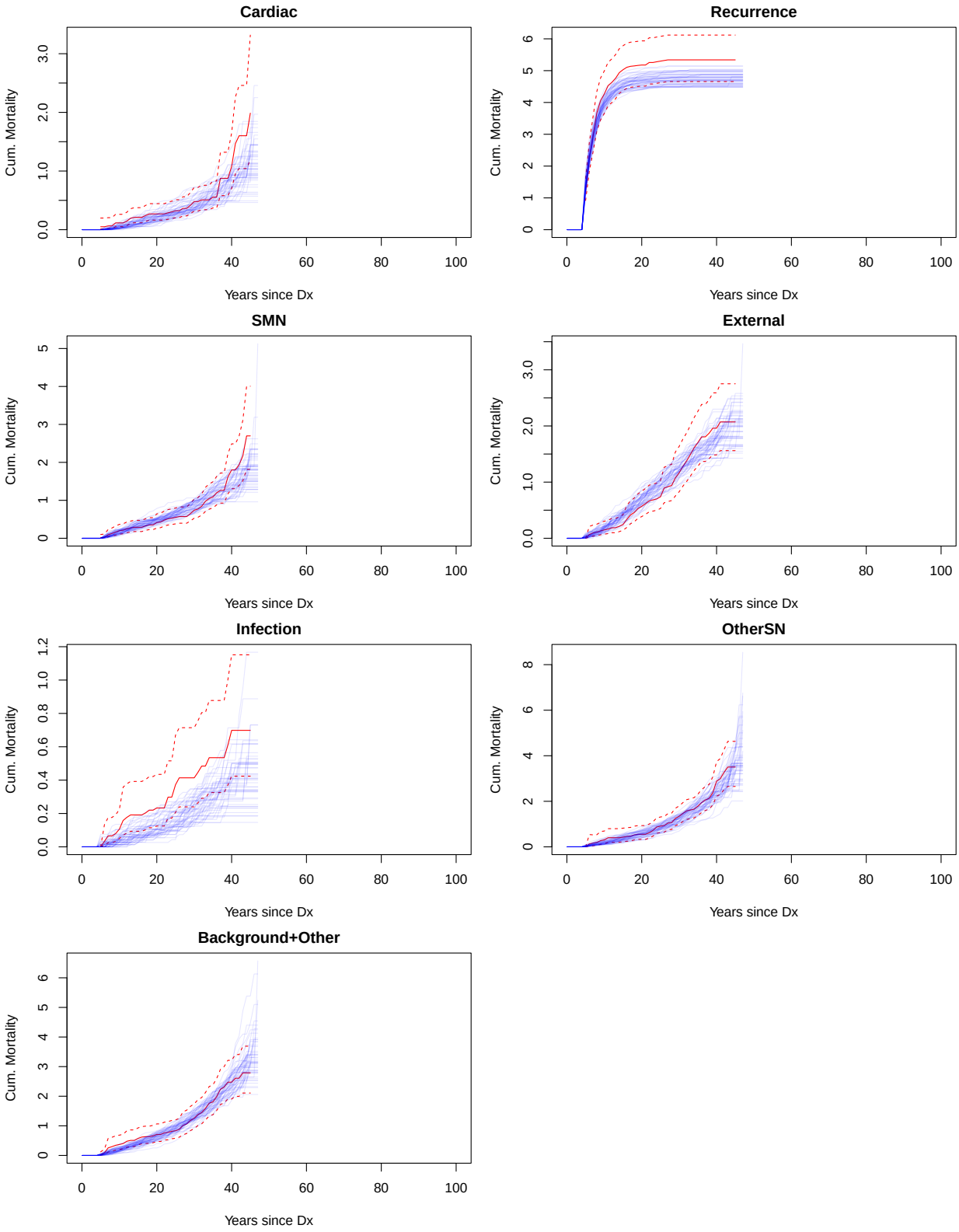
4.3.5.13 Soft Tissue Sarcoma



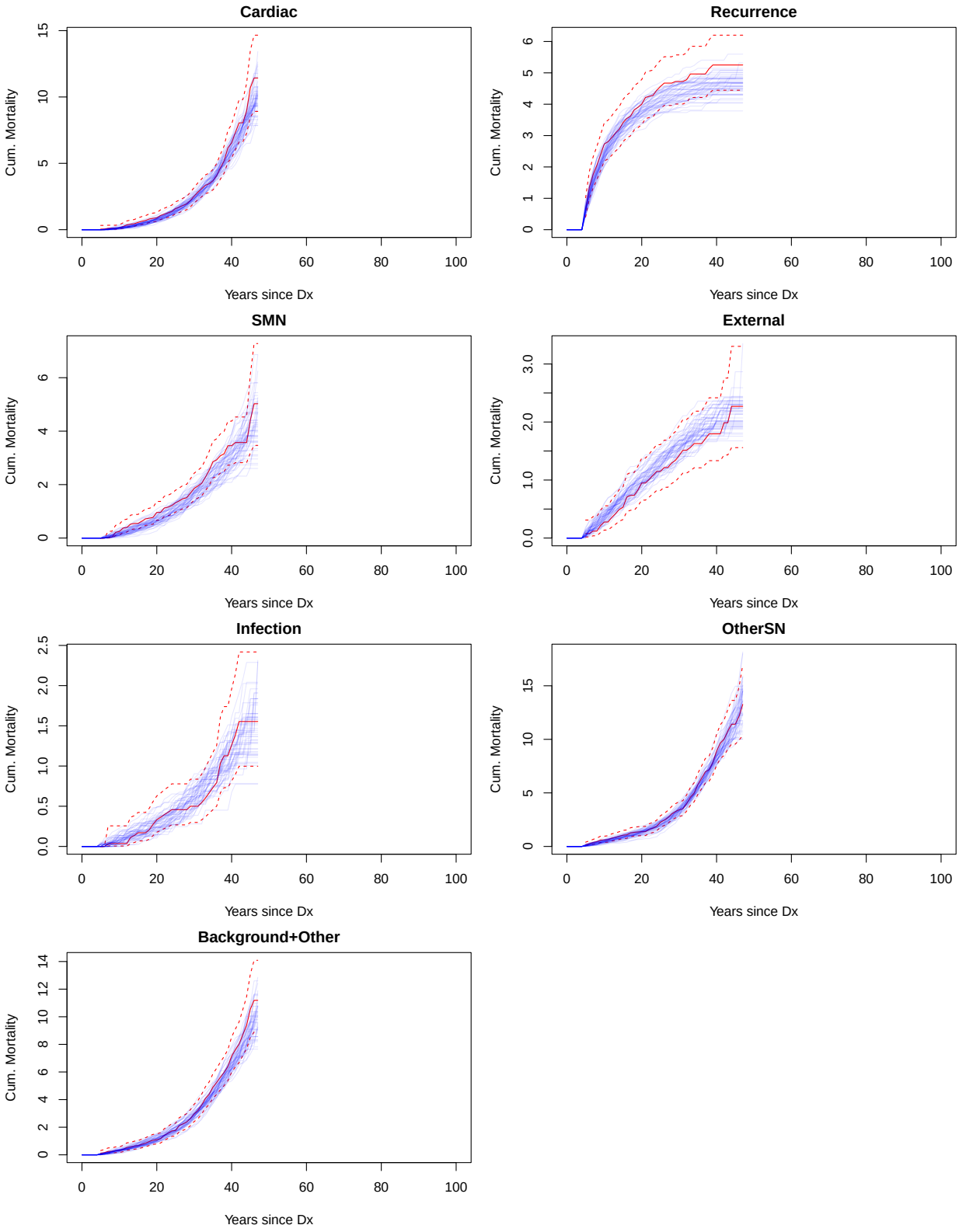
4.3.5.14 WT/NBL


Cardiac
Cum. Mortality
Years since Dx
Recurrence
Cum. Mortality
Years since Dx
SMN
Cum. Mortality
Years since Dx
External
Cum. Mortality
Years since Dx
Infection
Cum. Mortality
Years since Dx
OtherSN
Cum. Mortality
Years since Dx
Background+Other
Cum. Mortality
Years since Dx

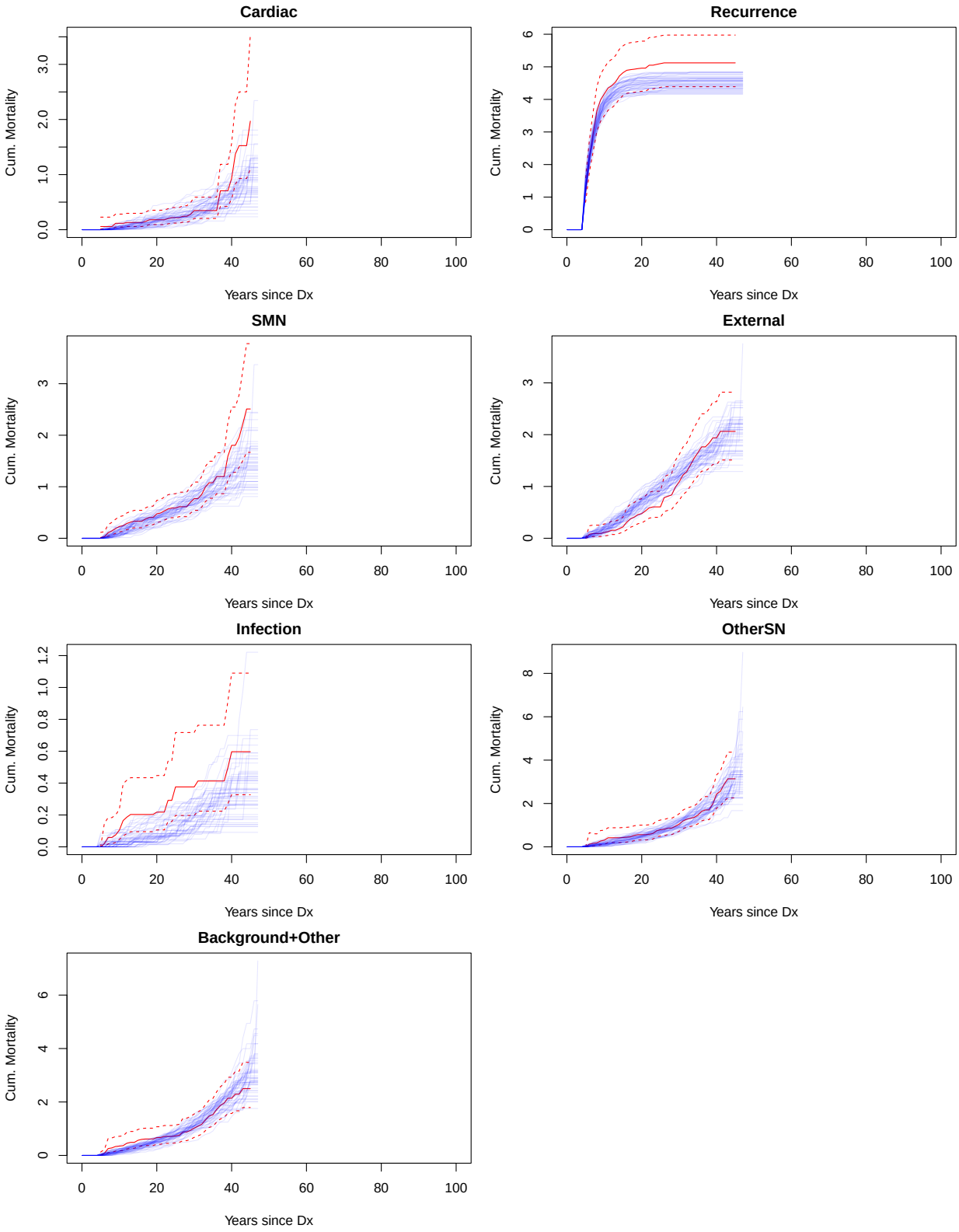
4.3.5.15 Leukemia



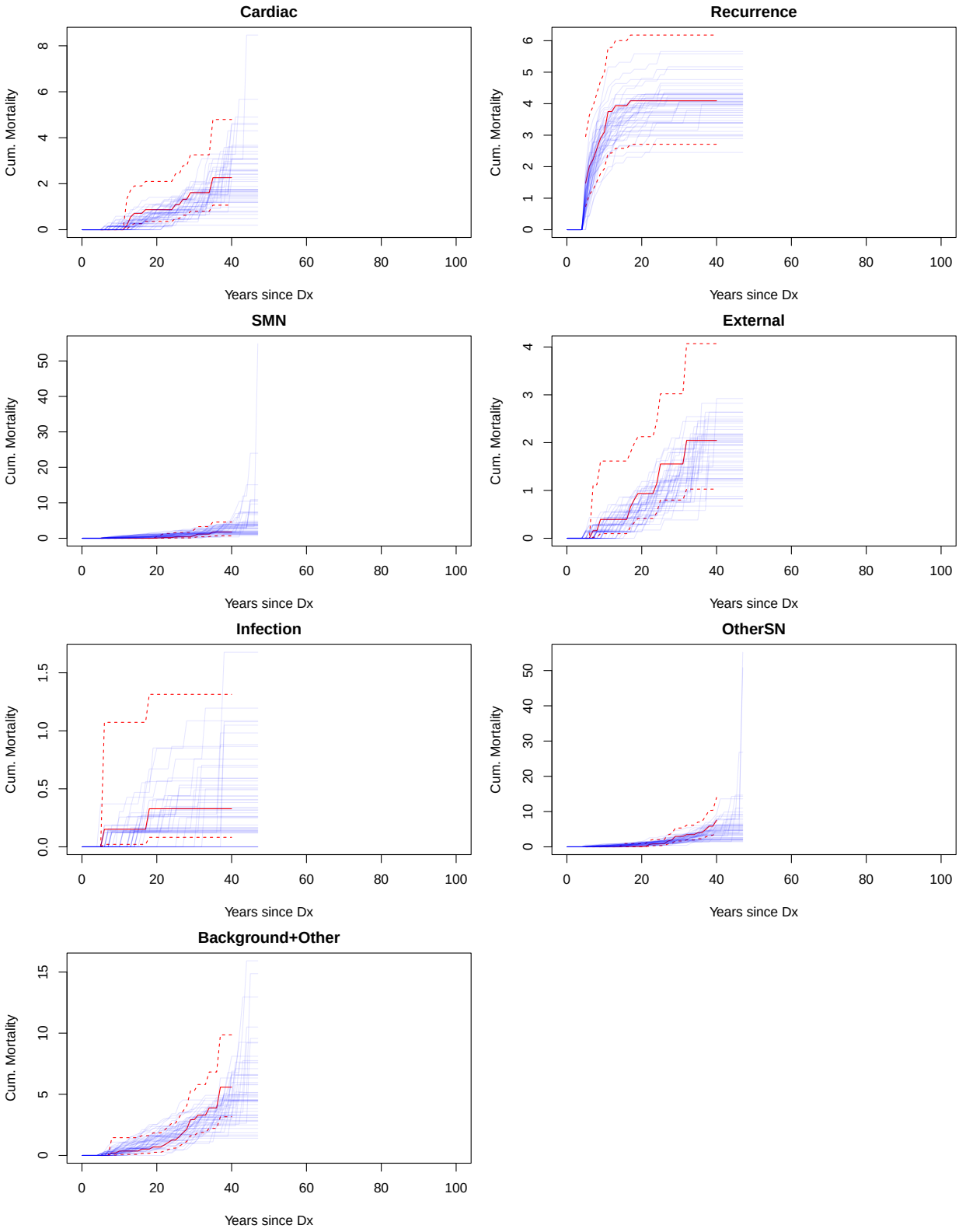
4.3.5.16 Lymphoma



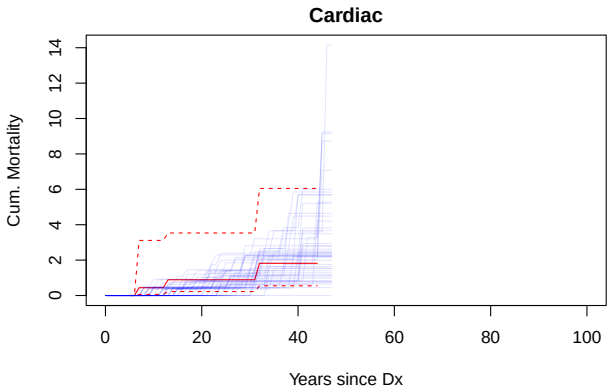
4.3.5.17 ALL

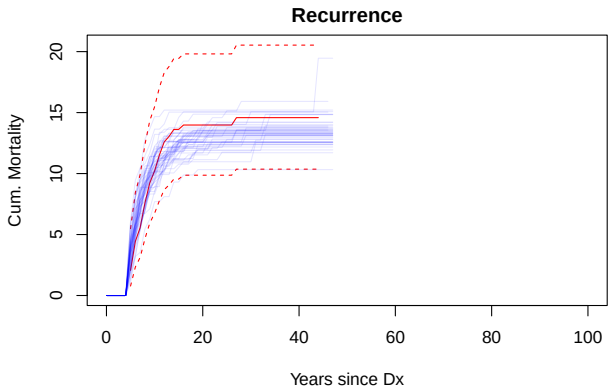

Cardiac
Cum. Mortality
0.0
1.0
2.0
3.0
0
20
40
60
80
100
Years since Dx
Recurrence
Cum. Mortality
0
1
2
3
4
5
6
0
20
40
60
80
100
Years since Dx
SMN
Cum. Mortality
0
1
2
3
0
20
40
60
80
100
Years since Dx
External
Cum. Mortality
0
1
2
3
0
20
40
60
80
100
Years since Dx
Infection
Cum. Mortality
0.0
0.2
0.4
0.6
0.8
1.0
1.2
0
20
40
60
80
100
Years since Dx
OtherSN
Cum. Mortality
0
2
4
6
8
0
20
40
60
80
100
Years since Dx
Background+Other
Cum. Mortality
0
2
4
6
0
20
40
60
80
100
Years since Dx

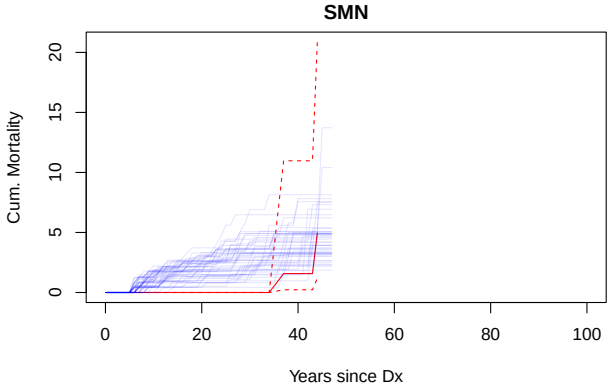
4.3.5.18 AML

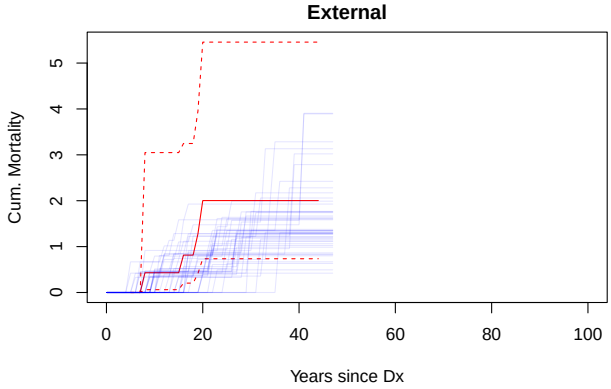

Cardiac
Cum. Mortality
Years since Dx
Recurrence
Cum. Mortality
Years since Dx
SMN
Cum. Mortality
Years since Dx
External
Cum. Mortality
Years since Dx
Infection
Cum. Mortality
Years since Dx
OtherSN
Cum. Mortality
Years since Dx
Background+Other
Cum. Mortality
Years since Dx

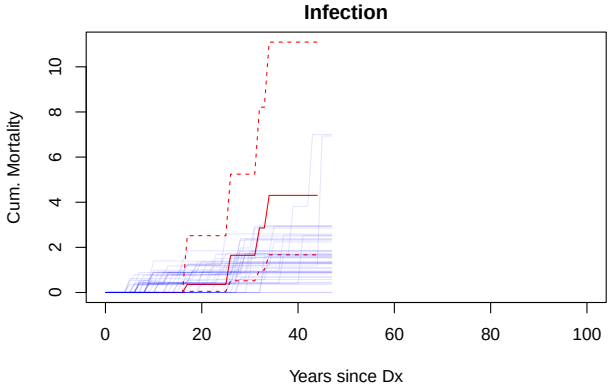
4.3.5.19 OtherLeukemia

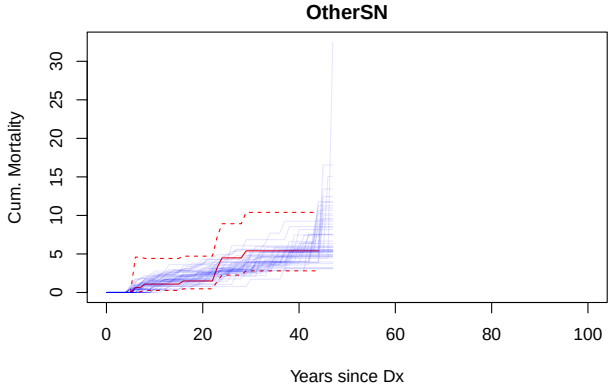


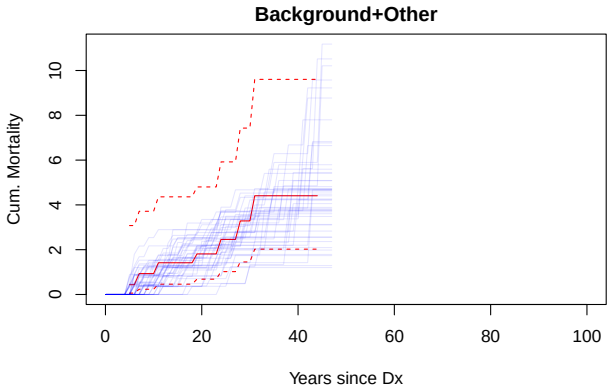




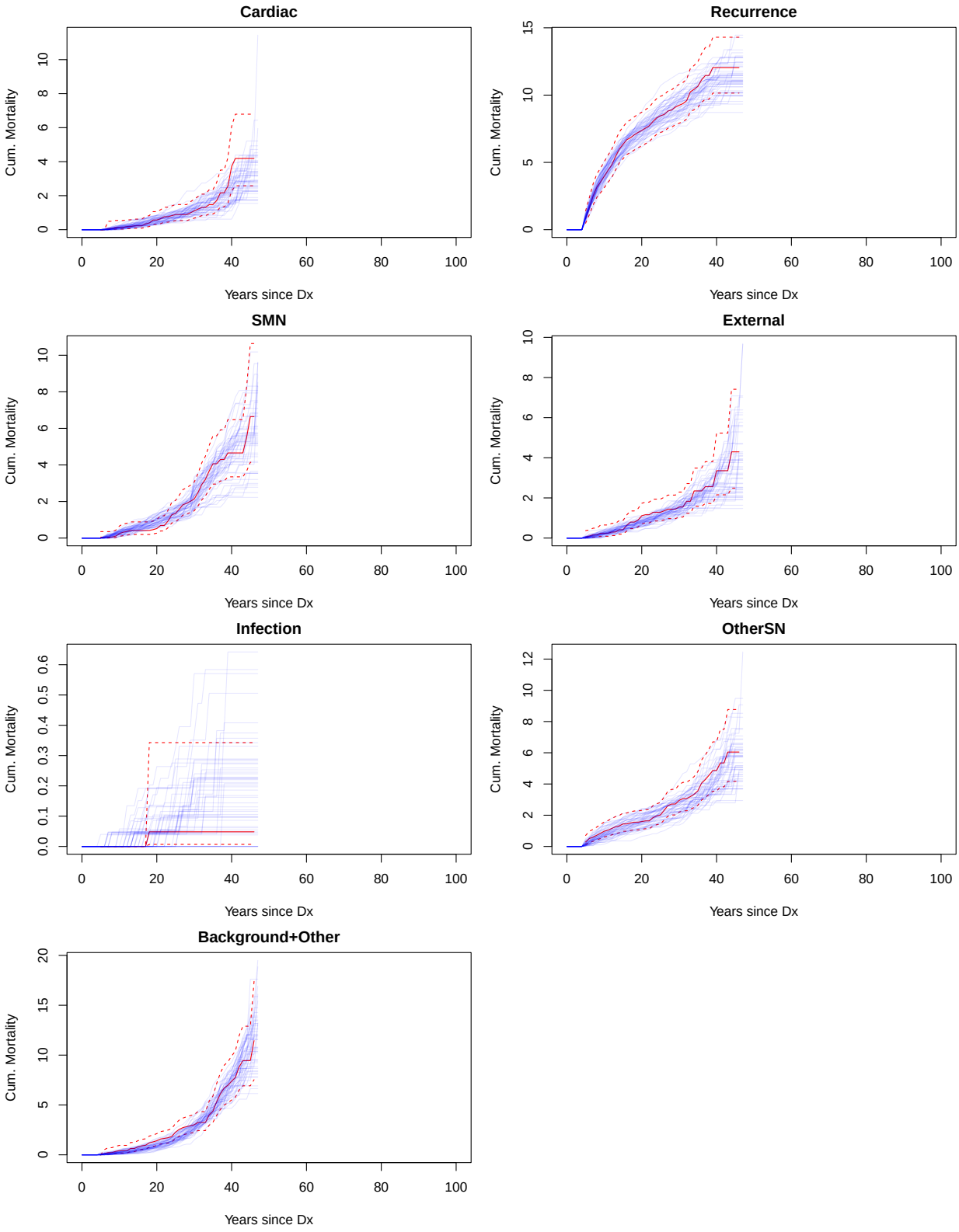




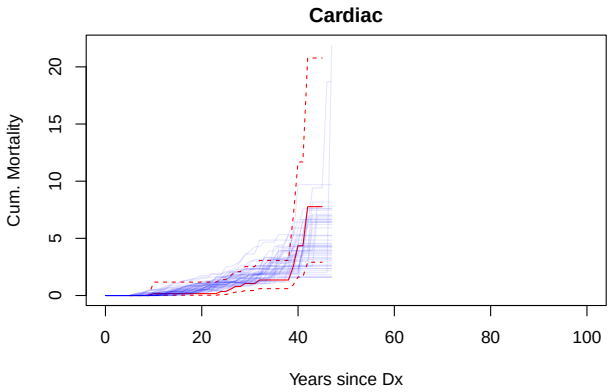


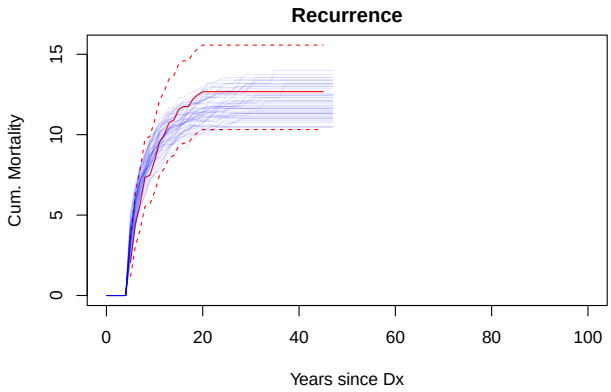


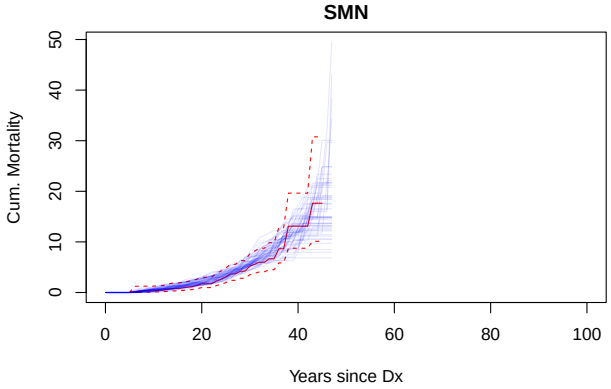
4.3.5.20 Astrocytoma

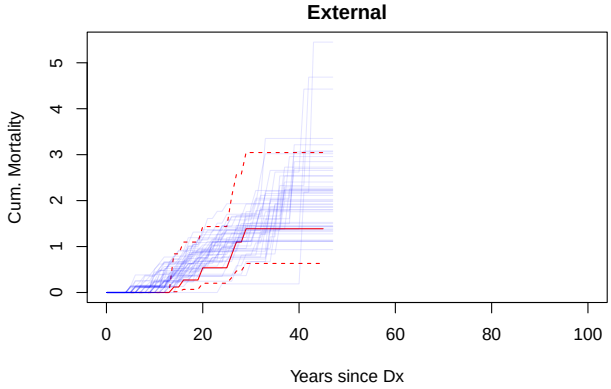


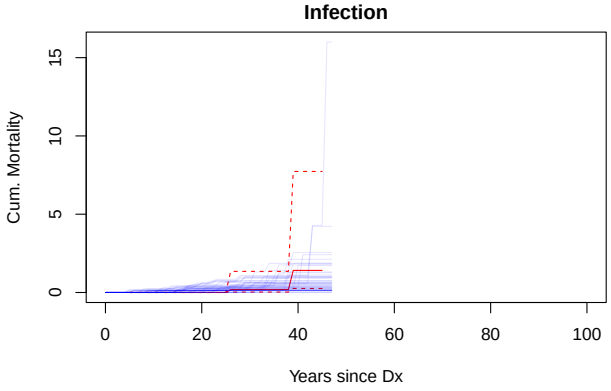
4.3.5.21 Medulloblastoma

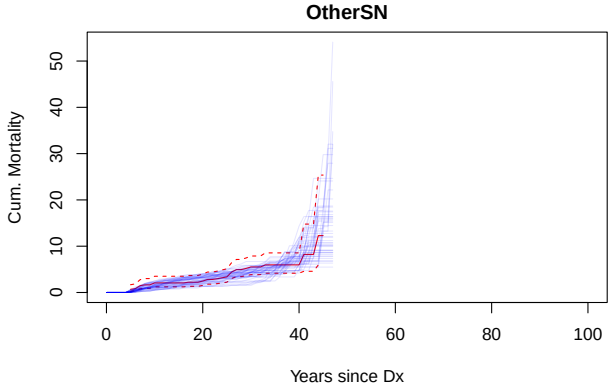


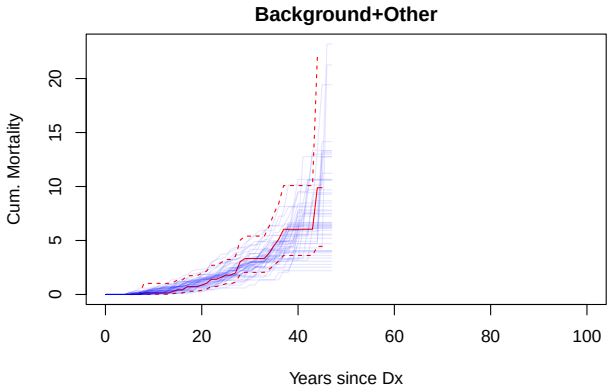




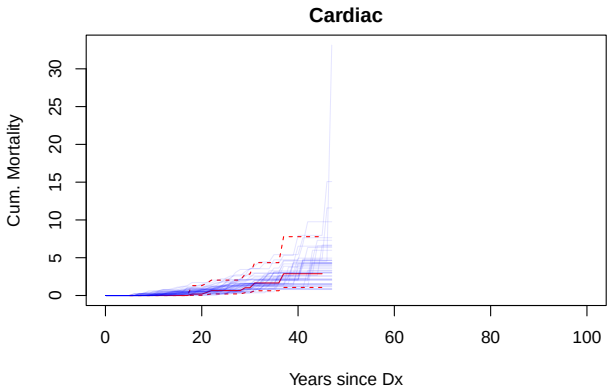


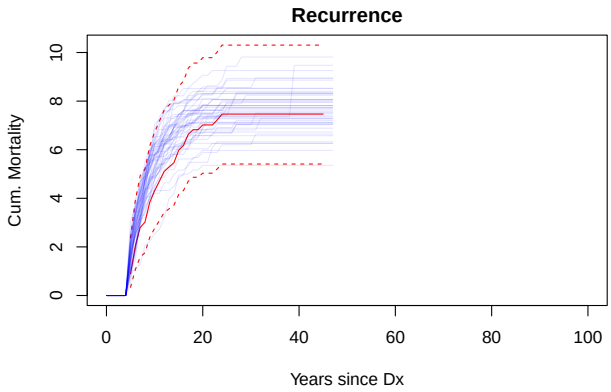


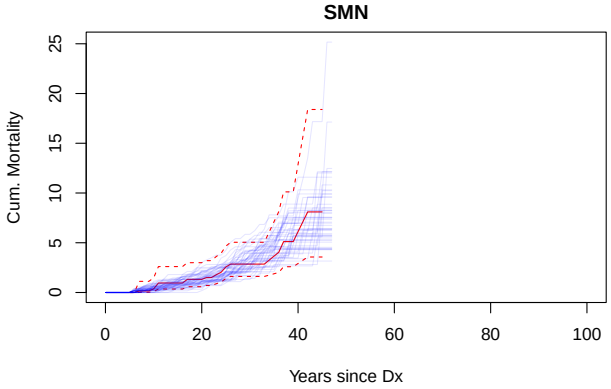


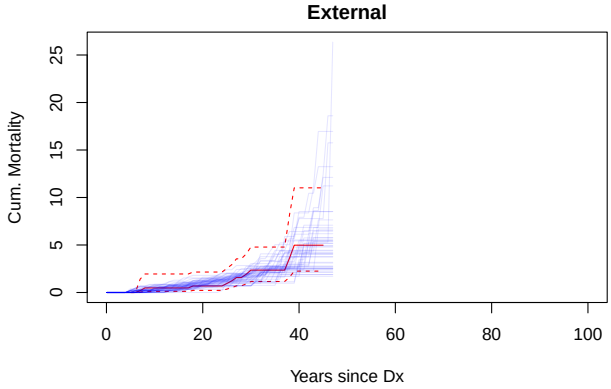


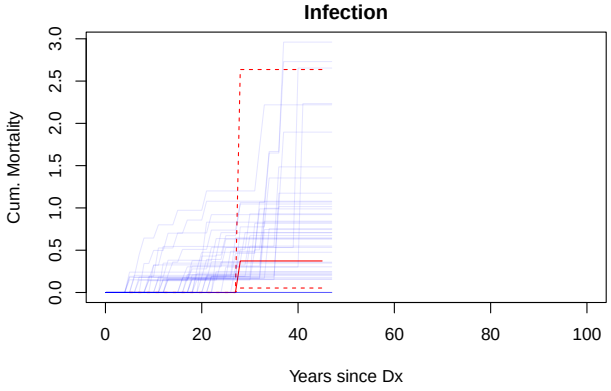
4.3.5.22 Other CNS

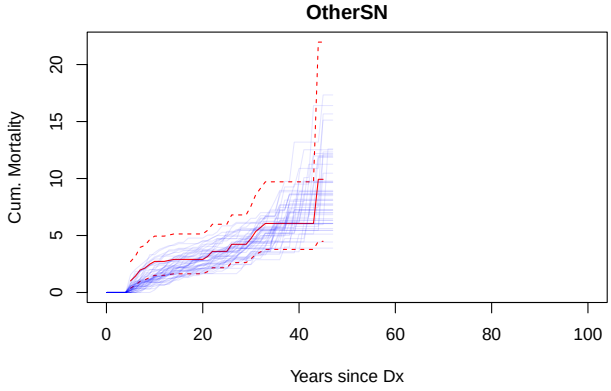


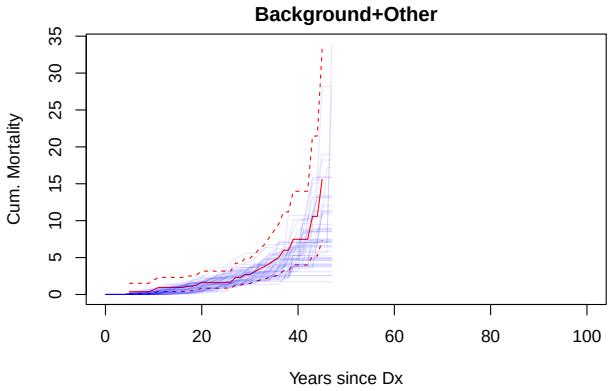




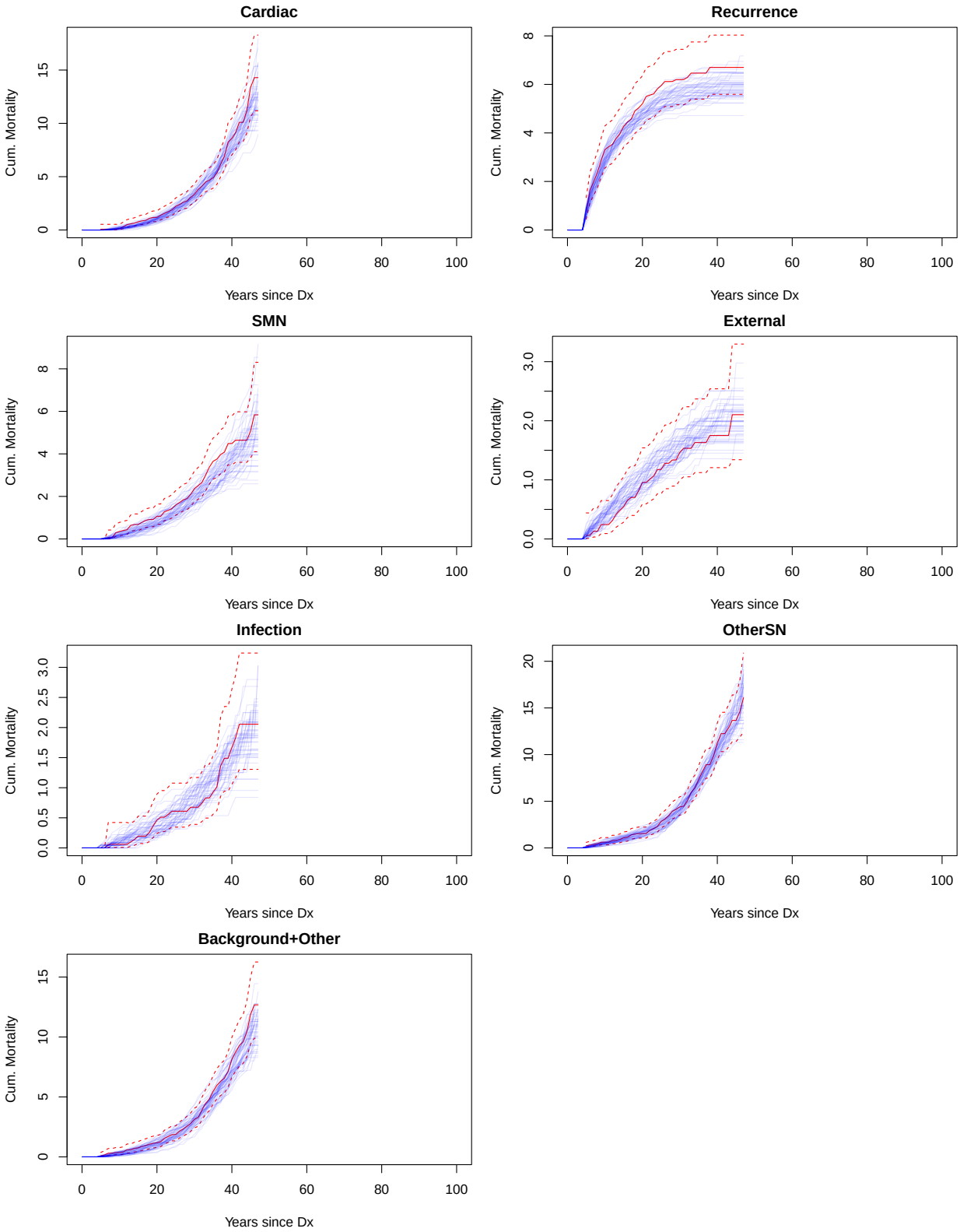






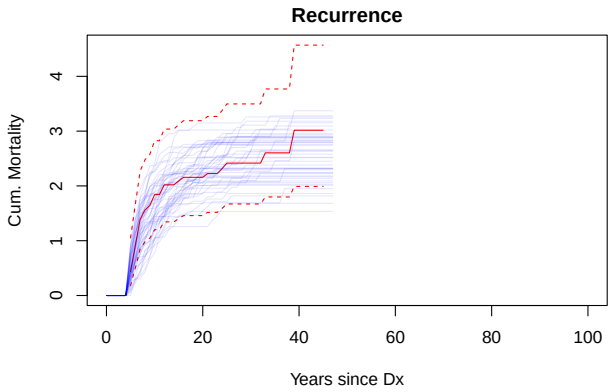


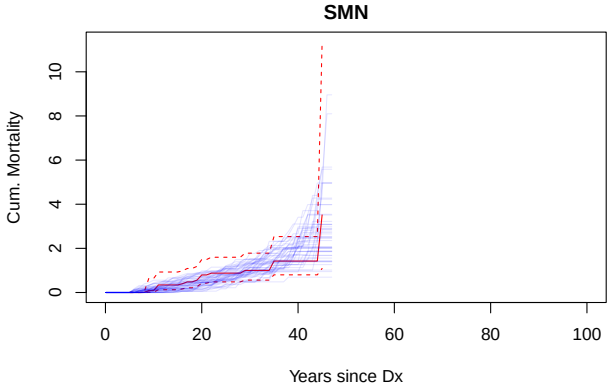
4.3.5.23 HL

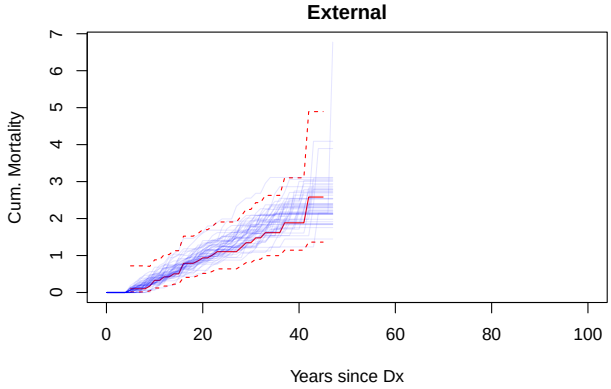

Cardiac
Cum. Mortality
Years since Dx
Recurrence
Cum. Mortality
Years since Dx
SMN
Cum. Mortality
Years since Dx
External
Cum. Mortality
Years since Dx
Infection
Cum. Mortality
Years since Dx
OtherSN
Cum. Mortality
Years since Dx
Background+Other
Cum. Mortality
Years since Dx

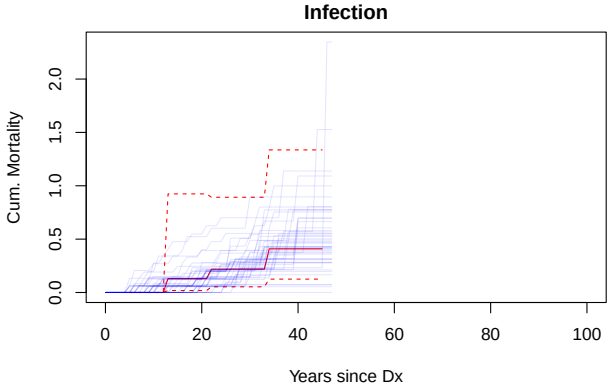
4.3.5.24 NHL

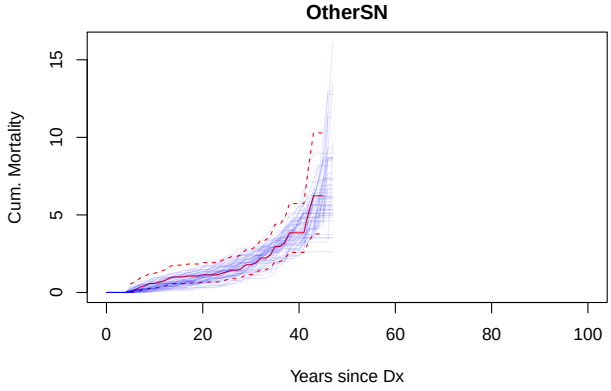
Cardiac
Cum. Mortality
0
2
4
6
8
10
0
20
40
60
80
100
Years since Dx

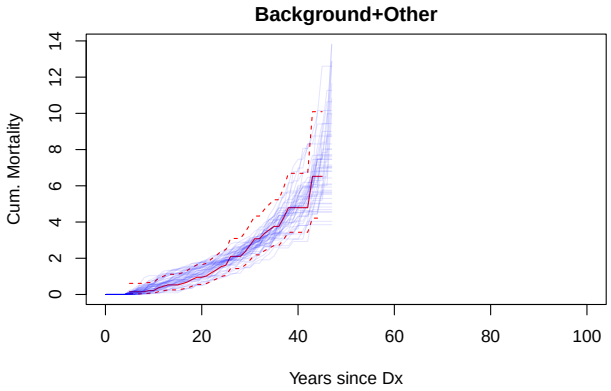

Recurrence
Cum. Mortality
0
1
2
3
4
0
20
40
60
80
100
Years since Dx


SMN
Cum. Mortality
0
2
4
6
8
10
0
20
40
60
80
100
Years since Dx

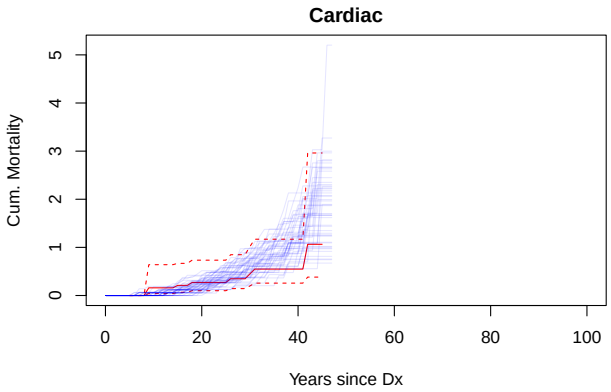

External
Cum. Mortality
0
1
2
3
4
5
6
7
0
20
40
60
80
100
Years since Dx

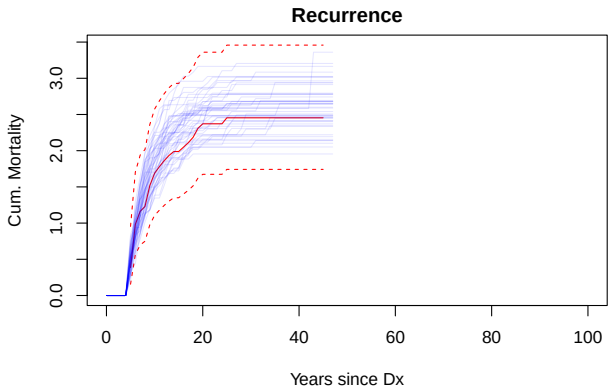

Infection
Cum. Mortality
0.0
0.5
1.0
1.5
2.0
0
20
40
60
80
100
Years since Dx

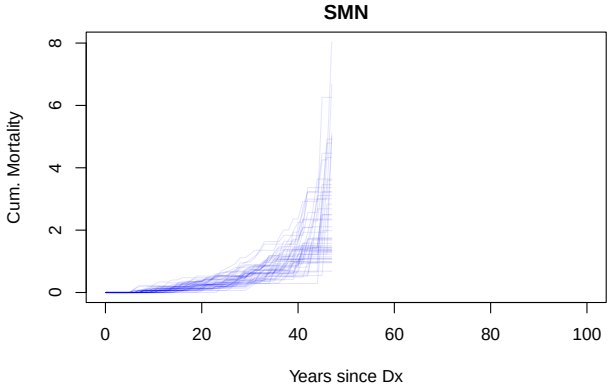

OtherSN
Cum. Mortality
0
5
10
15
0
20
40
60
80
100
Years since Dx

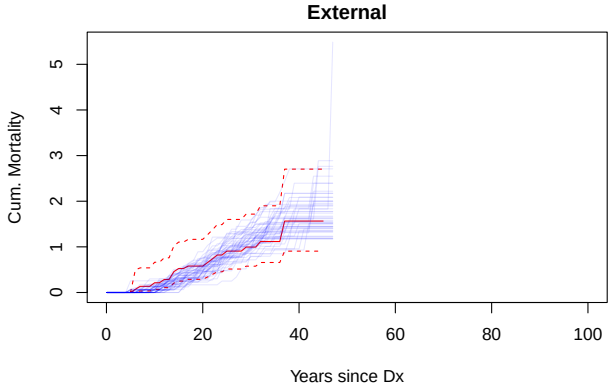

Background+Other
Cum. Mortality
0
2
4
6
8
10
12
14
0
20
40
60
80
100
Years since Dx

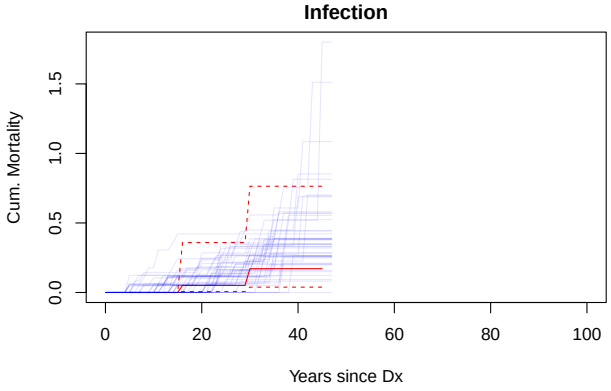
4.3.5.25 WT

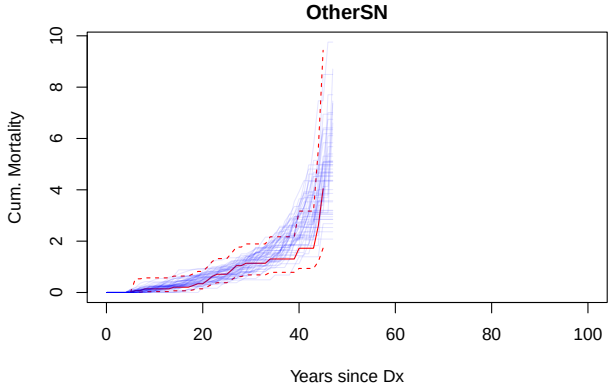

Cardiac
Cum. Mortality
0
1
2
3
4
5
0
20
40
60
80
100
Years since Dx

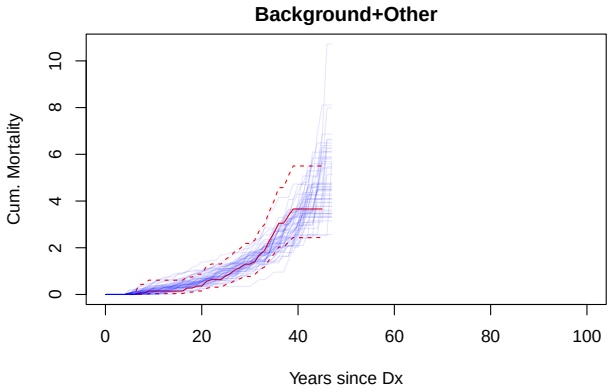

Recurrence
Cum. Mortality
0.0
1.0
2.0
3.0
0
20
40
60
80
100
Years since Dx


SMN
Cum. Mortality
0
2
4
6
8
0
20
40
60
80
100
Years since Dx

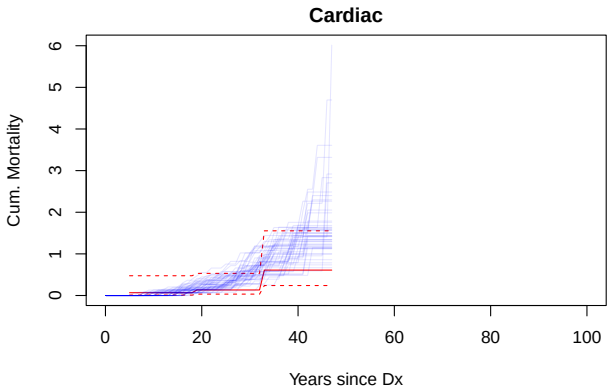

External
Cum. Mortality
0
1
2
3
4
5
0
20
40
60
80
100
Years since Dx

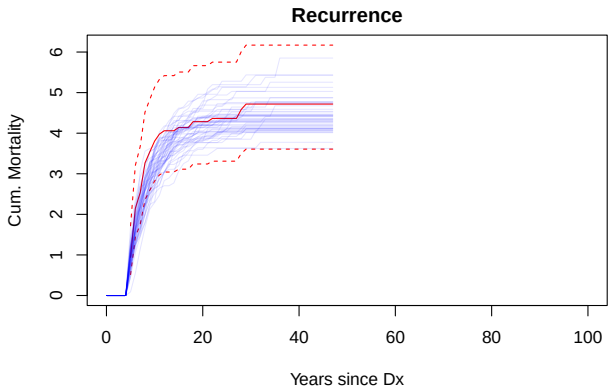

Infection
Cum. Mortality
0.0
0.5
1.0
1.5
0
20
40
60
80
100
Years since Dx

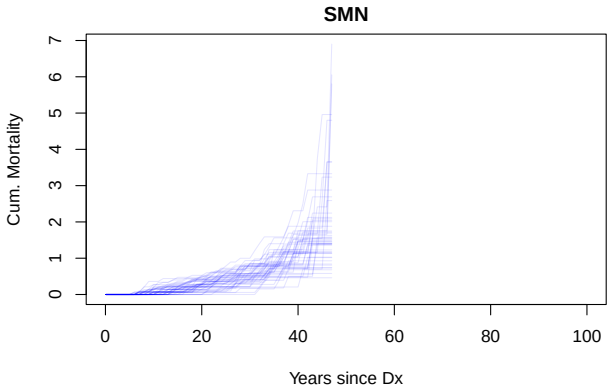

OtherSN
Cum. Mortality
0
2
4
6
8
10
0
20
40
60
80
100
Years since Dx

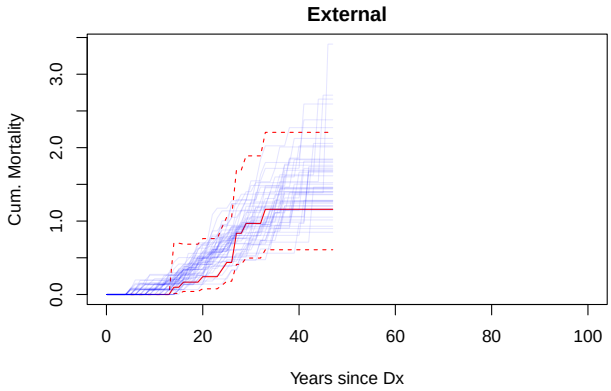

Background+Other
Cum. Mortality
0
2
4
6
8
10
0
20
40
60
80
100
Years since Dx

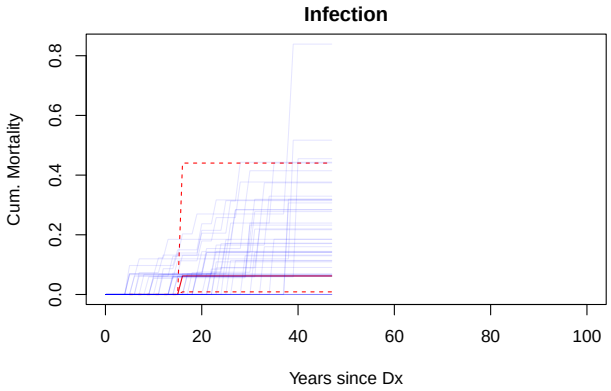
4.3.5.26 NBL

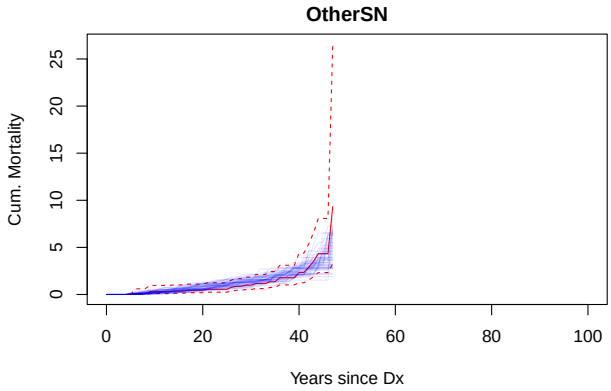

Cardiac
Cum. Mortality
0 1 2 3 4 5 6
0 20 40 60 80 100
Years since Dx

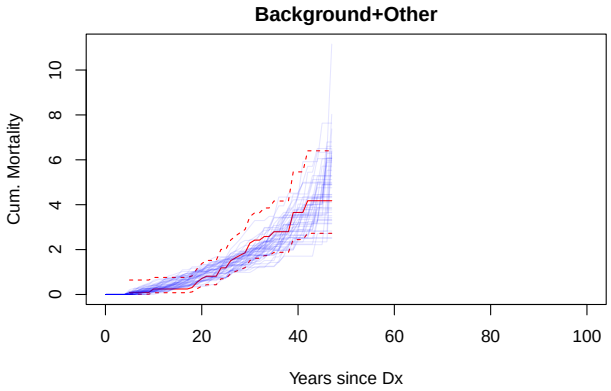

Recurrence
Cum. Mortality
0 1 2 3 4 5 6
0 20 40 60 80 100
Years since Dx


SMN
Cum. Mortality
0 1 2 3 4 5 6 7
0 20 40 60 80 100
Years since Dx

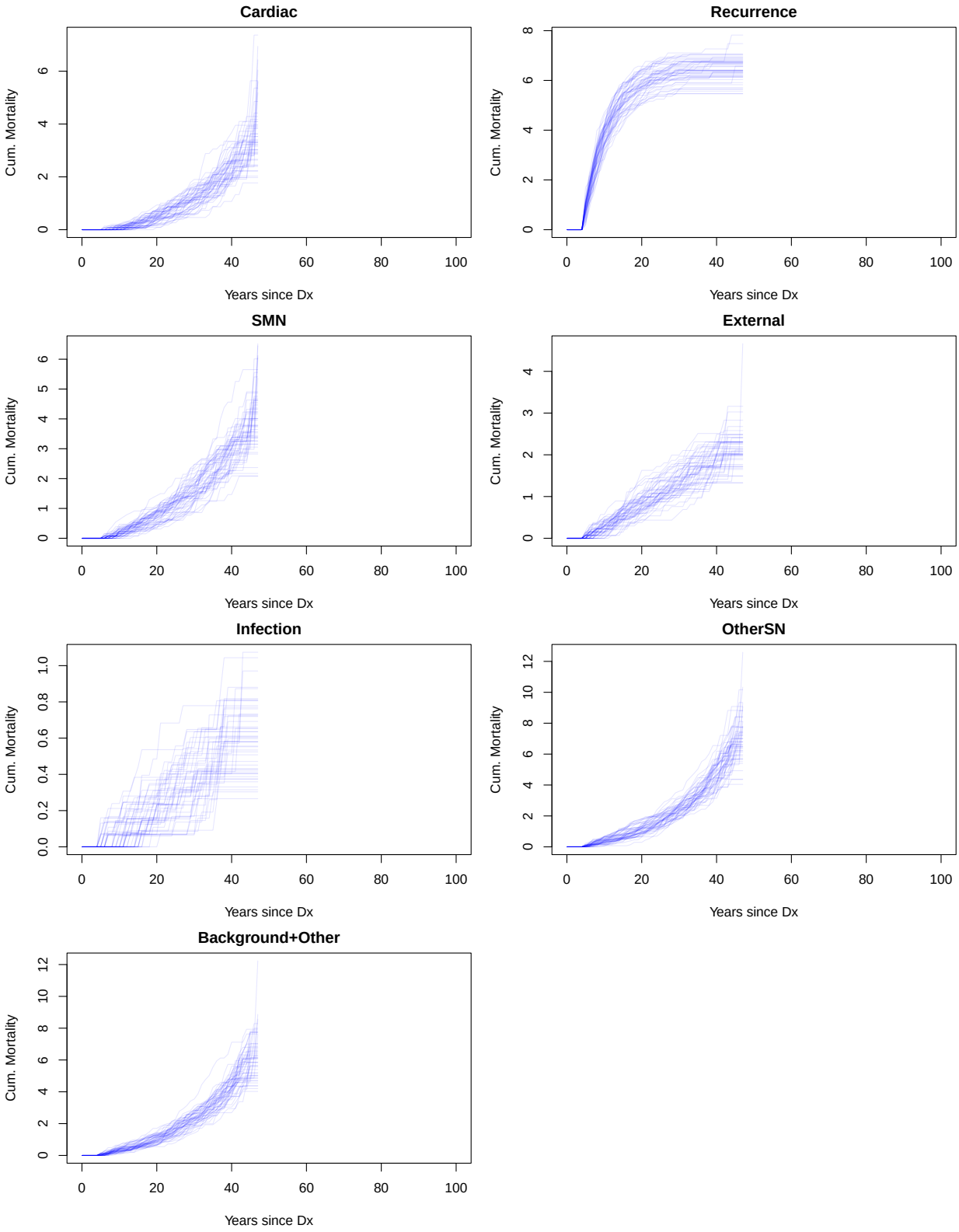

External
Cum. Mortality
0.0 1.0 2.0 3.0
0 20 40 60 80 100
Years since Dx


Infection
Cum. Mortality
0.0 0.2 0.4 0.6 0.8
0 20 40 60 80 100
Years since Dx

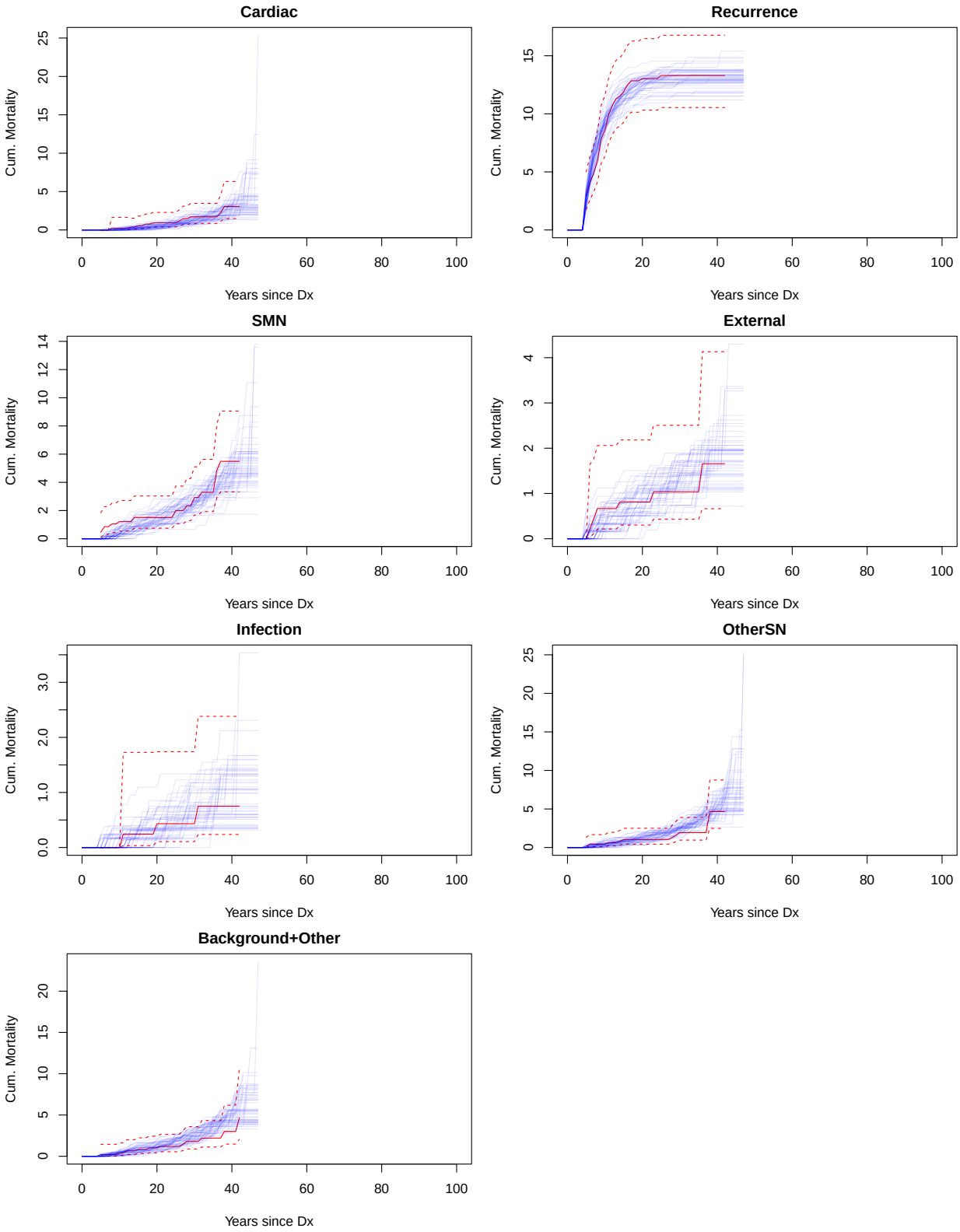

OtherSN
Cum. Mortality
0 5 10 15 20 25
0 20 40 60 80 100
Years since Dx


Background+Other
Cum. Mortality
0 2 4 6 8 10
0 20 40 60 80 100
Years since Dx

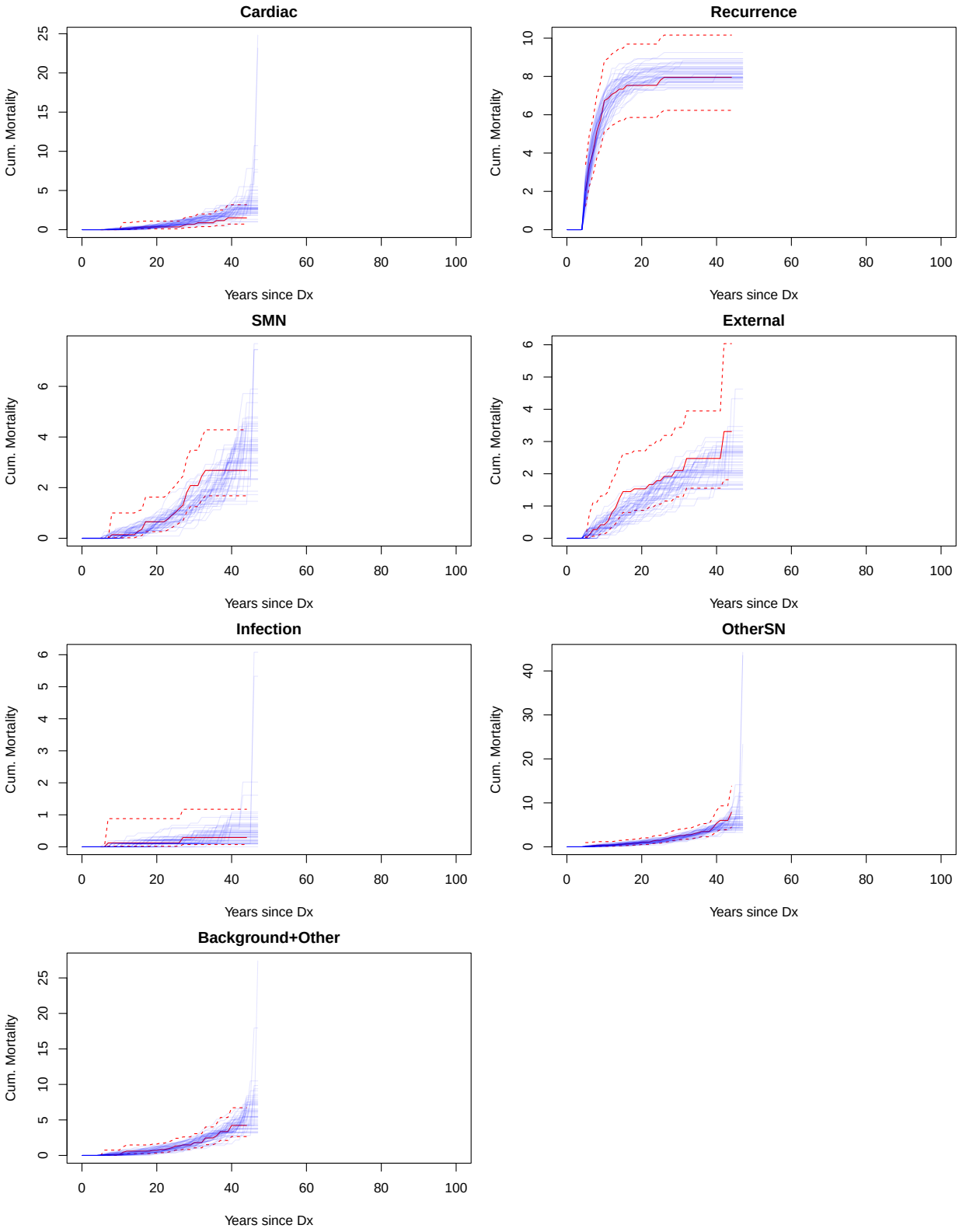
4.3.5.27 STS


Cardiac
Cum. Mortality
Years since Dx
Recurrence
Cum. Mortality
Years since Dx
SMN
Cum. Mortality
Years since Dx
External
Cum. Mortality
Years since Dx
Infection
Cum. Mortality
Years since Dx
OtherSN
Cum. Mortality
Years since Dx
Background+Other
Cum. Mortality
Years since Dx

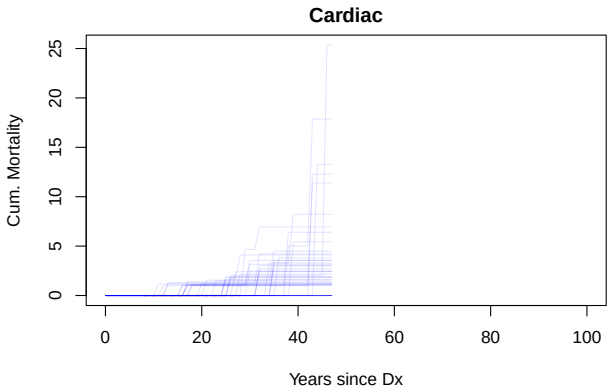
4.3.5.28 Ewings

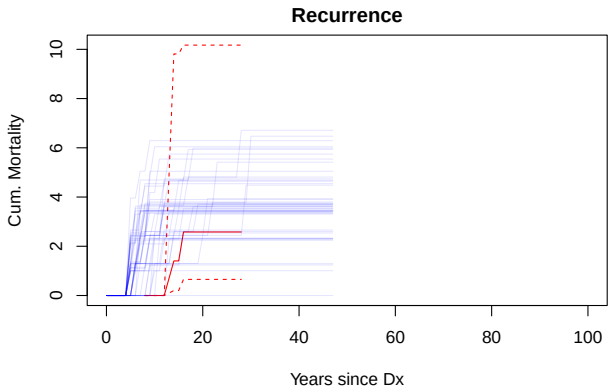


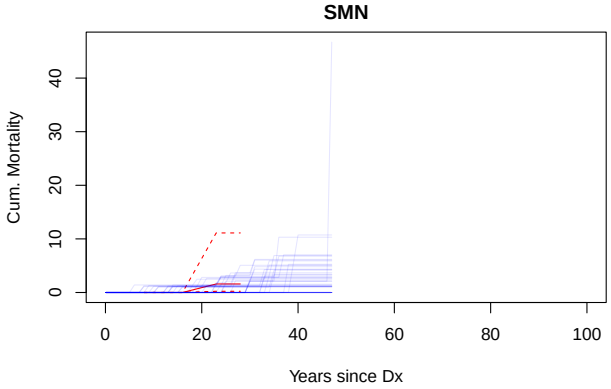
4.3.5.29 Osteosarcoma

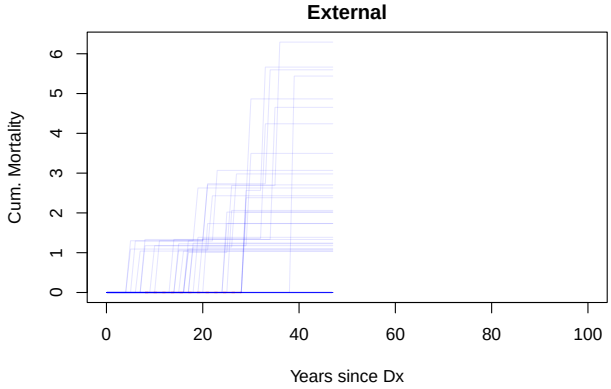


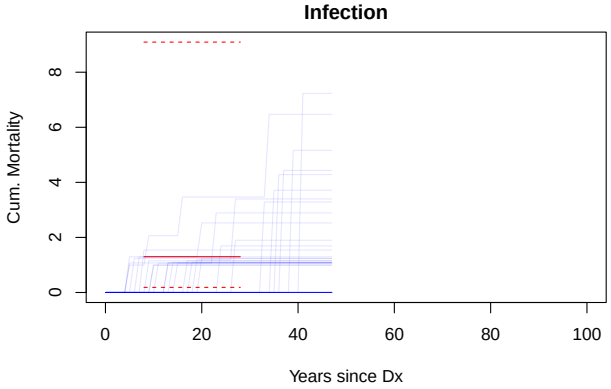
4.3.5.30 OtherBoneTumor

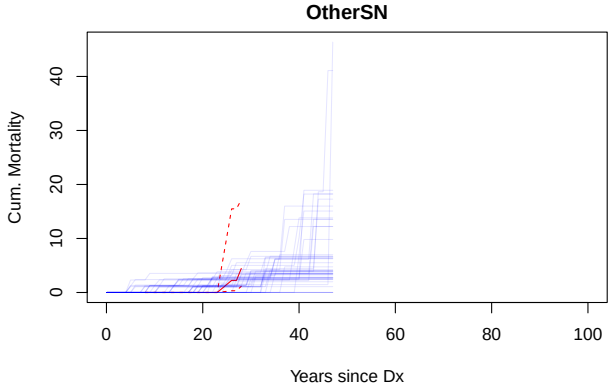


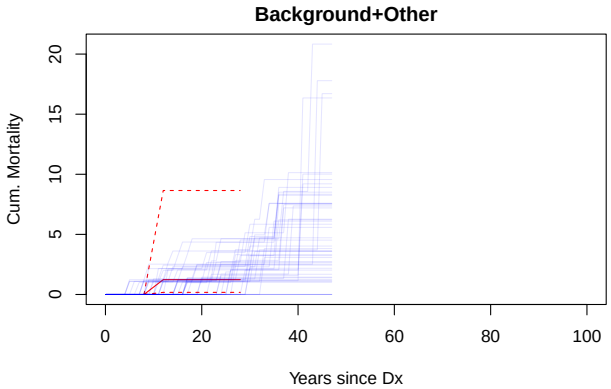




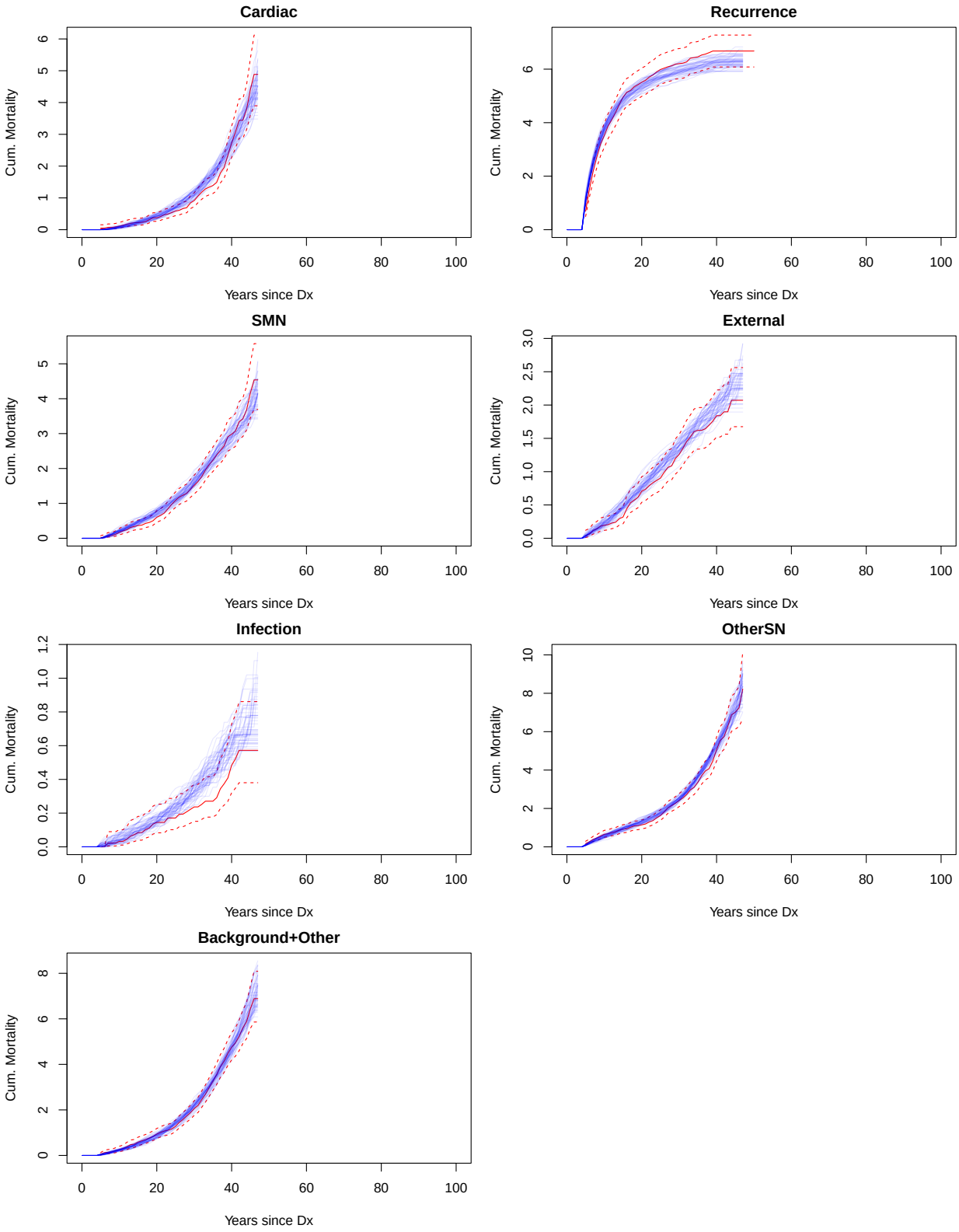




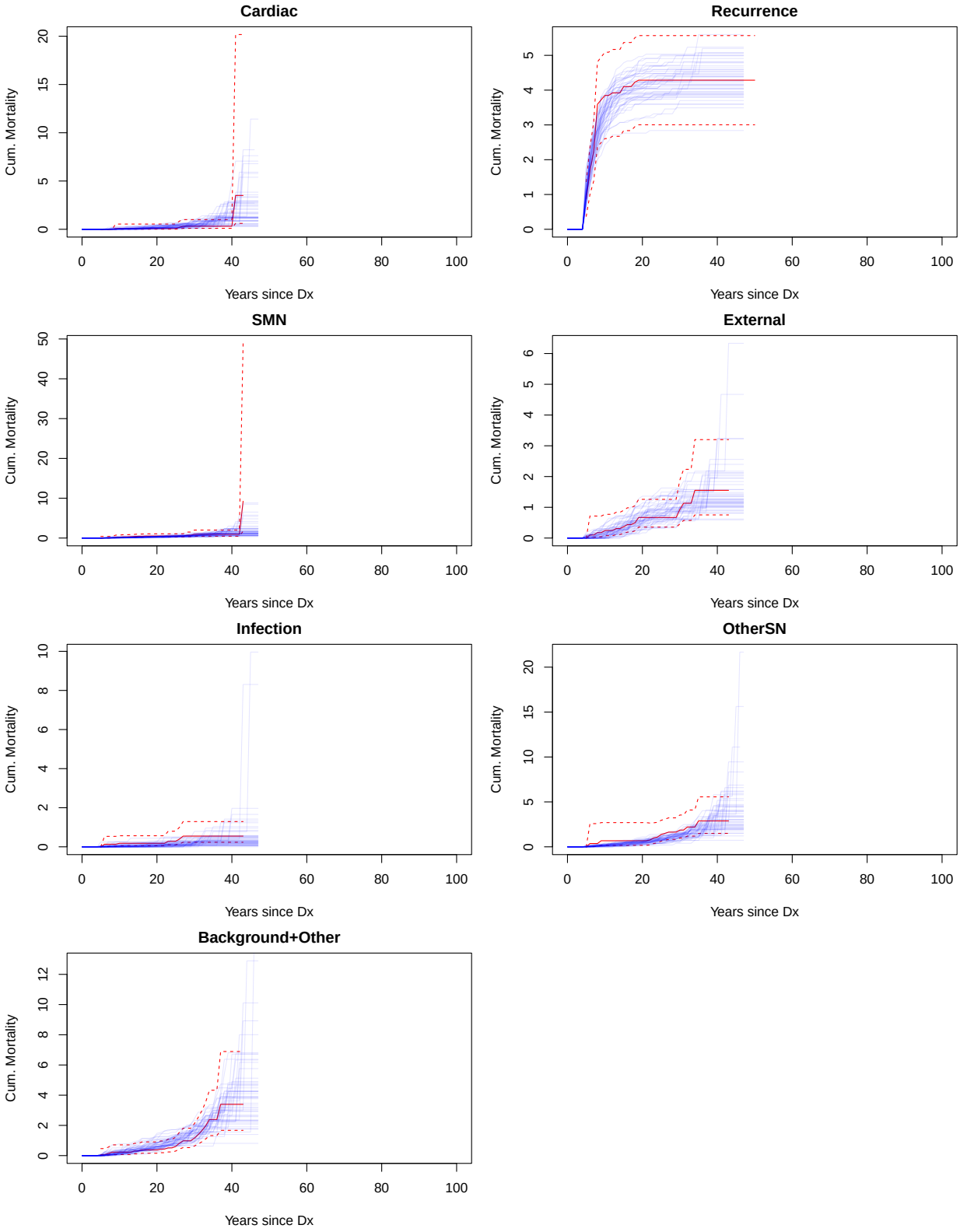




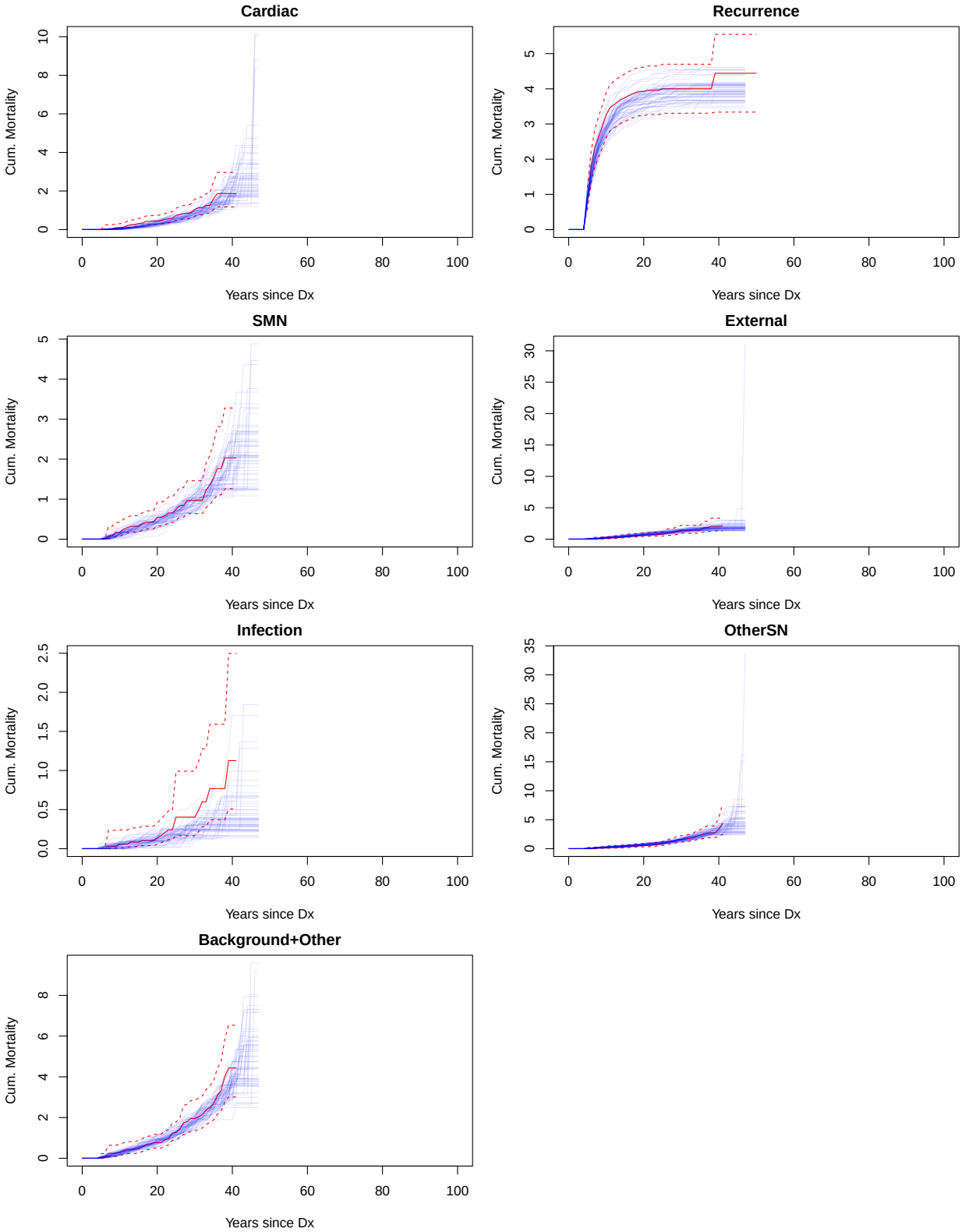
4.3.5.31 AnthNone



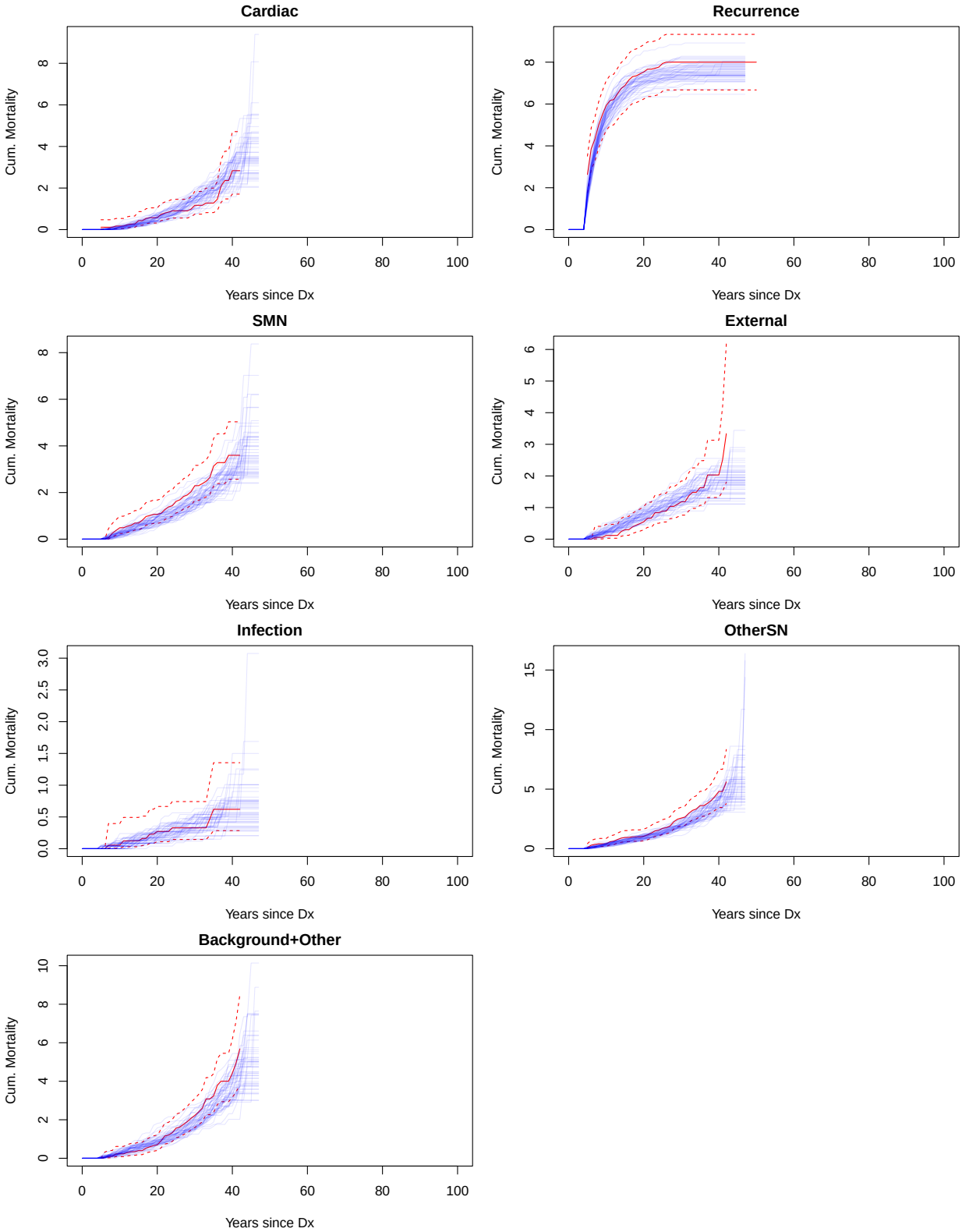
4.3.5.32 Anth<100



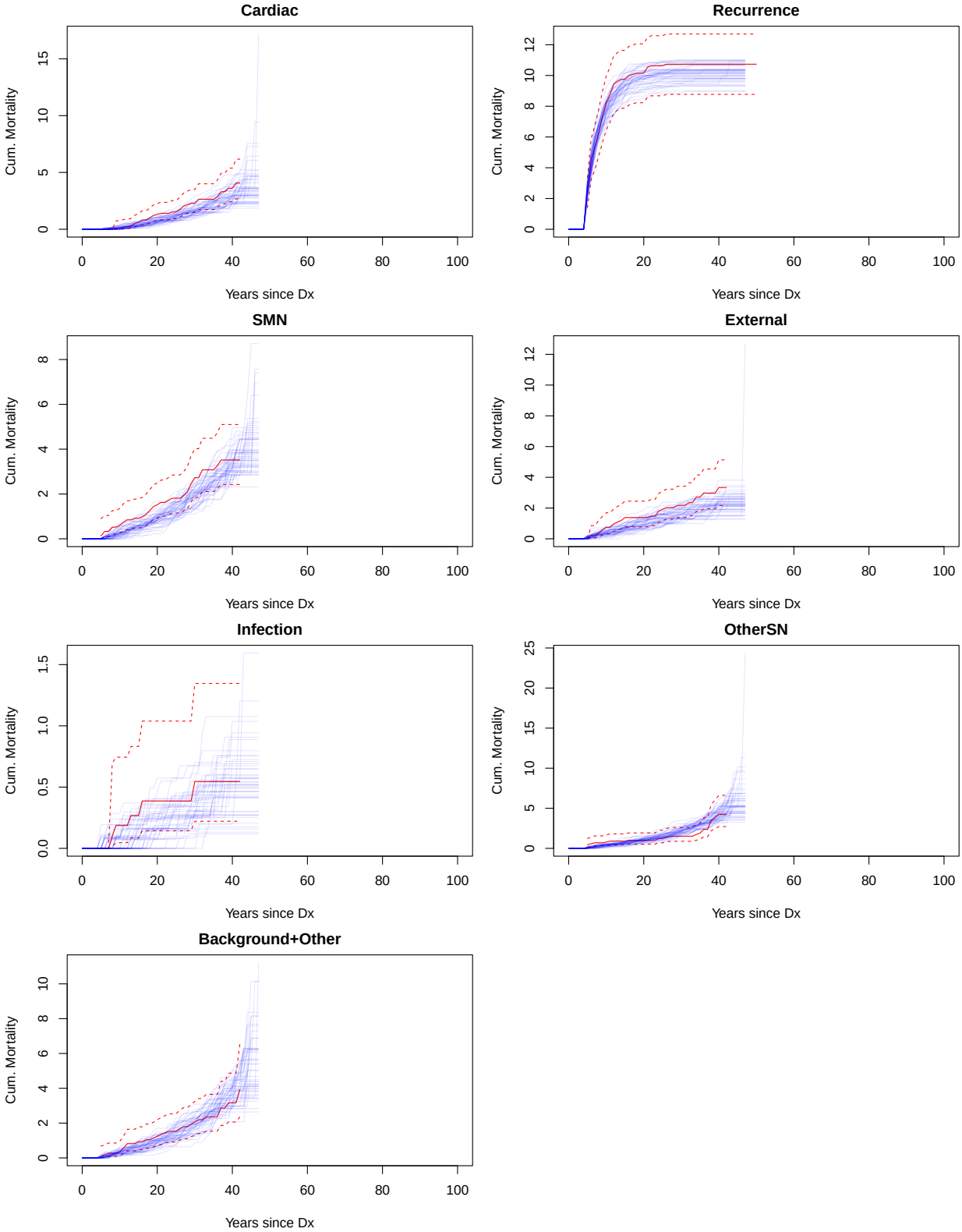
4.3.5.33 Anth100_249



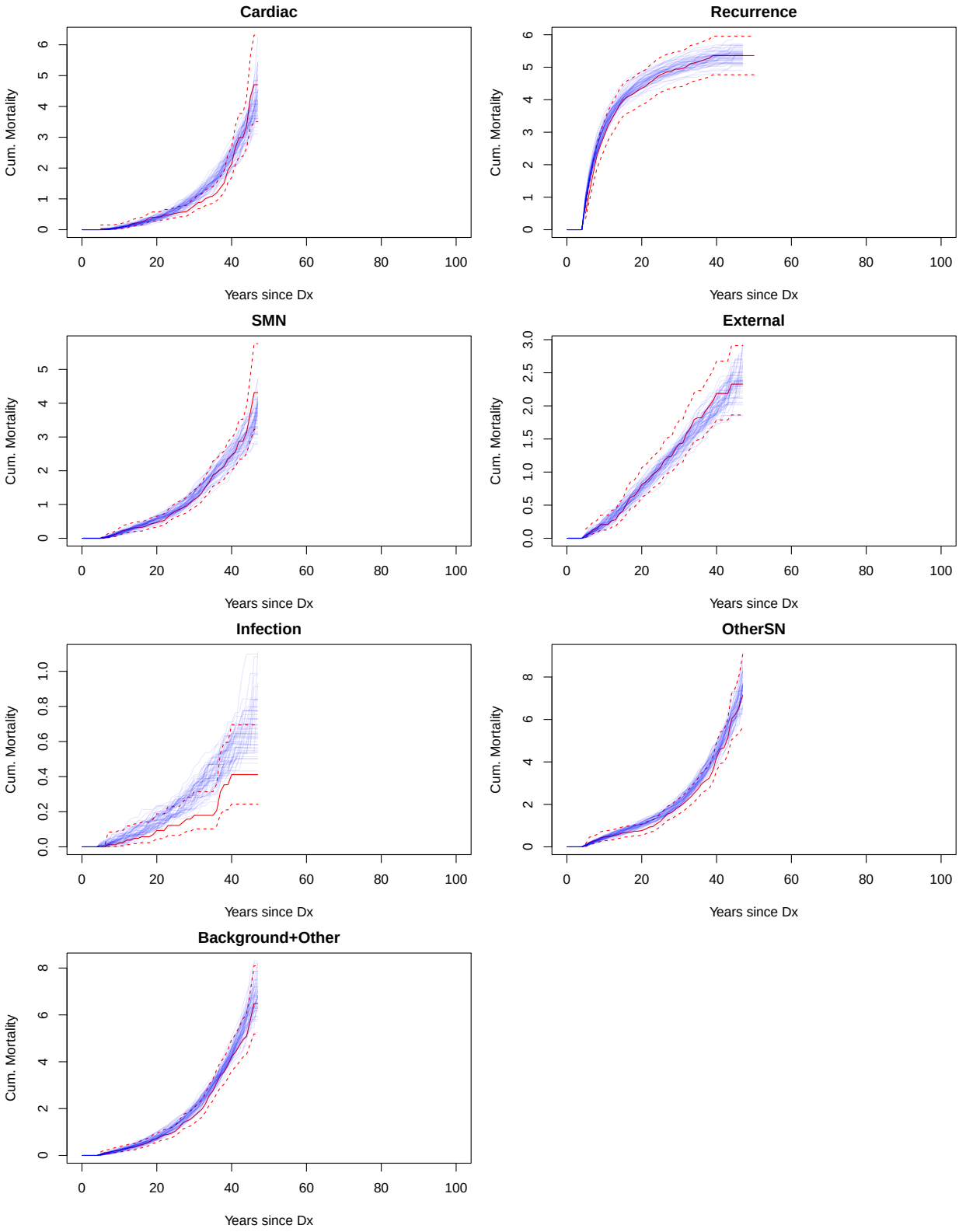
4.3.5.34 Anth250_399



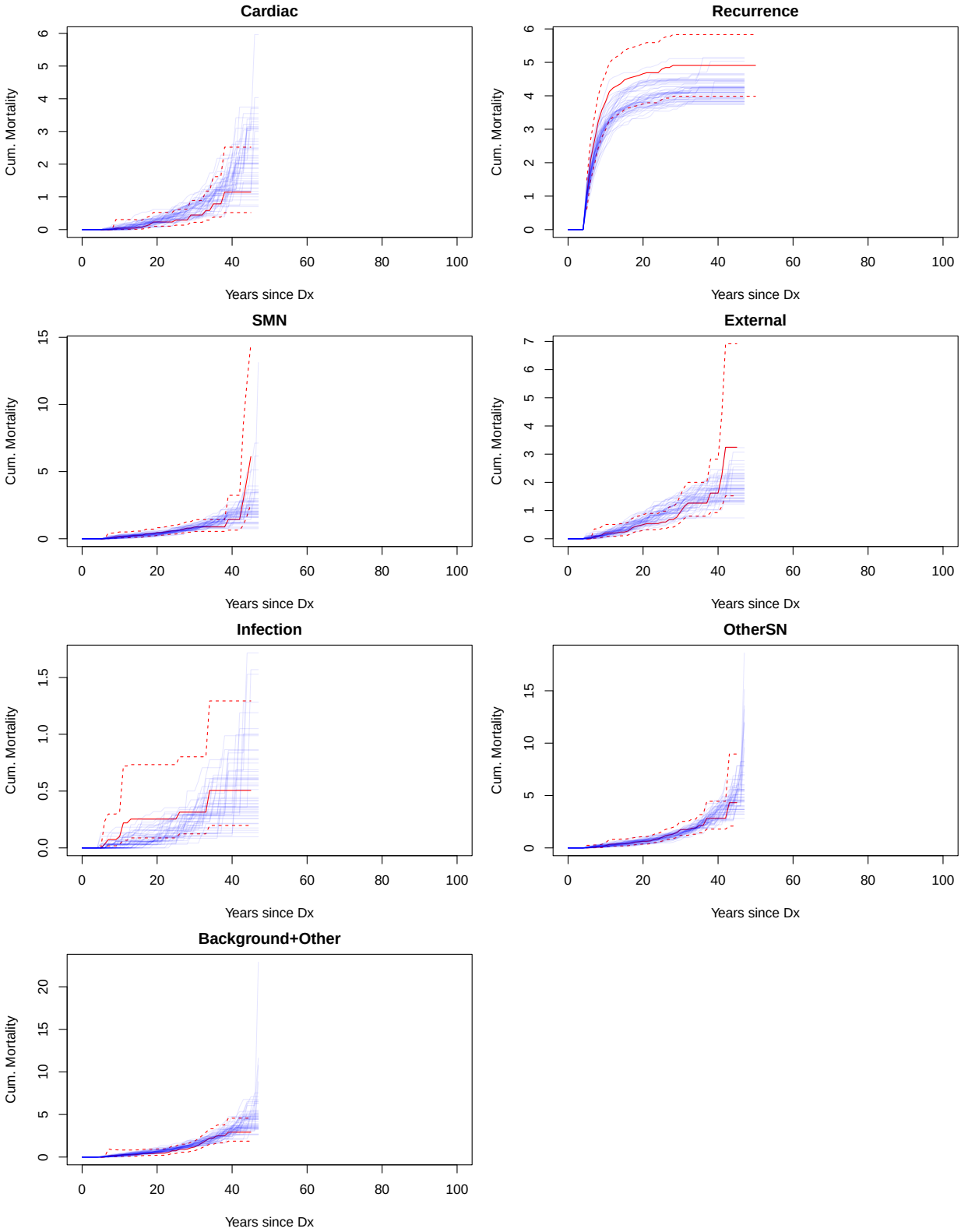
4.3.5.35 Anth400+



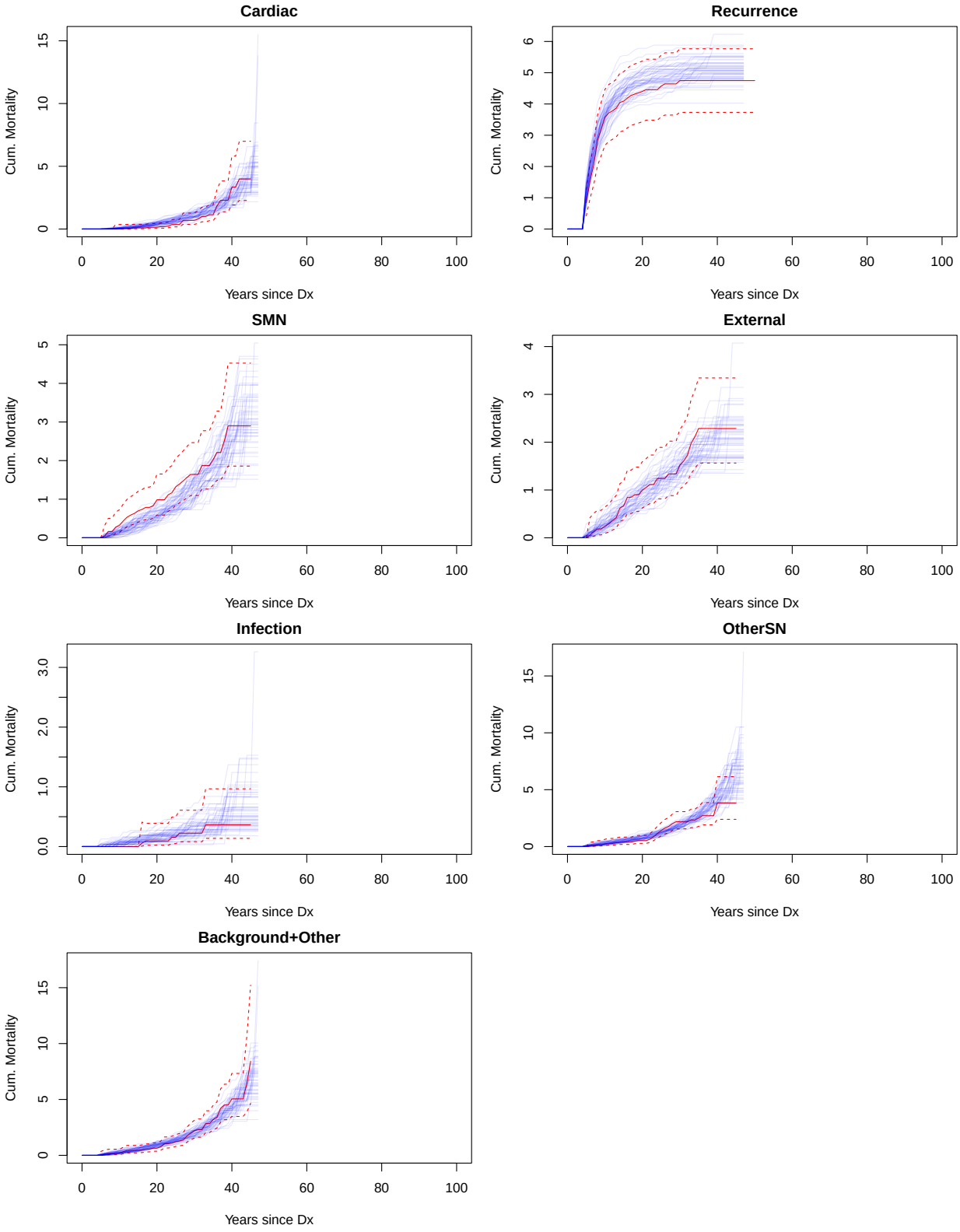
4.3.5.36 AlkNone



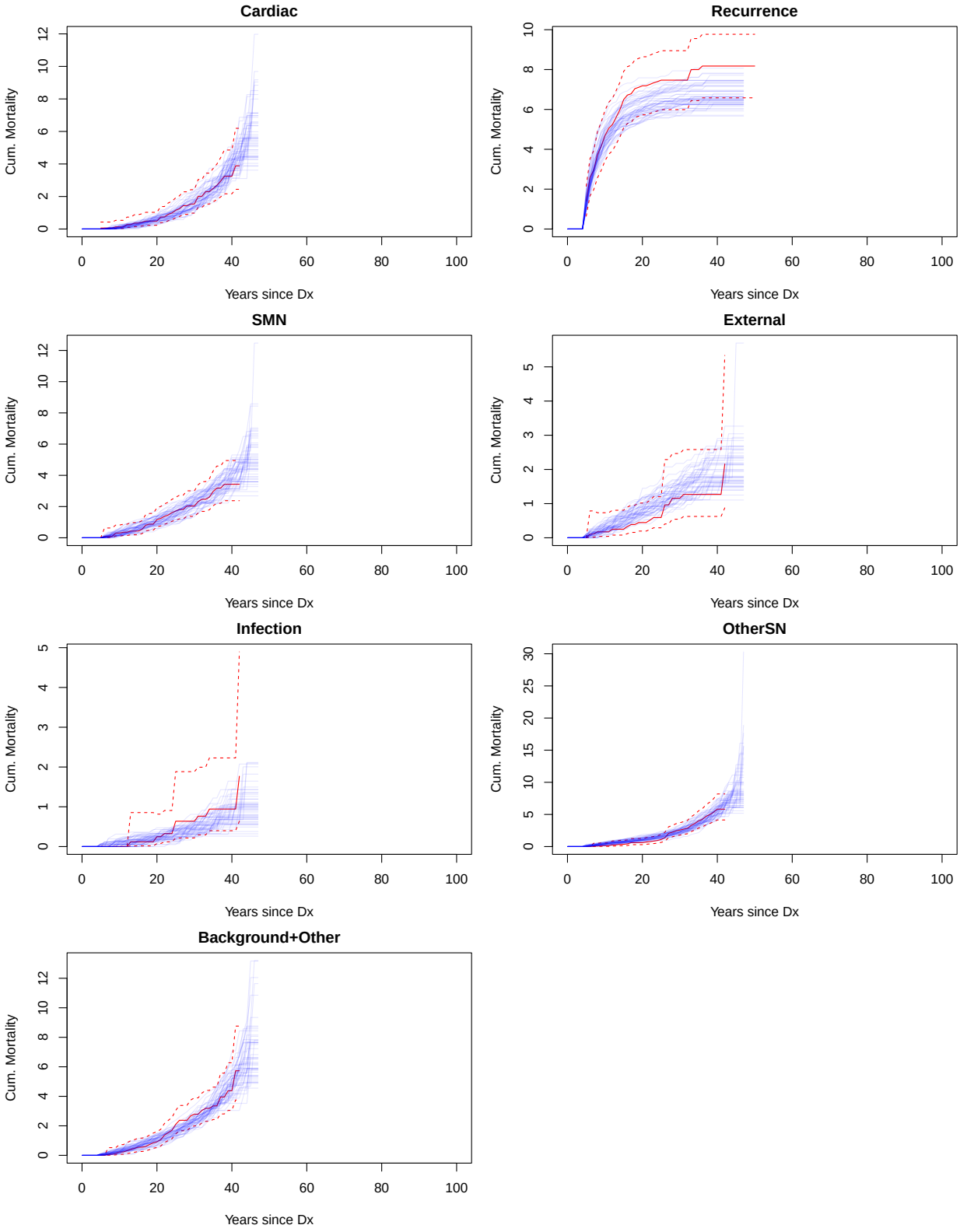
4.3.5.37 Alk<4000



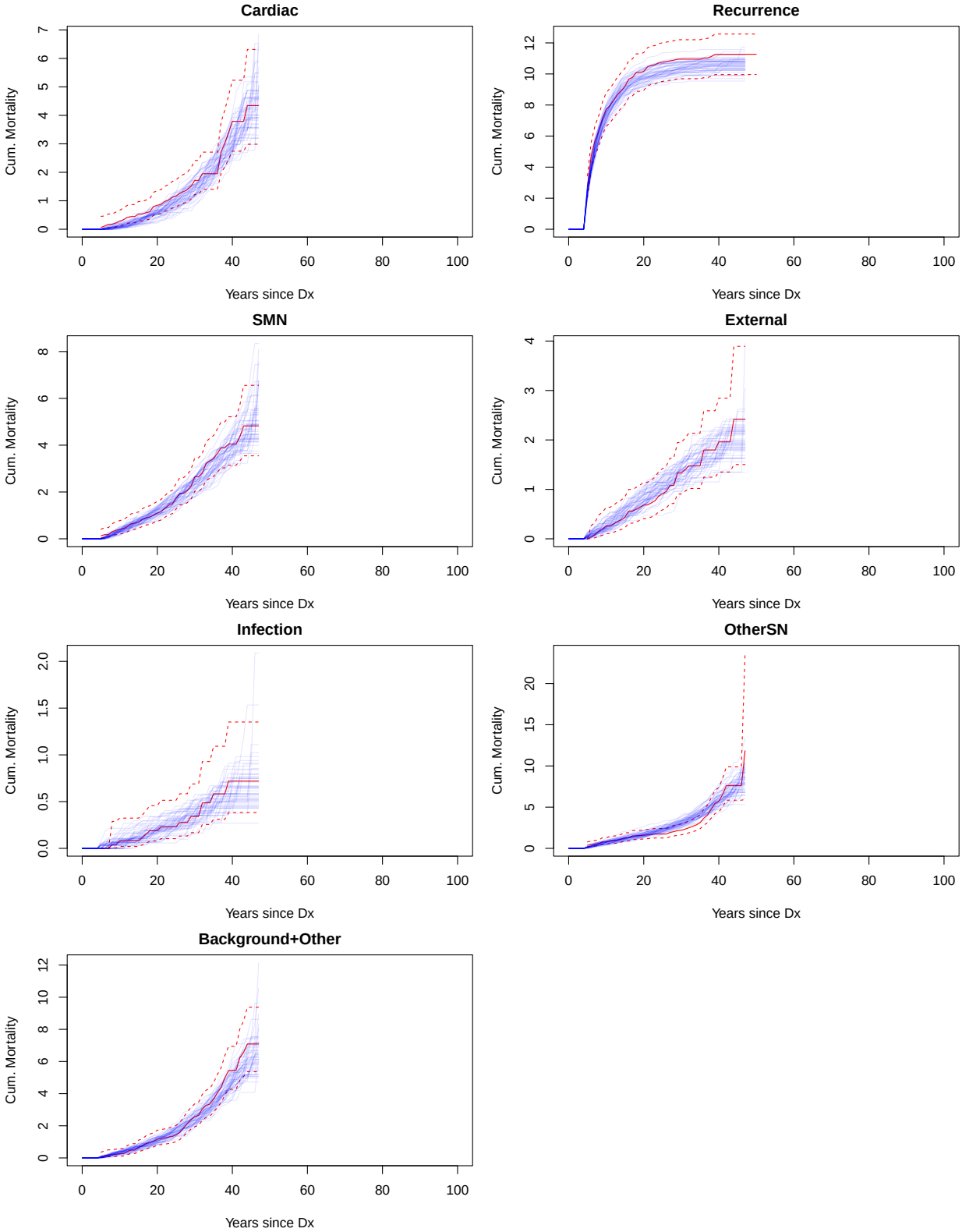
4.3.5.38 Alk4000_7999



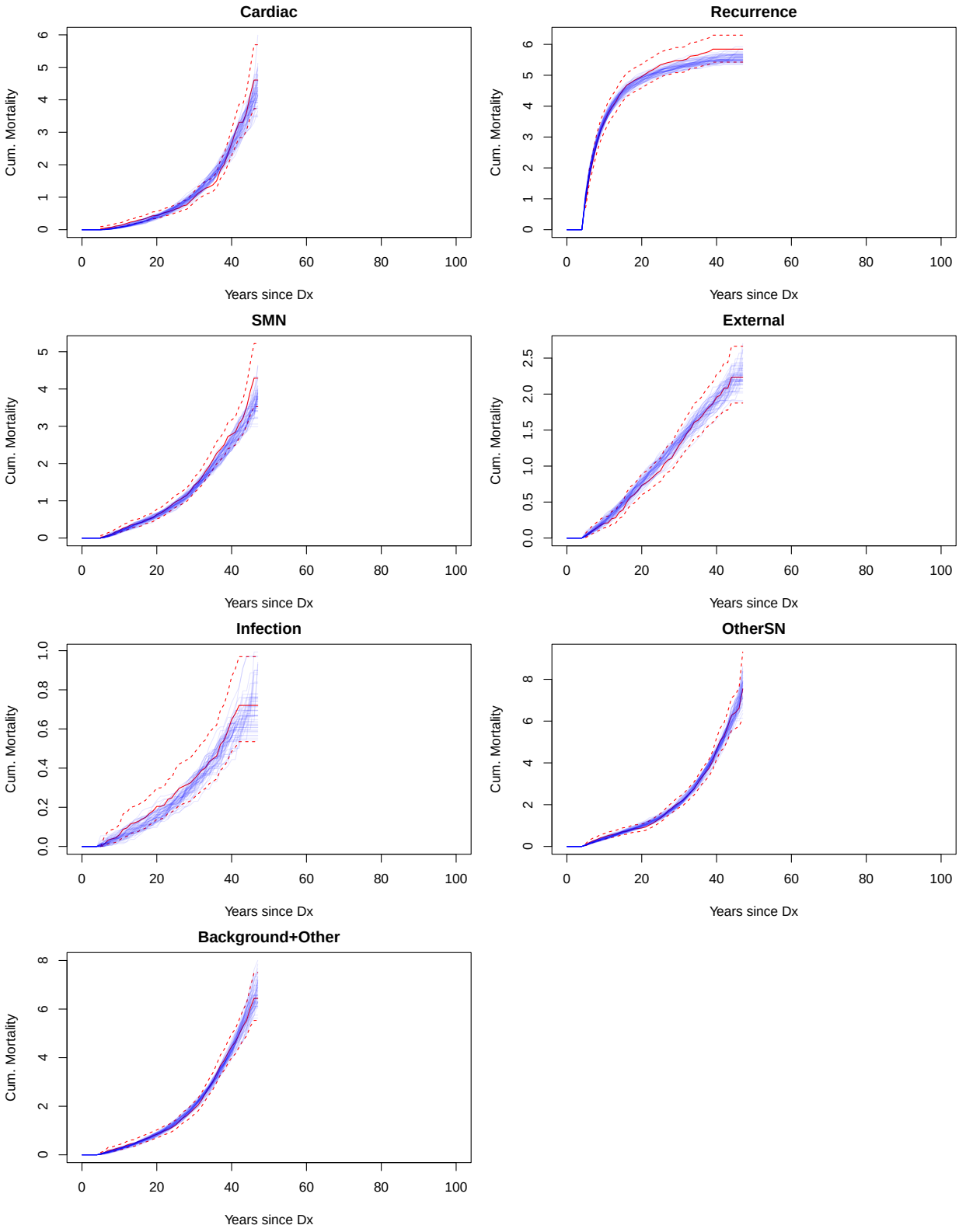
4.3.5.39 Alk8000_11999



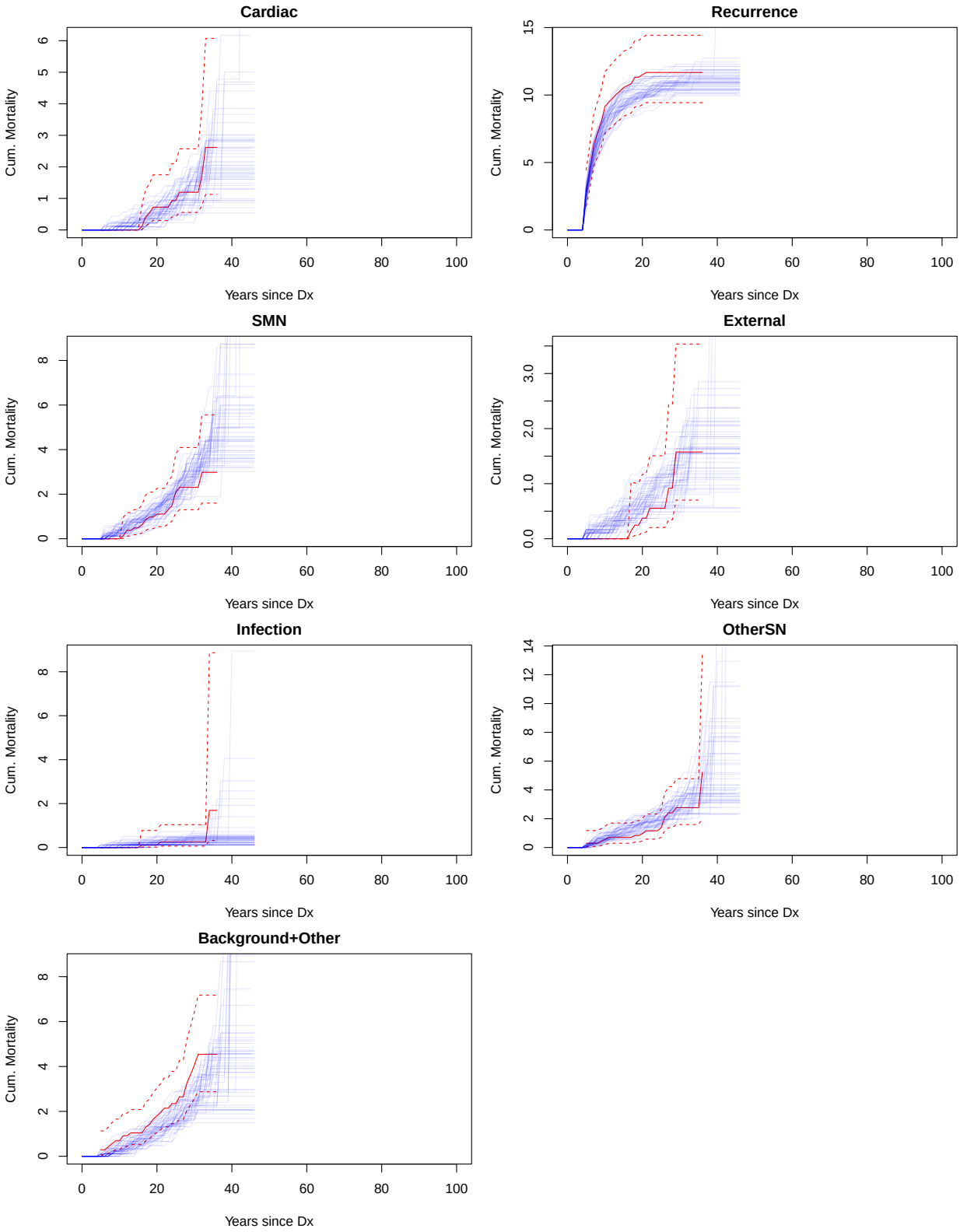
4.3.5.40 Alk12000+



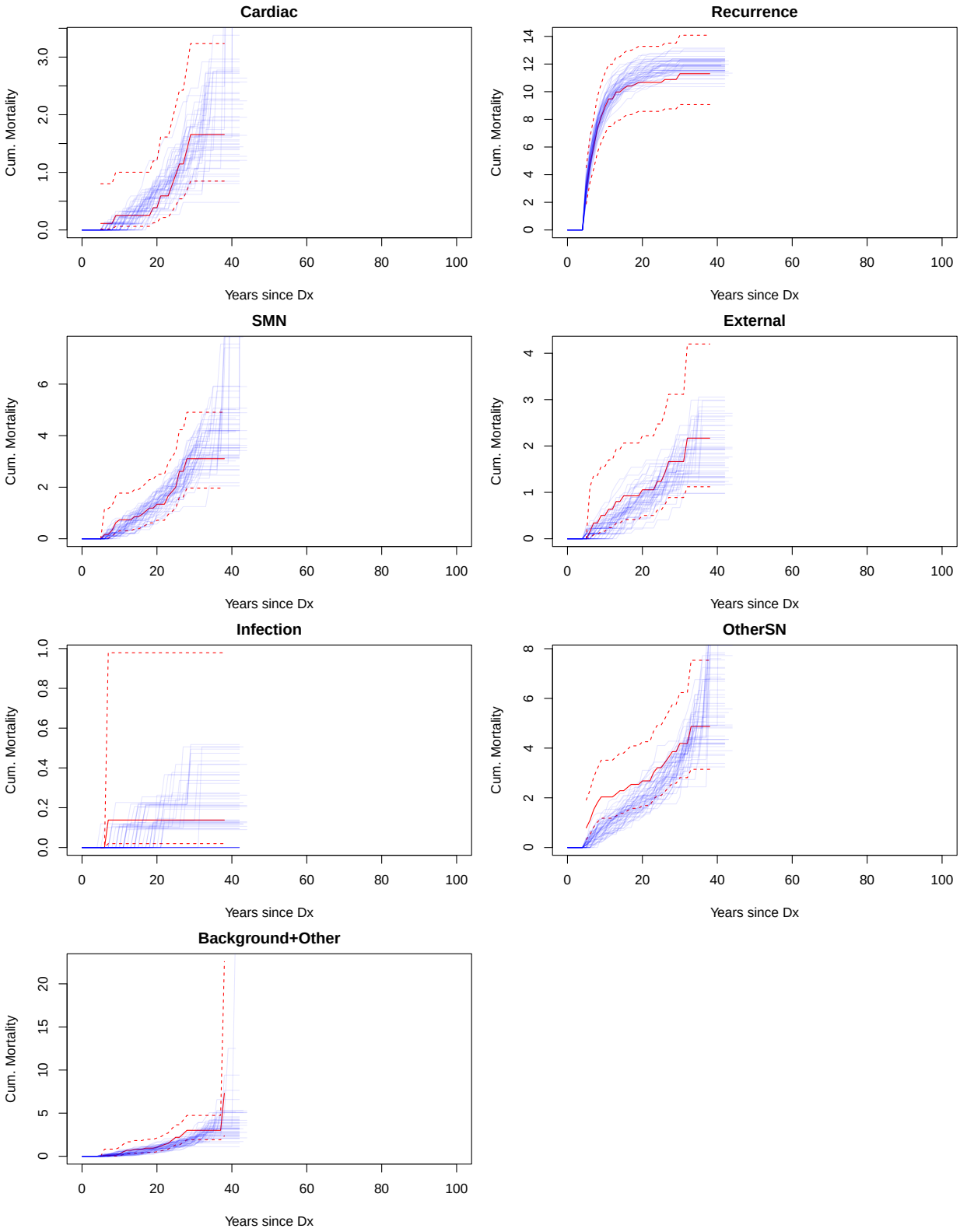
4.3.5.41 CispNone



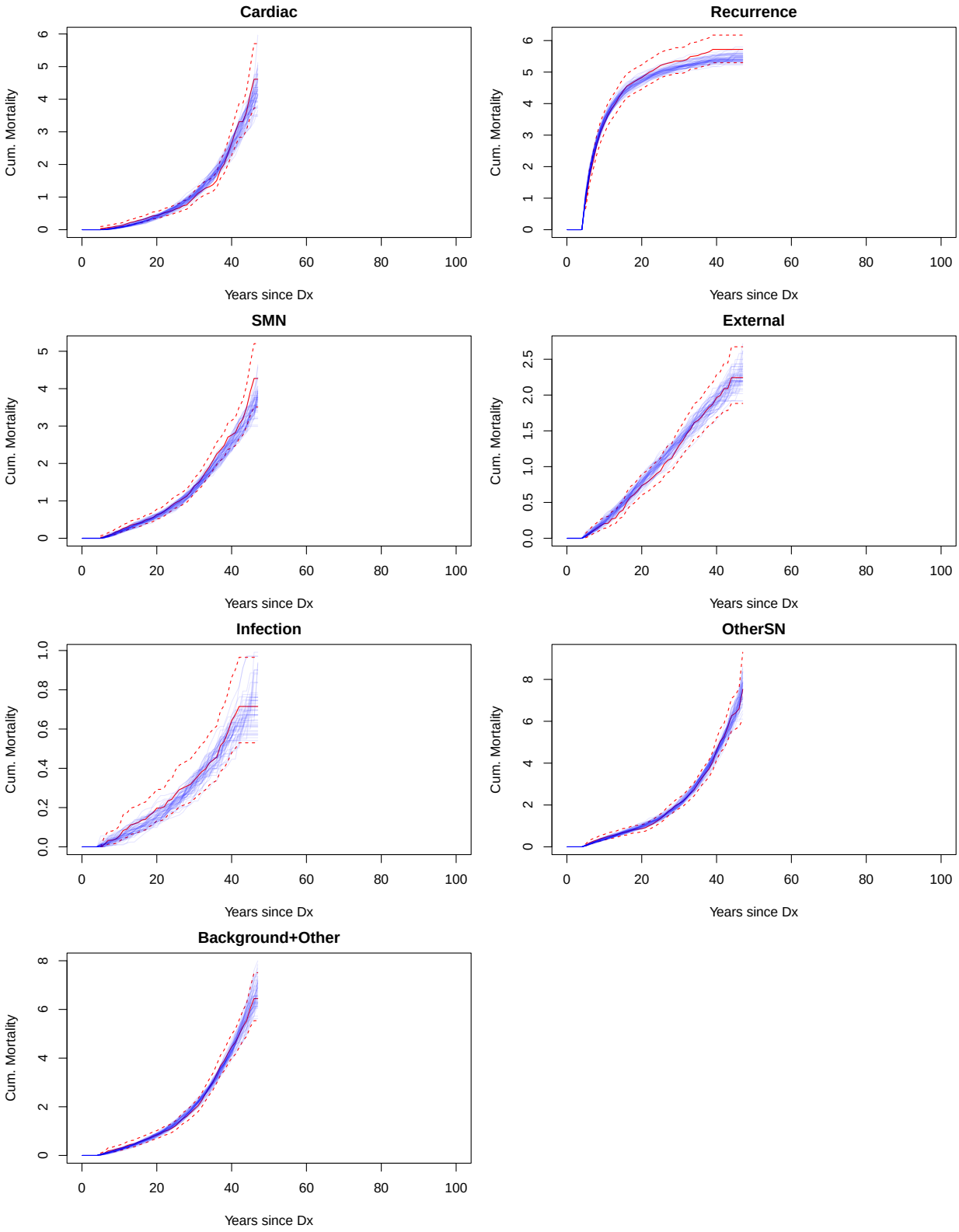
4.3.5.42 Cisp<400



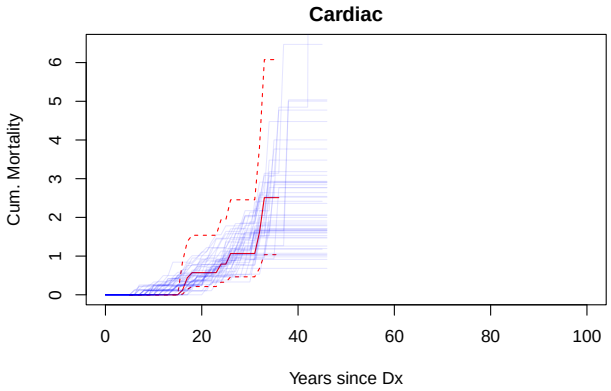
4.3.5.43 Cisp400+

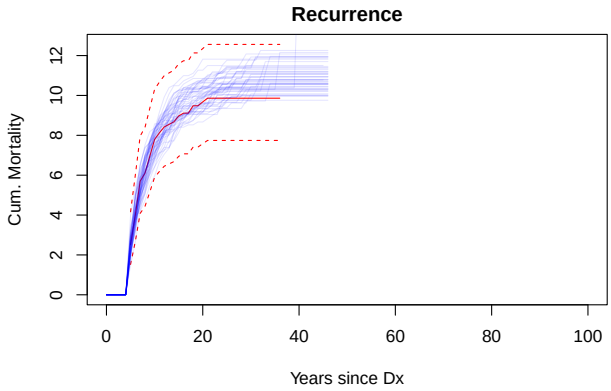


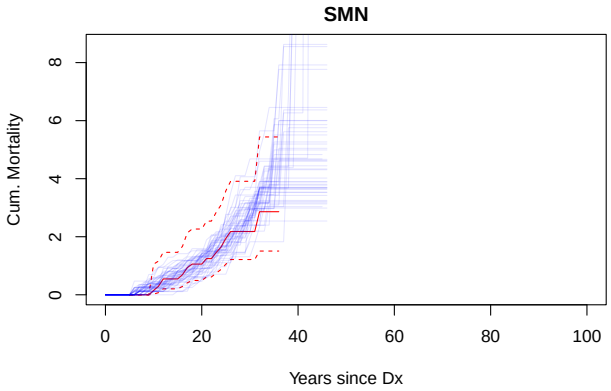
4.3.5.44 PlatNone

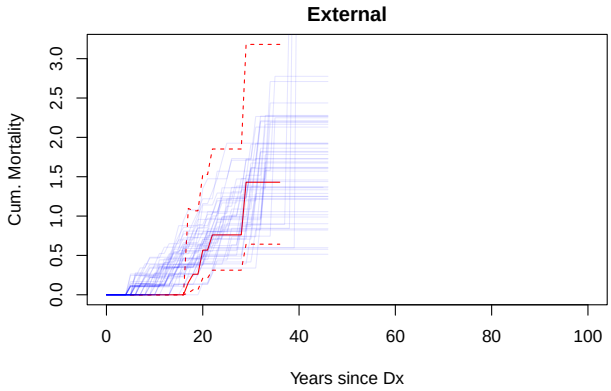


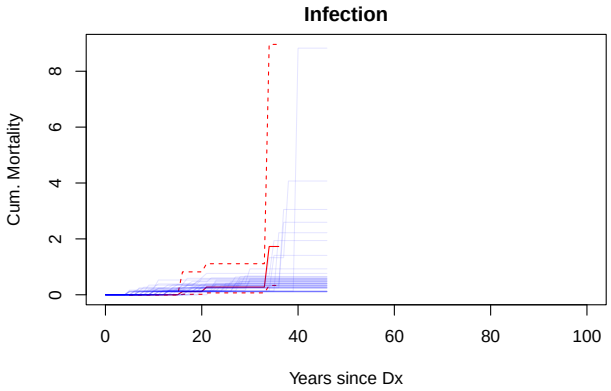
4.3.5.45 Plat<400

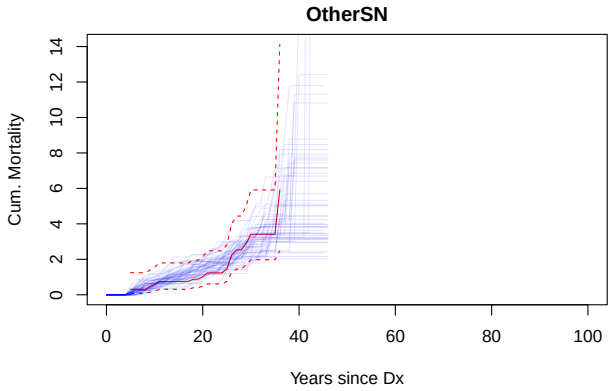


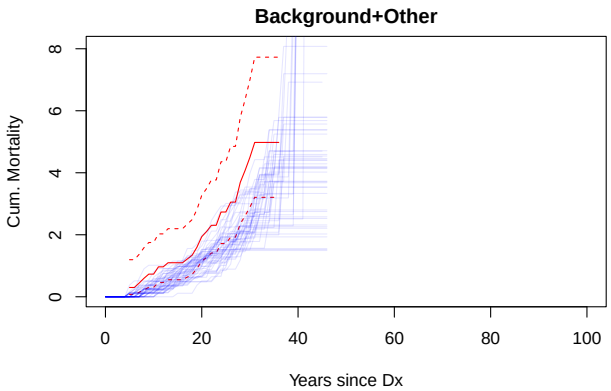




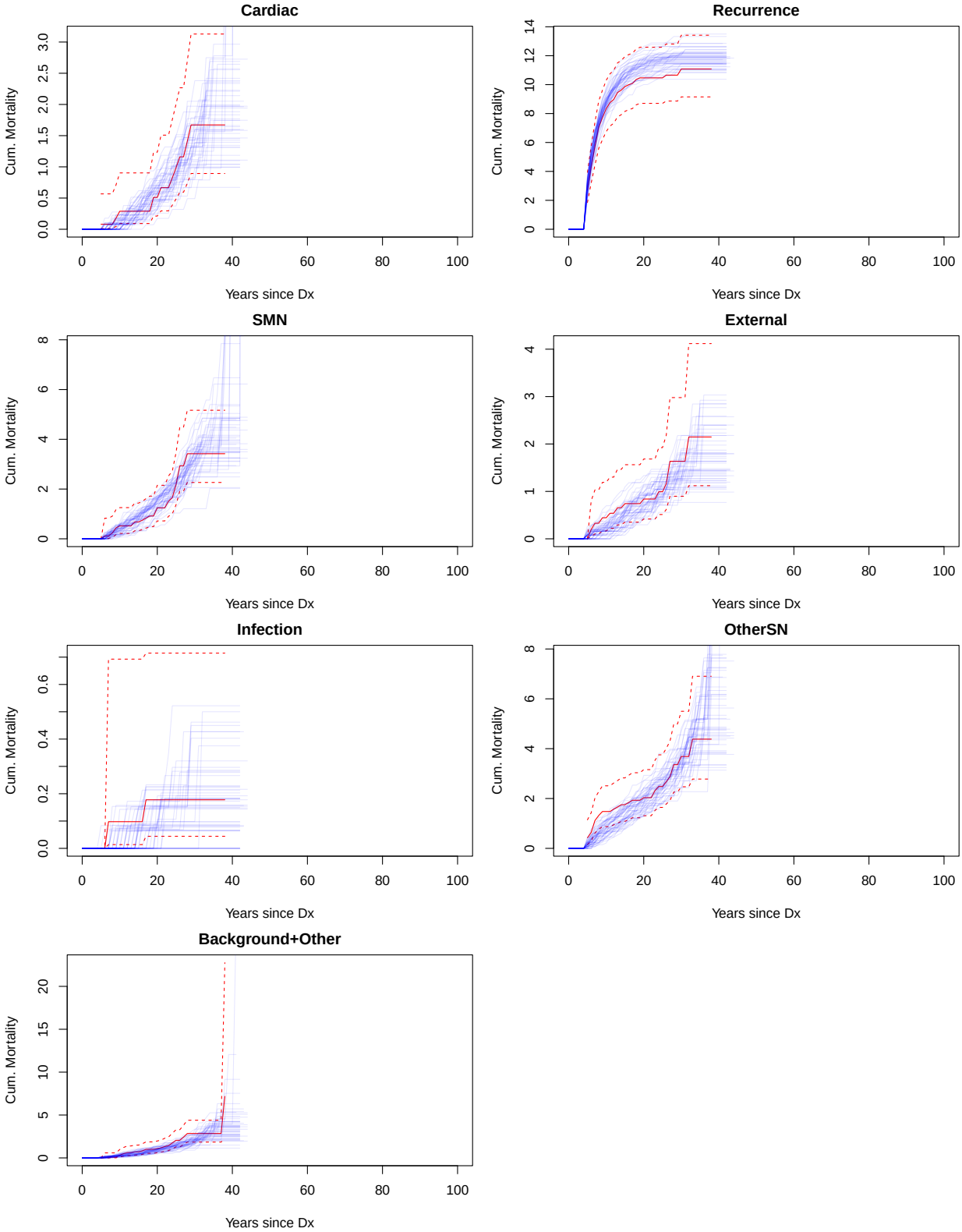




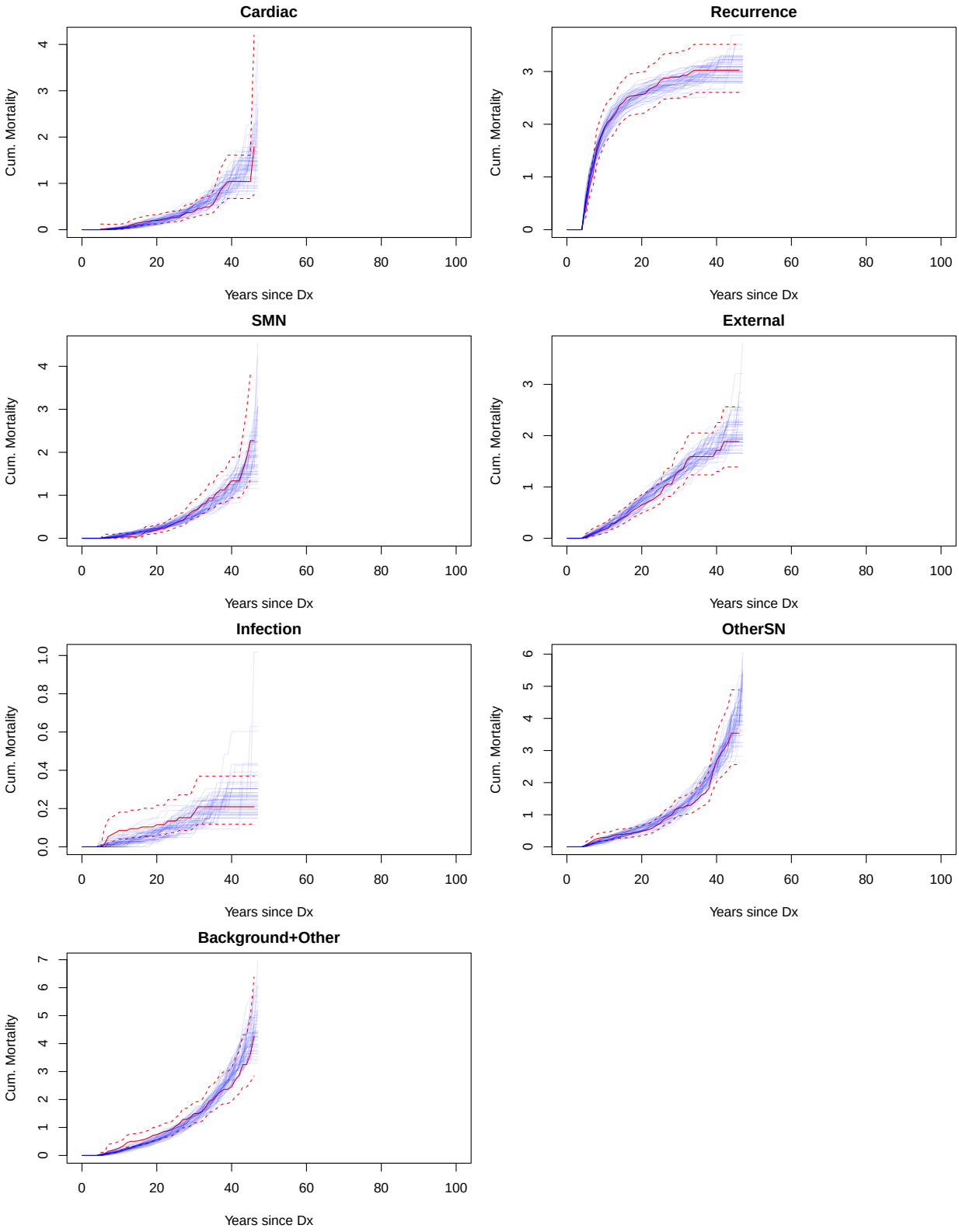




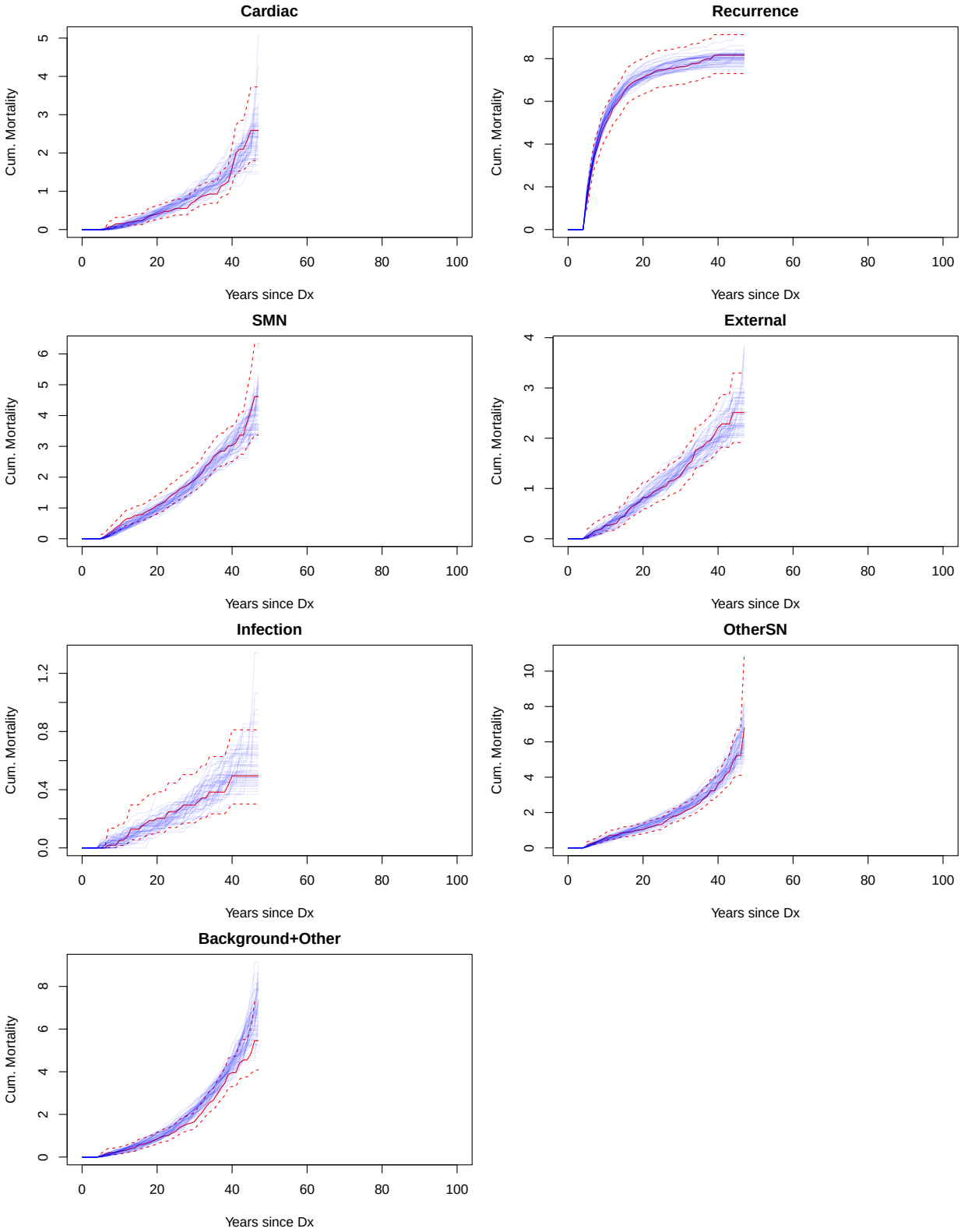
4.3.5.46 Plat400+



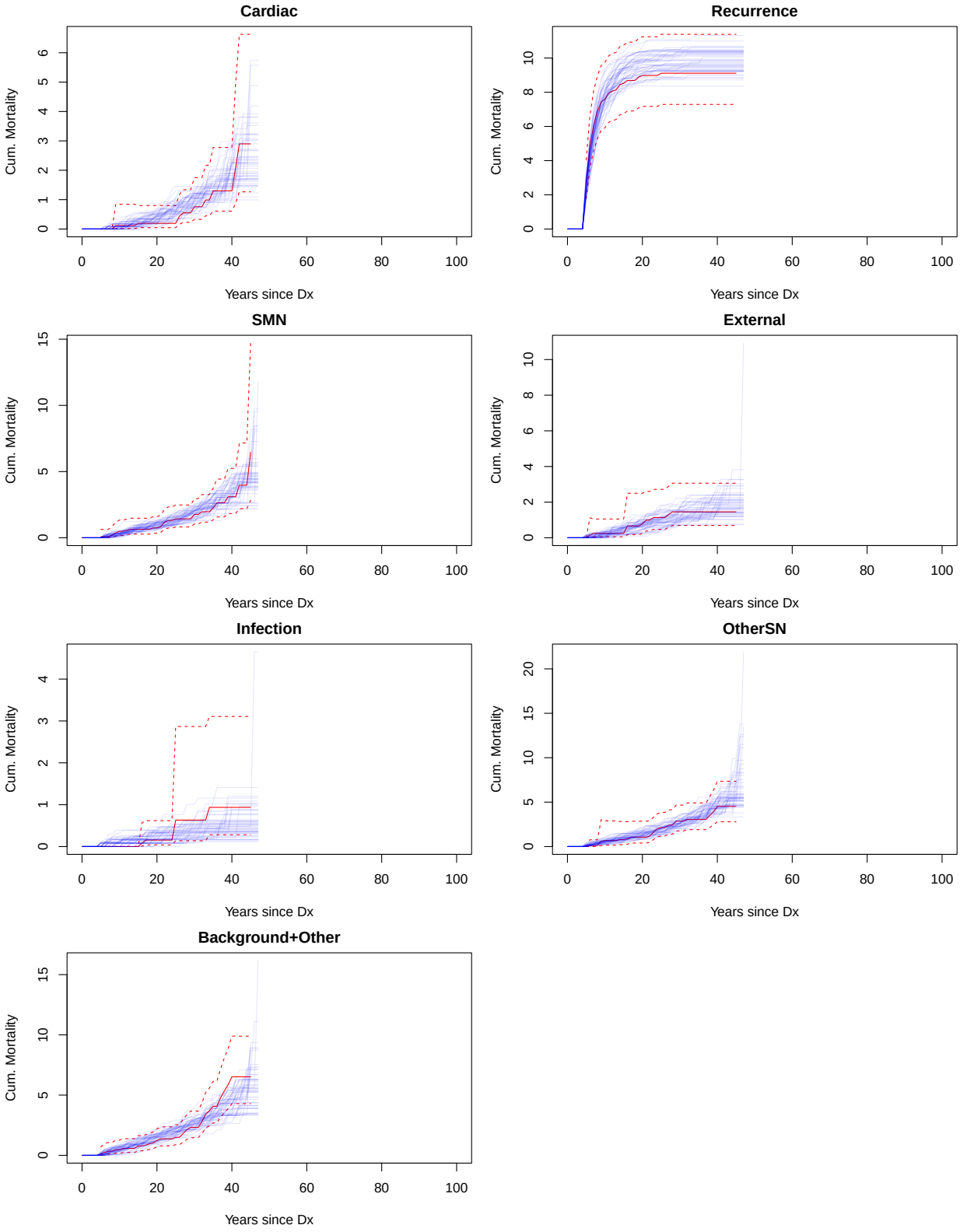
4.3.5.47 ChestNone



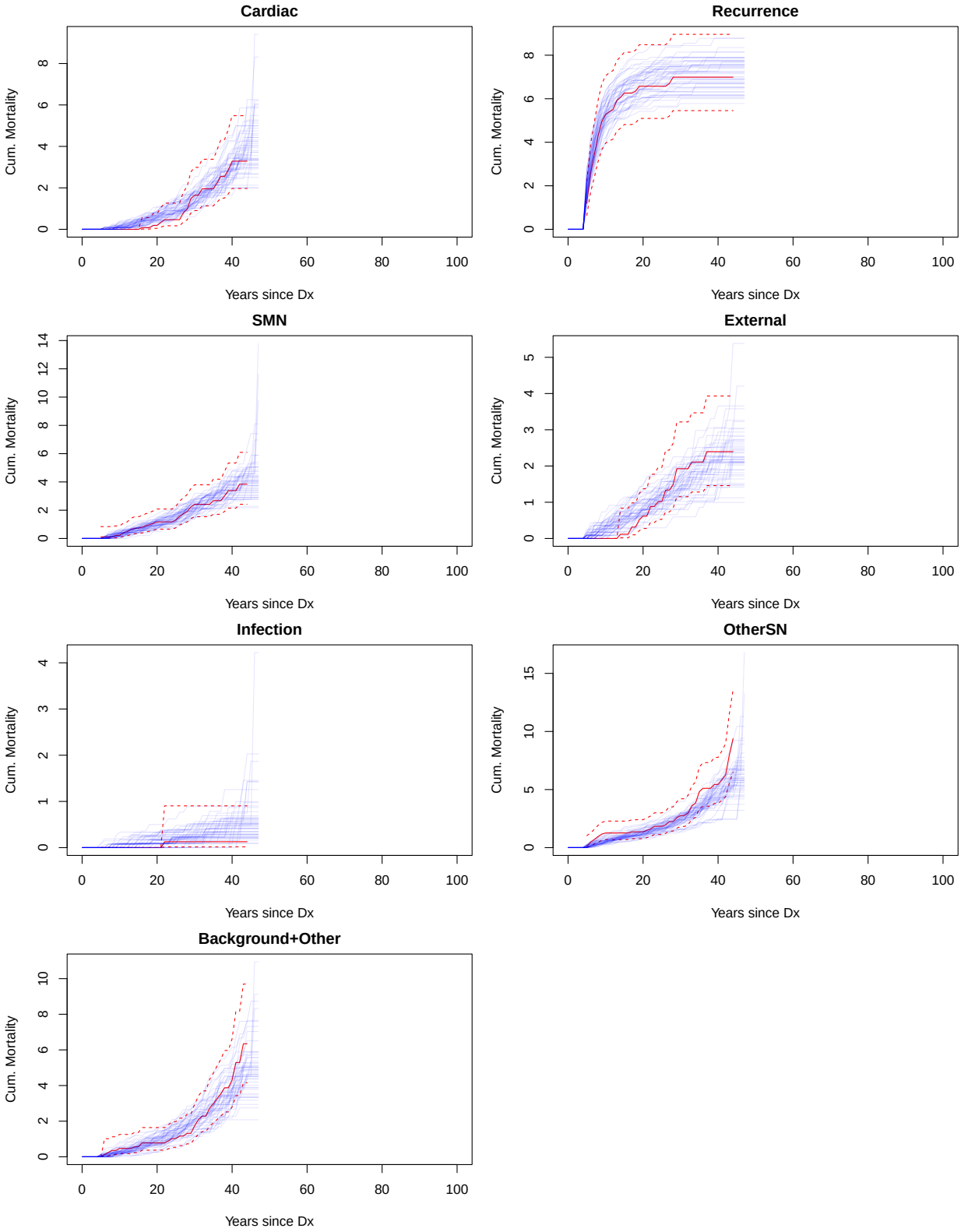
4.3.5.48 Chest<10



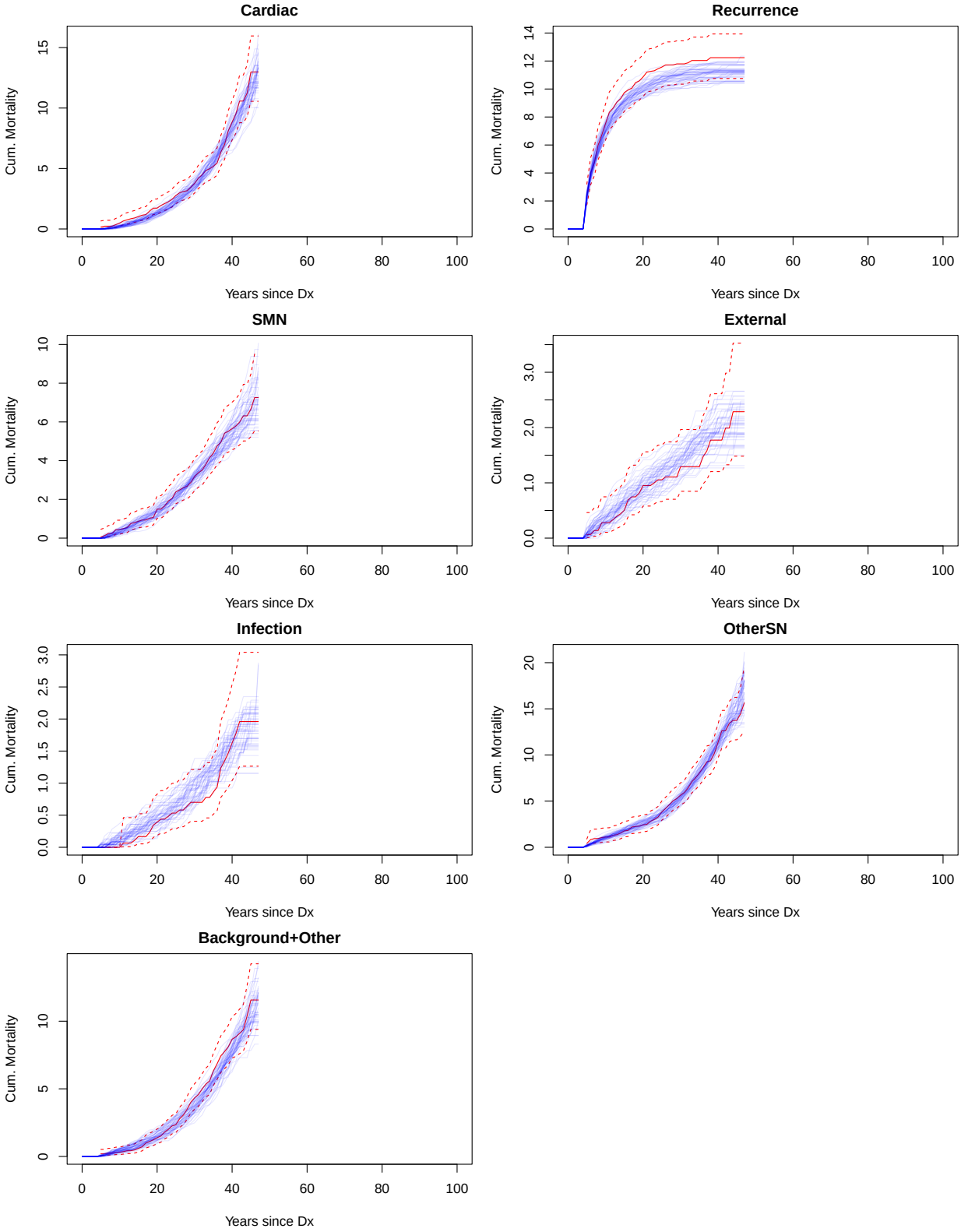
4.3.5.49 Chest10_19



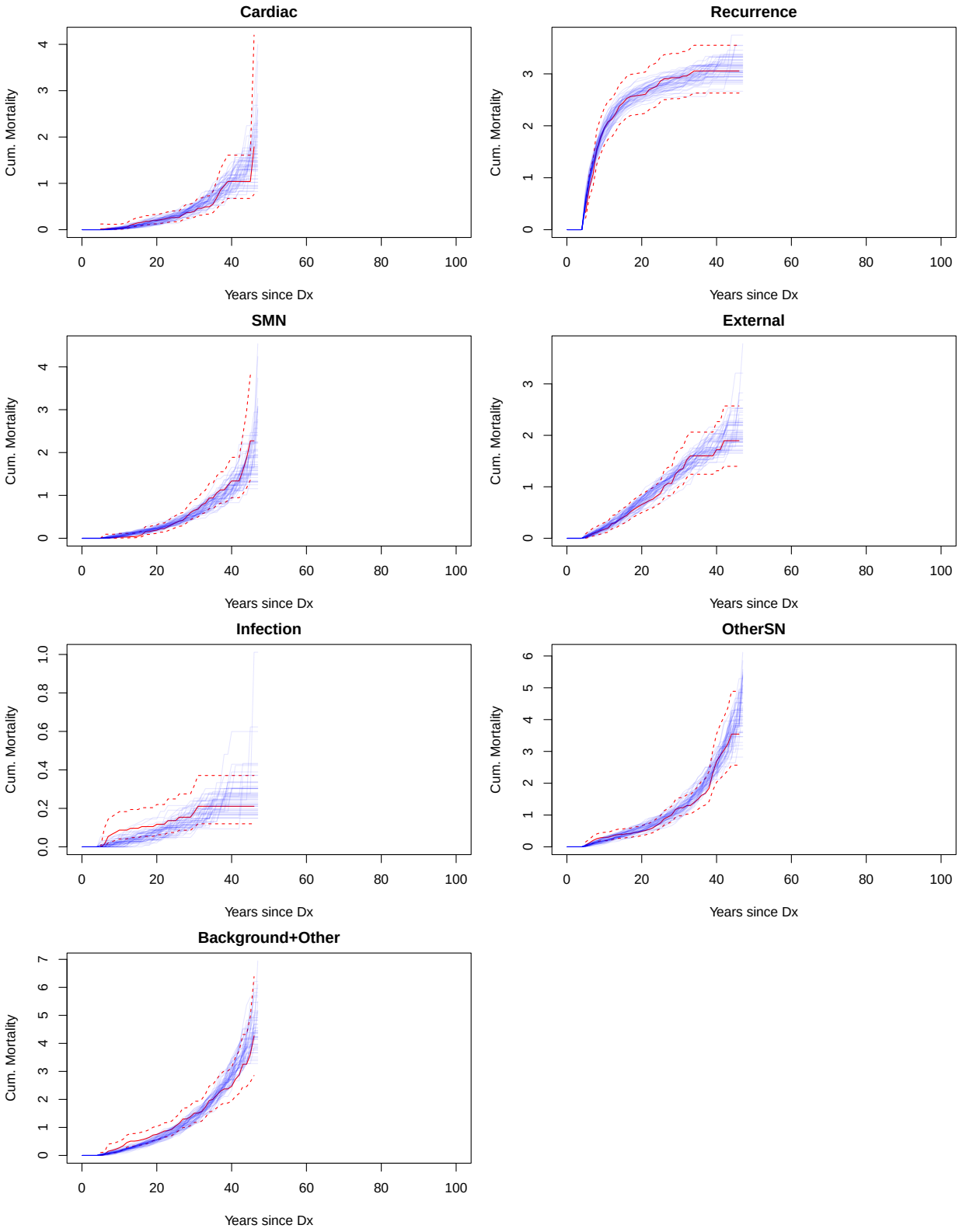
4.3.5.50 Chest20_29



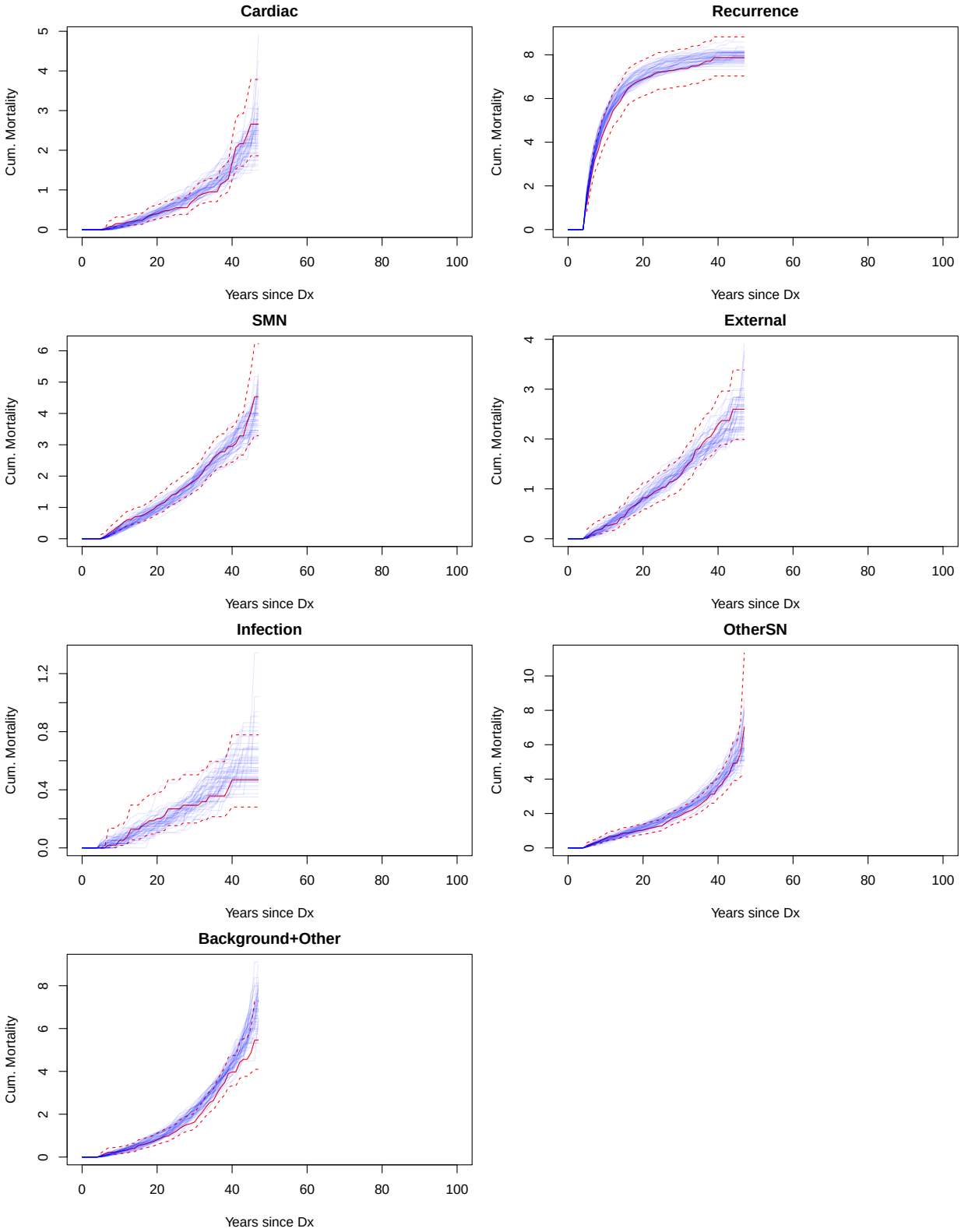
4.3.5.51 Chest30+



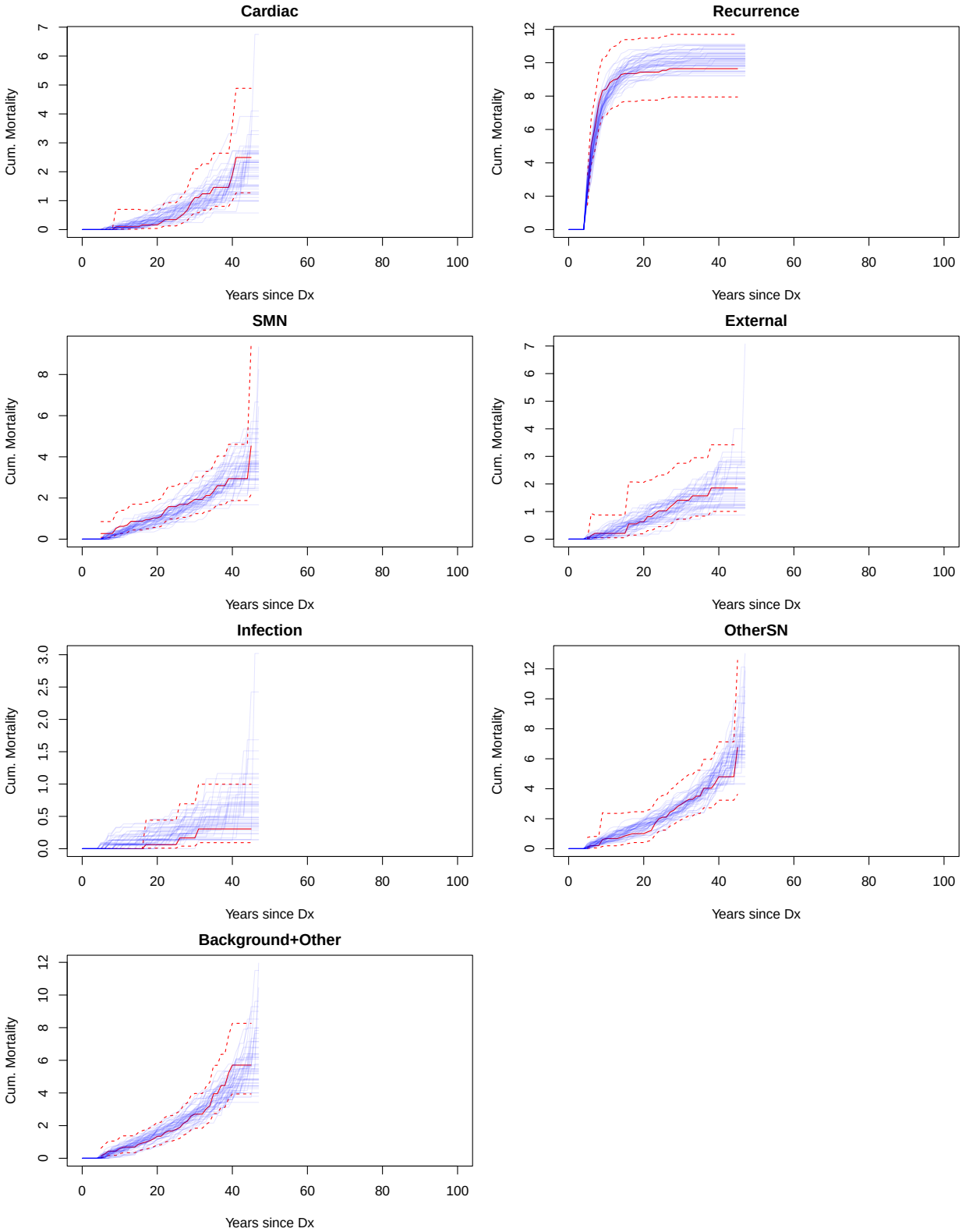
4.3.5.52 HeartNone



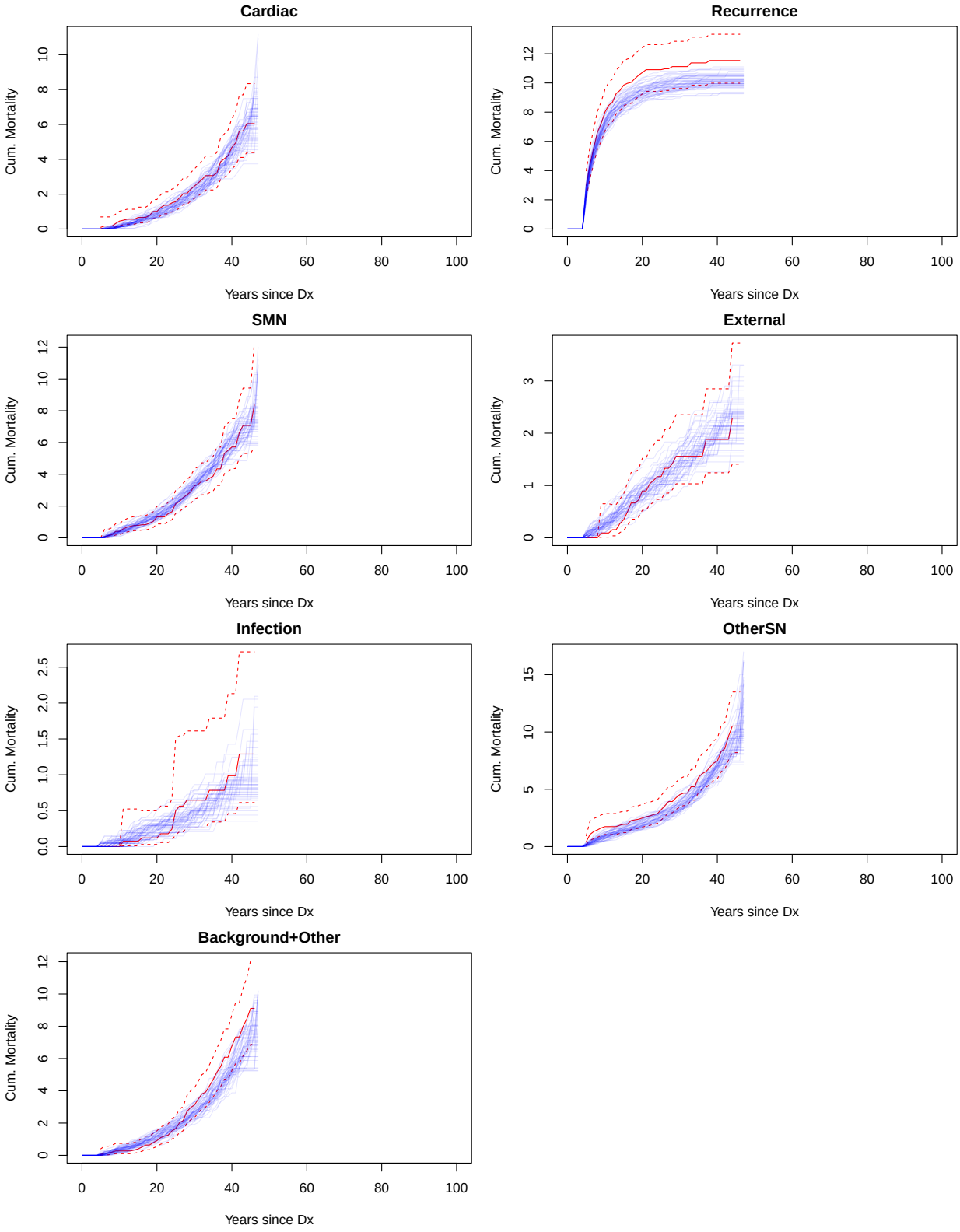
4.3.5.53 Heart<5



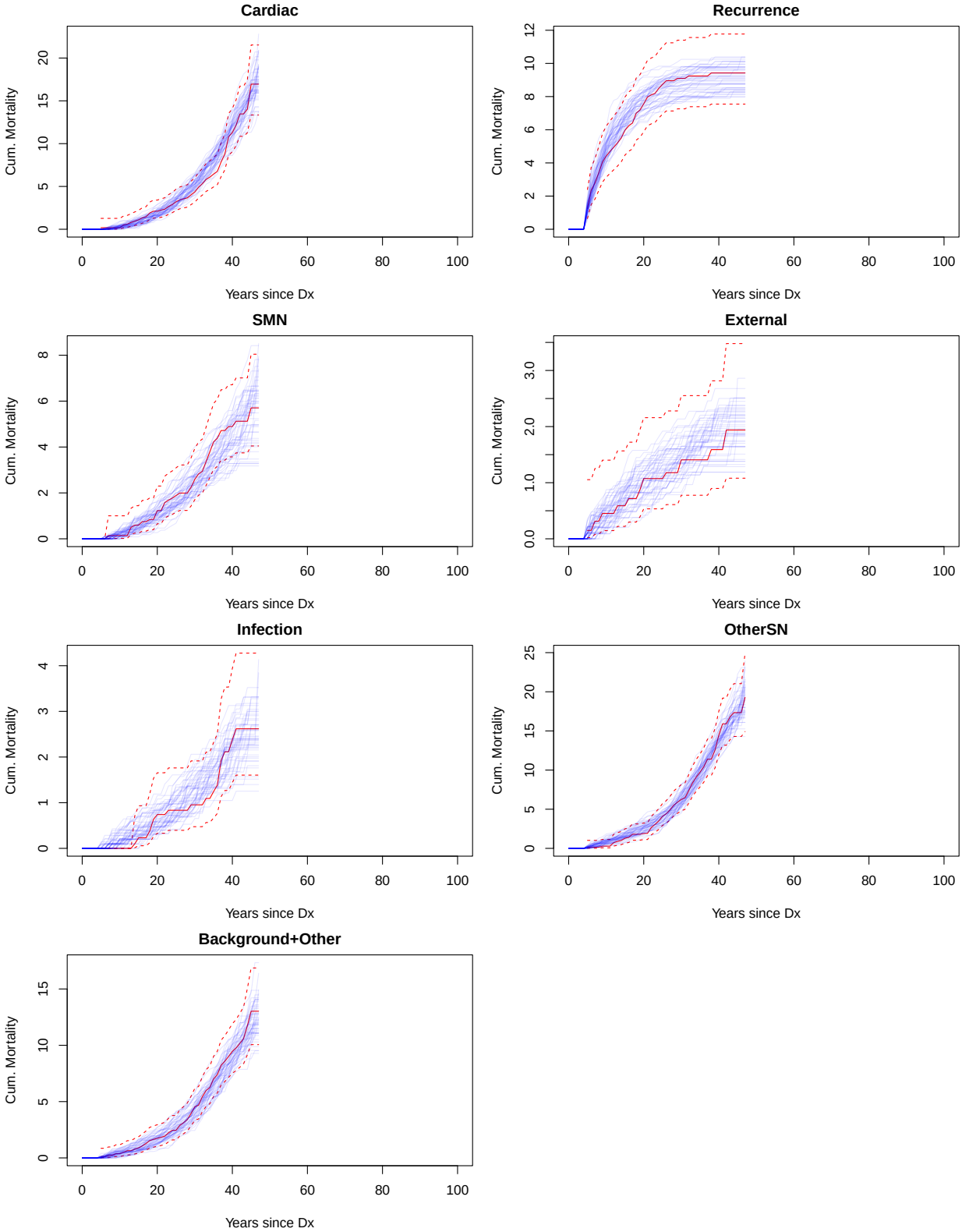
4.3.5.54 Heart5_14



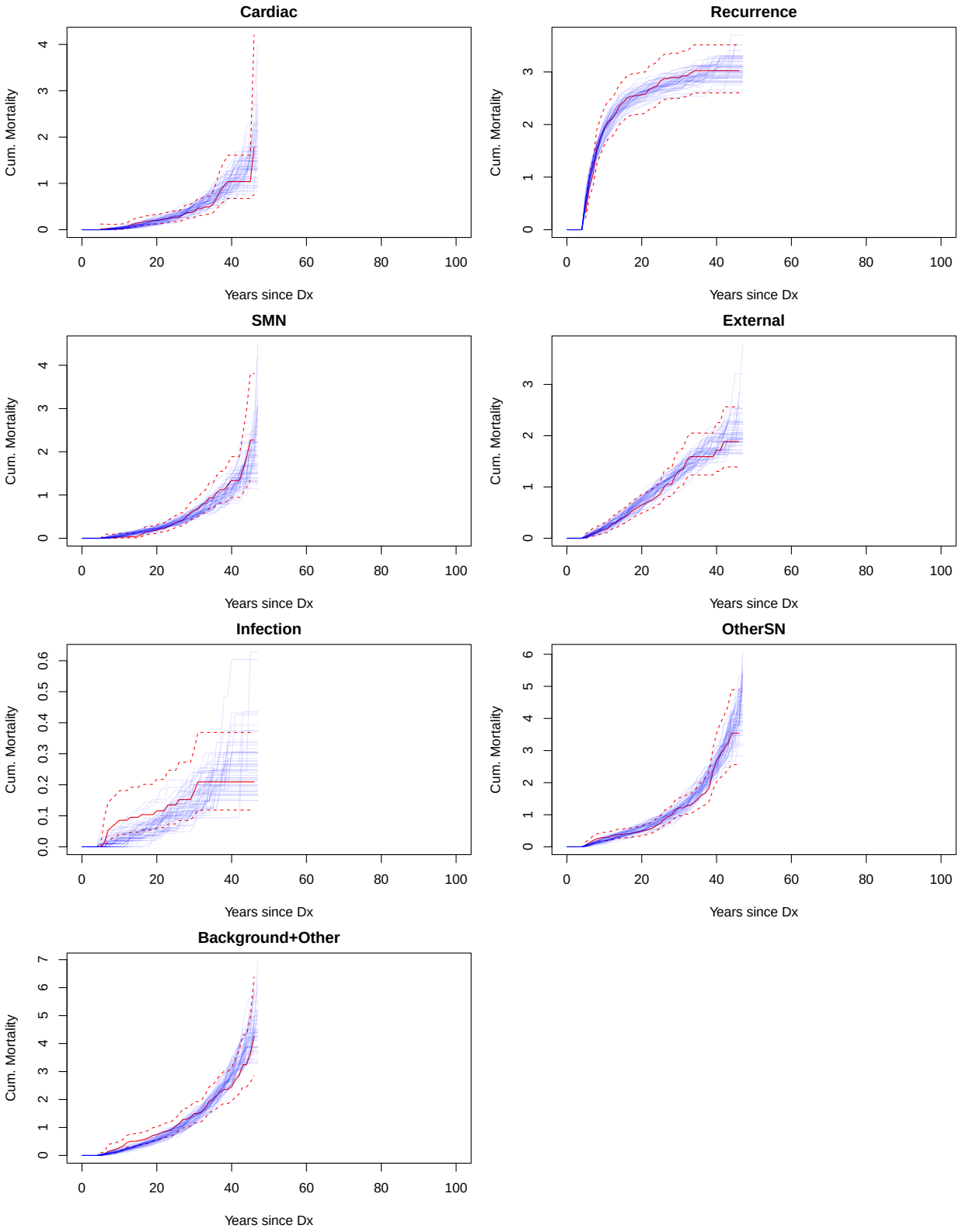
4.3.5.55 Heart15_34



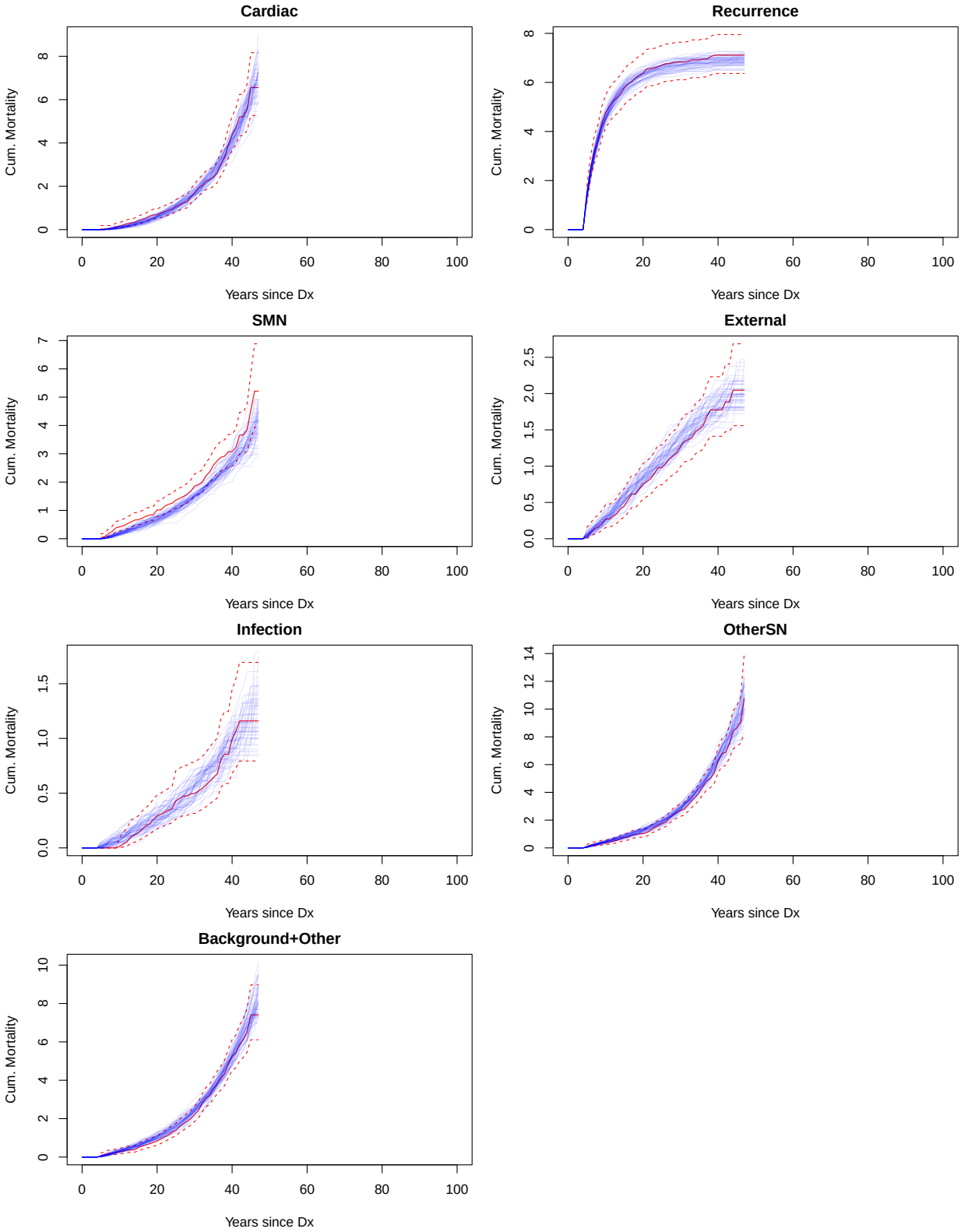
4.3.5.56 Heart35+



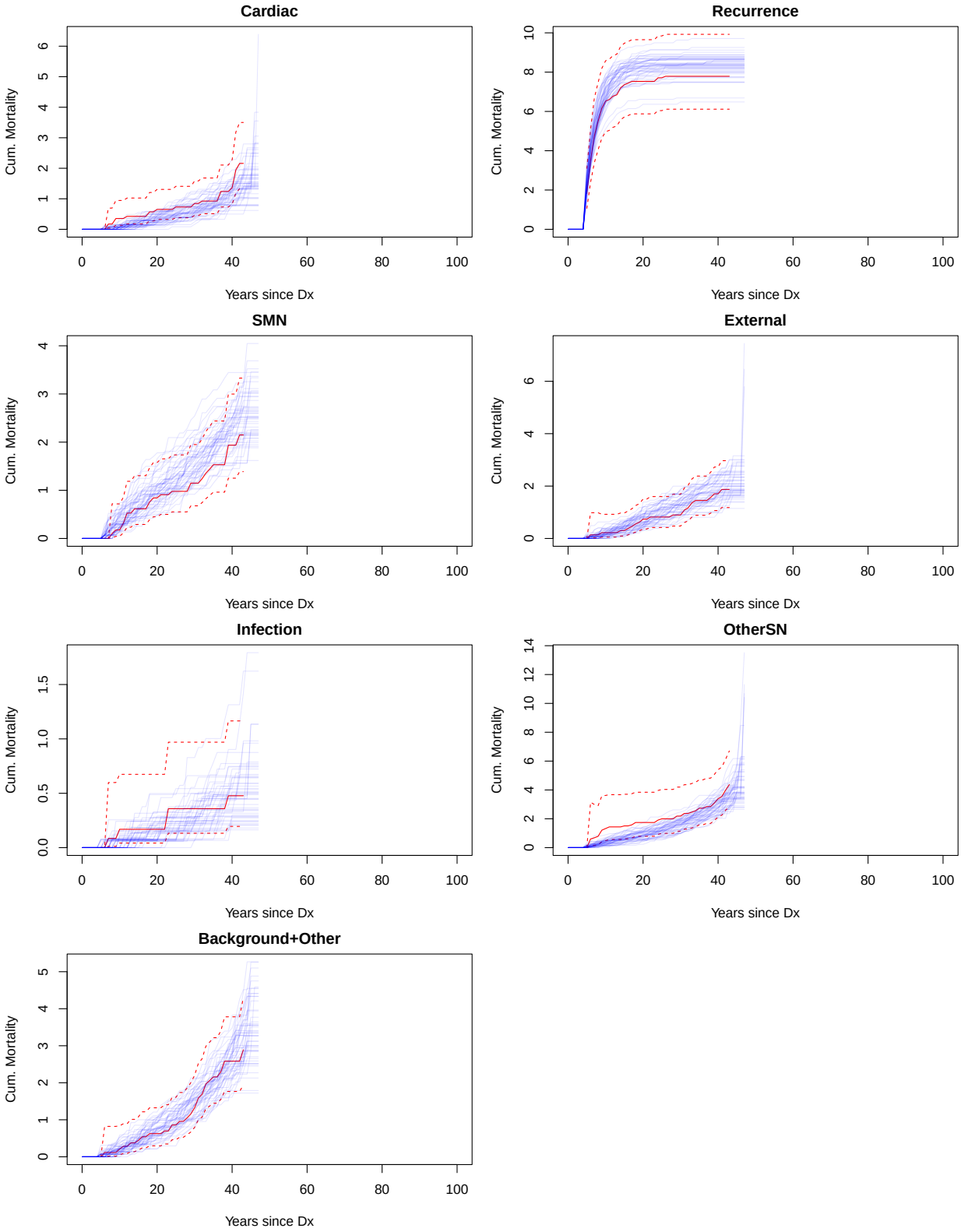
4.3.5.57 CRTNone



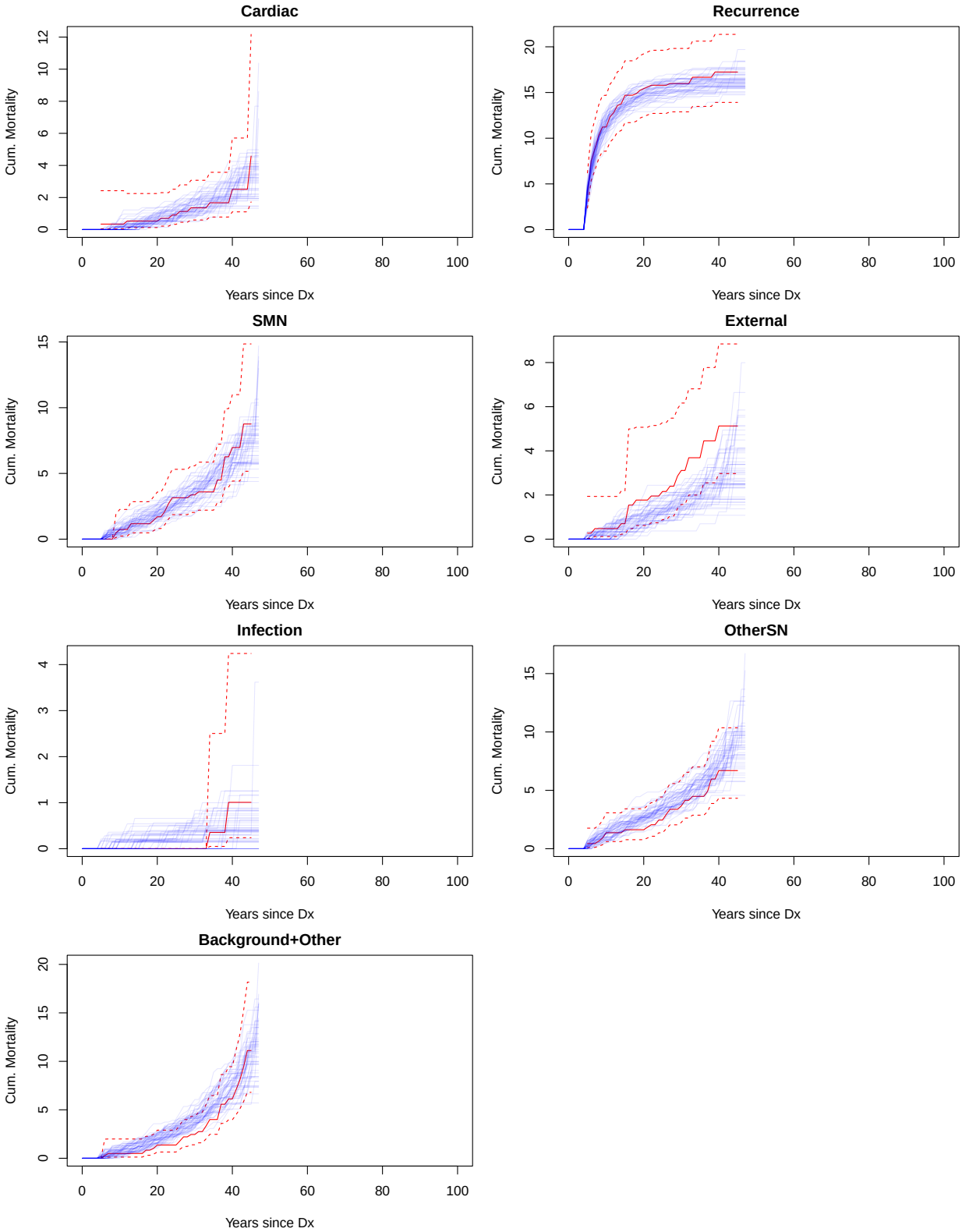
4.3.5.58 CRT<20


Cardiac
Cum. Mortality
Years since Dx
Recurrence
Cum. Mortality
Years since Dx
SMN
Cum. Mortality
Years since Dx
External
Cum. Mortality
Years since Dx
Infection
Cum. Mortality
Years since Dx
OtherSN
Cum. Mortality
Years since Dx
Background+Other
Cum. Mortality
Years since Dx

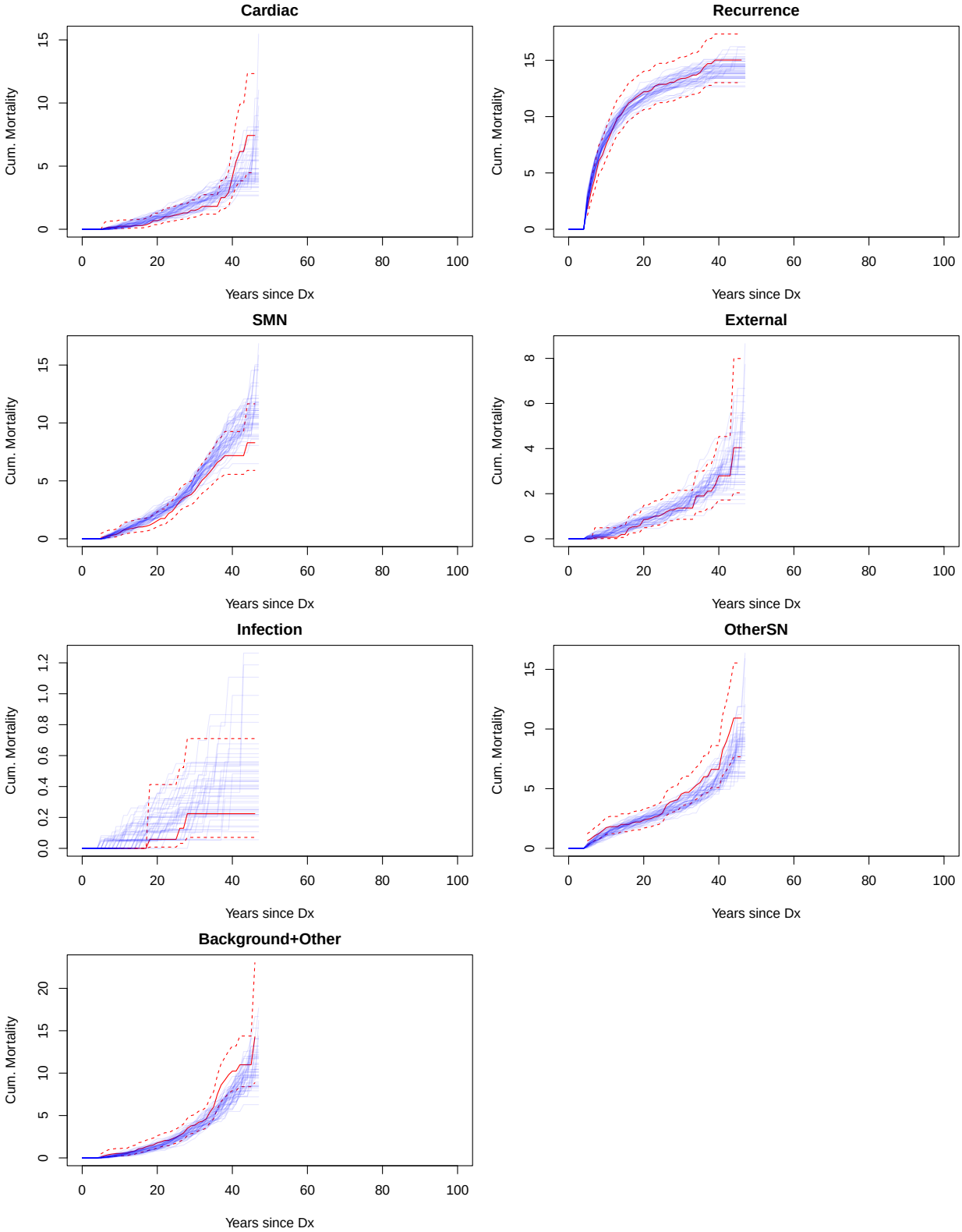
4.3.5.59 CRT20_29



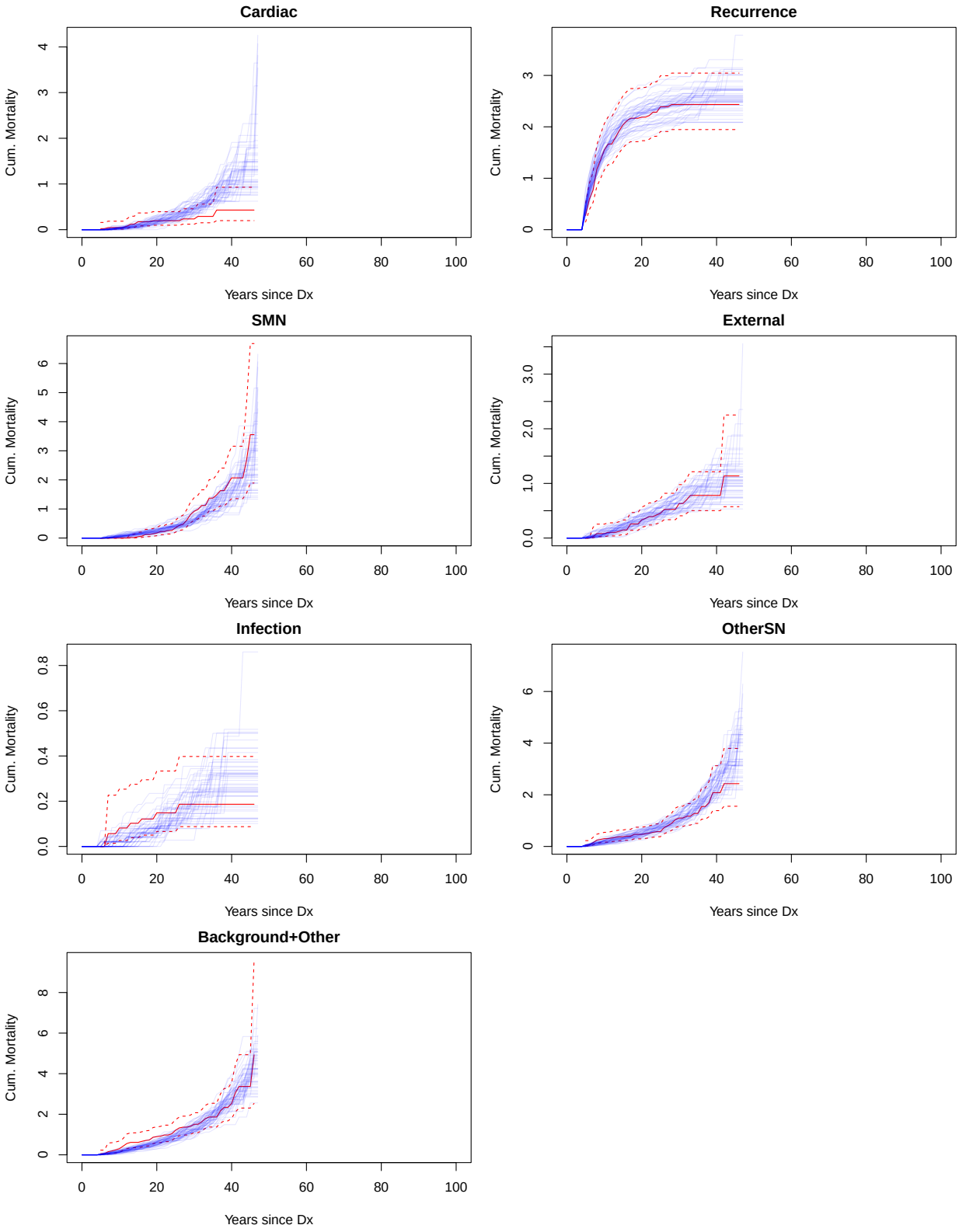
4.3.5.60 CRT30_49



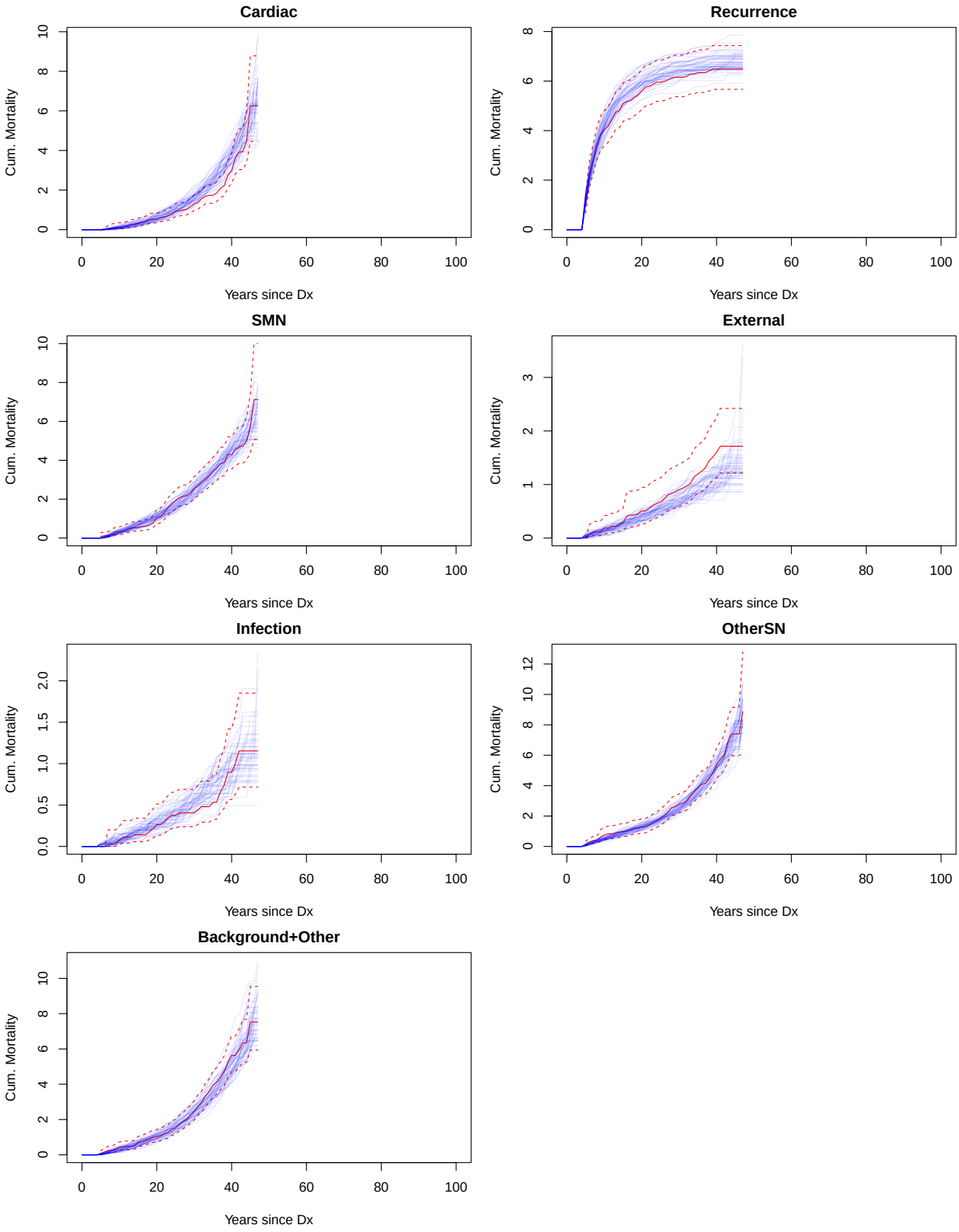
4.3.5.61 CRT50+


Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

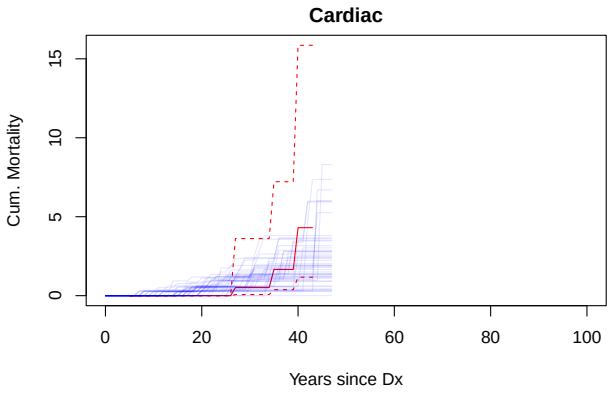
4.3.5.62 OvaryNone

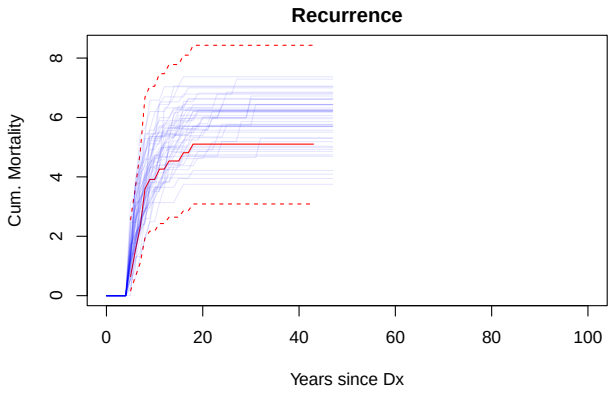


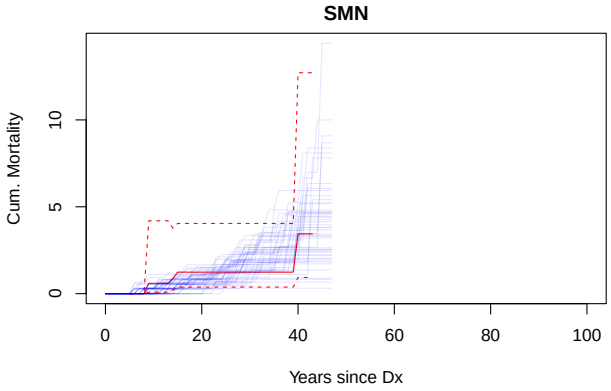
4.3.5.63 Ovary<10

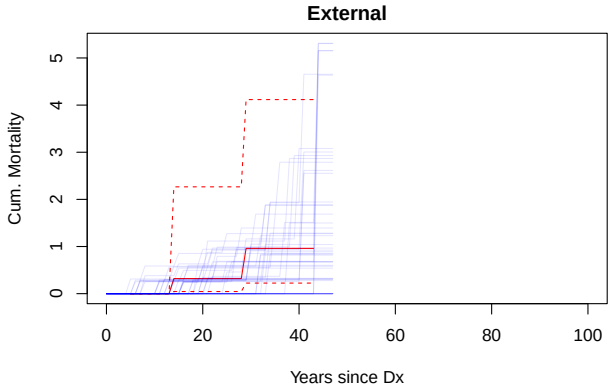


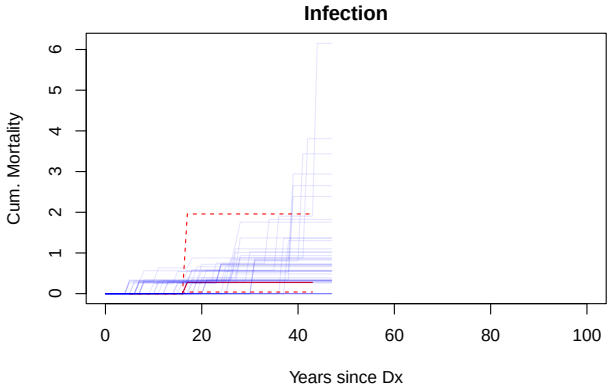
4.3.5.64 Ovary10-19

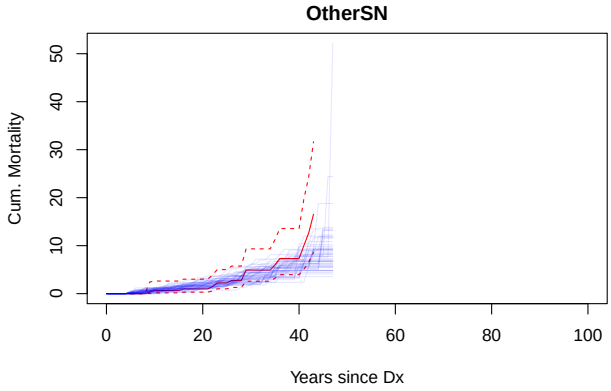


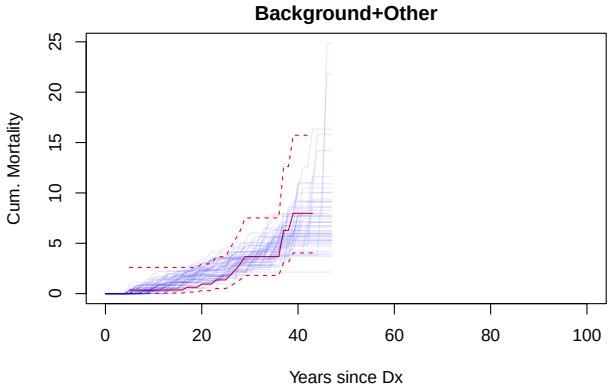




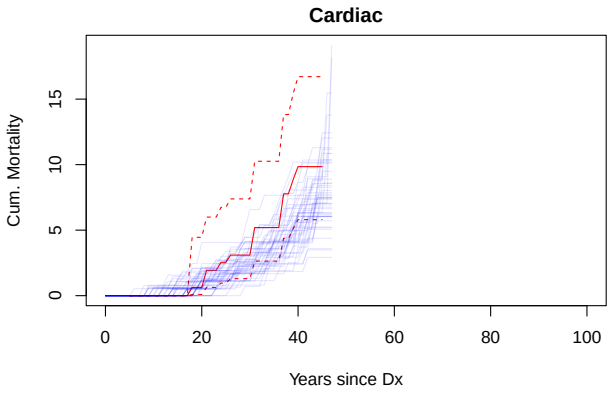


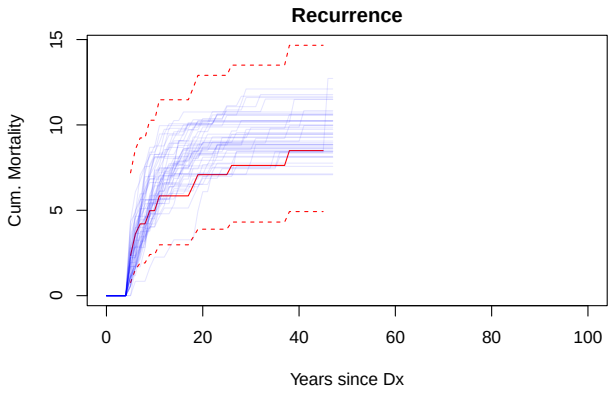


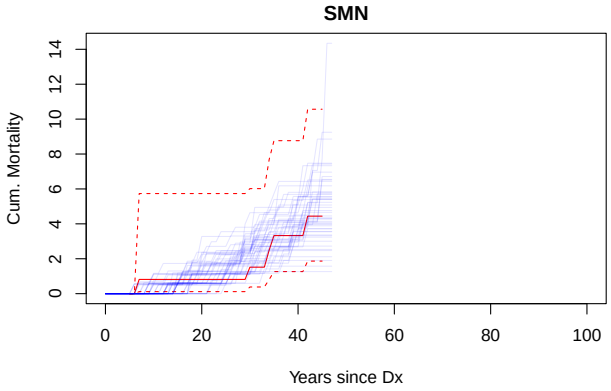


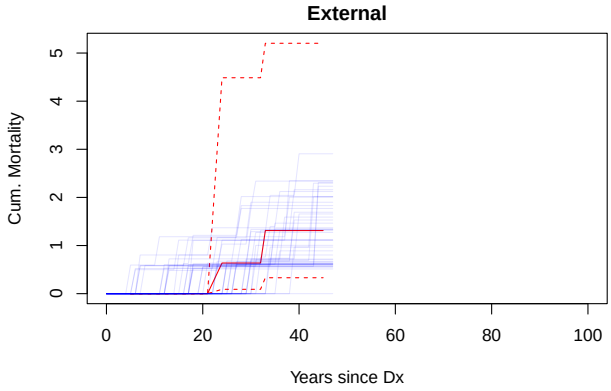


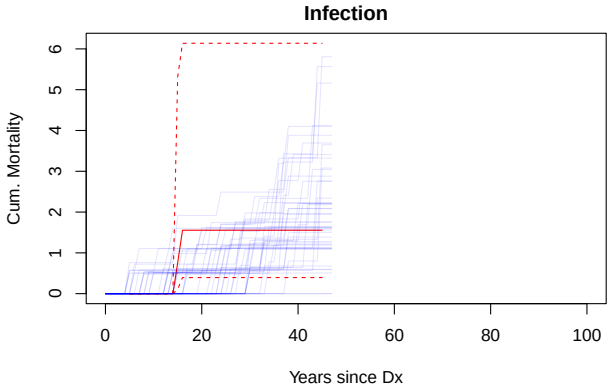
4.3.5.65 Ovary20+

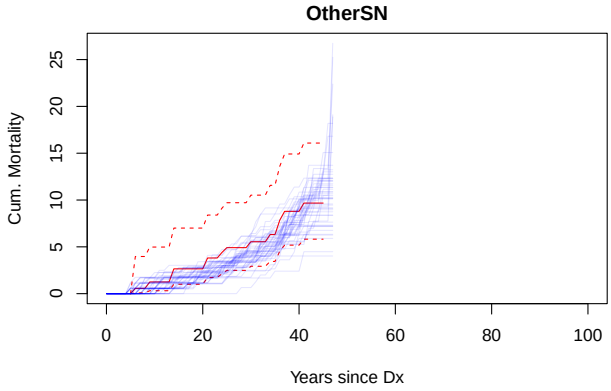


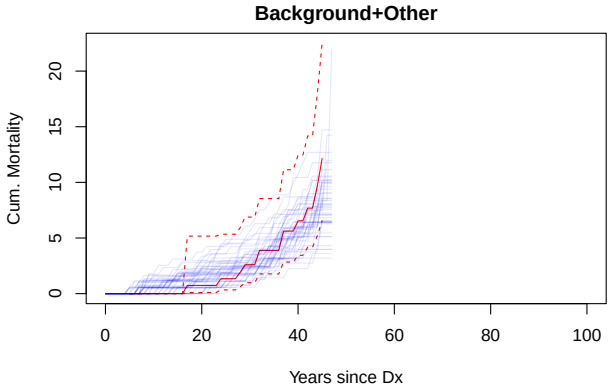




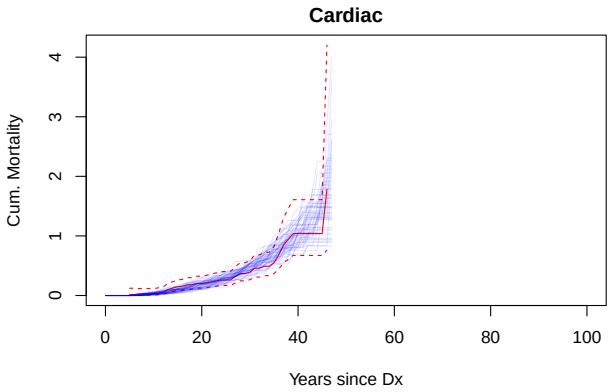


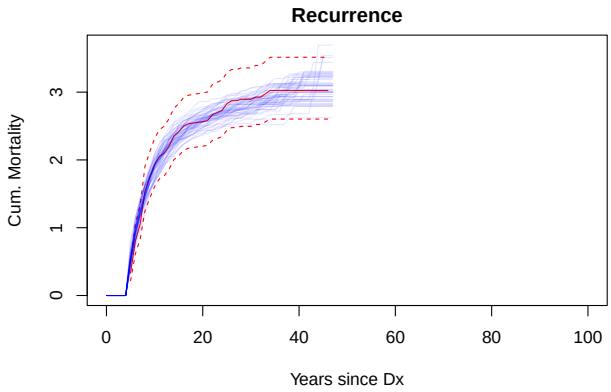


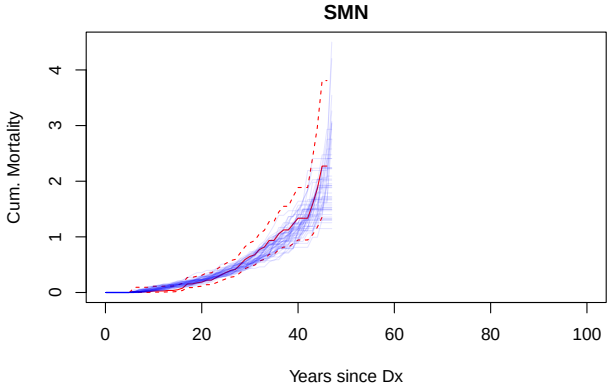


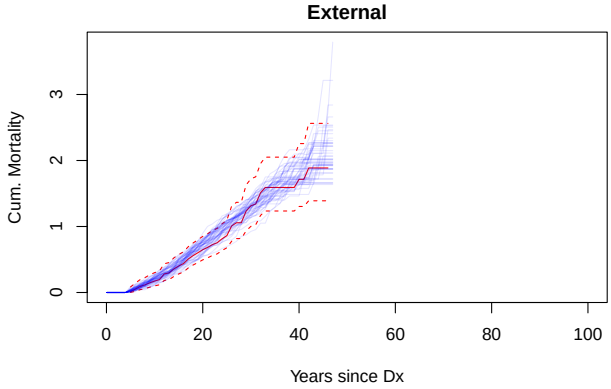


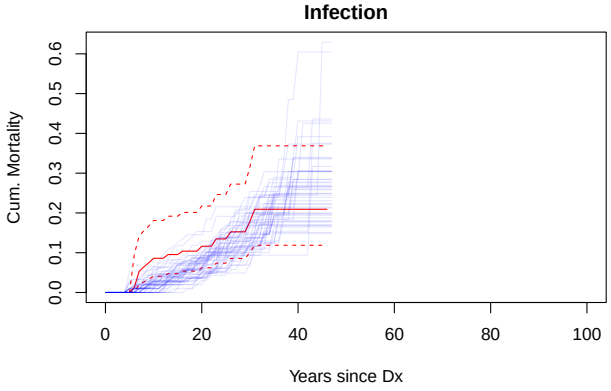
4.3.5.66 AbdPelNone

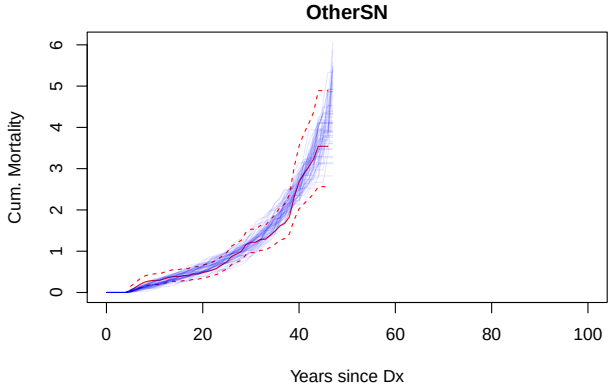


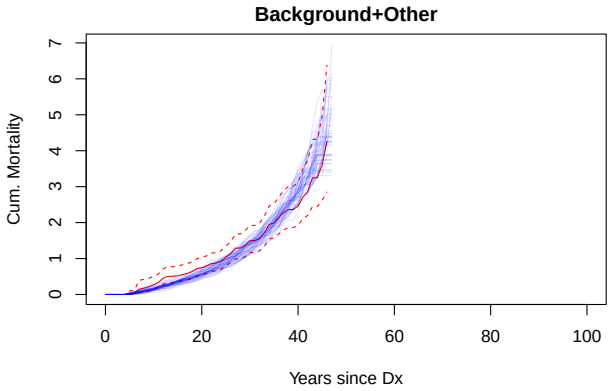




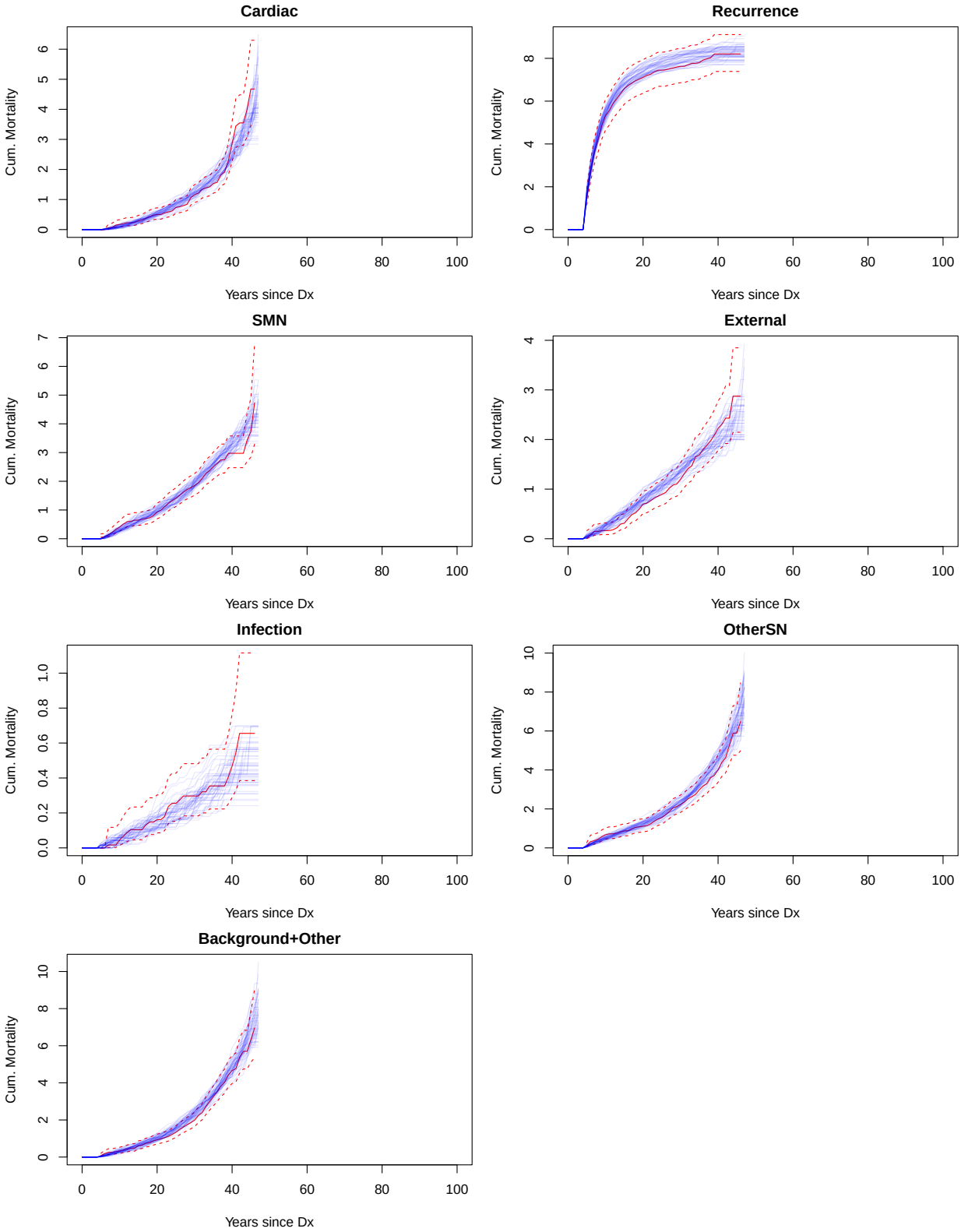




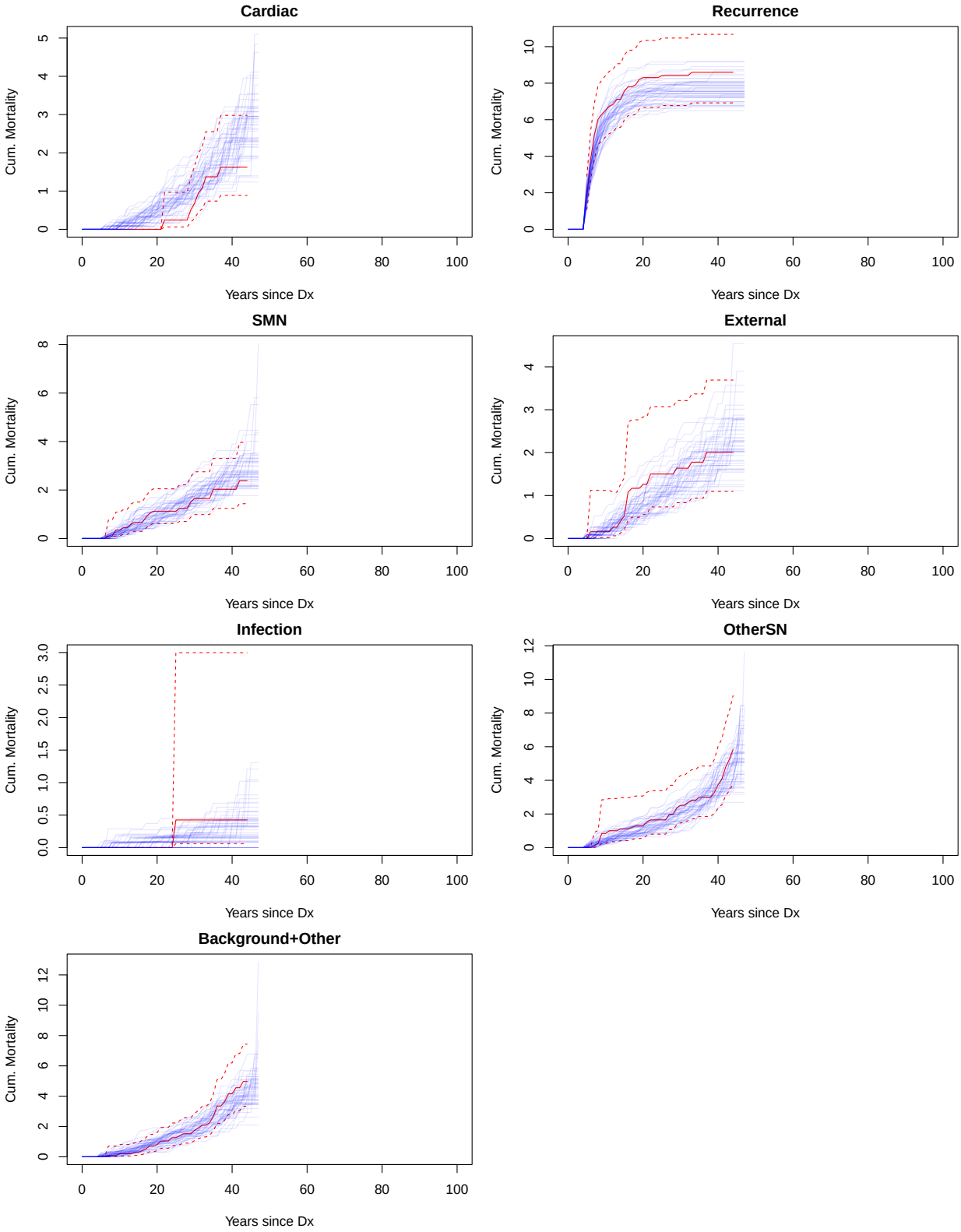




4.3.5.67 AbdPel<15



4.3.5.68 AbdPel15_24



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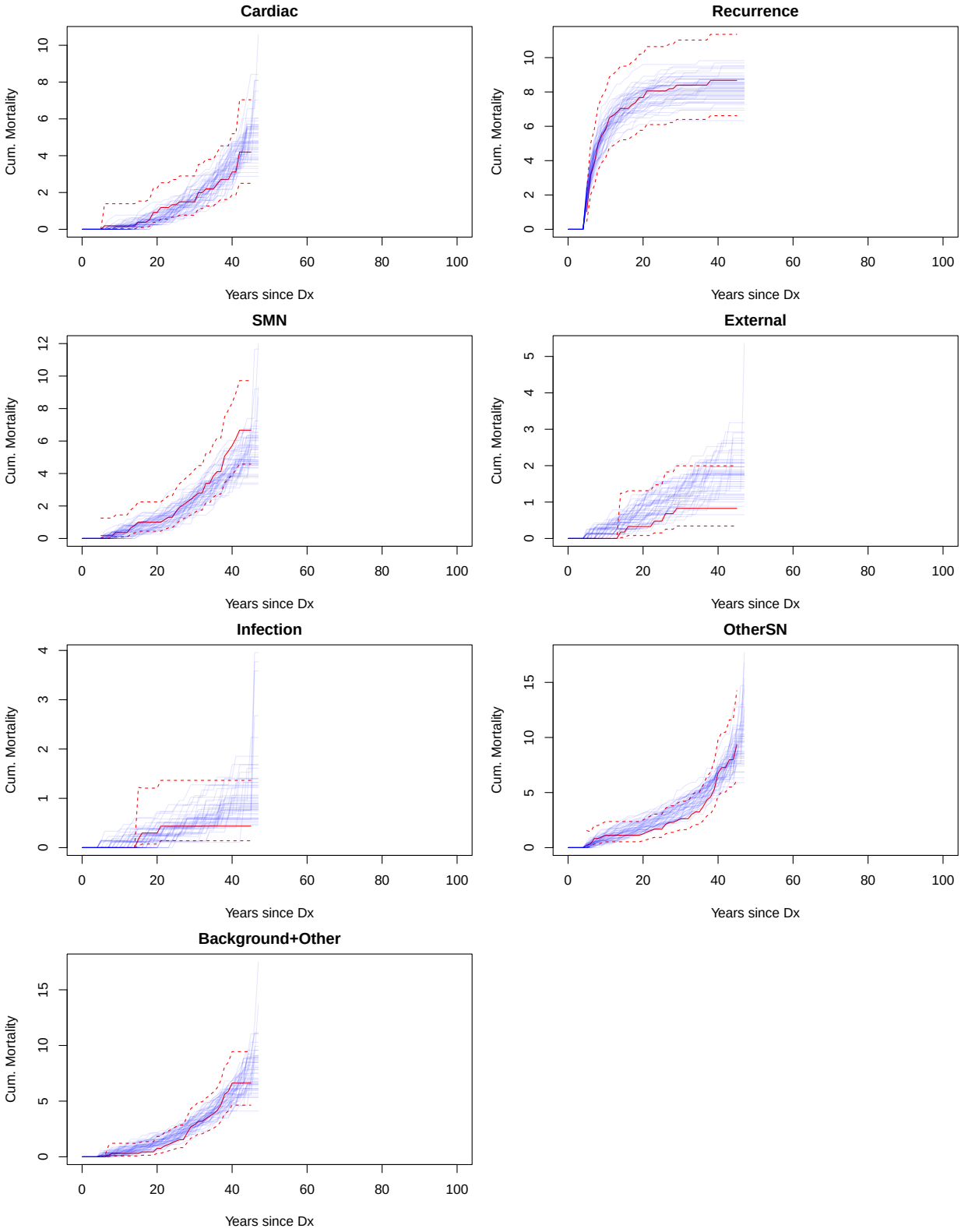
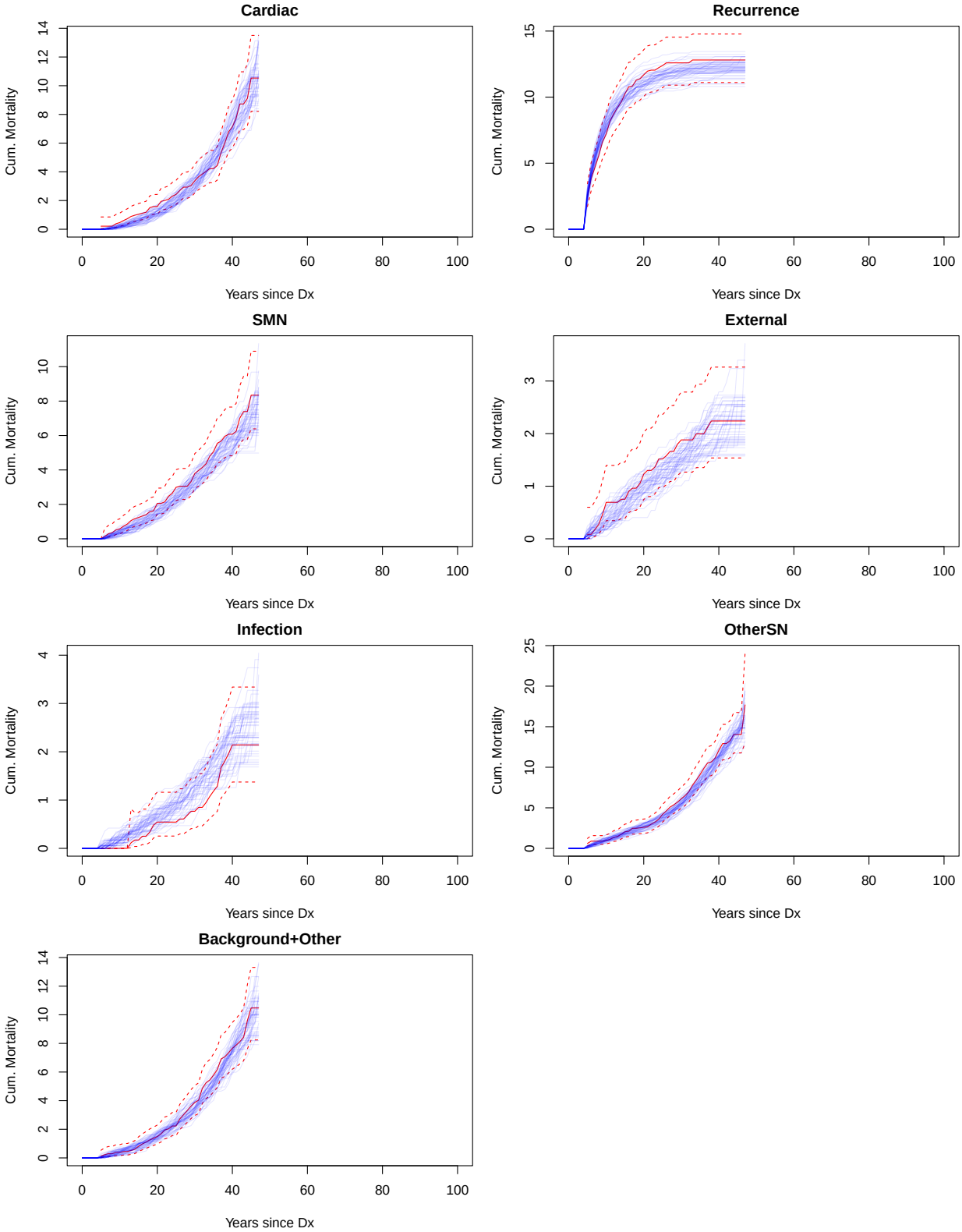
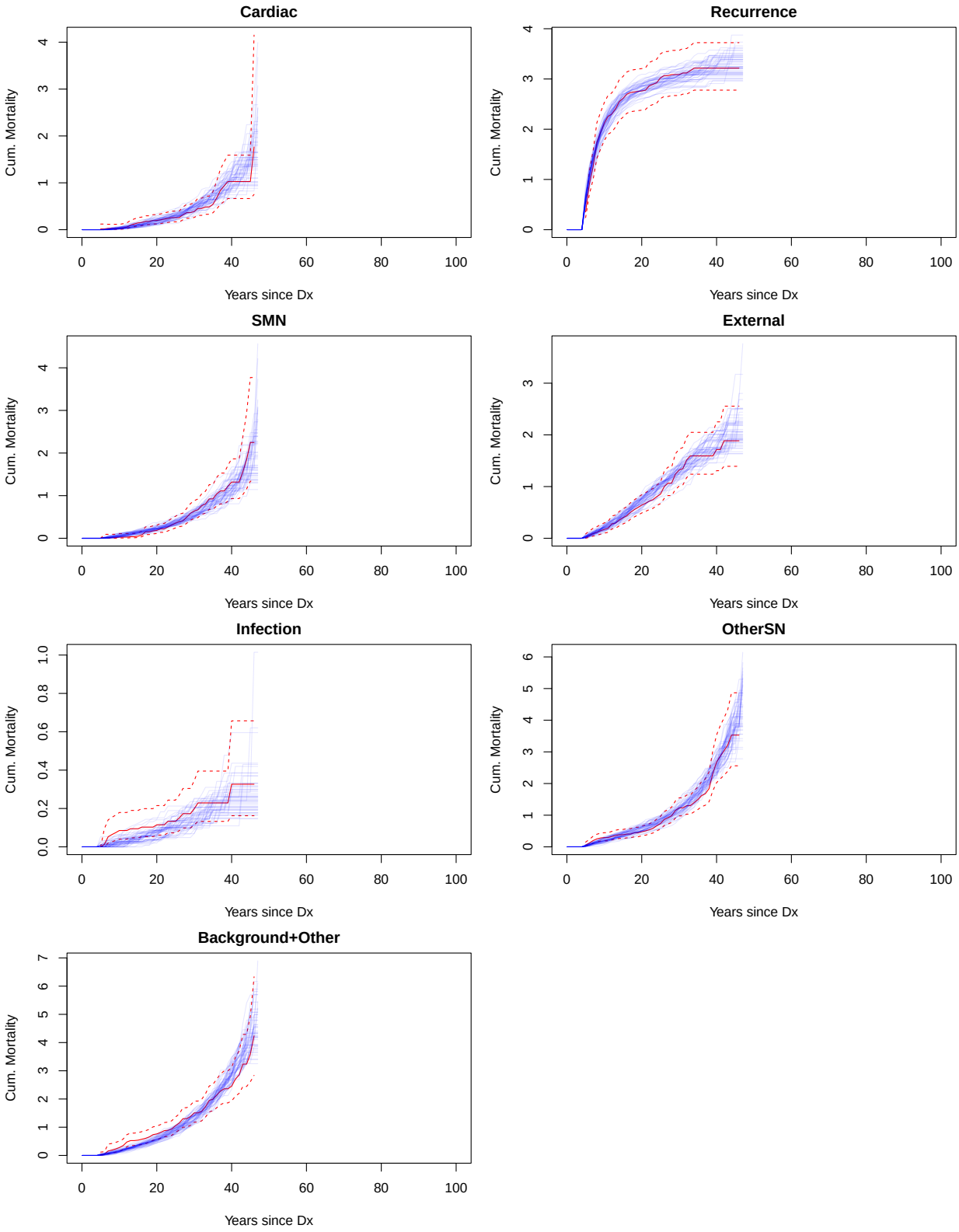


4.3.5.70 AbdPel35+



4.3.5.71 MaxRTNone



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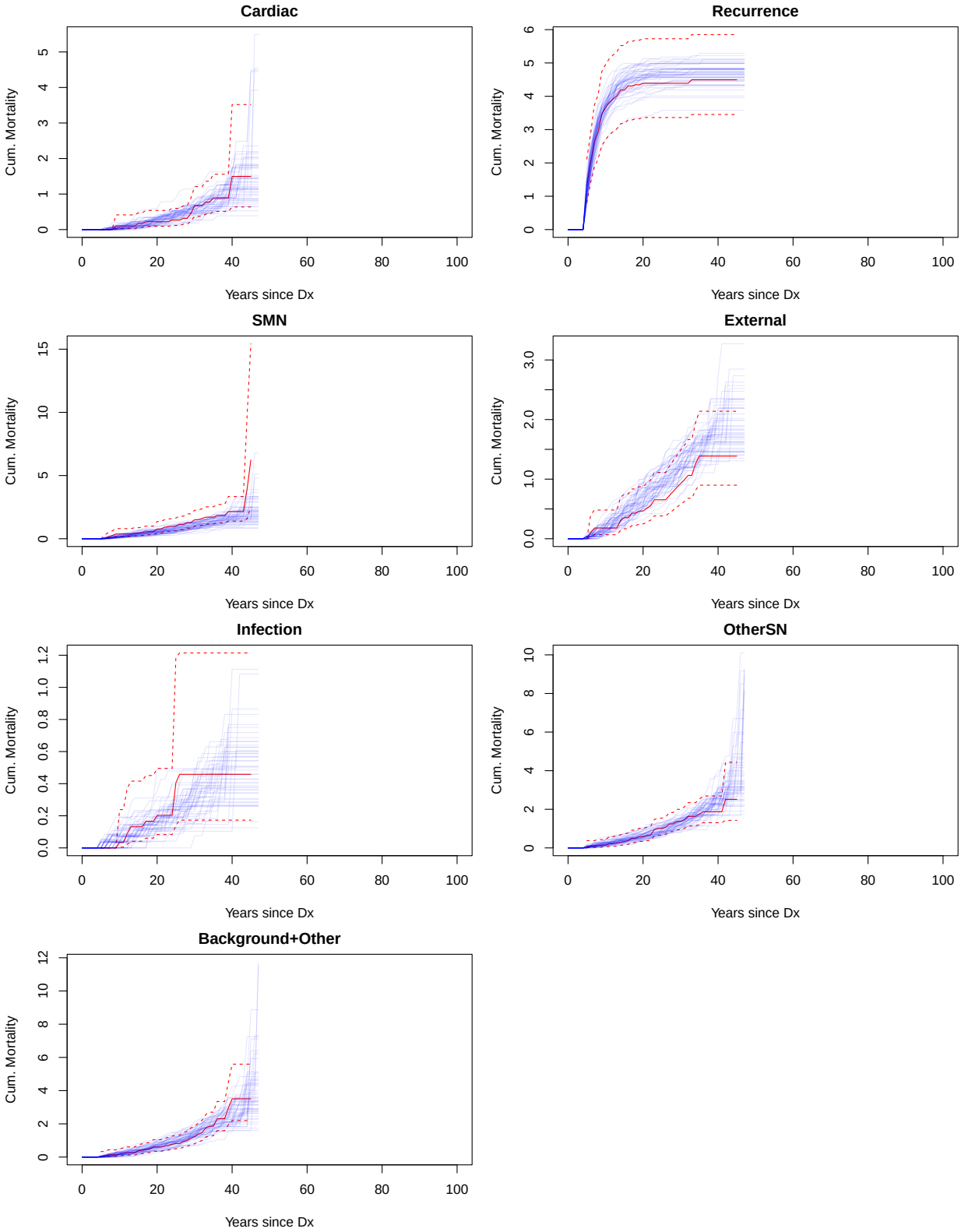

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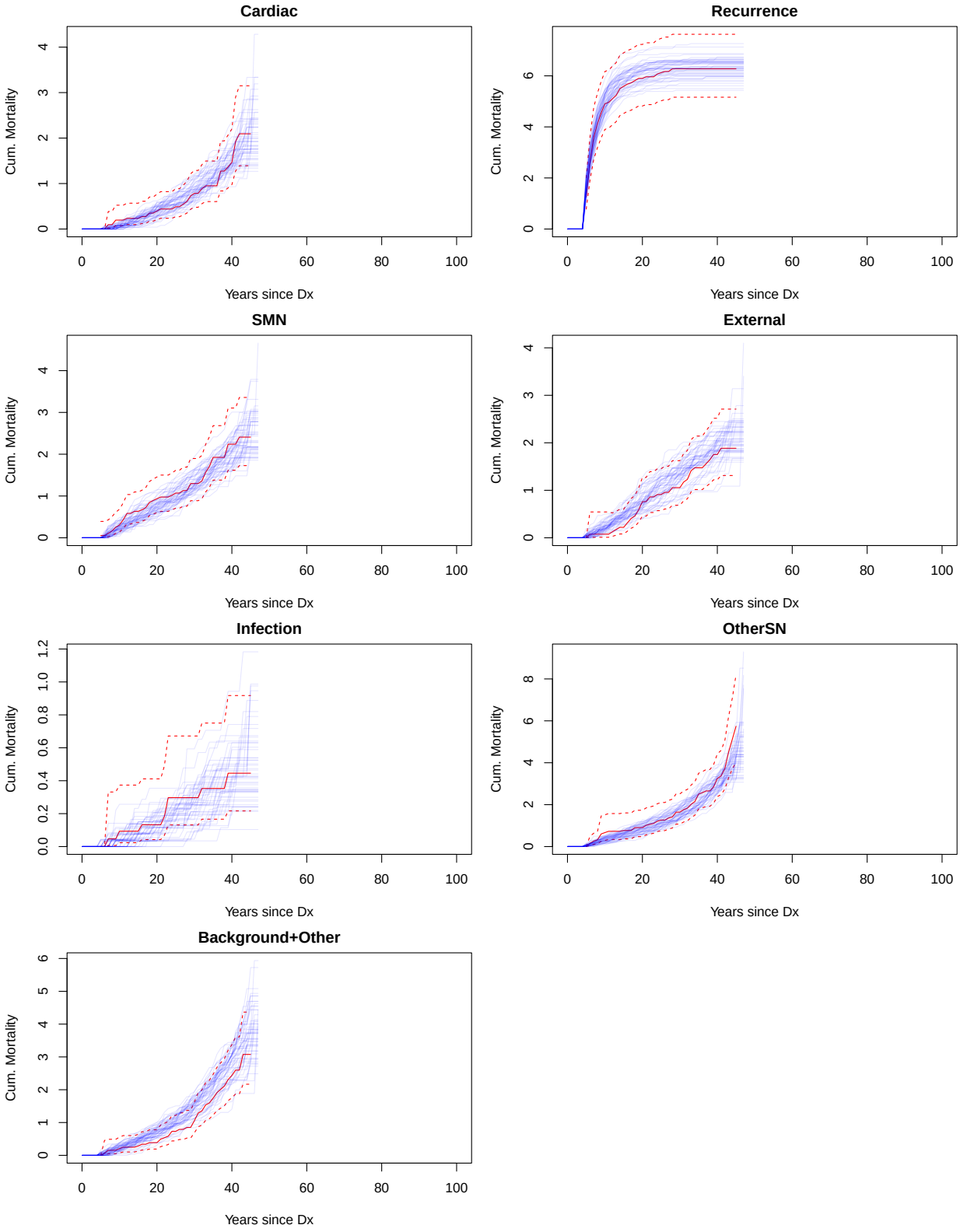
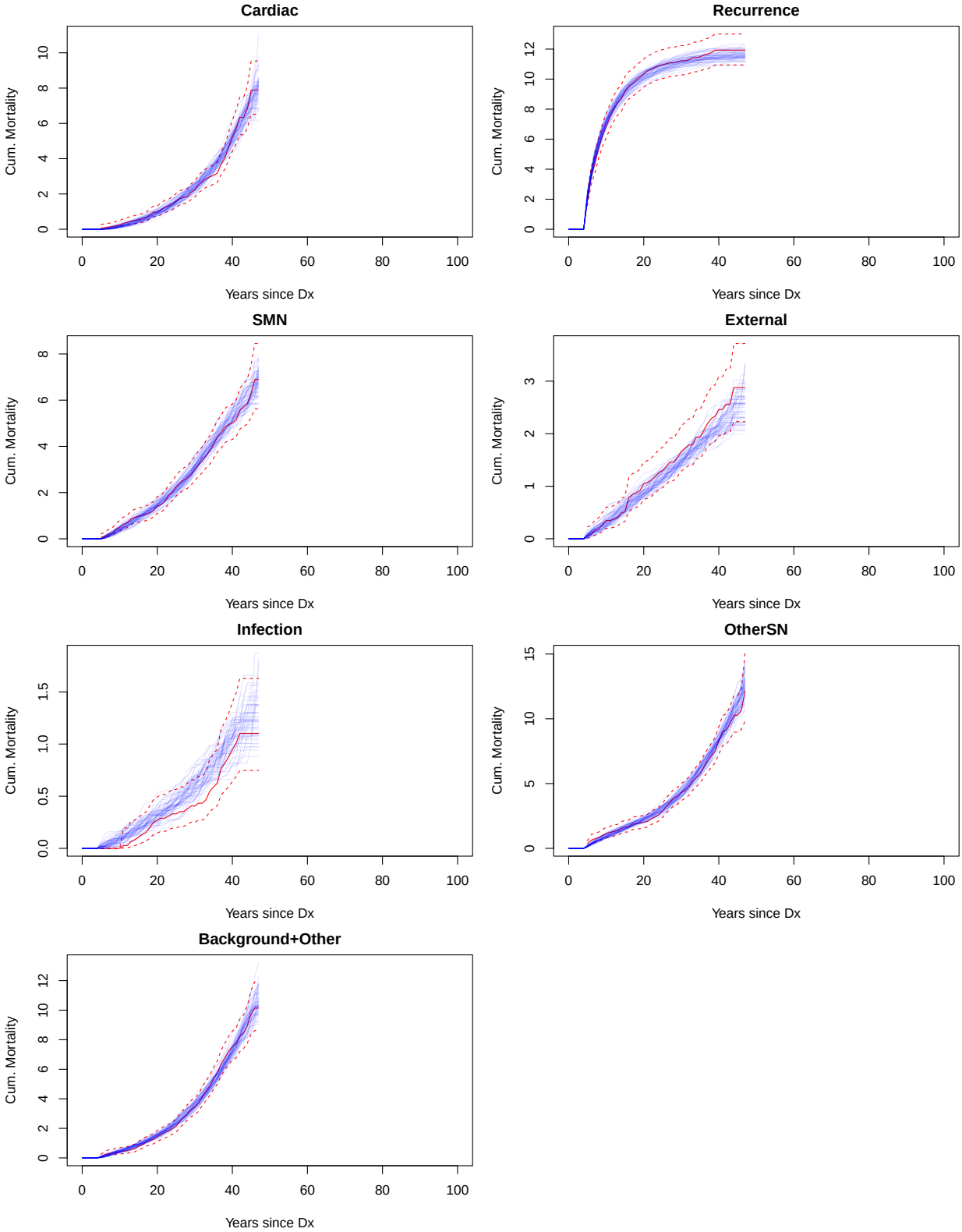
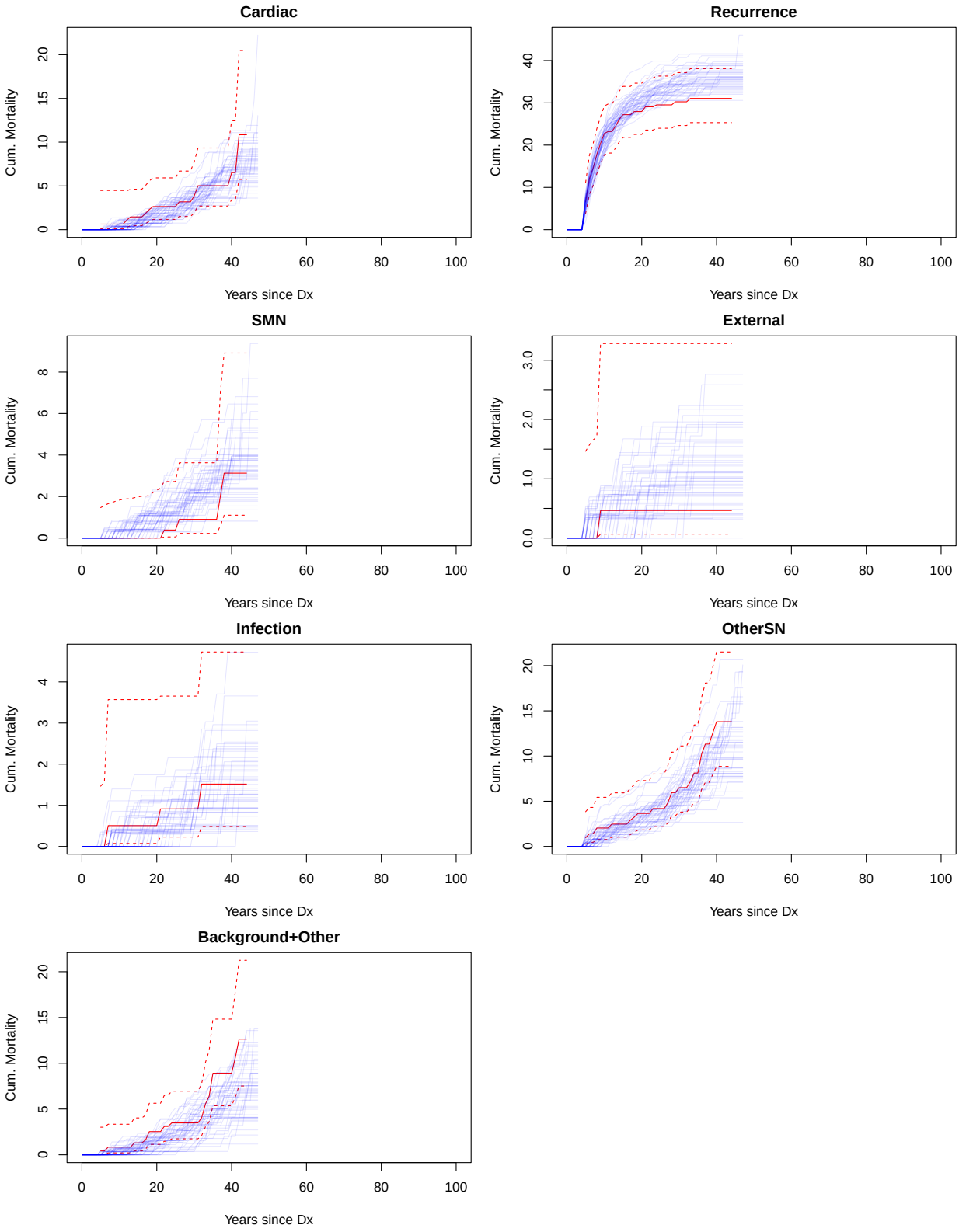


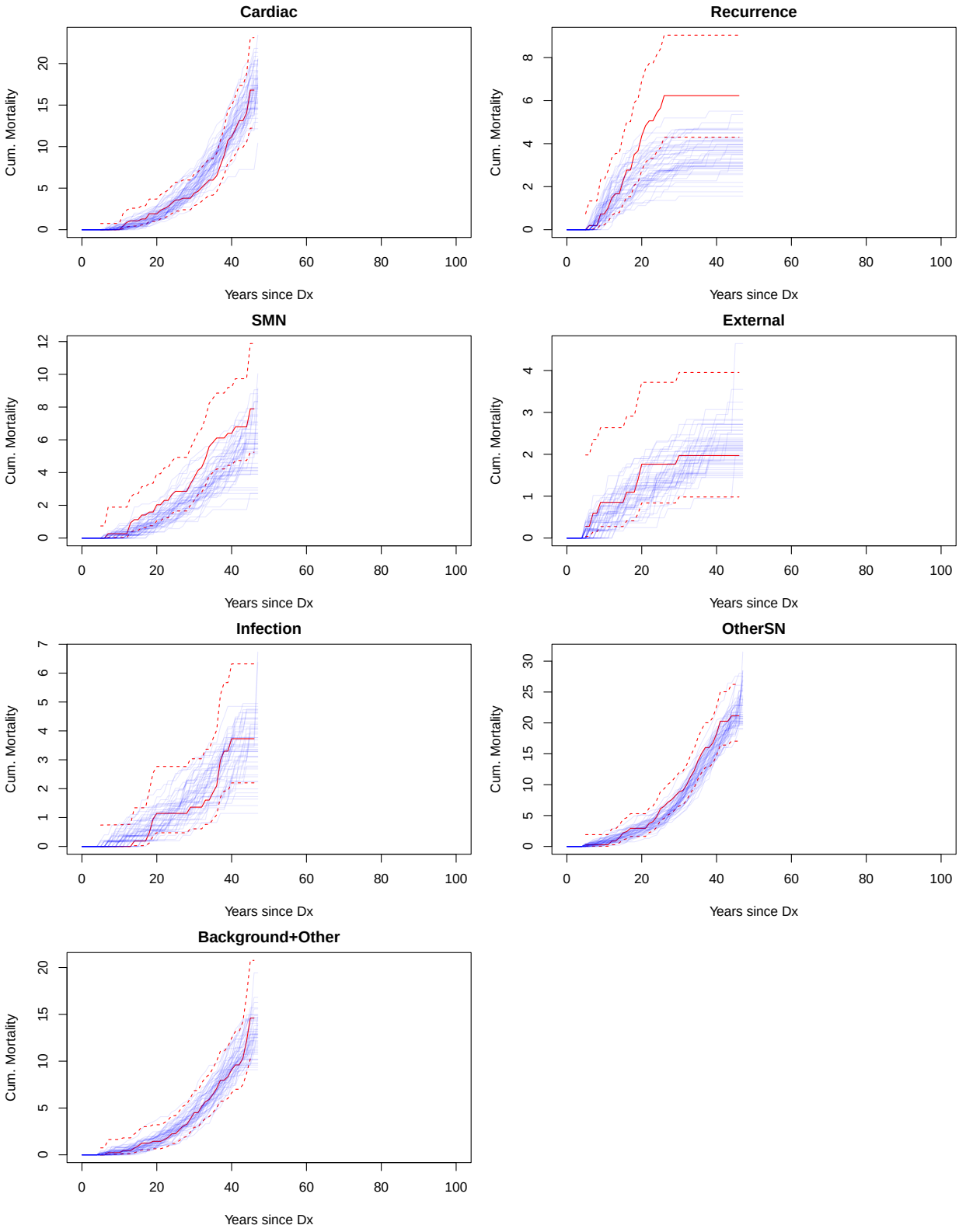
4.3.5.74 MaxRT30+



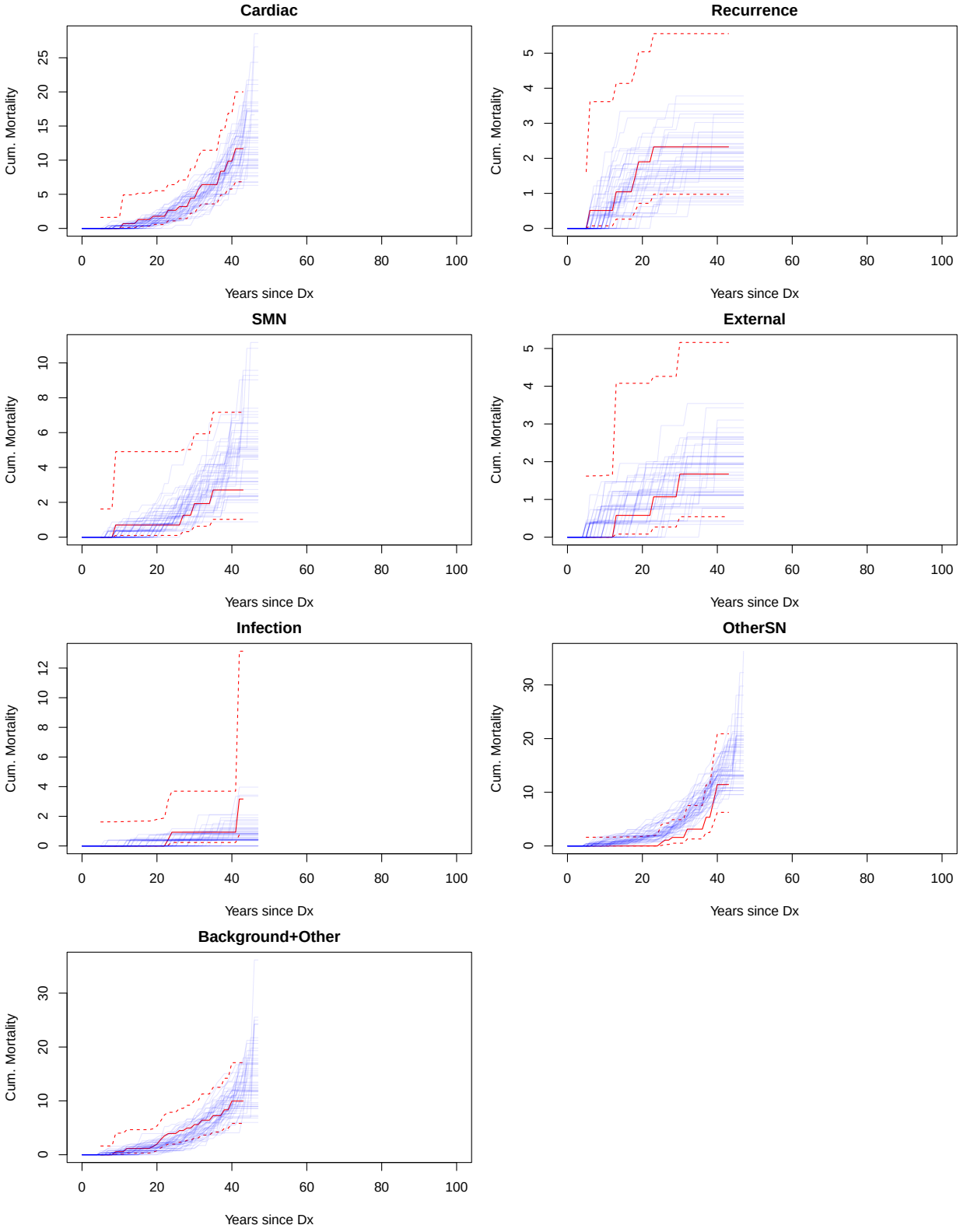
4.3.5.75 HL grp: Salvage



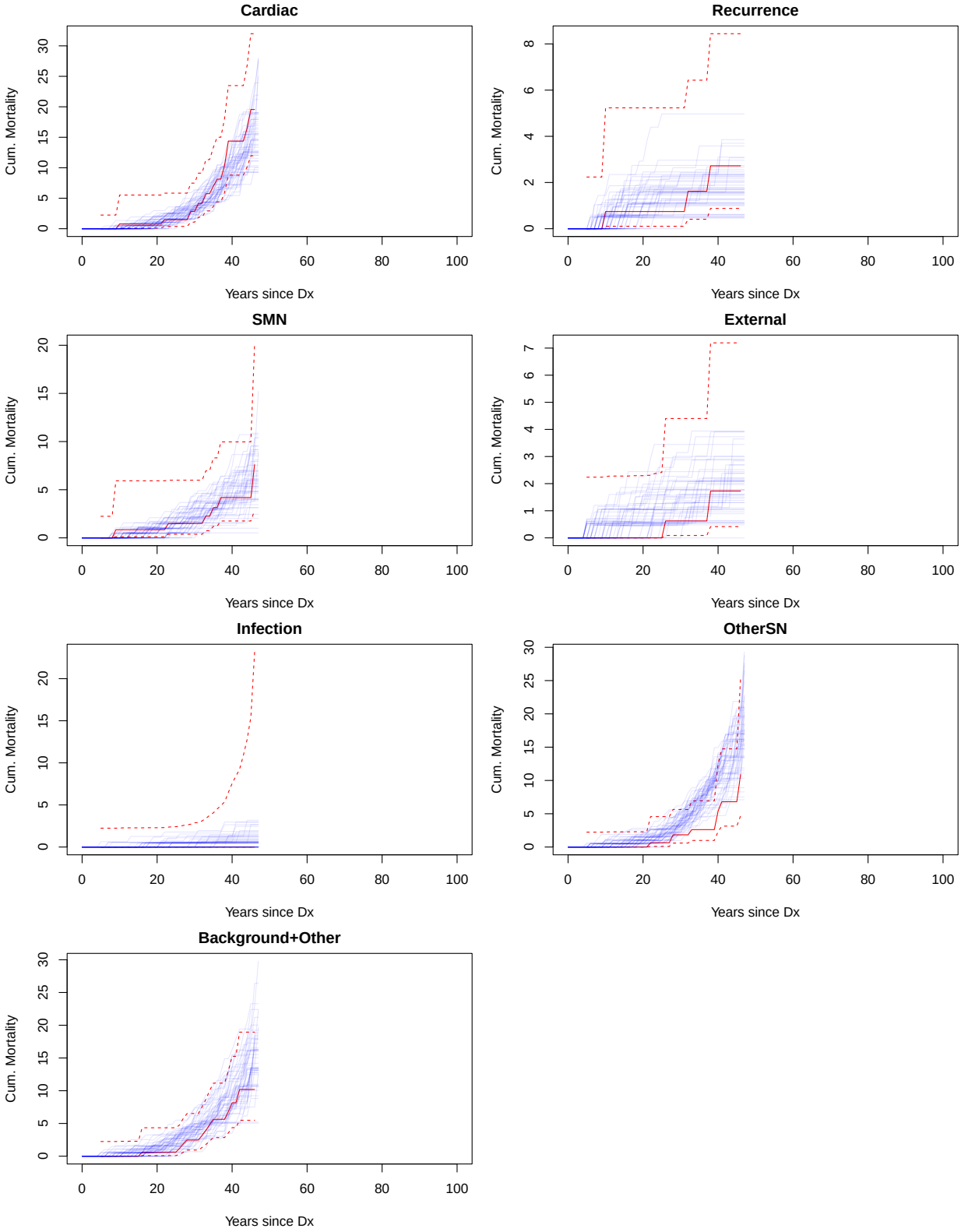
4.3.5.76 HL grp: Extended



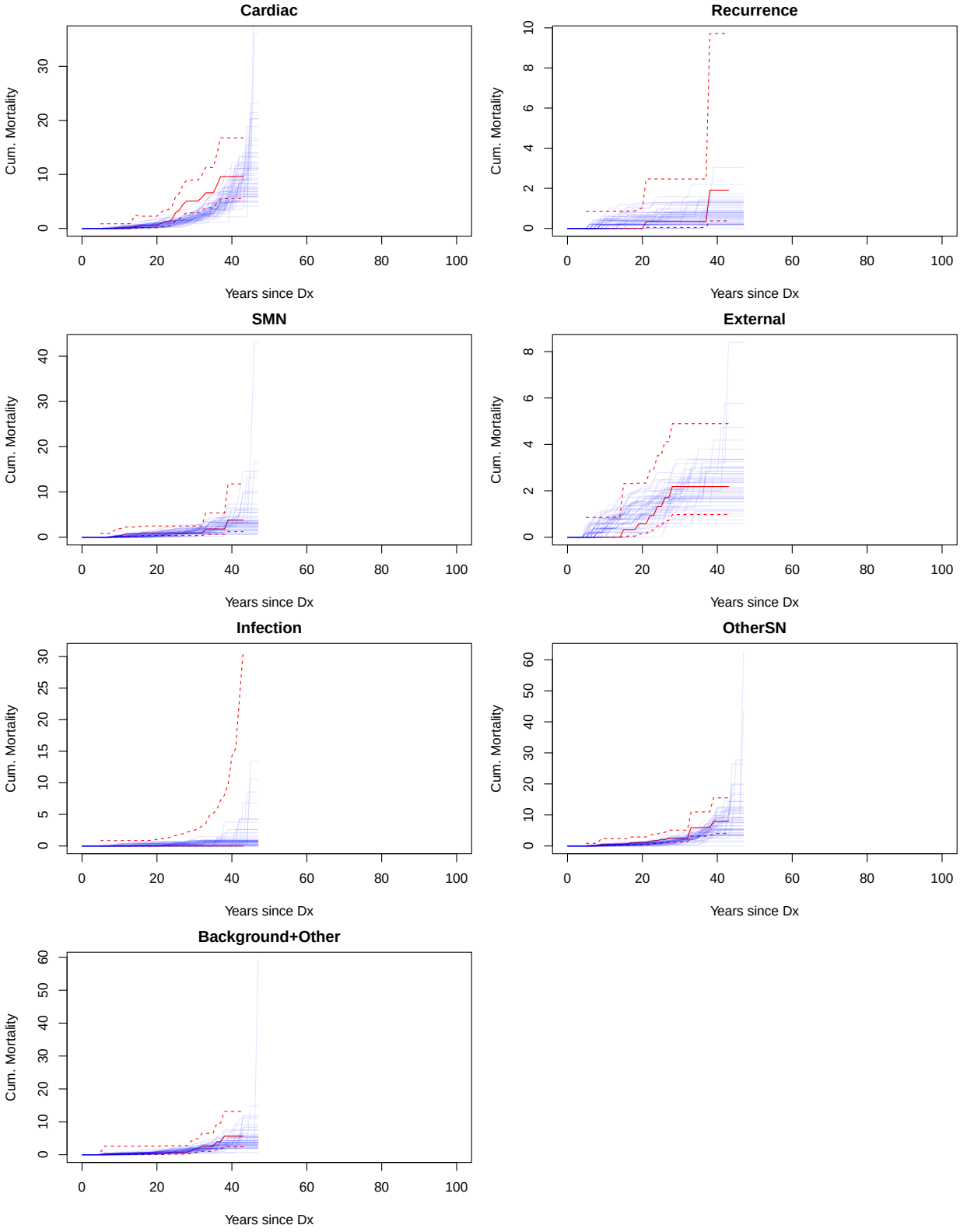
4.3.5.77 HL grp: Chest RT>=35 plus chemo



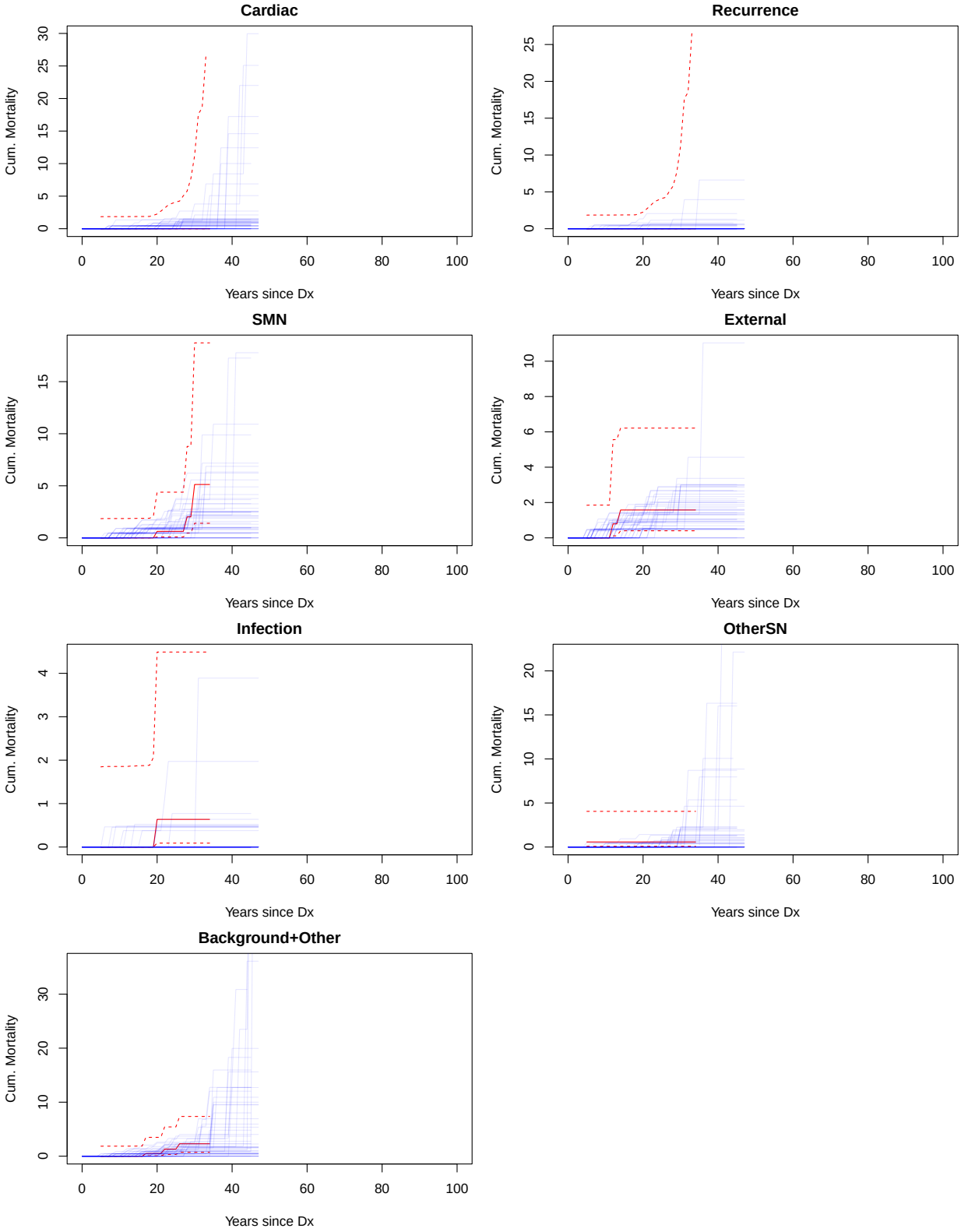
4.3.5.78 HL grp: Chest RT>=35 no chemo



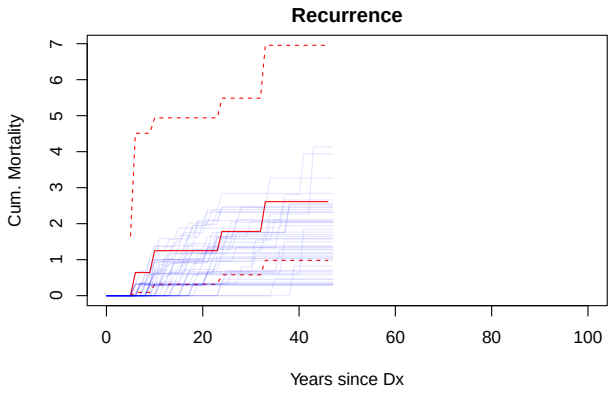
4.3.5.79 HL grp: Chest RT<35 plus chemo

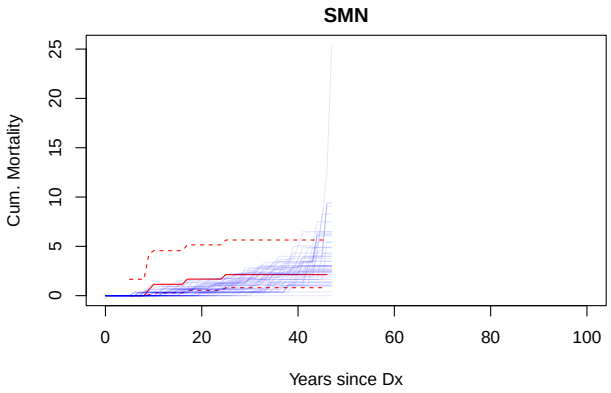


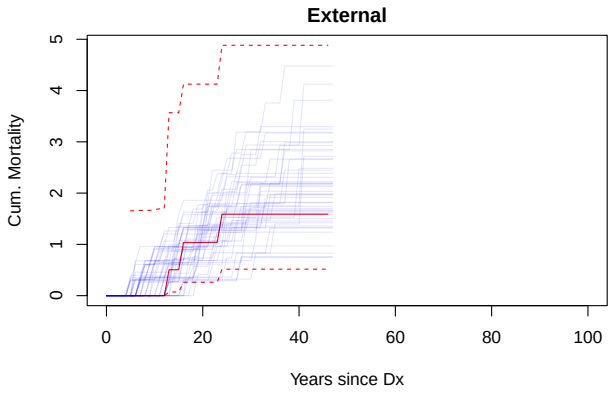
4.3.5.80 HL grp: Chemo without chest RT

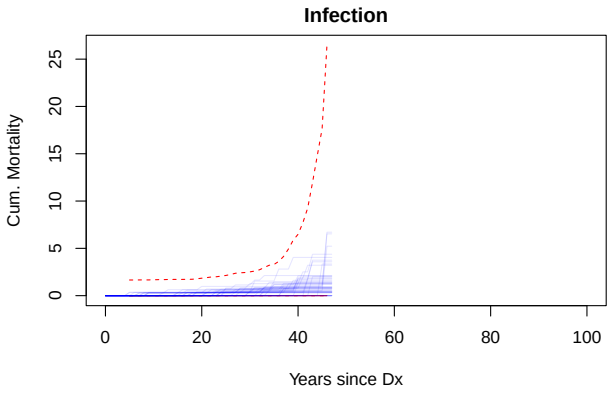


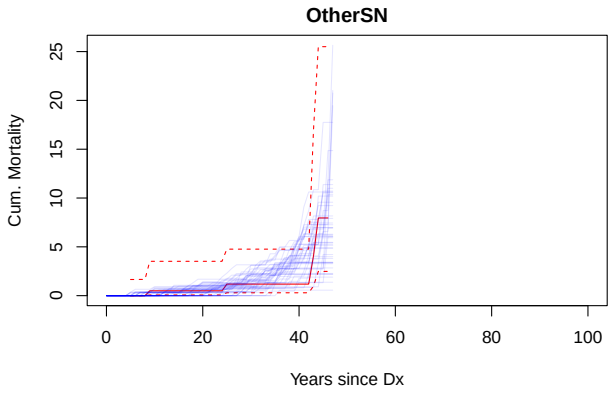
4.3.5.81 HL grp: Other

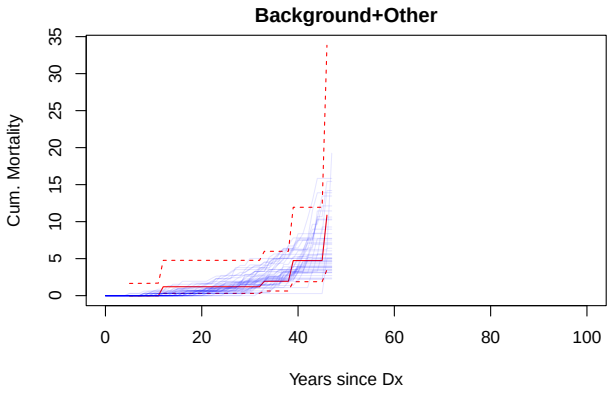




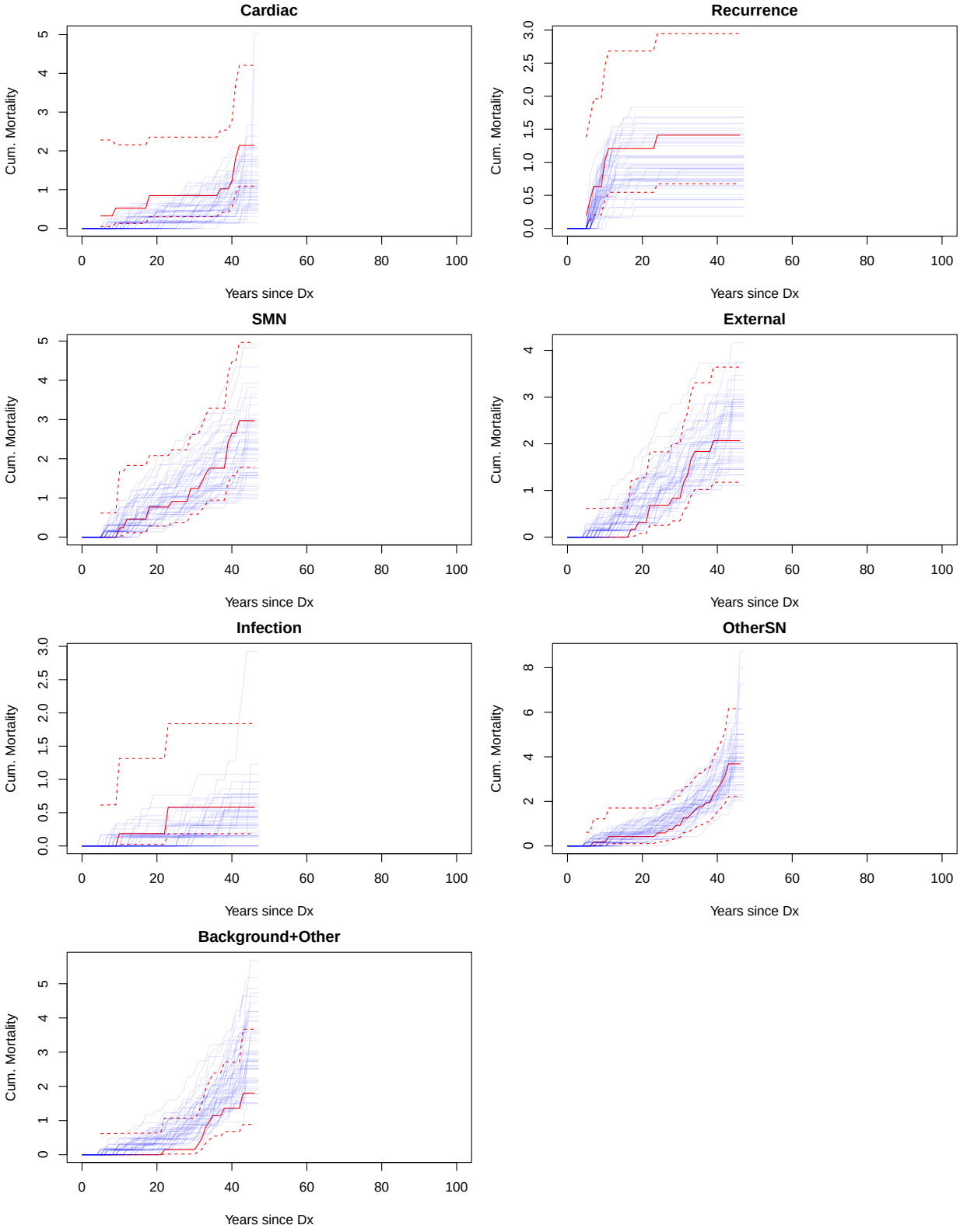




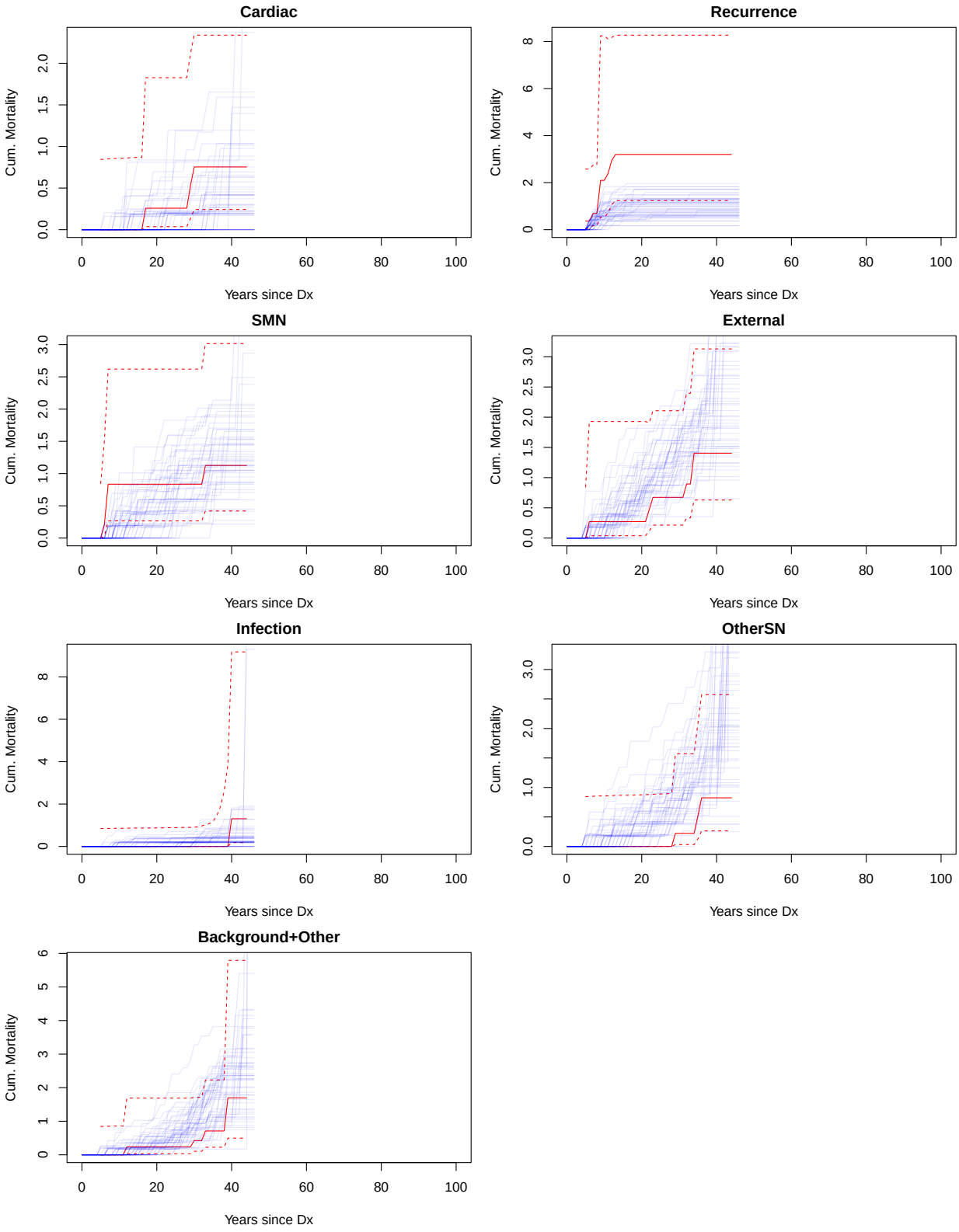




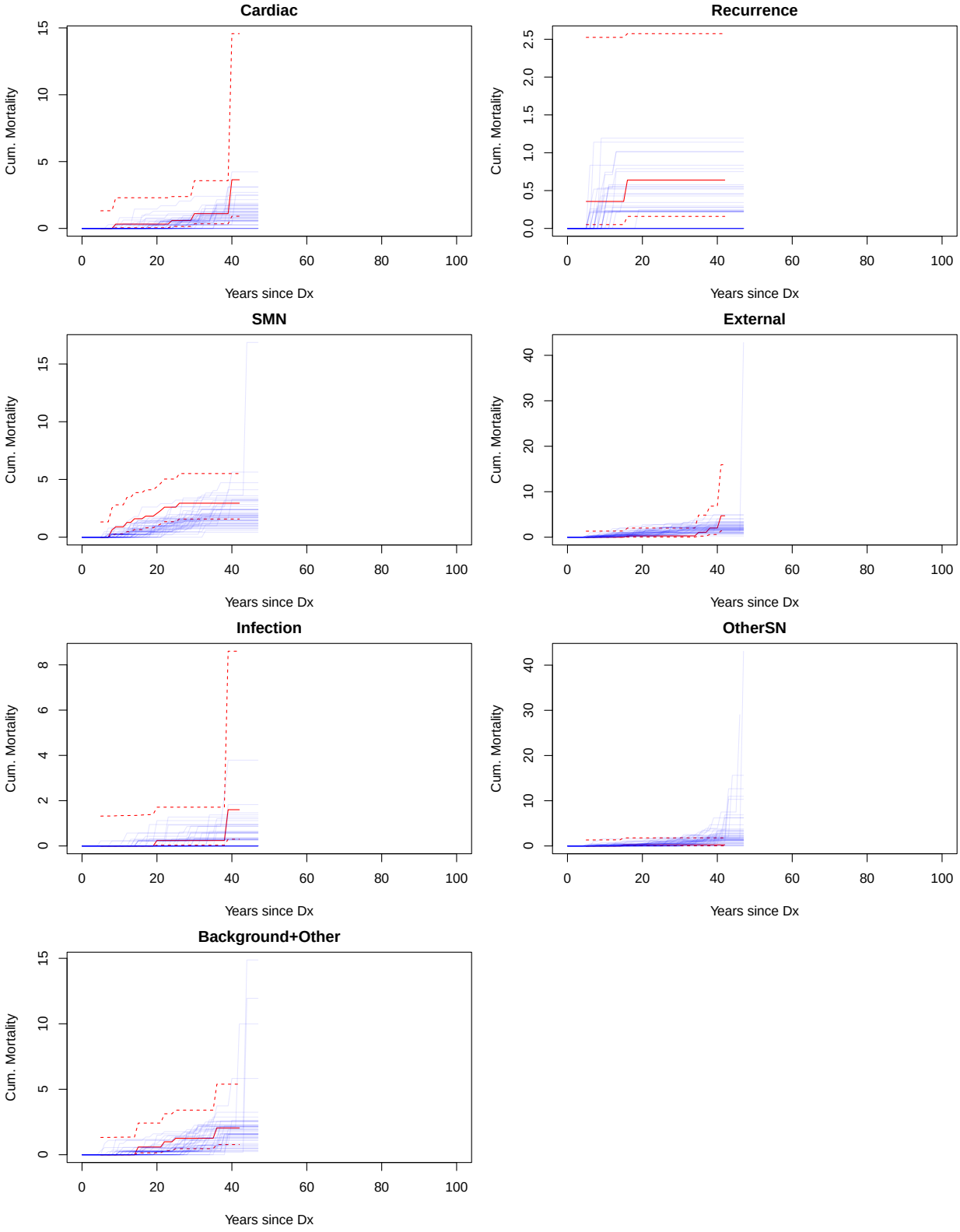
4.3.5.82 ALL grp: 1970s-like



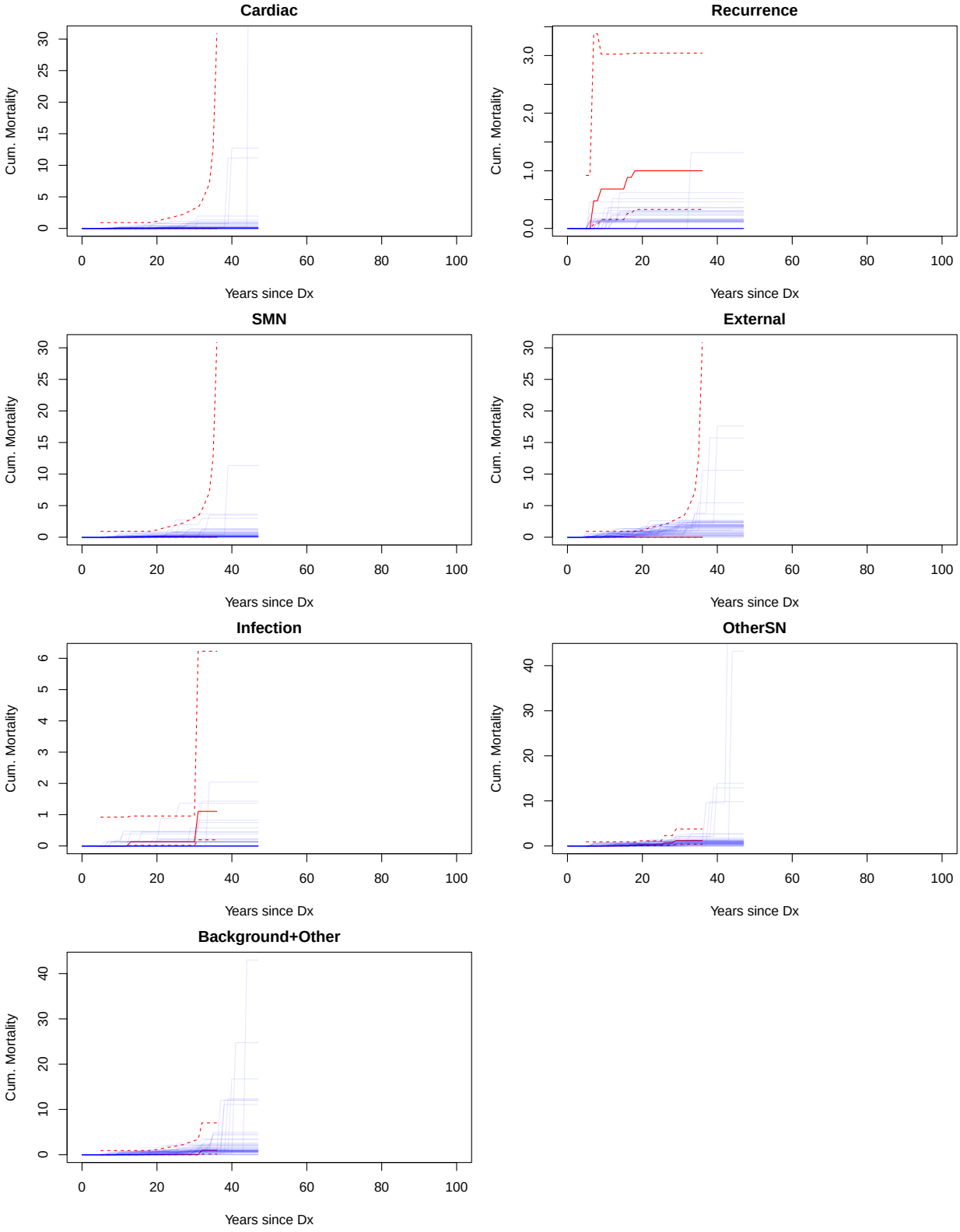
4.3.5.83 ALL grp: 1980s SR-like



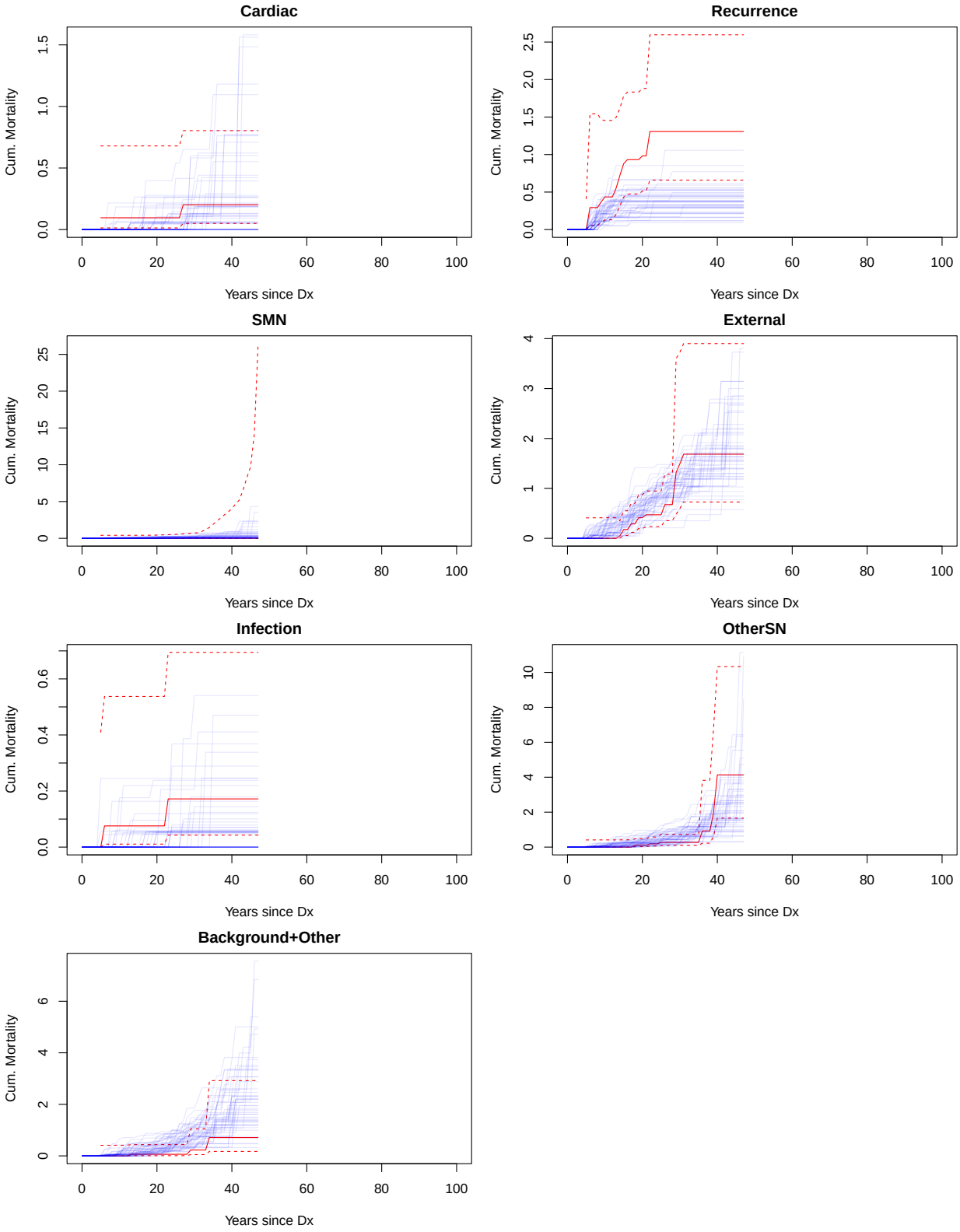
4.3.5.84 ALL grp: 1980s HR-like



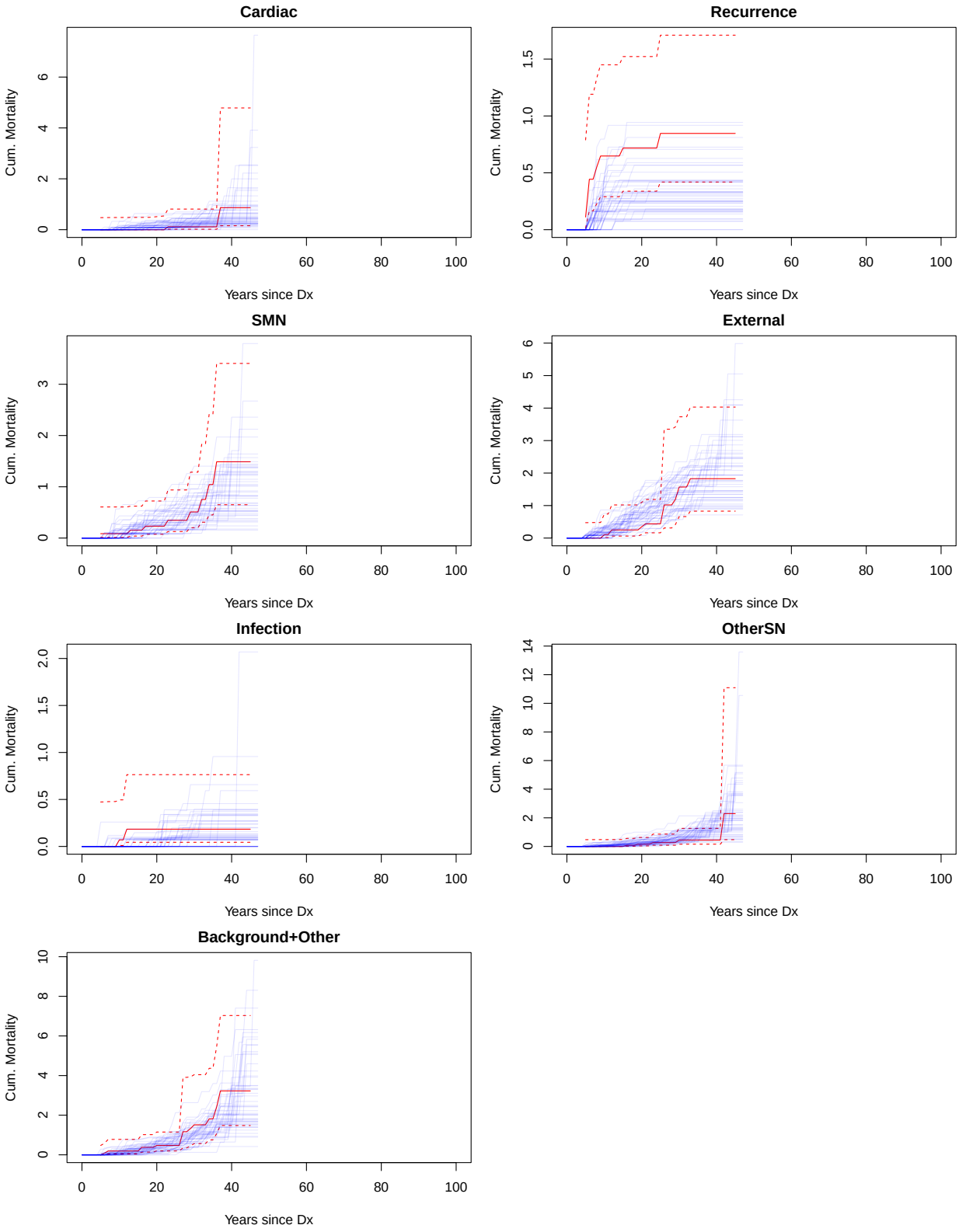
4.3.5.85 ALL grp: 1990s HR-like



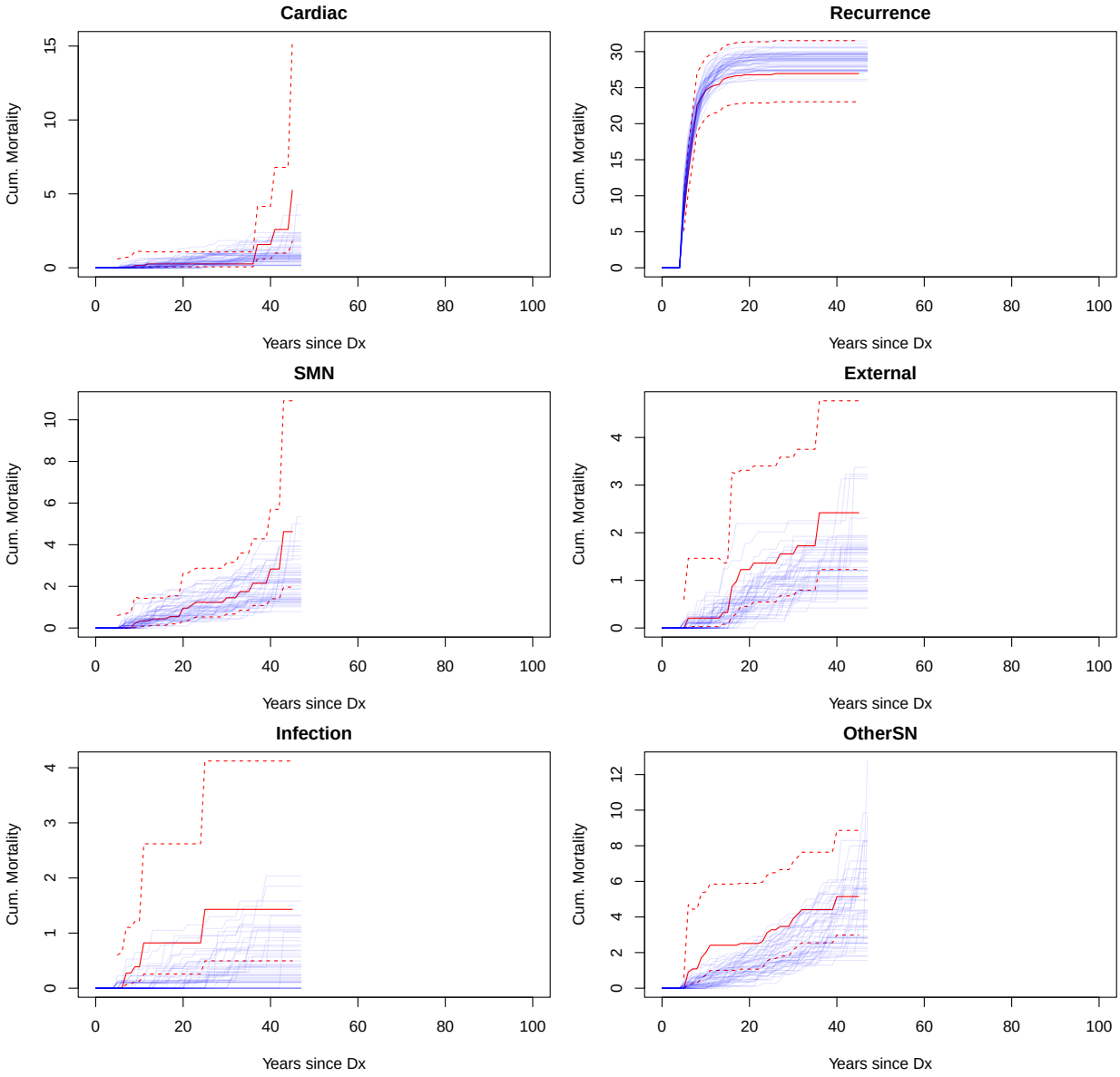
4.3.5.86 ALL grp: 1990s SR/Essig

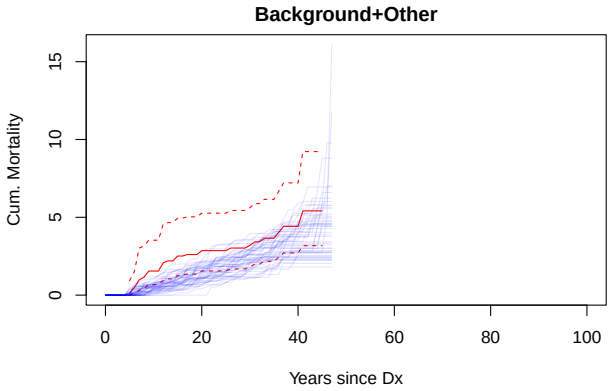


4.3.5.87 ALL grp: Other



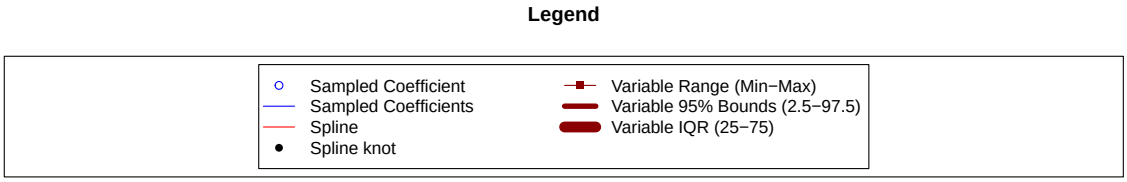
4.3.5.88 ALL grp: Relapse/Transplant




Background+Other
Cum. Mortality
0
5
10
15
0
20
40
60
80
100
Years since Dx

5 Calibrated Posteriors

Plots below show the mean (dot) and distribution (symmetric density plots) of the calibrated model parameters. Dashed black lines indicate 95% UI of the prior probability distributions (pre-calibration). The predicted spline values (mean + 95% UI) are also plotted for relevant model coefficients, as well as the distribution of the variable in the CCSS data.



Variable	Definition
Primary and indicator variables	
sex	sex=1 for female, sex=0 for male
a_dx	integer age at original cancer diagnosis (range = 0 to 20)
a_dx1	Representatation of 2nd term for restricted cubic spline for age at diagnosis
agey	current age
agey1	Representatation of 2nd term for restricted cubic spline for current age
anthd5	doxorubicin-equivalent total anthracycline dose (mg/m2) in first 5 years post diagnosis
anth1	anth1=1 for 0<dose<250 mg/m2 (doxorubicin-equivalent total anthracycline dose)
anth2	anth2=1 for dose >=250 mg/m2 (doxorubicin-equivalent total anthracycline dose)
anth412	anth412=1 if 0<dose<250 mg/m2 for anthracycline dose
anth41	anth41=1 if 0<dose<100 mg/m2 for anthracycline dose
anth42	anth42=1 if 100=<dose<250 mg/m2 for anthracycline dose
anth43	anth43=1 if 250=<dose<400 mg/m2 for anthracycline dose
anth44	anth44=1 if dose >=400 mg/m2 for anthracycline dose
pt_yn5i	cisplatinum-equivalent total platinum used in first 5 years (1=yes)
cispd5	cisplatinum dose (mg/m2) in first 5 years post diagnosis
procd5	procarbazine dose (mg/m2) in first 5 years post diagnosis
proc51	proc51=1 for 0<dose<4200 mg/m2 procarbazine in first 5 years post-diagnosis
proc52	proc52=1 for 4200<=dose <8400 mg/m2 procarbazine in first 5 years post-diagnosis
proc53	proc53=1 for dose >=8400 mg/m2 procarbazine in first 5 years post-diagnosis
chestd	radiation dose to chest (cGy) in first 5 years post diagnosis (body region data)
chestd1	chestd1 = 1 if 0<dose<25 Gy
chestd2	chestd2 = 1 if 25<= dose<35 Gy
chestd3	chestd3 = 1 if 35<= dose <45 Gy
chestd4	chestd4 = 1 if dose >=45 Gy
chest35	chest35=1 if radiation dose to chest >=35 Gy
chest312	chest312=1 if 0<dose<20 Gy for chest radiation dose
chest31	chest31=1 if 0<dose<10 Gy for chest radiation dose
chest32	chest32=1 if 10<dose<20 Gy for chest radiation dose
chest33	chest33=1 if 20<dose<30 Gy for chest radiation dose
chest34	chest34=1 if dose >=30 Gy for chest radiation dose
fldchest1	1, no direct chest RT
fldchest2	1, TBI or whole lung, any chest RT dose

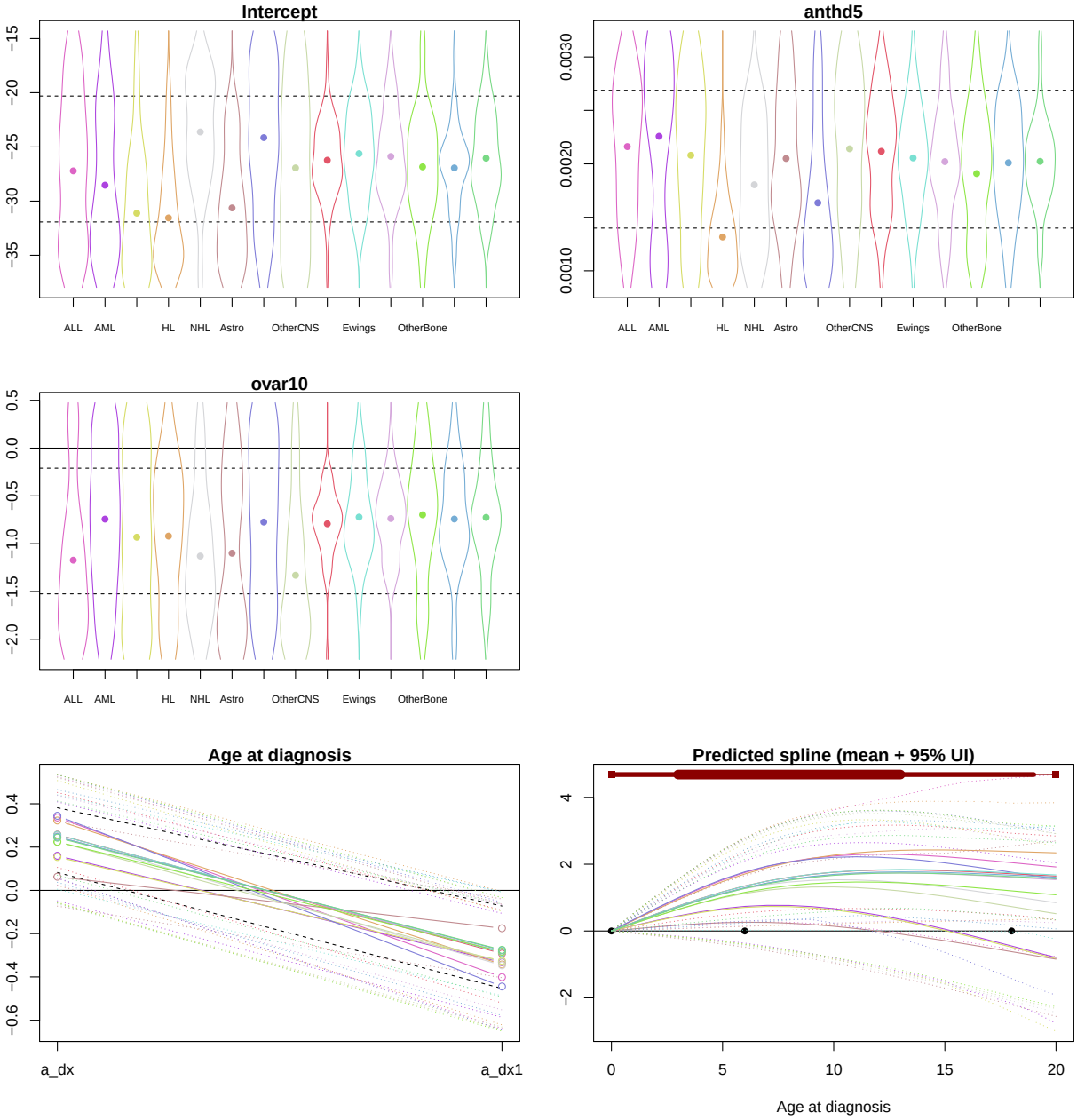
Variable	Definition
fldchest4	1, mantle location, 0<chest RT<30 Gy
fldchest5	1, mantle location, 30<=chest RT<50 Gy
fldchest6	1, mantle location, chest RT>=50 Gy
fldchest7	1, mediastinal location, any chest RT dose
fldchest8	1, spine or other chest RT, any dose
heartd	radiation dose to heart (cGy) in first 5 years post diagnosis (dosimetry data)
heart1	heart1=1 if 0<dose<15 Gy for radiation dose to heart
heart2	heart2=1 15<=dose<25 Gy for radiation dose to heart
heart3	heart3=1 25<=dose<35 Gy for radiation dose to heart
heart4	heart4=1 dose >=35 Gy for radiation dose to heart
heart1b	heart1b=1 if 0<dose<25 Gy for radiation dose to heart
heart2b	heart2b=1 if 25<=dose<35 Gy for radiation dose to heart
heart3b	heart3b=1 if dose >=35 Gy for radiation dose to heart
hrt35	hrt35=1 if dose >=35 Gy for radiation dose to heart
minovar	minimum radiation dose to ovary (cGy) (dosimetry data)
abdpel	maximum radiation dose to abdomen or pelvis (cGy) in first 5 years post diagnosis (body region data)
abdpel1	abdpel1=1 for 0<dose<35 Gy (maximum radiation dose to abdomen/pelvis)
abdpel2	abdpel2=1 for dose >=35 Gy (maximum radiation dose to abdomen/pelvis)
ovar1	ovar1=1 for 0< dose <10 Gy (minimum RT dose to ovary)
ovar2	ovar2=1 for 10< dose <20 Gy (minimum RT dose to ovary)
ovar3	ovar3=1 for dose 20+ Gy (minimum RT dose to ovary)
ovar10	ovar10=1 for dose >=10 Gy (minimum RT dose to ovary)
alkd5b	cyclophosphamide-equivalent total alkylator dose, per 100 mg/m2, in first 5 years post diagnosis
alk1	alk1 =1 for 0<dose <8000 mg/m2 (cyclophosphamide-equivalent total alkylator dose, mg/m2)
alk2	alk2 =1 for>=8000 mg/m2 (cyclophosphamide-equivalent total alkylator dose, mg/m2)
alk12	None or <12000, 12000+
alk41	alk41=1 if 0<dose<4000 mg/m2 for alkylator dose
alk42	alk42=1 if 4000<dose<8000 mg/m2 for alkylator dose
alk43	alk43=1 if 8000<dose<12000 mg/m2 for alkylator dose
alk44	alk44=1 if dose >=12000 mg/m2 for alkylator dose
crtd	maximum radiation dose to any brain segment (cGy) in first 5 years post diagnosis (body region data)
crtgy	maximum radiation dose to any brain segment (in Gy, not cGy) in first 5 years post diagnosis (body region data)
crt534	indicator of maximum radiation dose to any brain segment (>=30 Gy)
crt51	crt51=1 if 0<dose<20 Gy for maximum radiation dose to any brain segment
crt52	crt52=1 if 20=<dose<30 Gy for maximum radiation dose to any brain segment
crt53	crt53=1 if 30=<dose<40 Gy for maximum radiation dose to any brain segment
crt54	crt54=1 if dose >=40 Gy for maximum radiation dose to any brain segment
crtgy1	crtgy1=1 if 0<dose<40 Gy for maximum radiation dose to any brain segment
crtgy2	crtgy2=1 if 40=<dose<50 Gy for maximum radiation dose to any brain segment
crtgy3	crtgy3=1 if 50=<dose<60 Gy for maximum radiation dose to any brain segment
crtgy4	crtgy4=1 if dose >=60 Gy for maximum radiation dose to any brain segment
crtleuk1	Representatation of 2nd term for restricted cubic spline for radiation dose to any brain segment (knots at 10,50,90% among leukemia patients)
crtcns1	Representatation of 2nd term for restricted cubic spline for radiation dose to any brain segment (knots at 10,50,90% among CNS patients)
crtlymp1	Representatation of 2nd term for restricted cubic spline for radiation dose to any brain segment (knots at 10,50,90% among lymphoma patients)

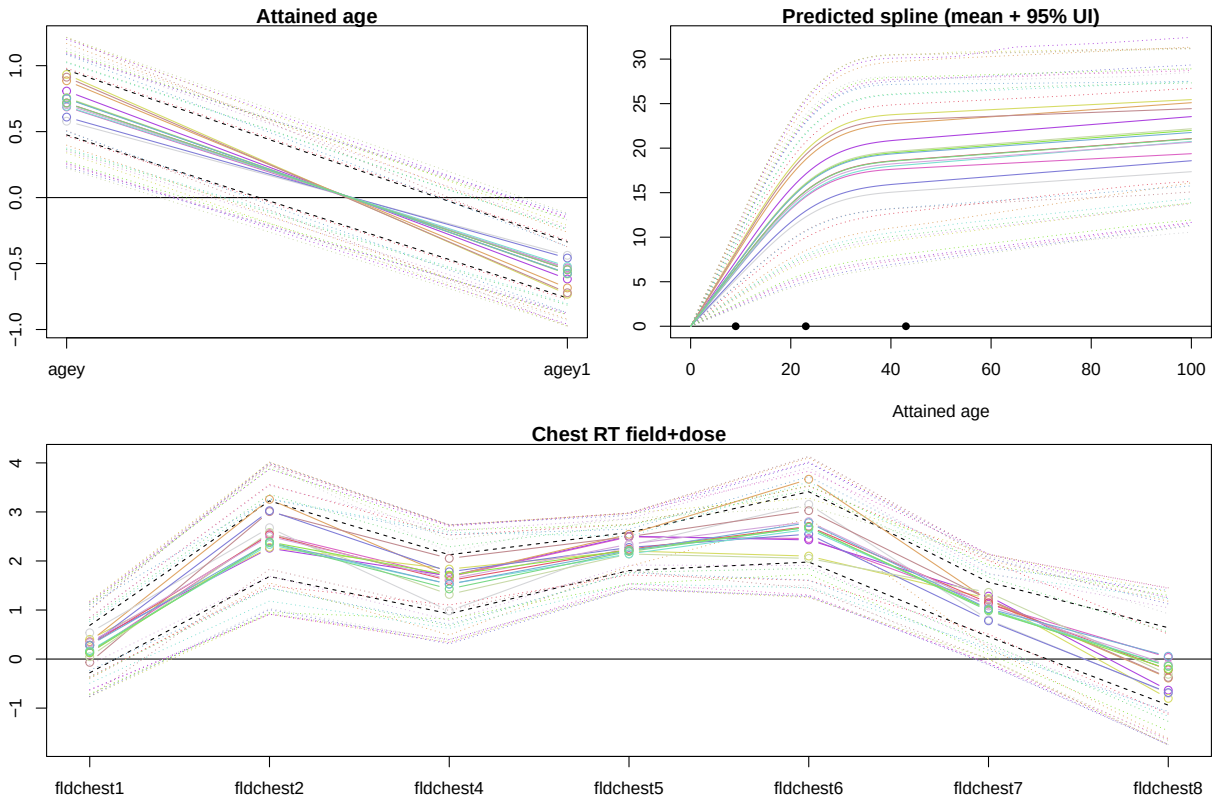
Variable	Definition
crtoth1	Representatation of 2nd term for restricted cubic spline for radiation dose to any brain segment (knots at 10,50,90% among patients other than leukemia, CNS or lymphoma)
maxrtgy	maximum radiation dose to any body region(in Gy not cGy) in first 5 years (body region data)
max35	max35=1 if maximum radiation dose to any region>=35 Gy
maxrt11	maxrt11=1 if 0<dose<20 Gy for maximum radiation dose to any body region
maxrt21	maxrt21=1 if 20=<dose<30 Gy for maximum radiation dose to any body region
maxrt31	maxrt31=1 if dose >=30 Gy for maximum radiation dose to any body region
max30_1	max30_1=1 if 0<dose<30 Gy for maximum radiation dose to any body region
max30_2	max30_2=1 if dose >=30 Gy for maximum radiation dose to any body region
bmt_yn5i	indicator of bone marrow transplant in first 5 years post diagnosis
yearDx	year of original cancer diagnosis (1970-1999)
y_cc	year of the condition-1975
y_dx1970	interger years since 1970
year75_79	indicator for year of original cancer diagnosis (1975-1979)
year80_84	indicator for year of original cancer diagnosis (1980-1984)
year85_89	indicator for year of original cancer diagnosis (1985-1989)
year90_94	indicator for year of original cancer diagnosis (1990-1994)
year95_99	indicator for year of original cancer diagnosis (1995-1999)
recurei	recurei =1 indicates recurrence of original cancer in first 5 years post diagnosis
chemo	chemo=1 indicates any chemotherapy in first 5 years
rad	rad=1 indicates any radiation in first 5 years
surg	surg=1 indicates any surgery in first 5 years
maxsegrtdose	maximum radiation dose to any brain segment (cGy) in first 5 years post diagnosis (body region data)
dexa5	indicator of dexamethasone in first 5 years post diagnosis
cyta_risk	indicator of cytarabine in first 5 years post diagnosis
cyclodose5	cyclophosphamide dose (mg/m2) in first 5 years post diagnosis
Interaction terms	
anth1*a_dx	Interaction of indicator of anthracycline dose (0<250 mg/m2) with integer age at cancer diagnosis
anth2*a_dx	Interaction of indicator of anthracycline dose (>=250 mg/m2) with integer age at cancer diagnosis
anth1*agey	Interaction of indicator of anthracycline dose (0<250 mg/m2) with current age
anth2*agey	Interaction of indicator of anthracycline dose (>=250 mg/m2) with current age
anth1*year30	Interaction of indicator of anthracycline dose (<250 mg/m2) with indicator of 30 years or more after cancer diagnosis
anth2* year30	Interaction of indicator of anthracycline dose (>=250 mg/m2) with indicator of 30 years or more after cancer diagnosis
anth1*heart1b	Interaction of indicator of anthracycline dose (0< 250 mg/m2) with 0<dose<25 Gy RT dose to heart
anth1*heart2b	Interaction of indicator of anthracycline dose (0< 250 mg/m2) with 25<=dose<35 Gy RT dose to heart
anth1*heart3b	Interaction of indicator of anthracycline dose (0< 250 mg/m2) with dose >=35 Gy RT dose to heart
anth2*heart1b	Interaction of indicator of anthracycline dose (>=250 mg/m2) with 0<dose<25 Gy RT dose to heart
anth2*heart2b	Interaction of indicator of anthracycline dose (>=250 mg/m2) with 25<=dose<35 Gy RT dose to heart
anth2*heart3b	Interaction of indicator of anthracycline dose (>=250 mg/m2) with dose >=35 Gy RT dose to heart

Variable	Definition
brain*year25	Interaction term for indicator of CNS diagnosis with indicator of years since diagnosis>=25
female*a_dx	Interaction of indicator of female sex with integer age at cancer diagnosis
female*anthd5	Interaction of female sex with doxorubicin-equivalent anthracycline dose
hrt35*year30	Interaction of indicator of 30 years or more post cancer diagnosis with indicator of heart RT dose >=35 Gy
year30*a_dx	Interaction of indicator of 30 years or more post cancer diagnosis with integer age at cancer diagnosis

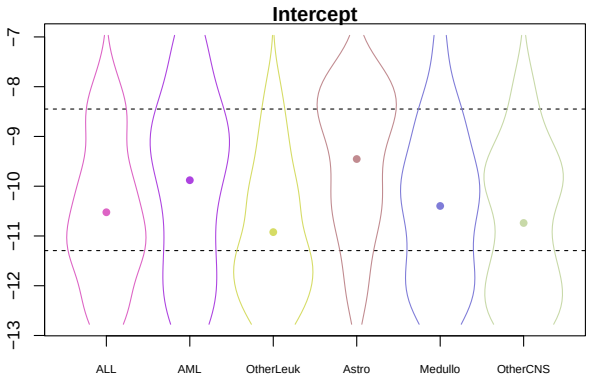
5.1 Incidence Prediction Models

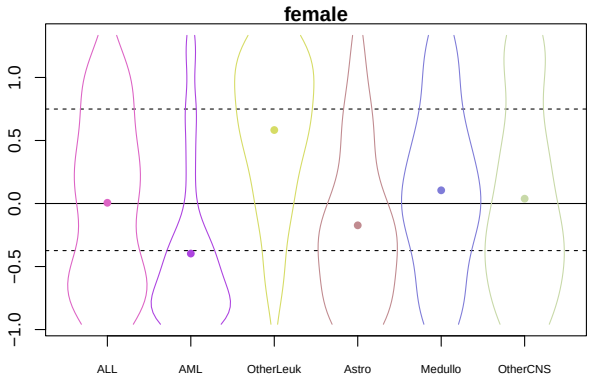
5.1.1 Breast

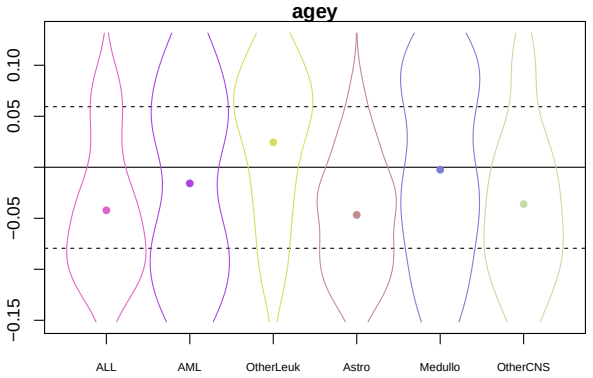


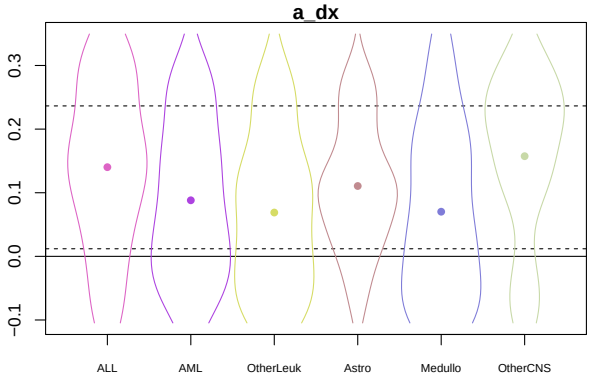

Attained age
1.0
0.5
0.0
−0.5
−1.0
agey
agey1
Predicted spline (mean + 95% UI)
30
25
20
15
10
5
0
0
20
40
60
80
100
Attained age
Chest RT field+dose
4
3
2
1
0
−1
fldchest1
fldchest2
fldchest4
fldchest5
fldchest6
fldchest7
fldchest8

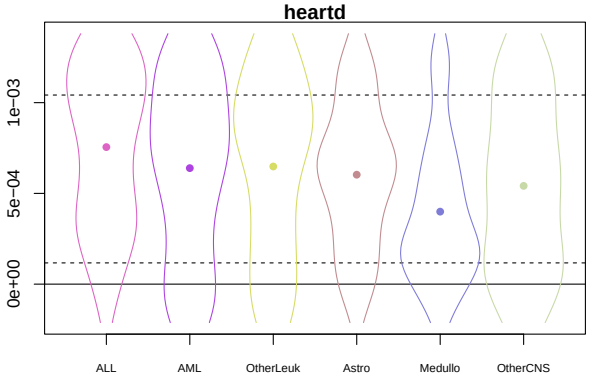
5.1.2 HF - CNS/Leukemia

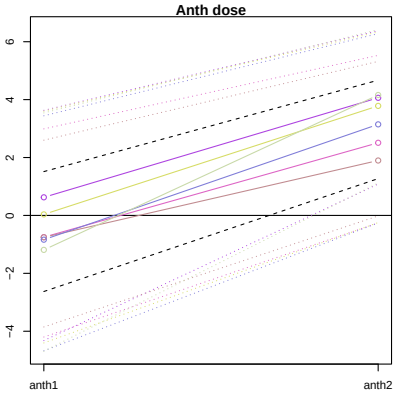


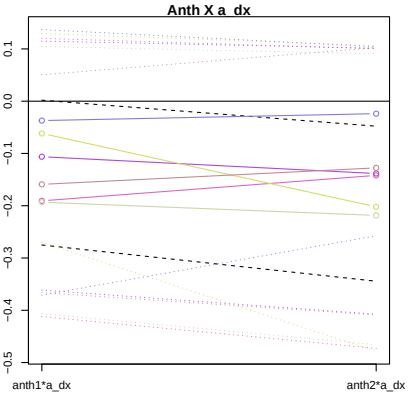


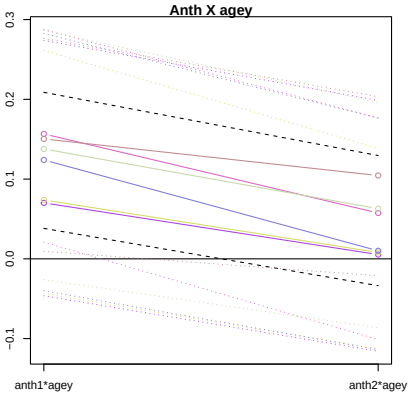




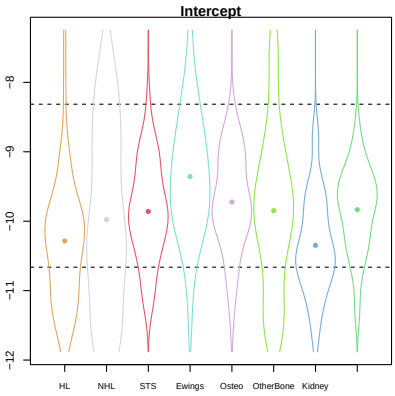


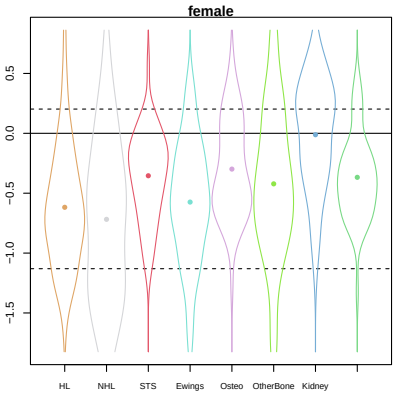


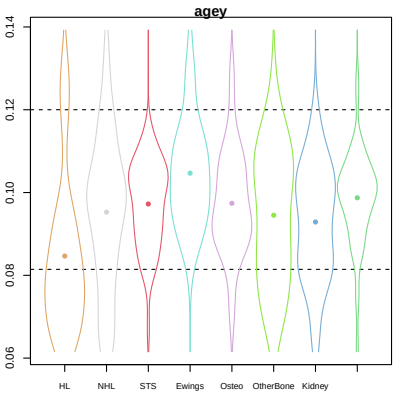


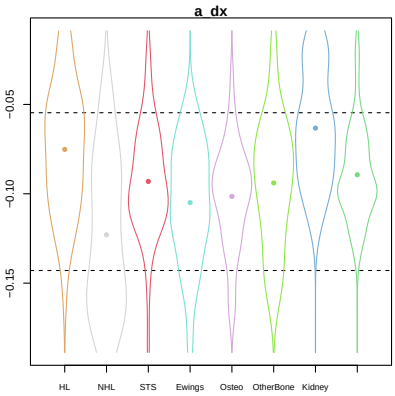


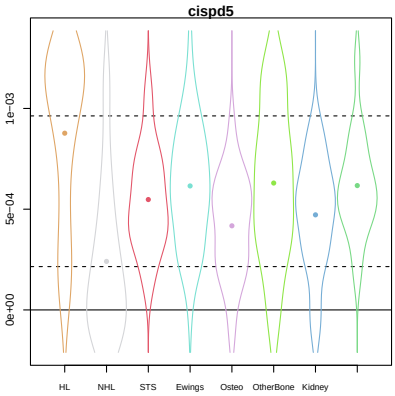
5.1.3 HF - All other diagnoses

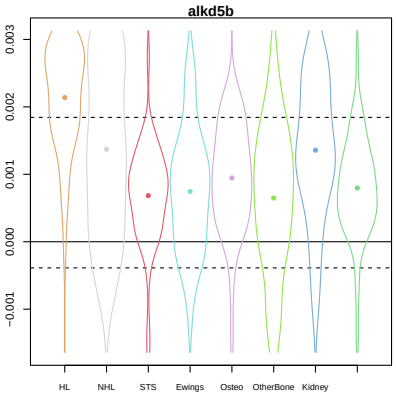


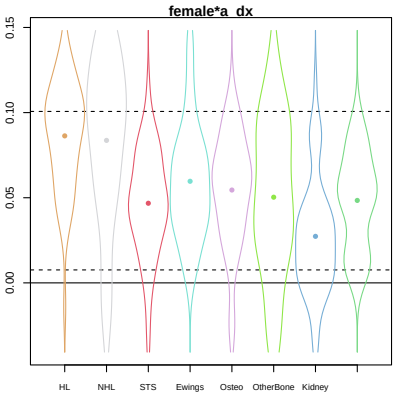


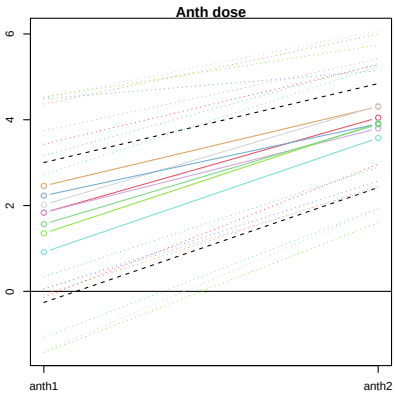


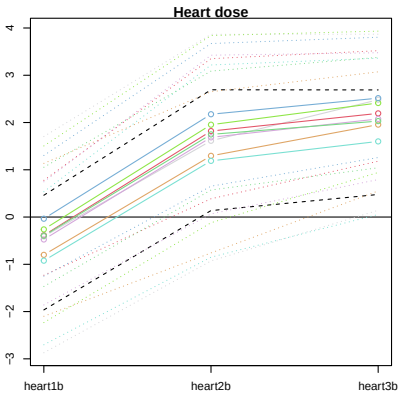


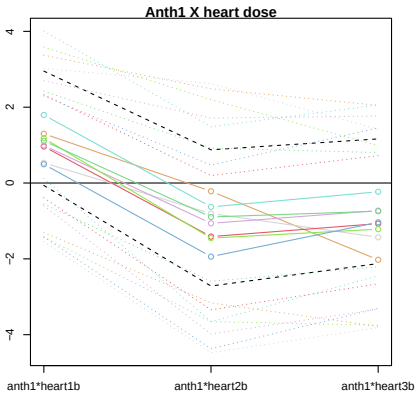


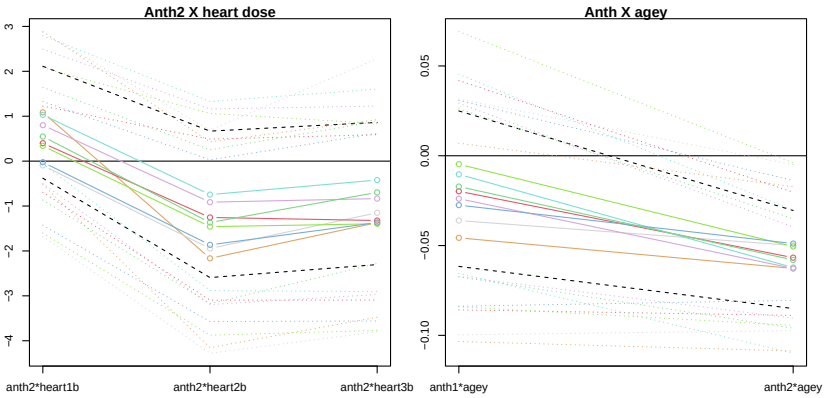




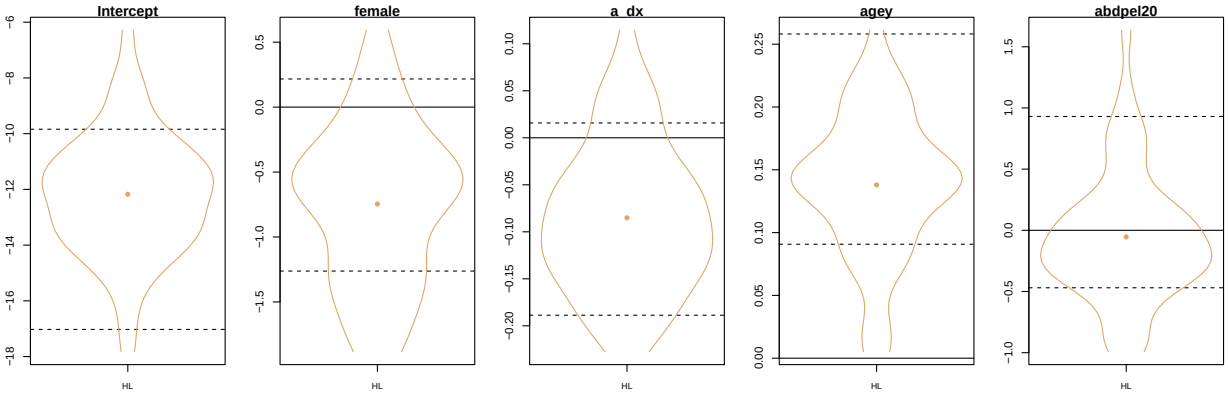


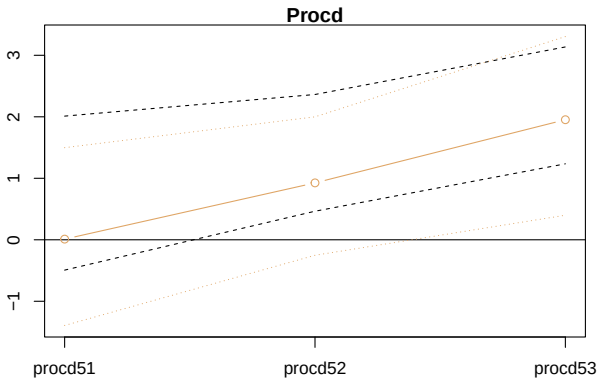




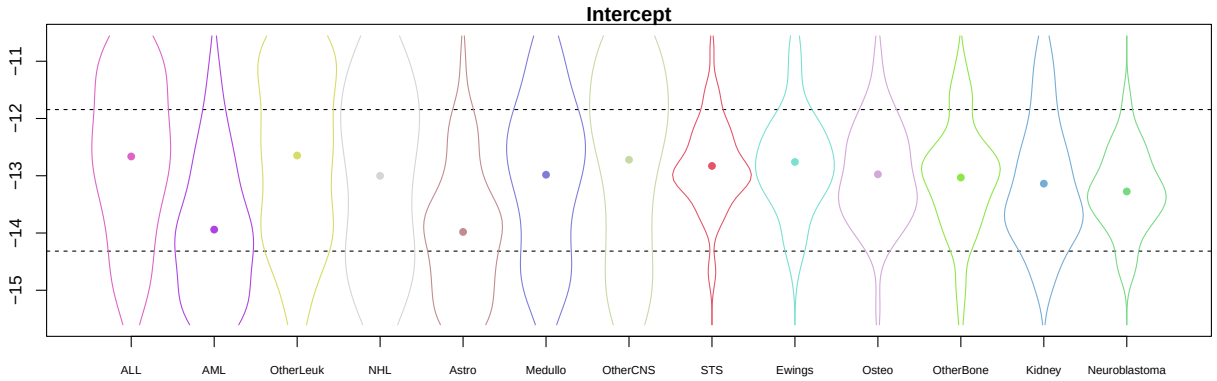

Anth2 X heart dose
3
2
1
0
−1
−2
−3
−4
anth2*heart1b
anth2*heart2b
anth2*heart3b
Anth X agey
0.05
0.00
−0.05
−0.10
anth1*agey
anth2*agey

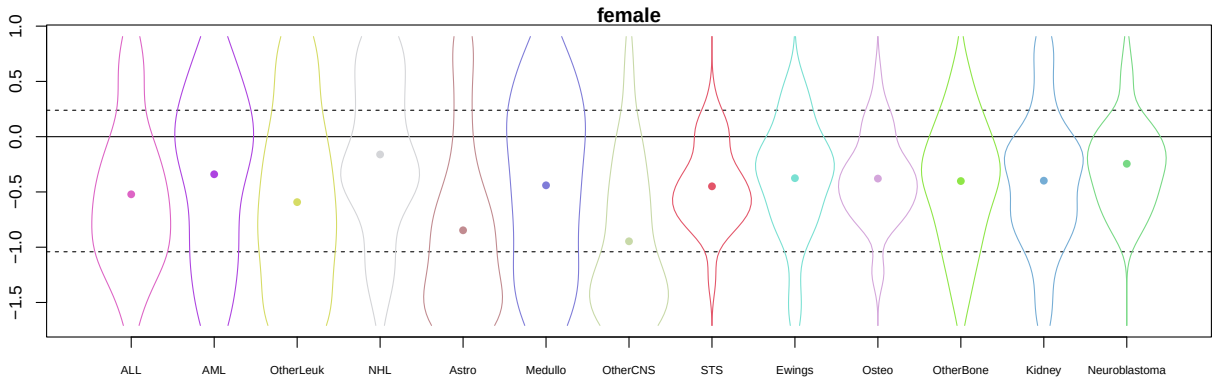
5.1.4 Colorectal - Hodgkins Lymphoma

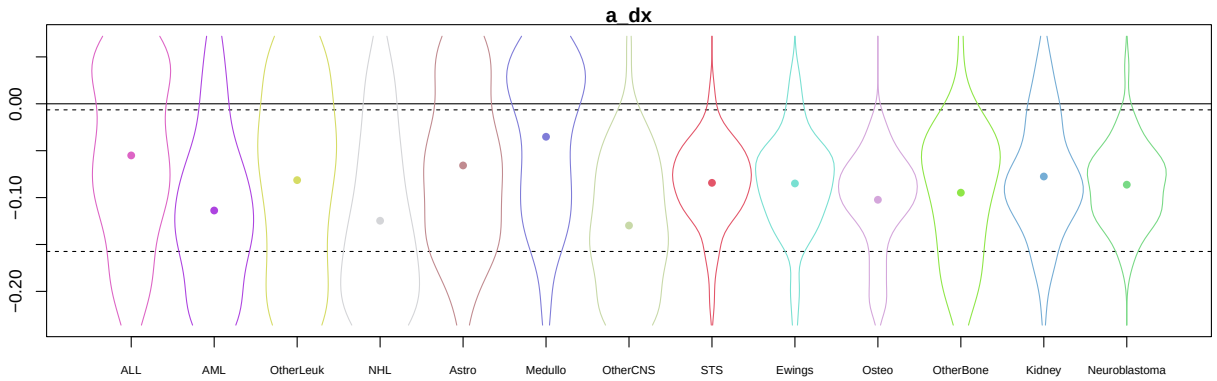


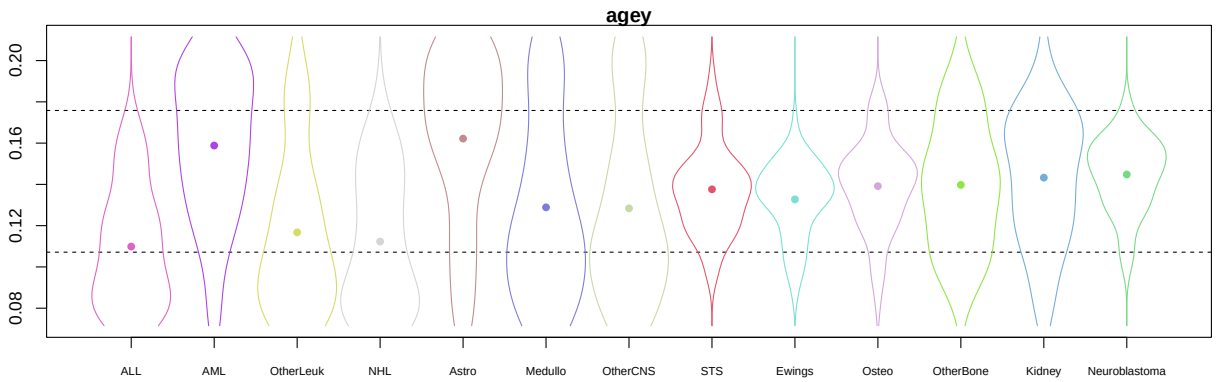


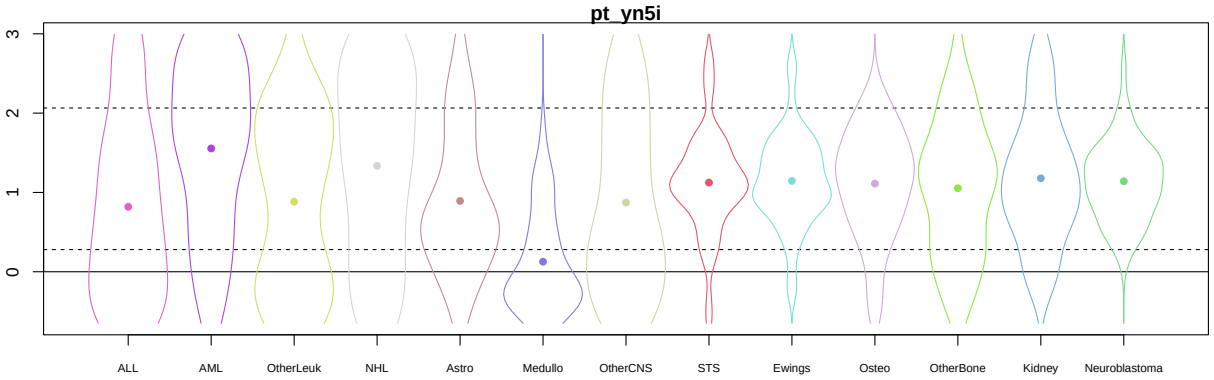
5.1.5 Colorectal - All other diagnoses

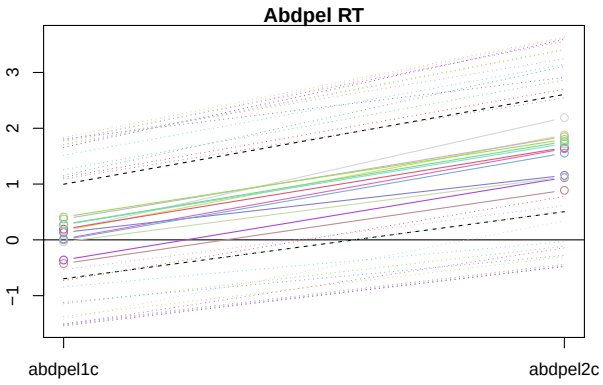


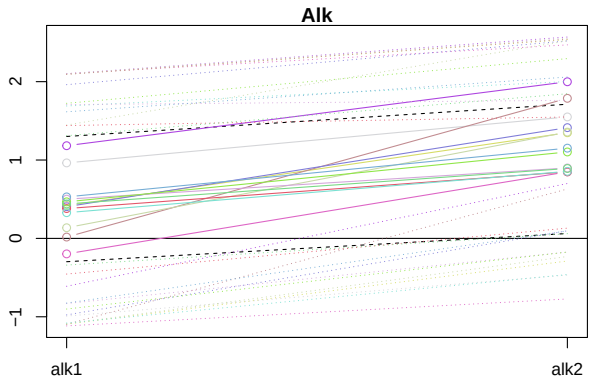




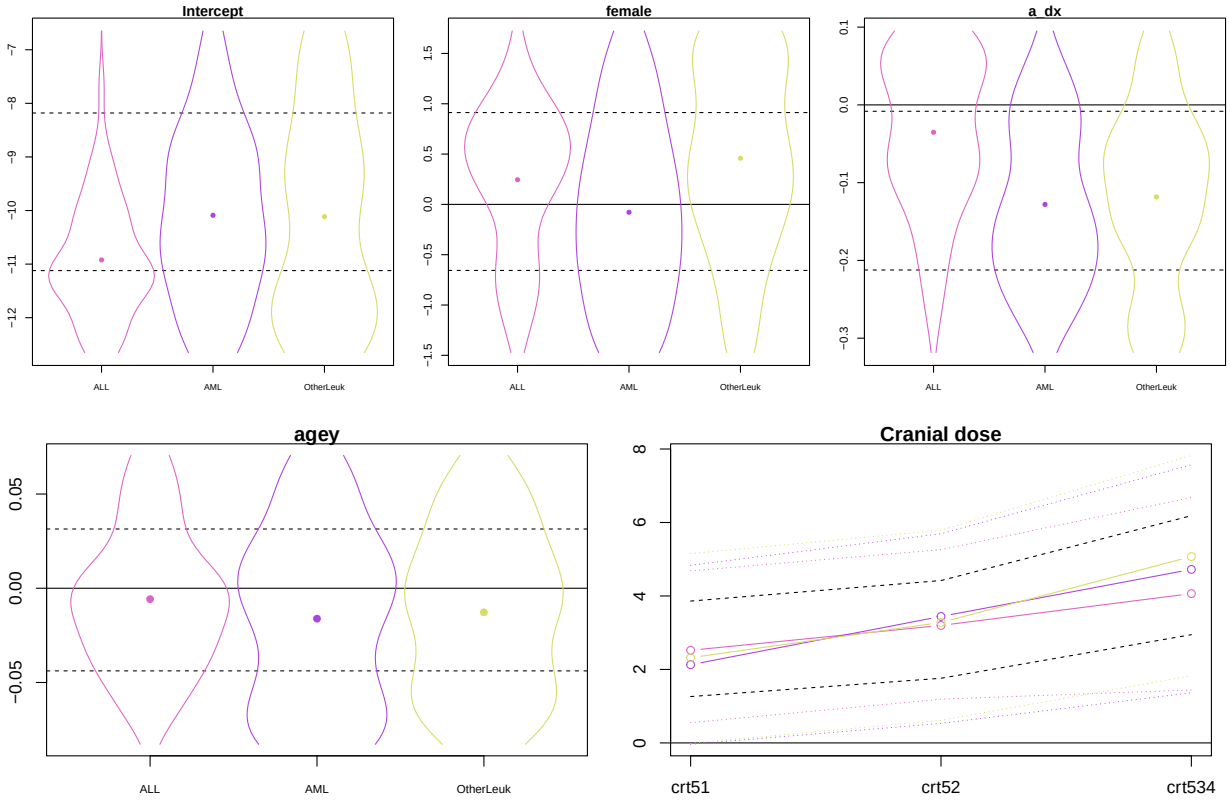



pt_yn5i
3
2
1
0
ALL
AML
OtherLeuk
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

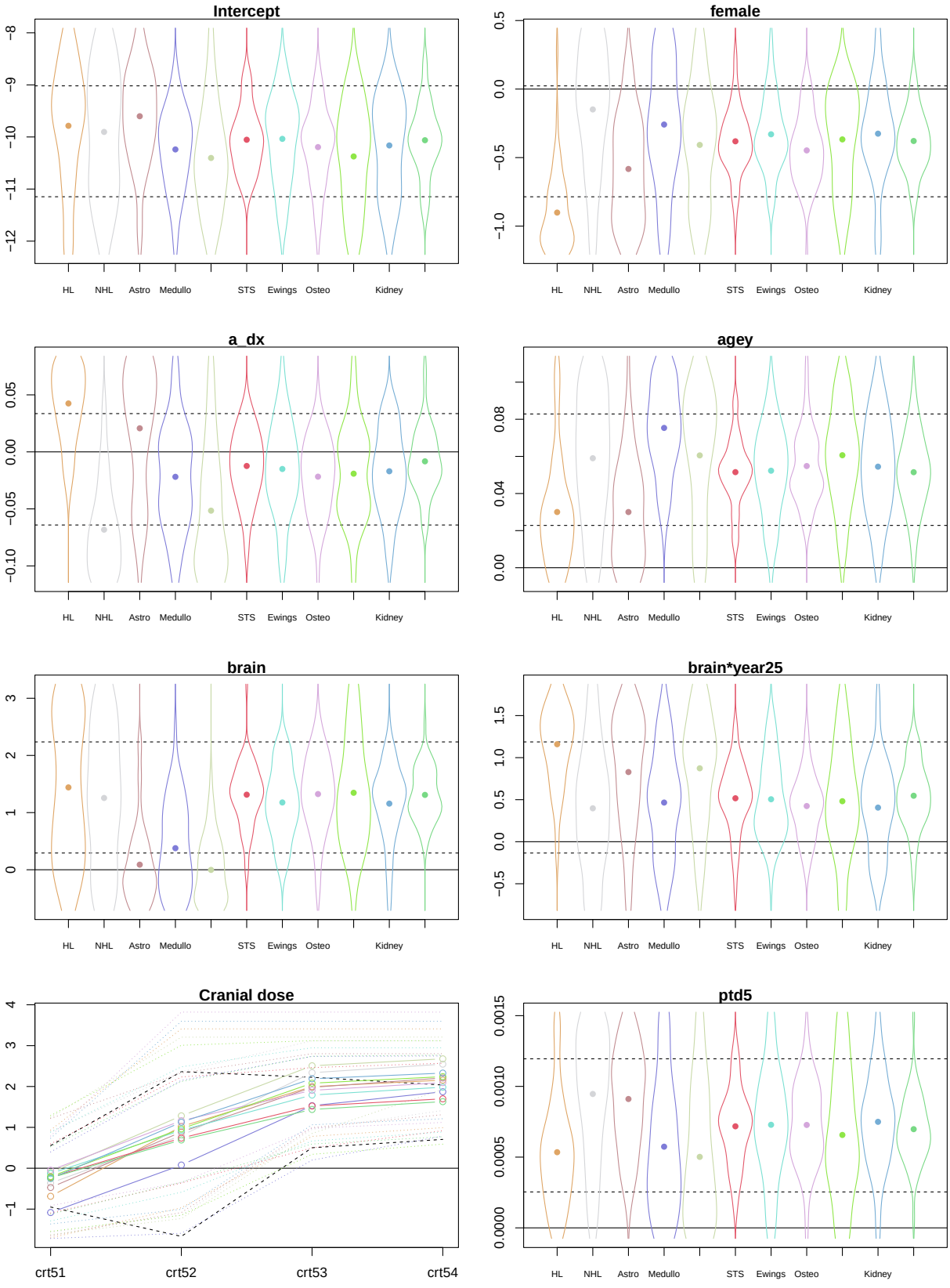

Abdpel RT
3
2
1
0
−1
abdpel1c
abdpel2c

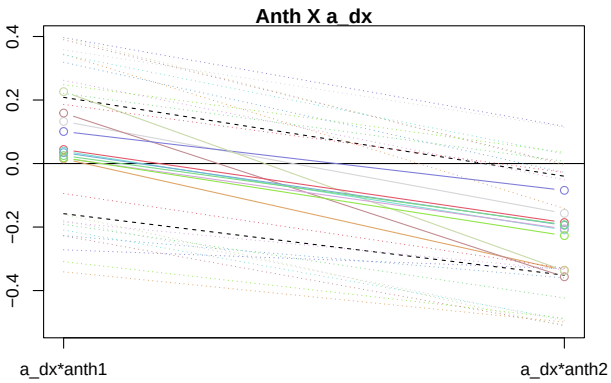

Alk
2
1
0
−1
alk1
alk2

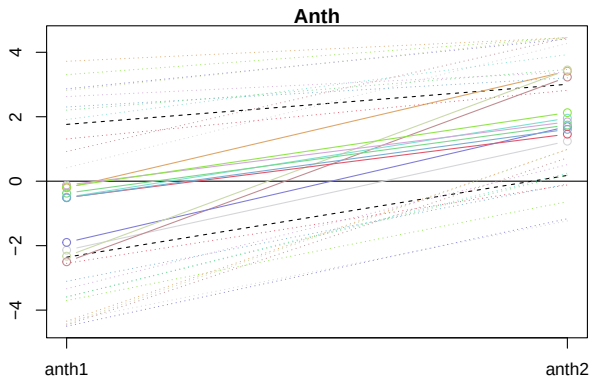
5.1.6 Glial Tumors - Leukemia



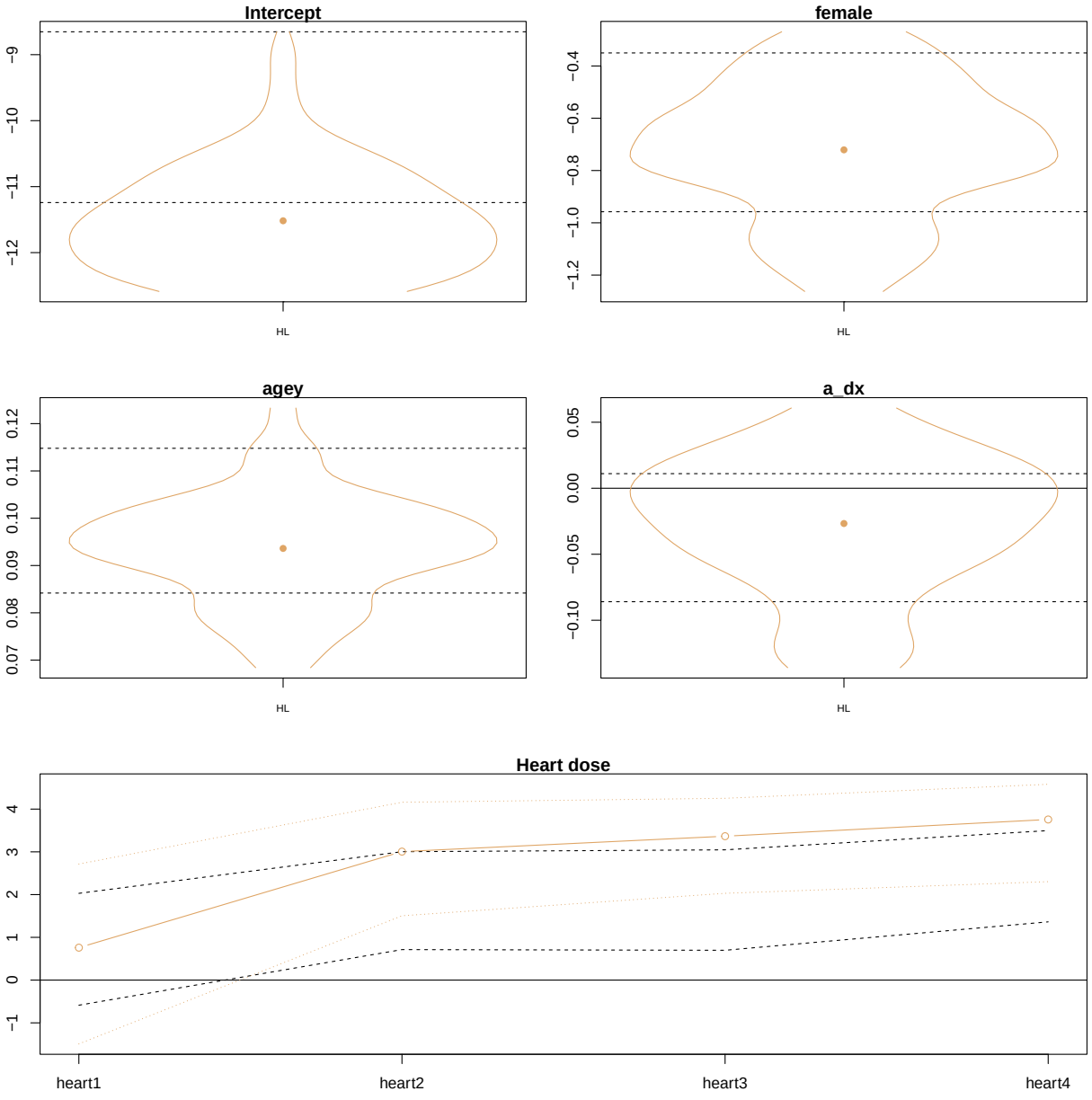
5.1.7 Glial Tumors - All other diagnoses



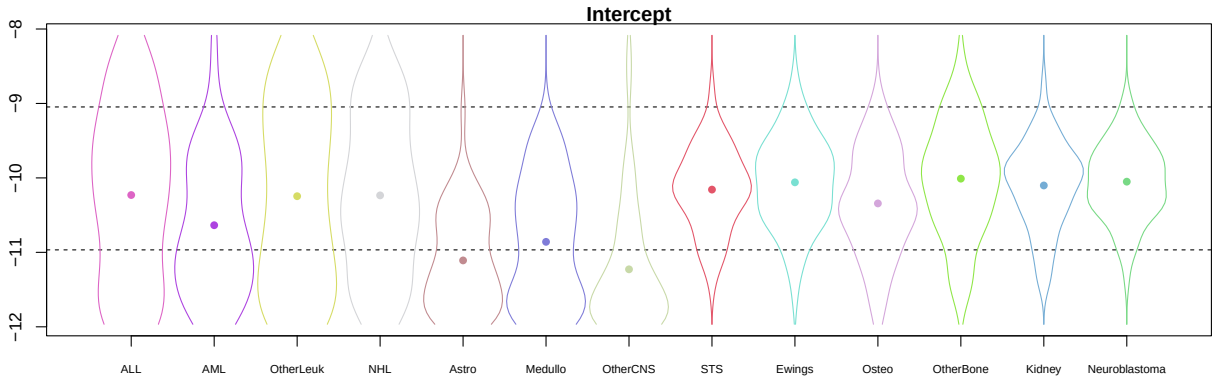

Anth X a_dx
0.4
0.2
0.0
−0.2
−0.4
a_dx*anth1
a_dx*anth2

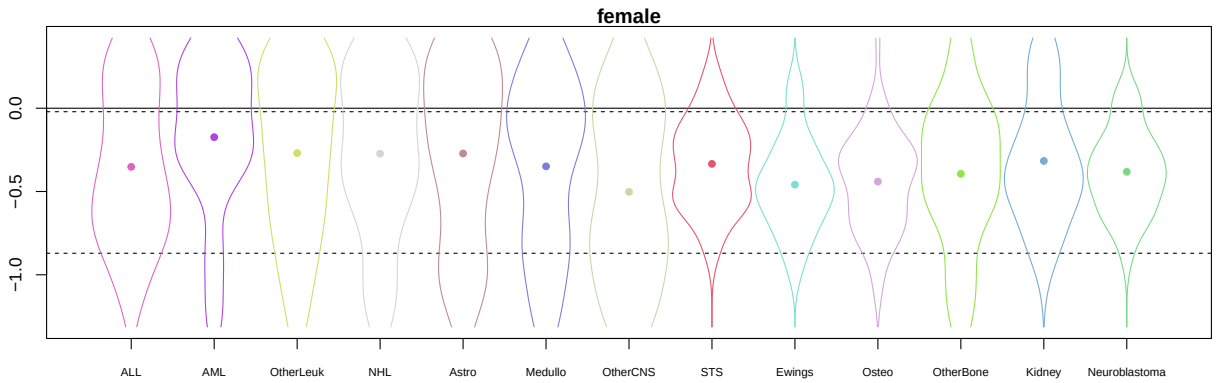

Anth
4
2
0
−2
−4
anth1
anth2

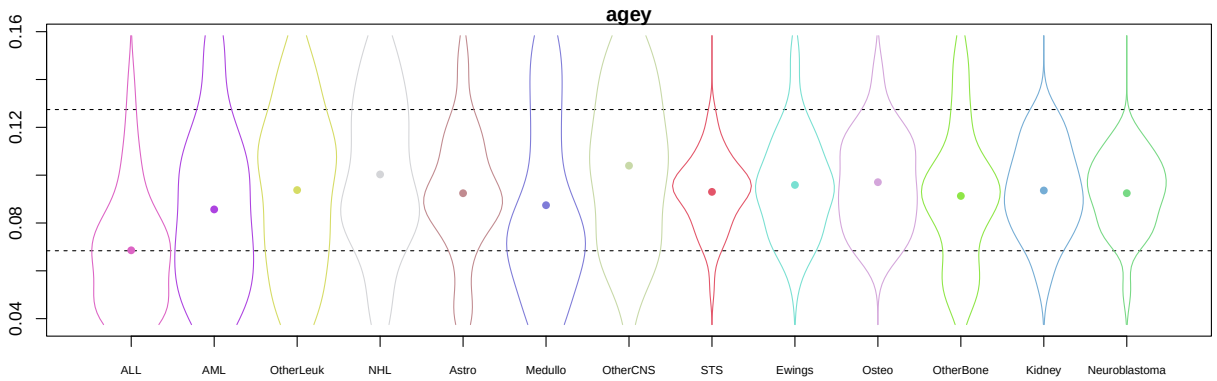
5.1.8 CAD/MI - Hodgkins Lymphoma

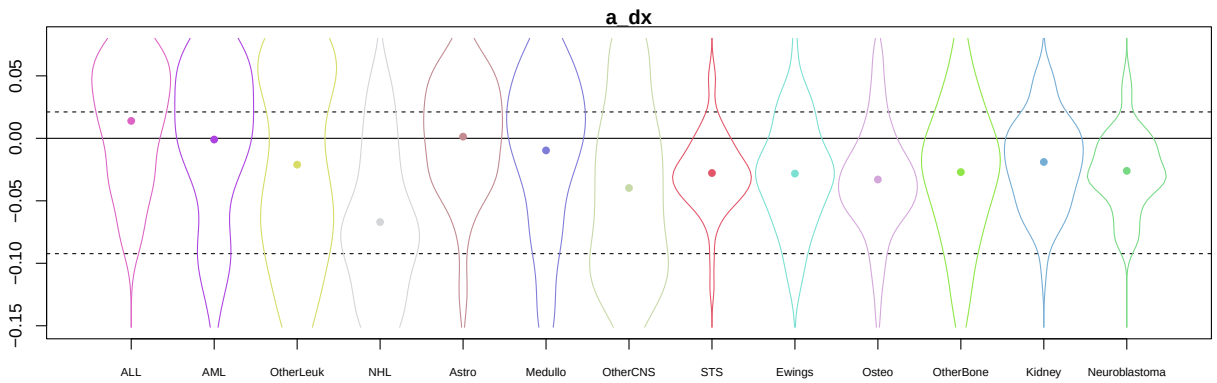


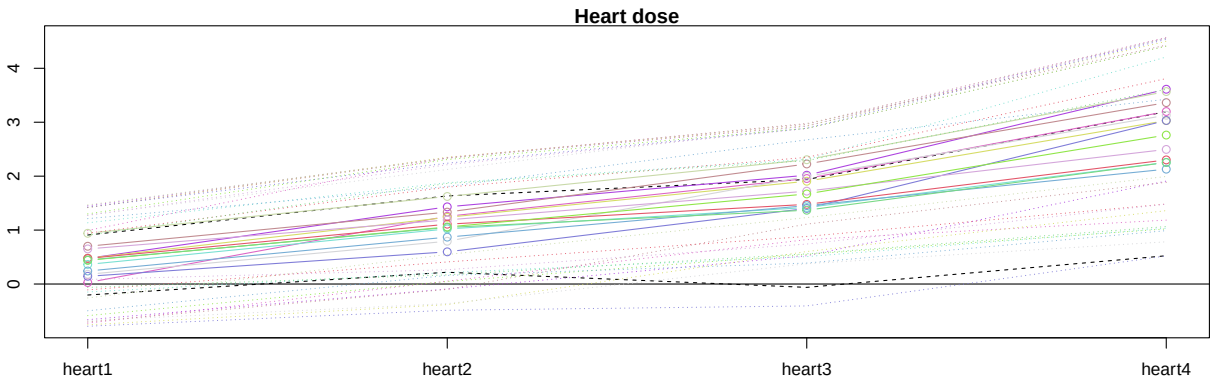
5.1.9 CAD/MI - All other diagnoses







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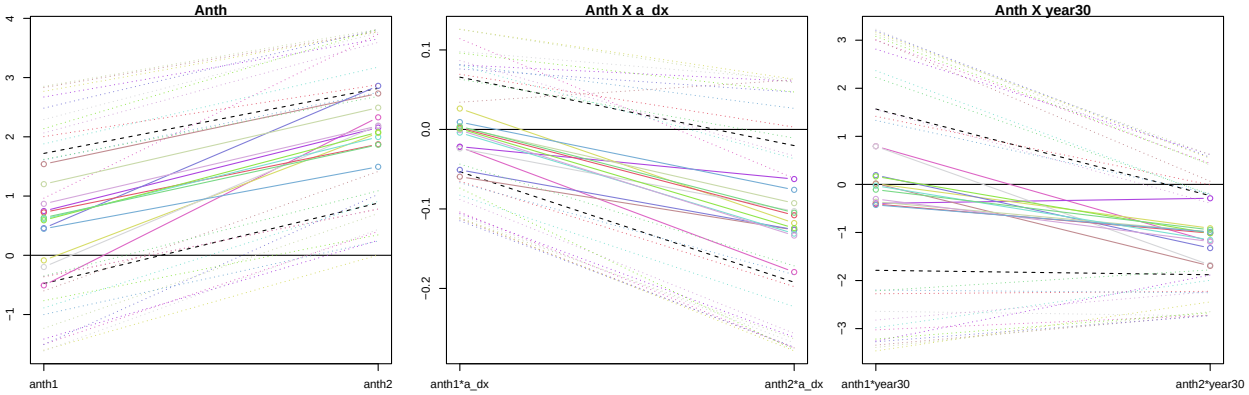
0
1
2
3
4
heart1
heart2
heart3
heart4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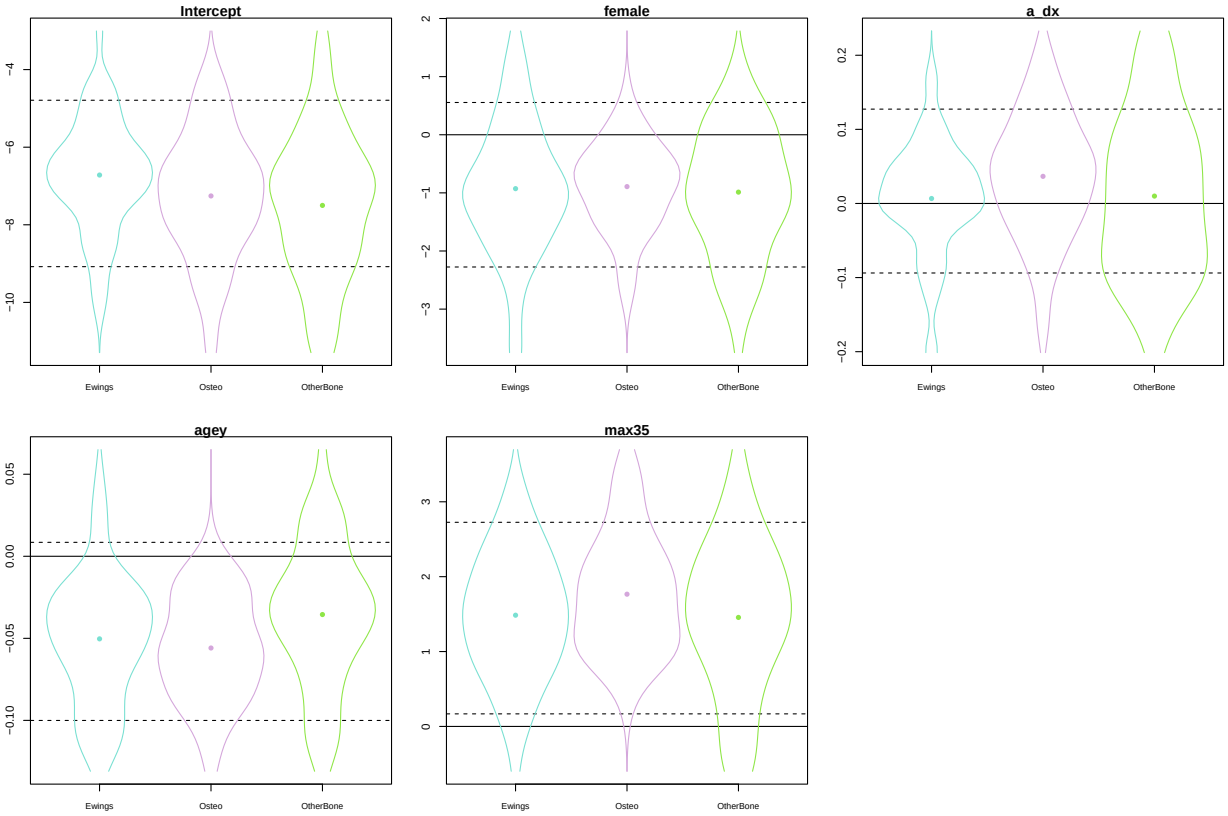
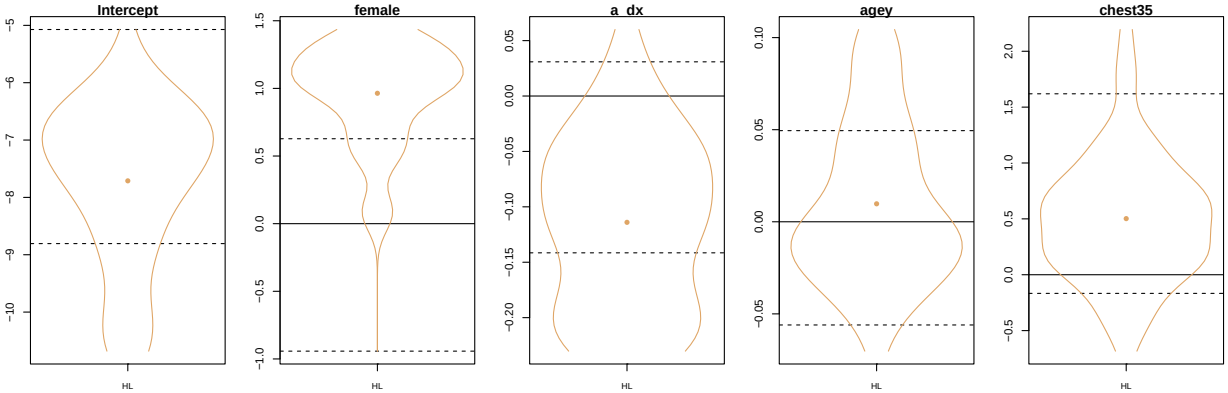
1
2
3
4
anth1
anth2
Anth X a_dx
−0.2
−0.1
0.0
0.1
anth1*a_dx
anth2*a_dx
Anth X year30
−3
−2
−1
0
1
2
3
anth1*year30
anth2*year30

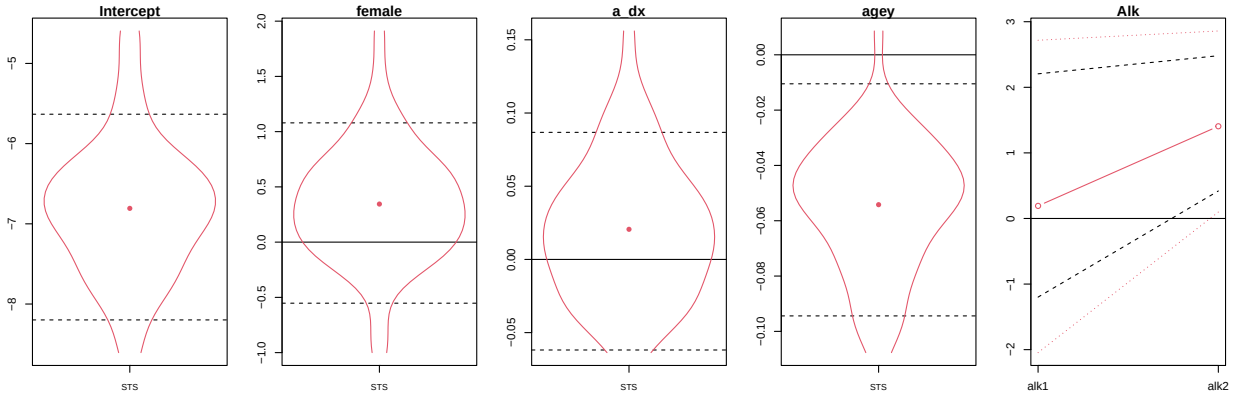
5.1.10 Sarcoma - Bone tumors



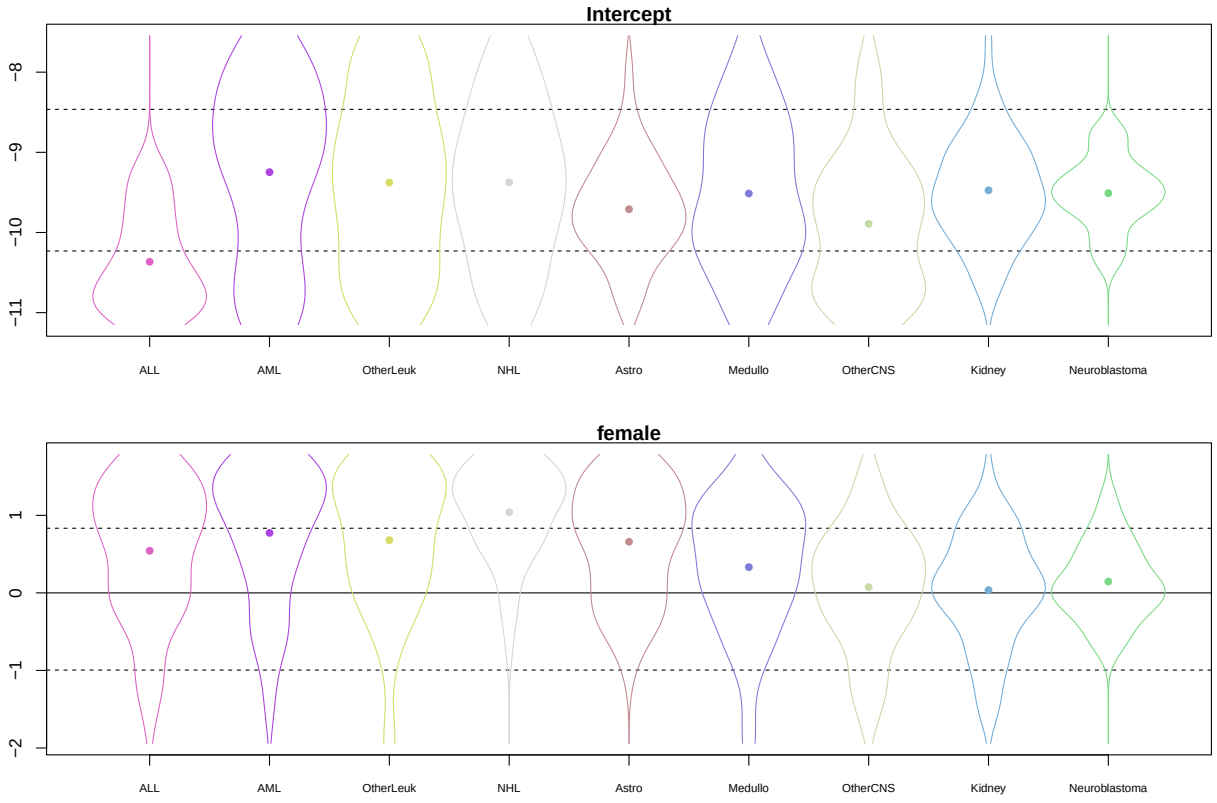
5.1.11 Sarcoma - HL

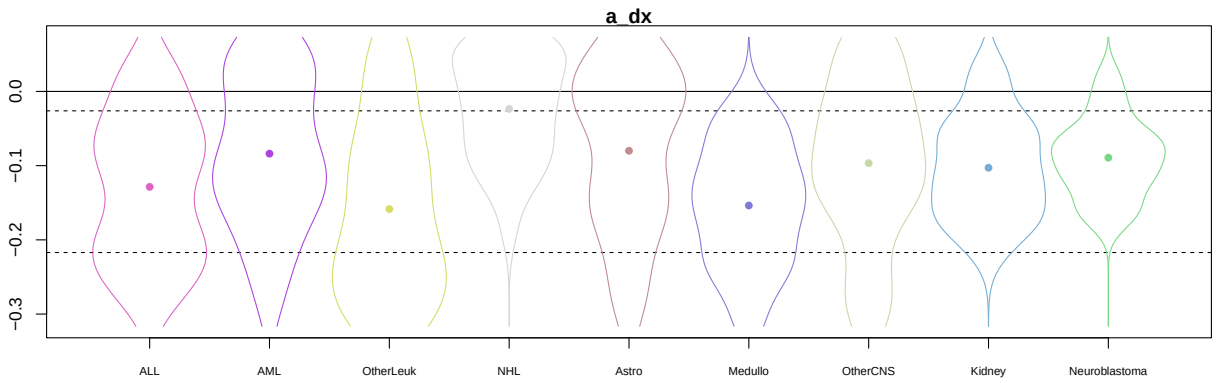


5.1.12 Sarcoma - STS



5.1.13 Sarcoma - All other diagnoses

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−0.3
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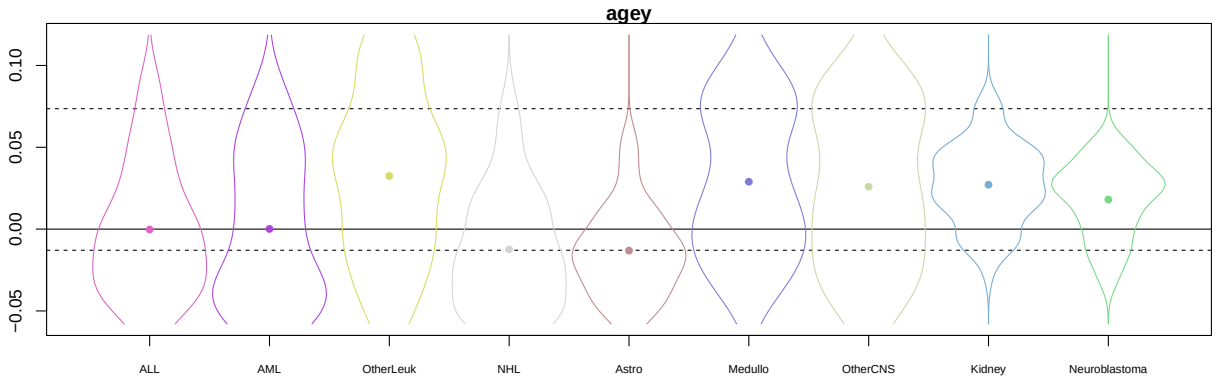
AML
OtherLeuk
NHL
Astro
Medullo
OtherCNS
Kidney
Neuroblastoma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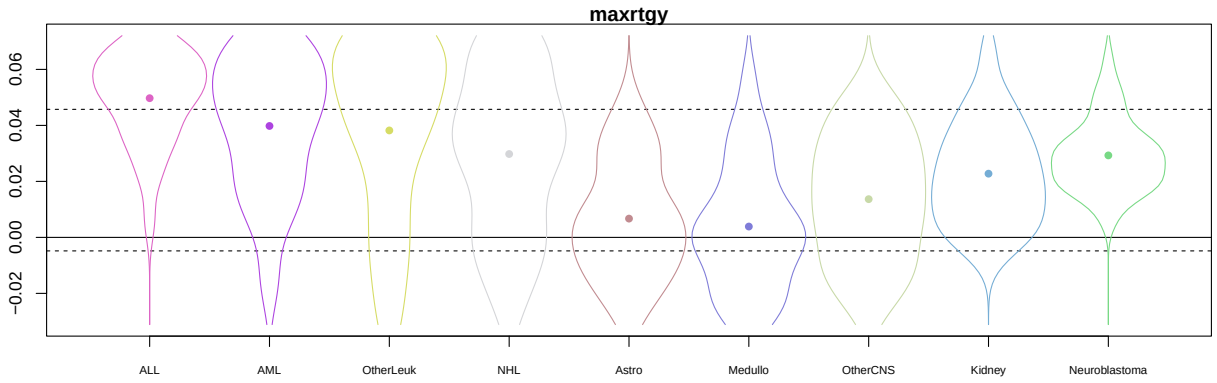
NHL
Astro
Medullo
OtherCNS
Kidney
Neuroblastoma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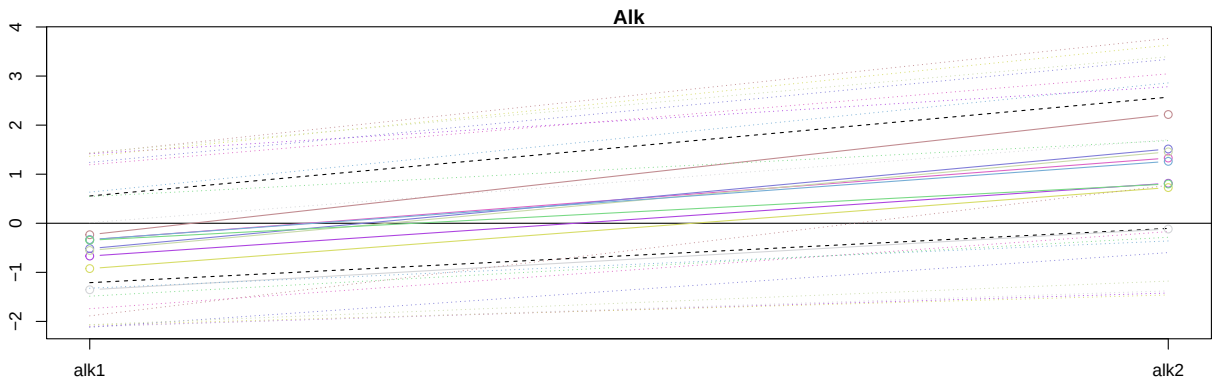
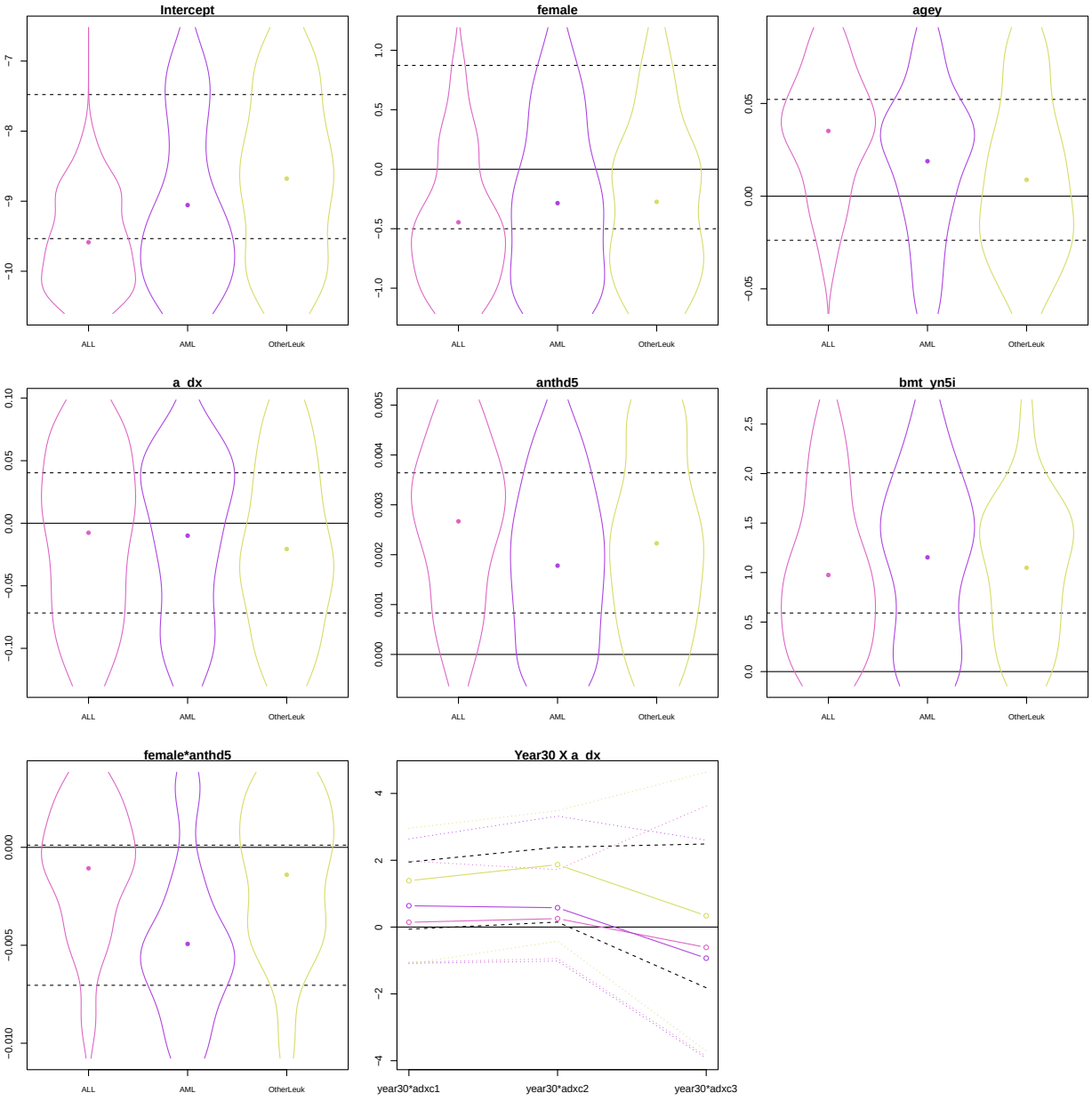
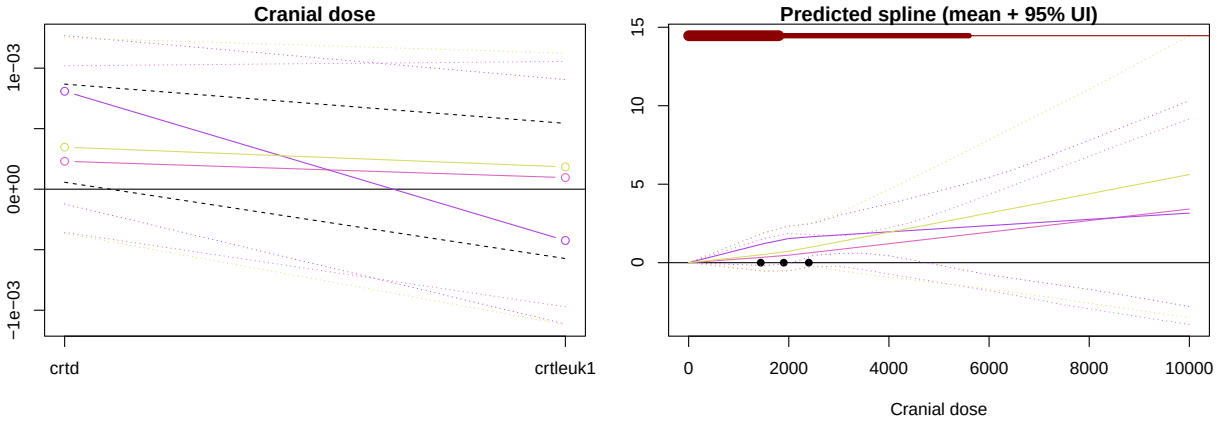
Kidney
Neuroblastoma

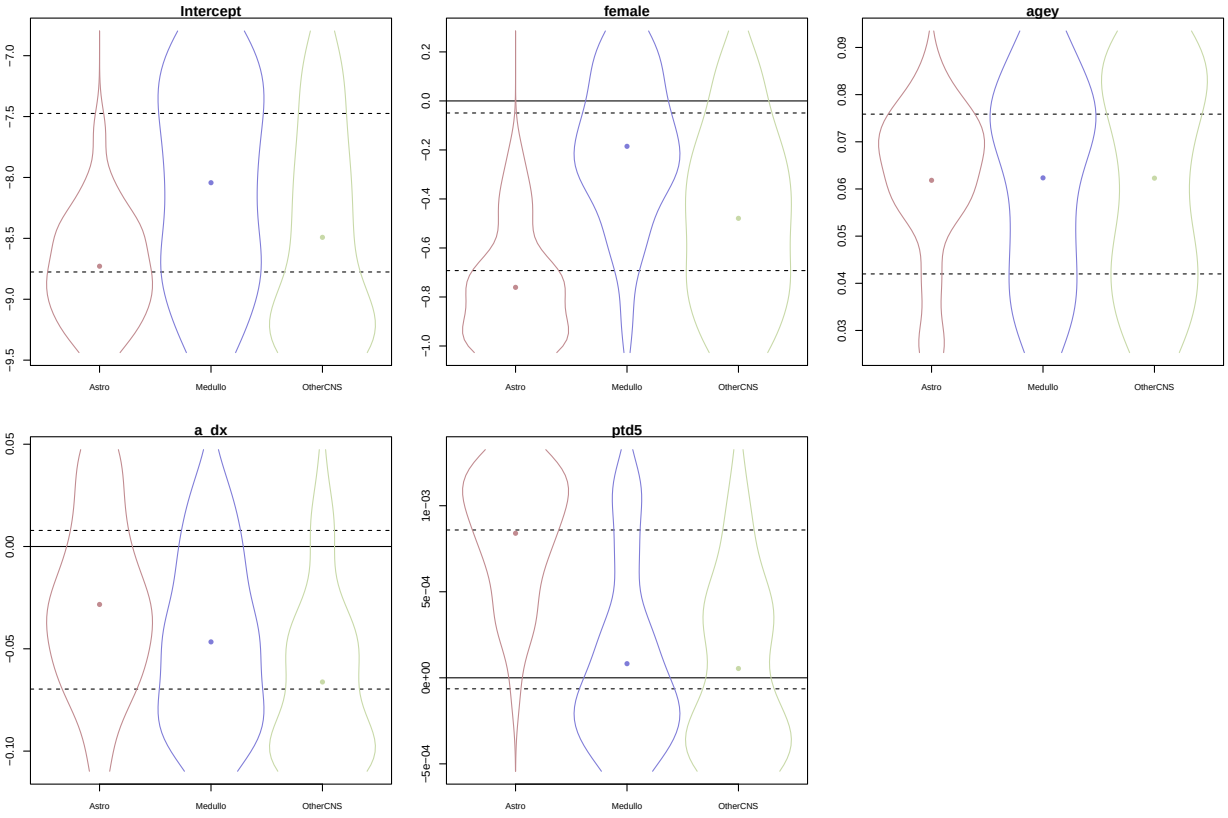

Alk
4
3
2
1
0
−1
−2
alk1
alk2

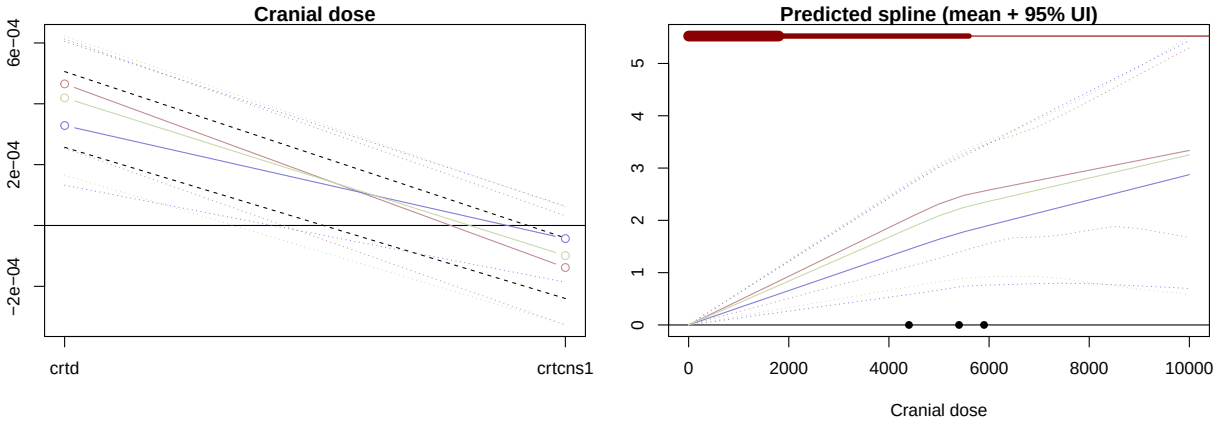
5.1.14 Stroke - Leukemia



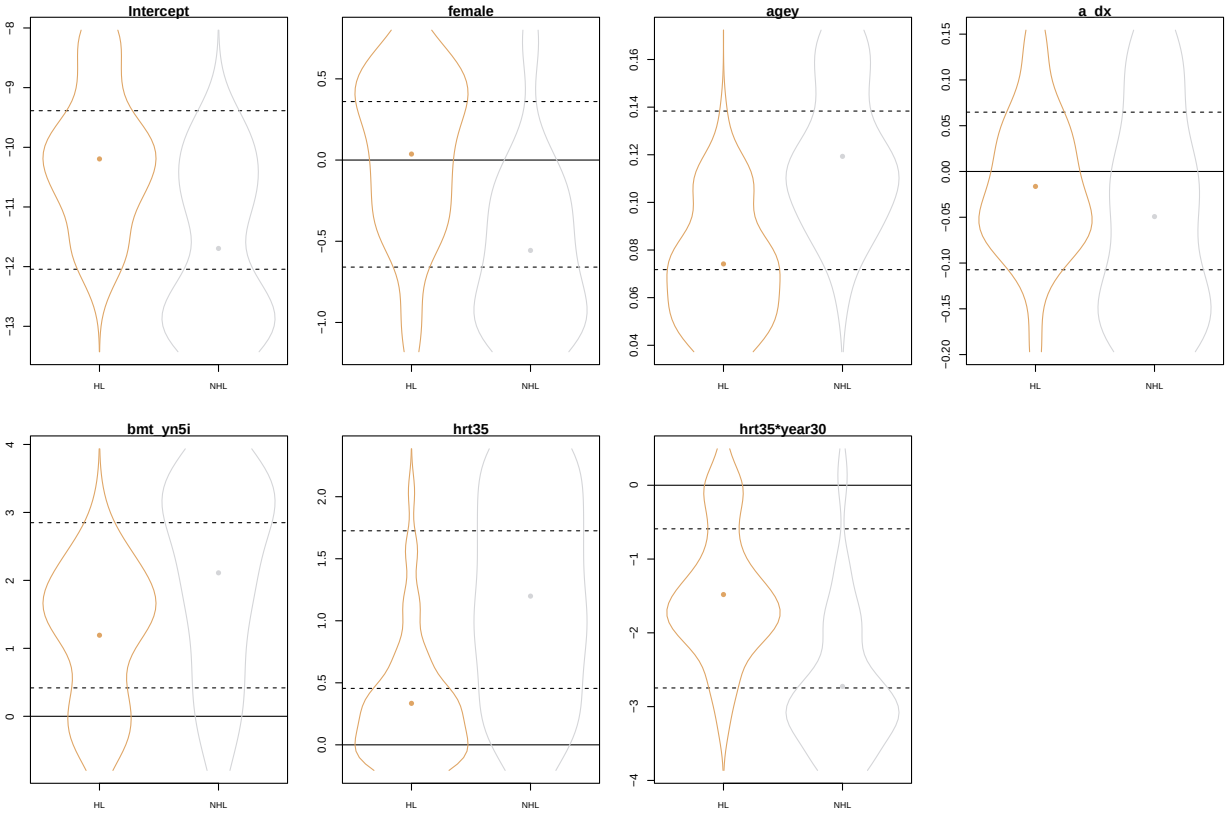


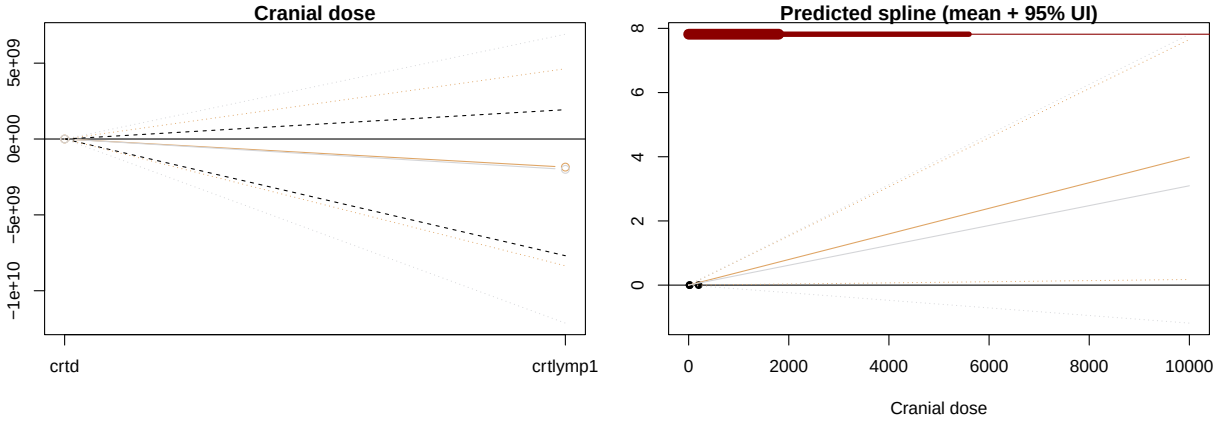
5.1.15 Stroke - CNS



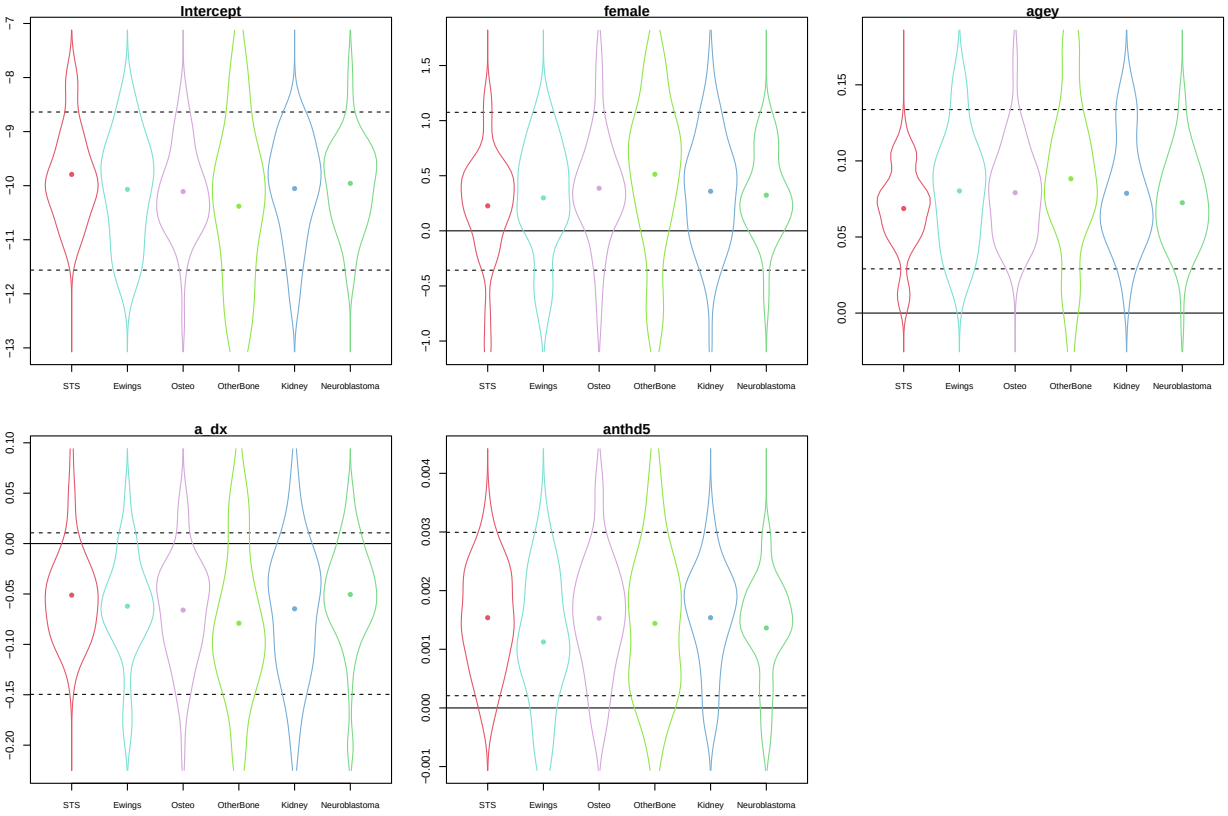


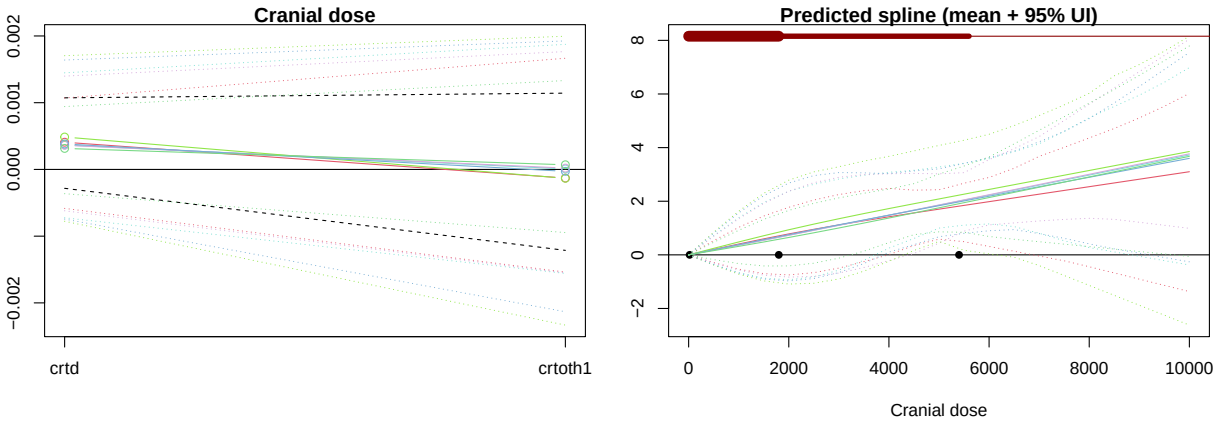
5.1.16 Stroke - Lymphoma



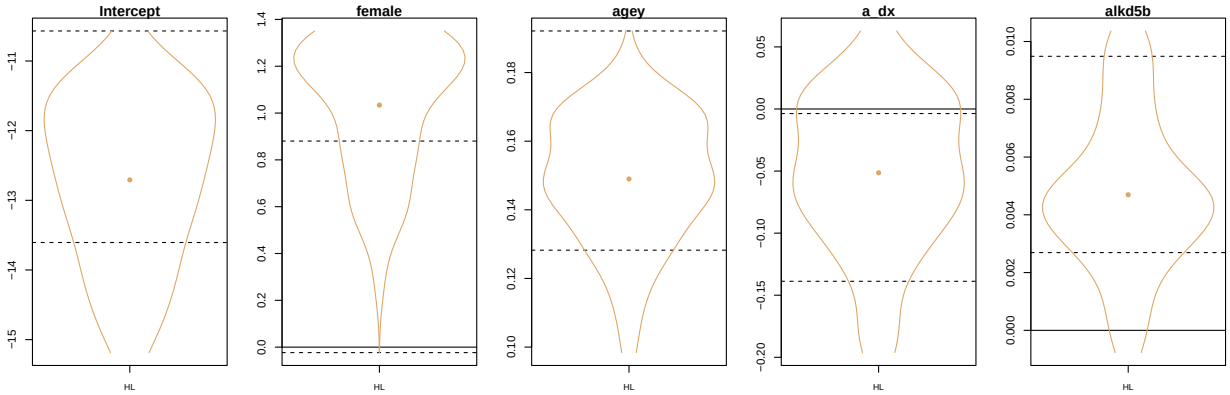


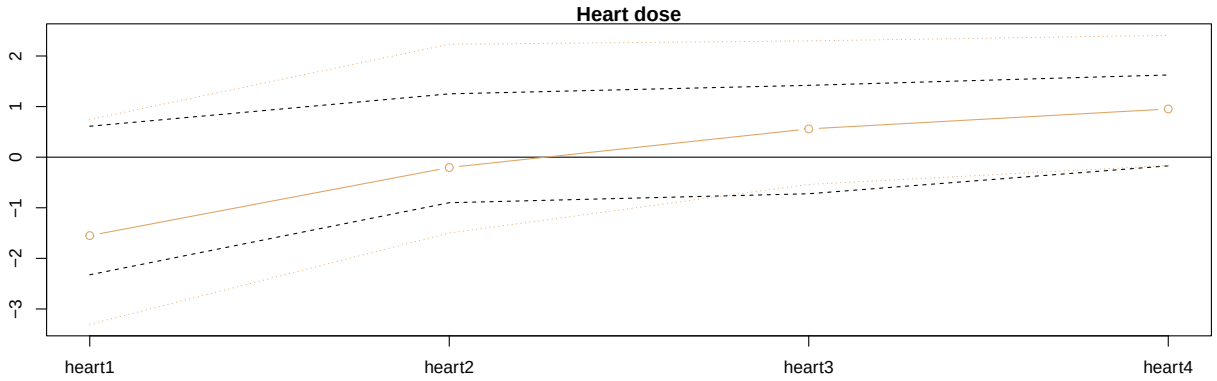
5.1.17 Stroke - All other diagnoses



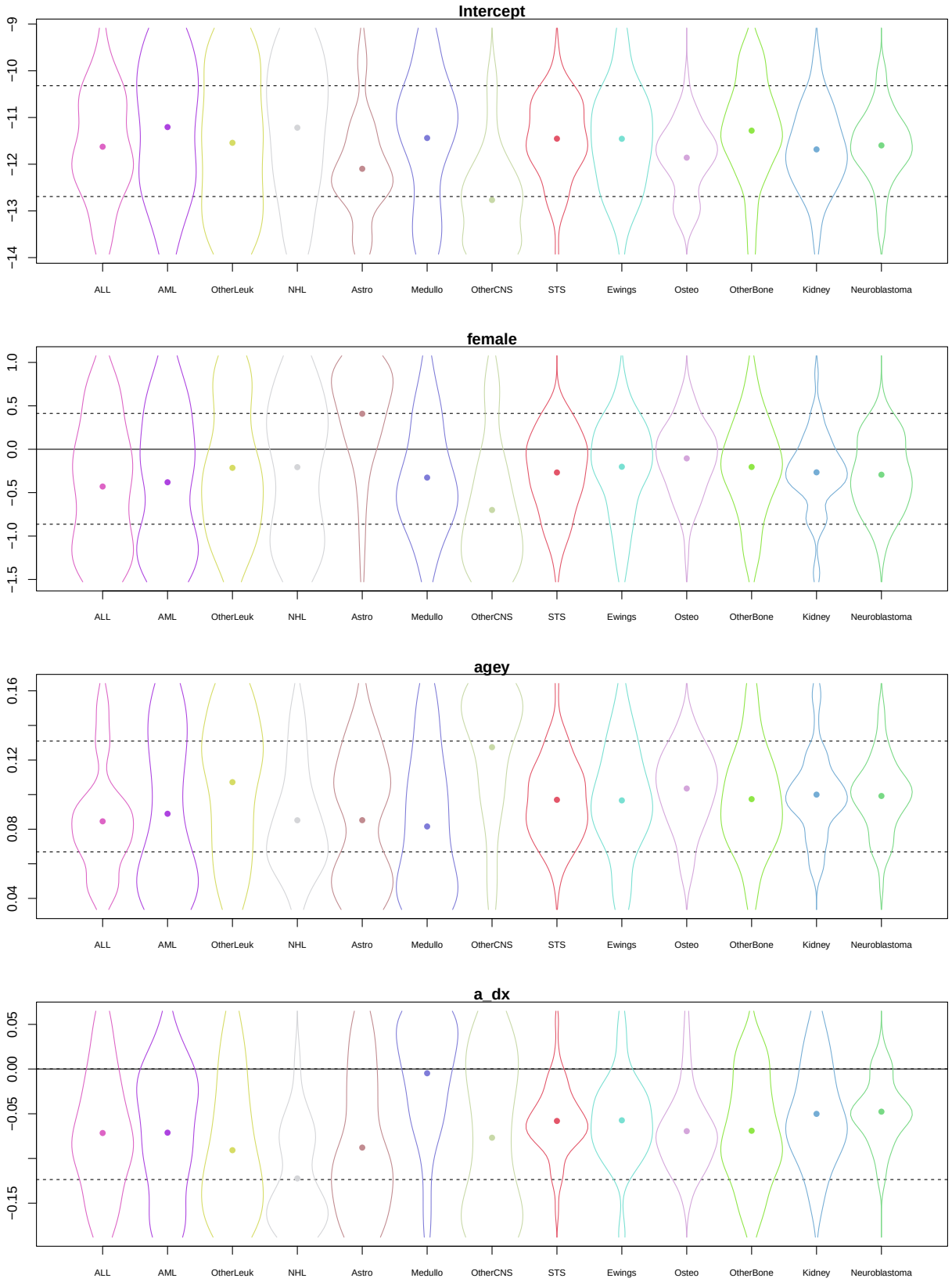


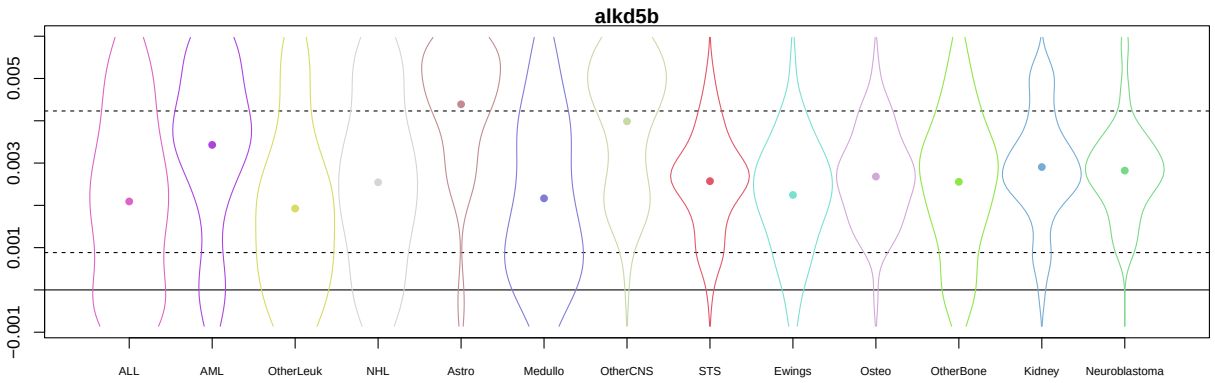
5.1.18 Valvular Disease - HL





5.1.19 Valvular Disease - All other diagnoses

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0.001
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NHL
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Medullo
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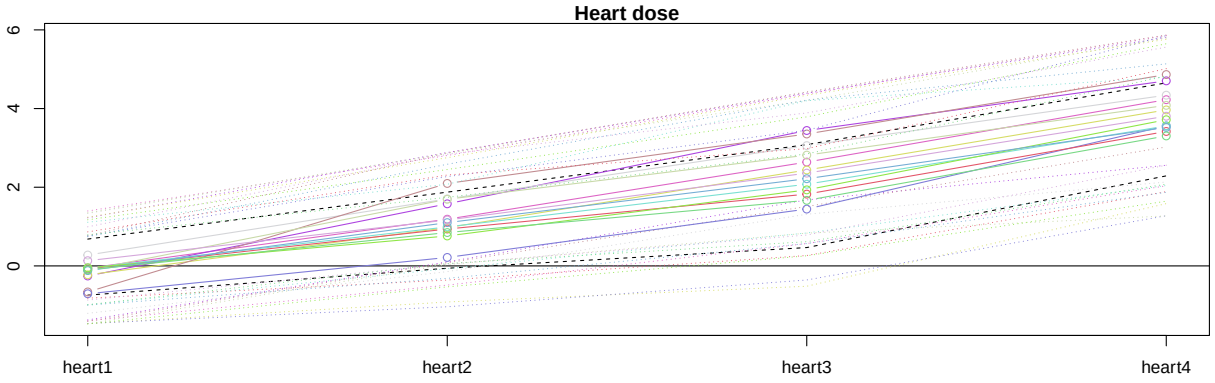
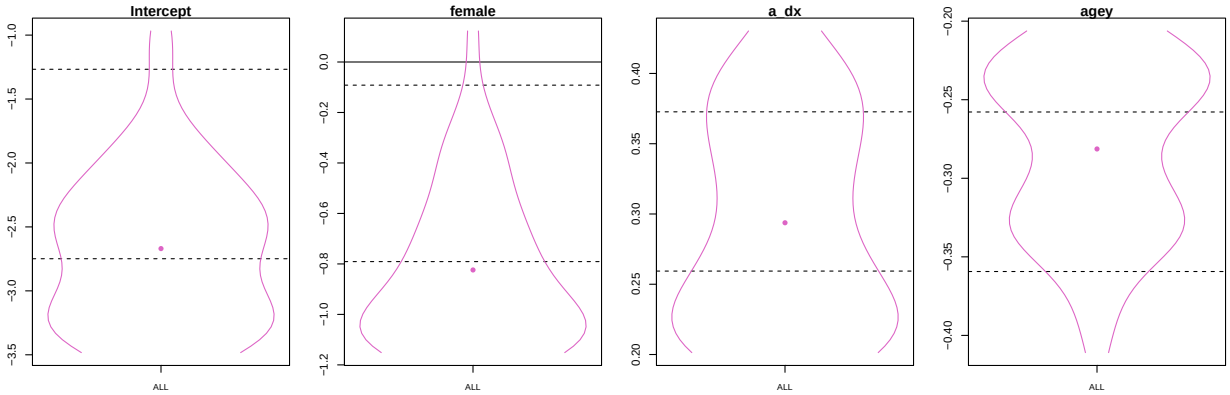
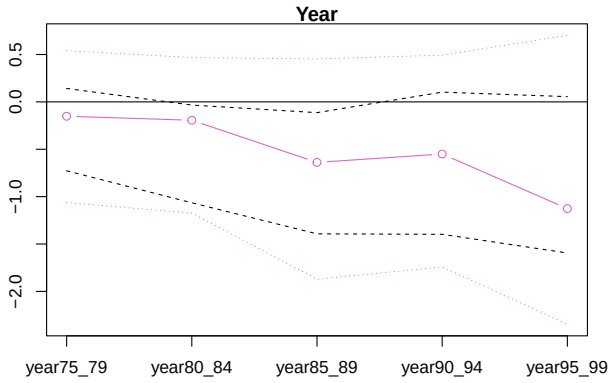
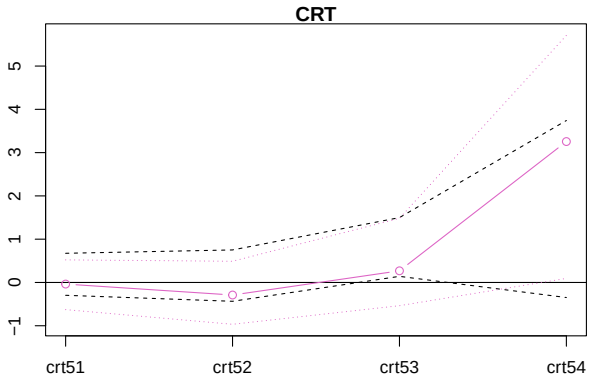
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

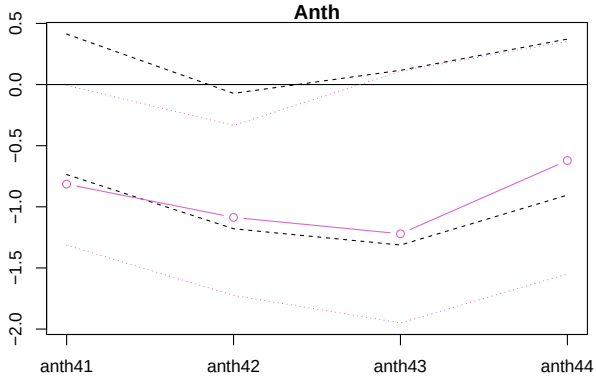

Heart dose
6
4
2
0
heart1
heart2
heart3
heart4

5.1.20 Late Recurrence - ALL

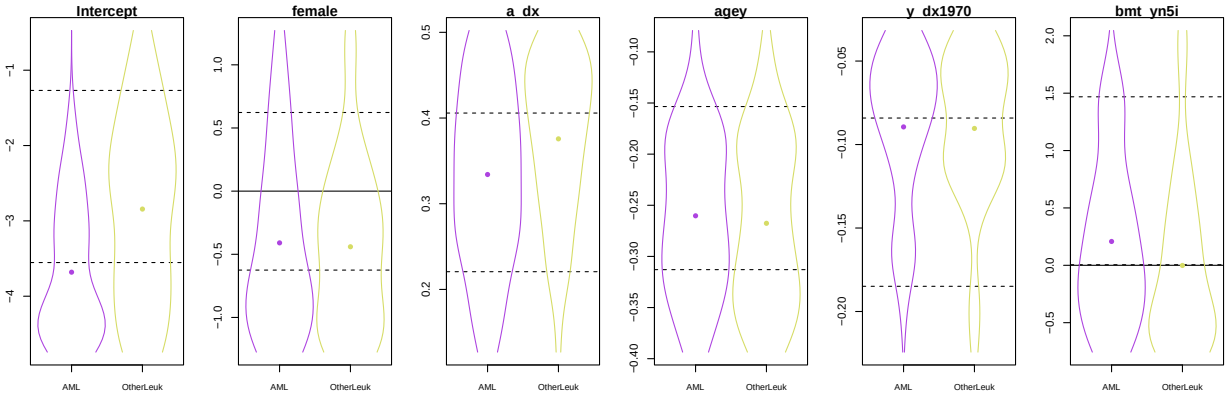




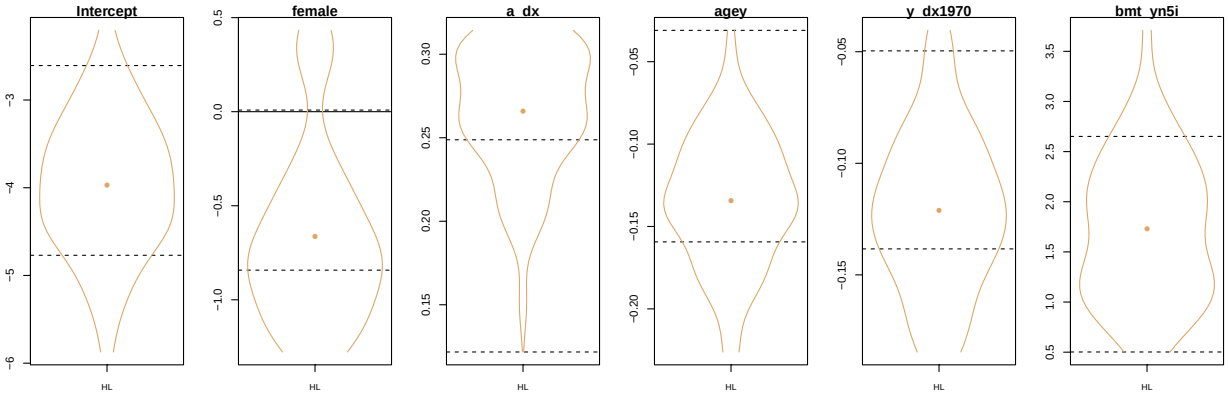


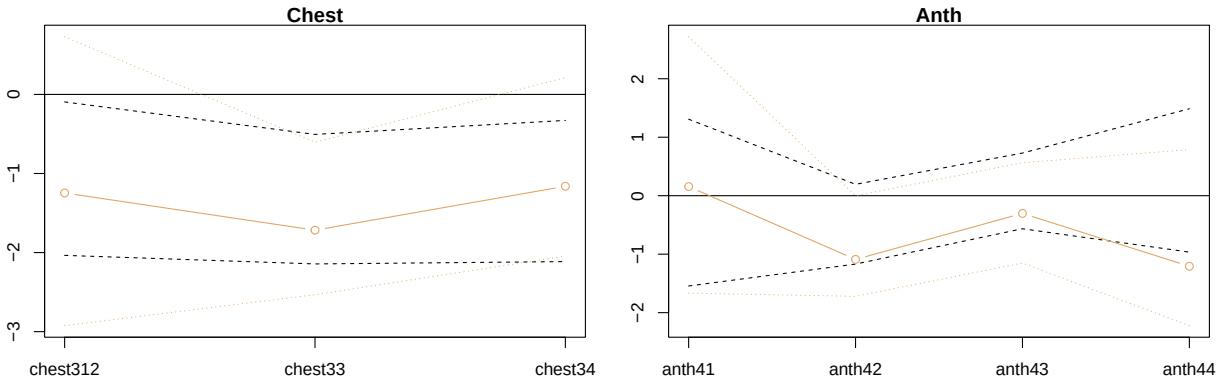


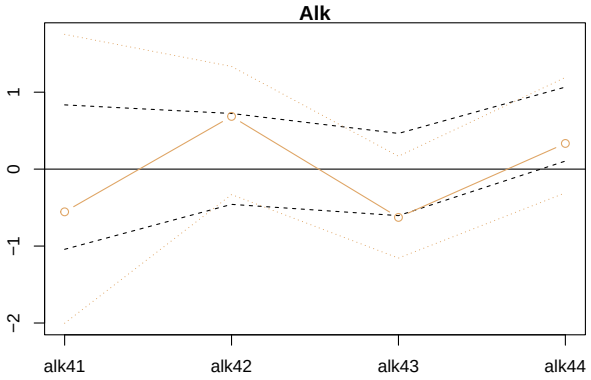
5.1.21 Late Recurrence - AML + OtherLeuk



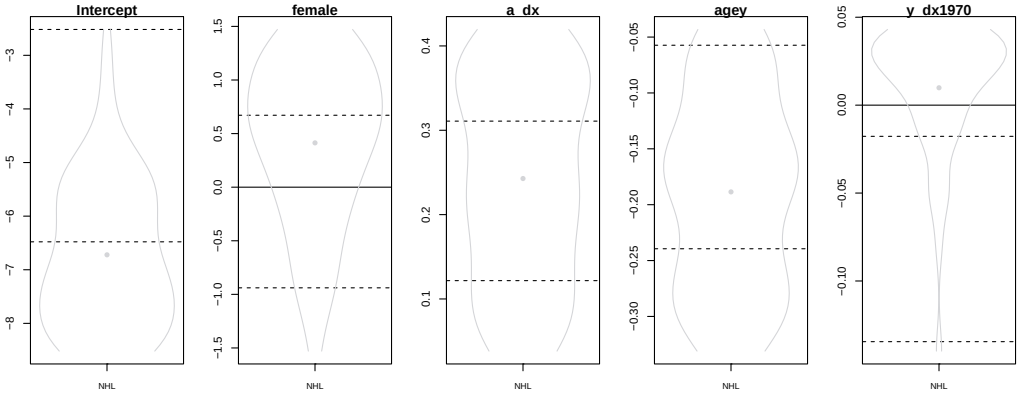
5.1.22 Late Recurrence - HL

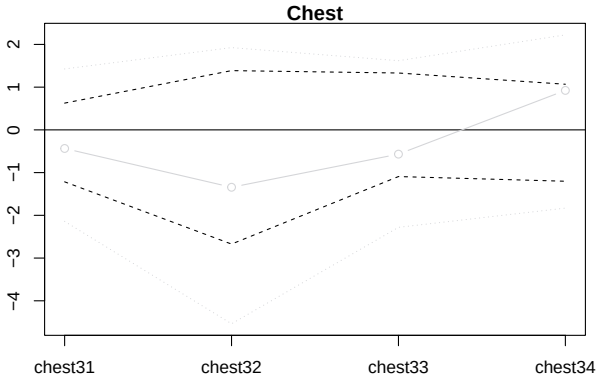




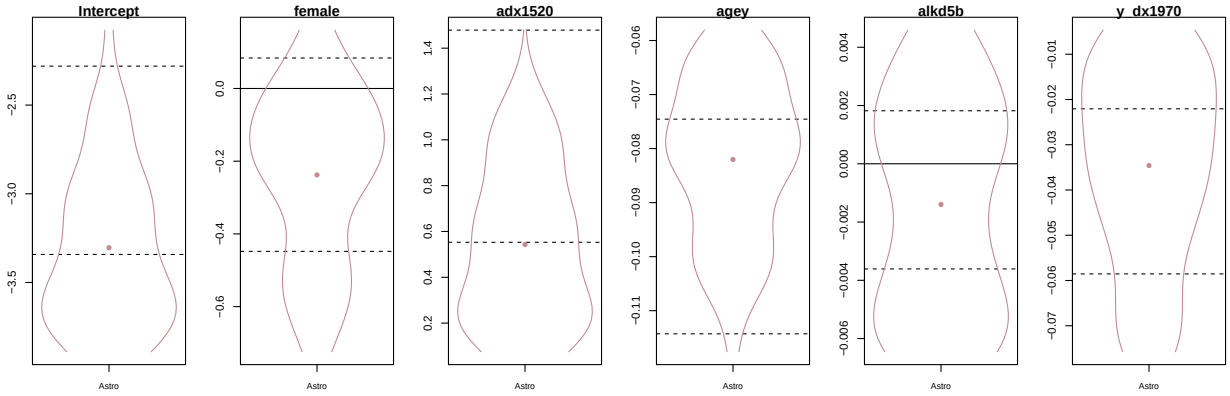


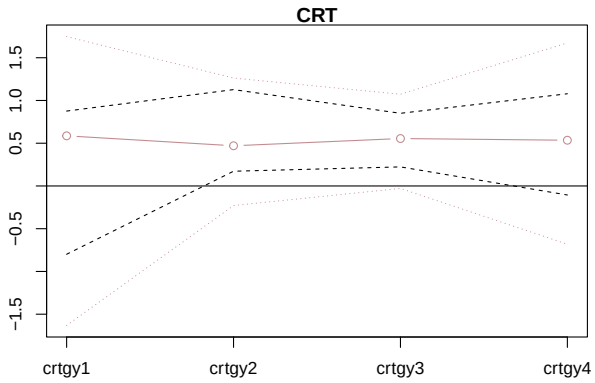
5.1.23 Late Recurrence - NHL



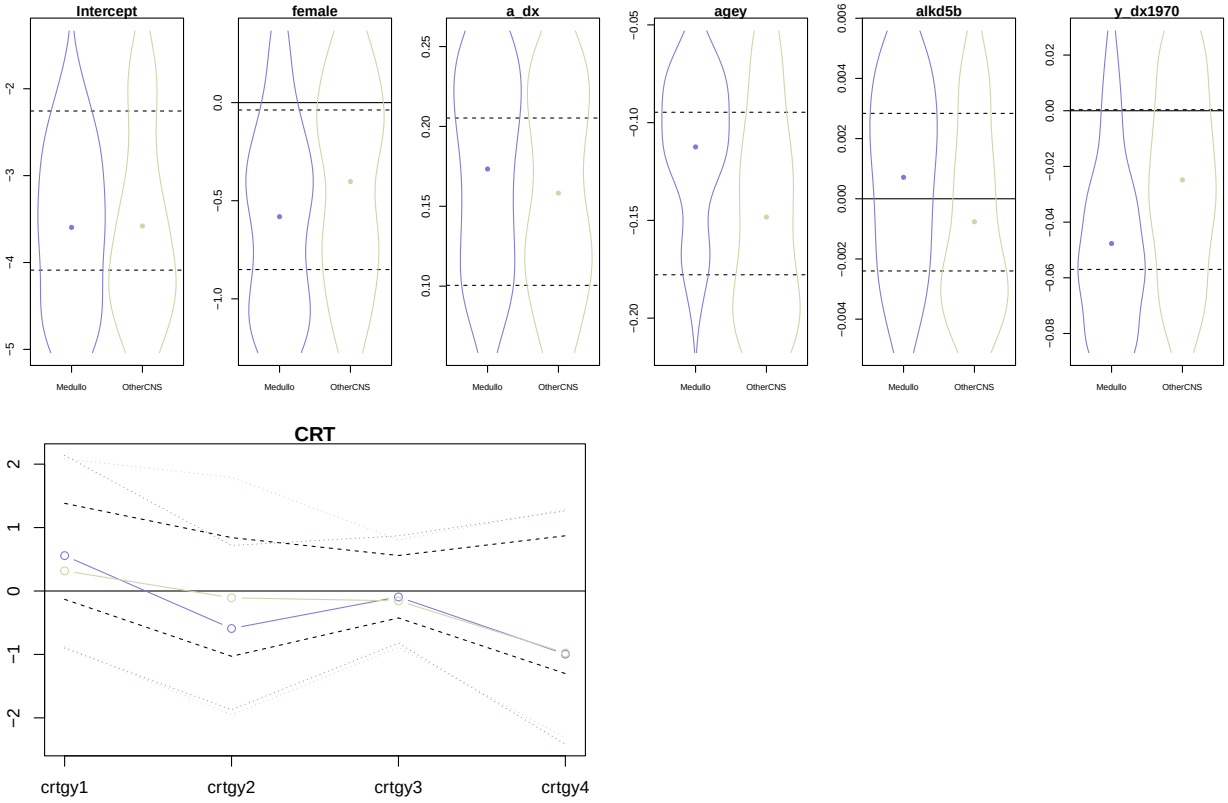


5.1.24 Late Recurrence - Astrocytoma

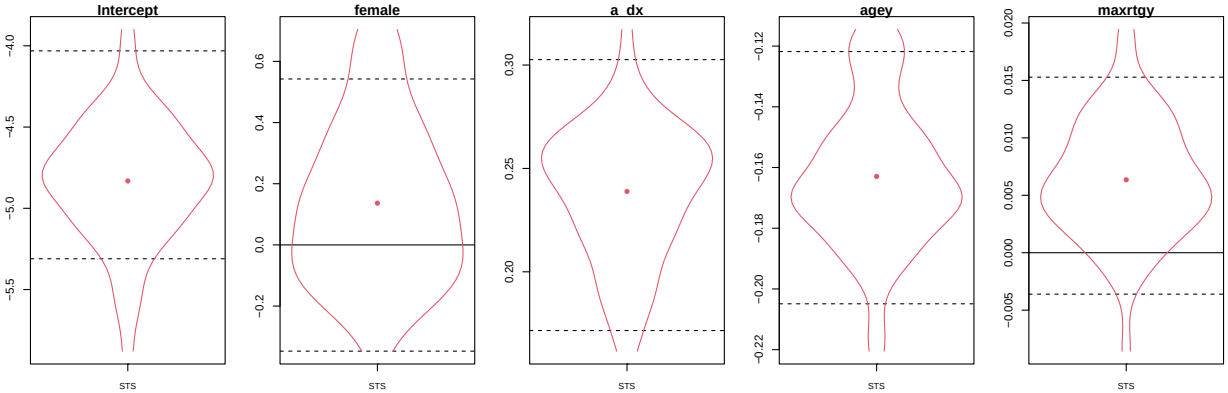




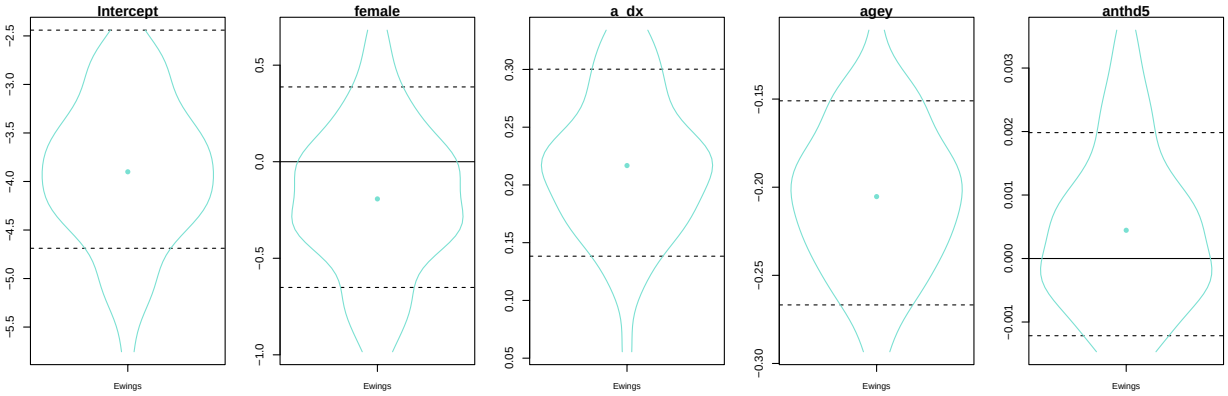
5.1.25 Late Recurrence - Other CNS

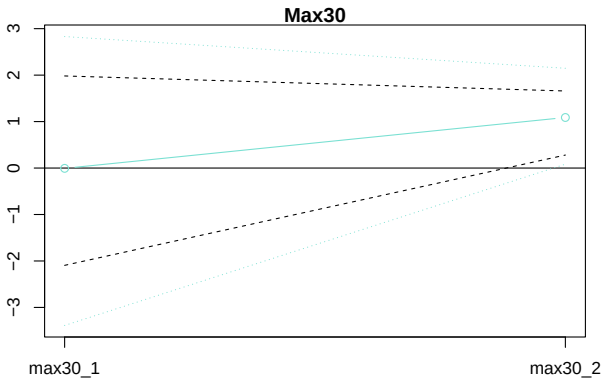


5.1.26 Late Recurrence - STS

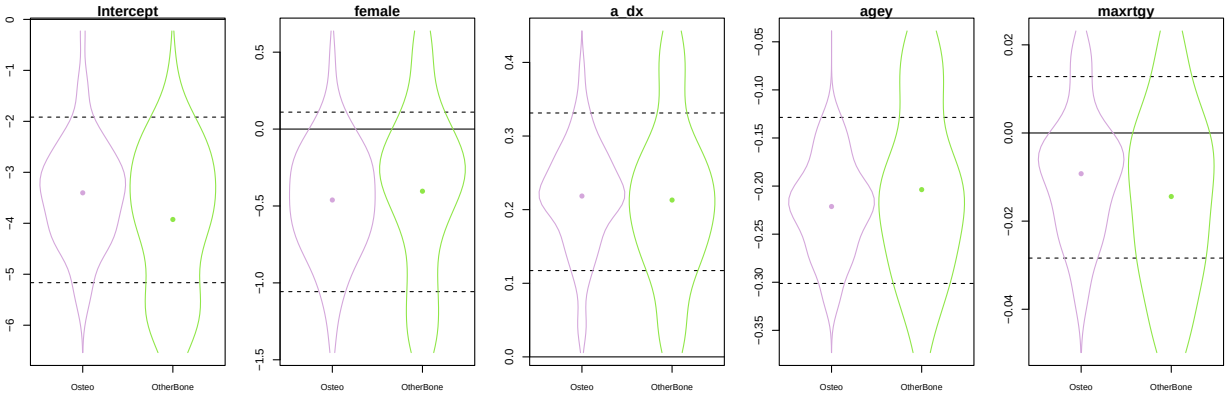


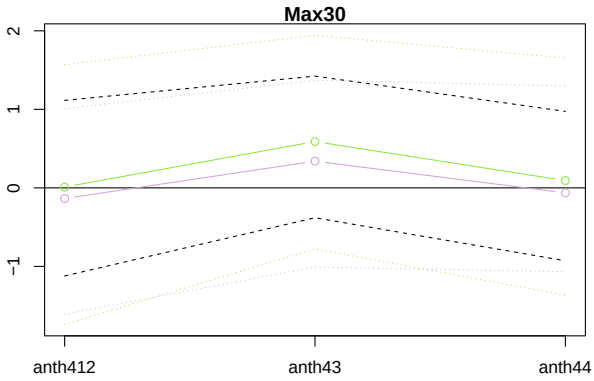
5.1.27 Late Recurrence - Ewings



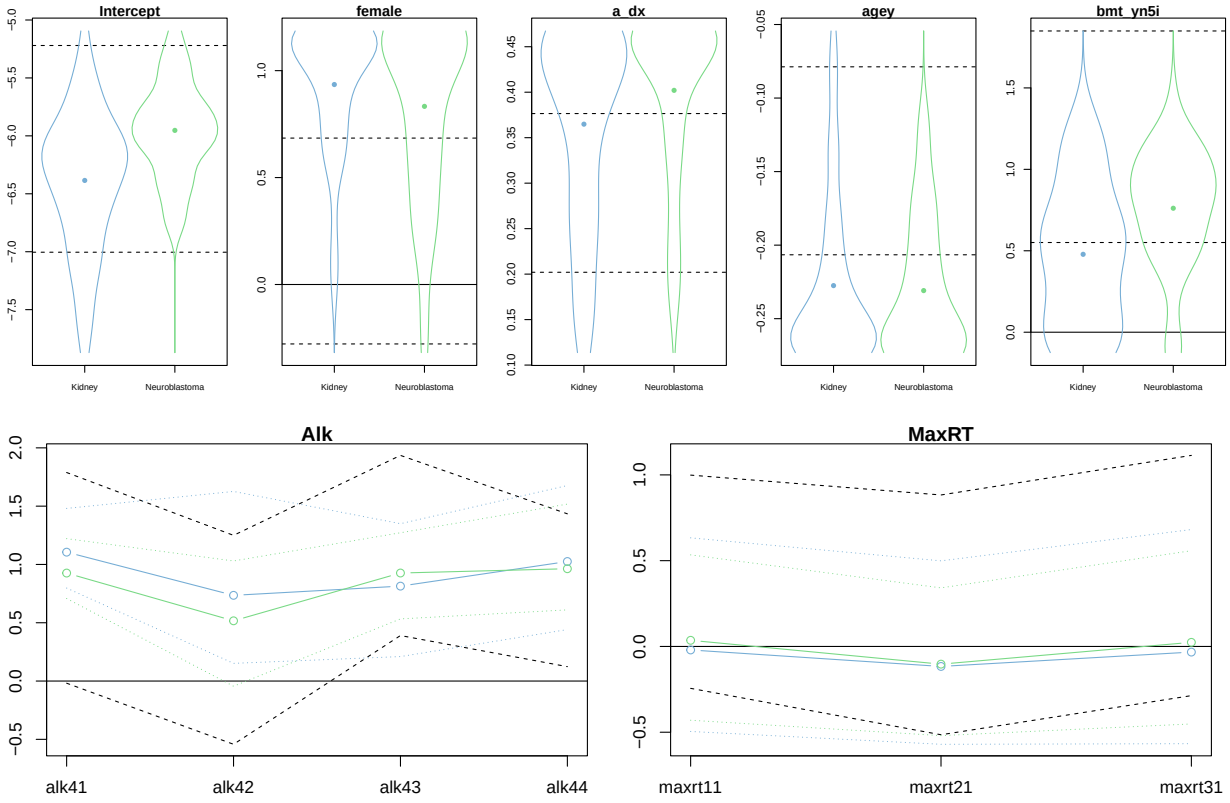


5.1.28 Late Recurrence - Other Bone





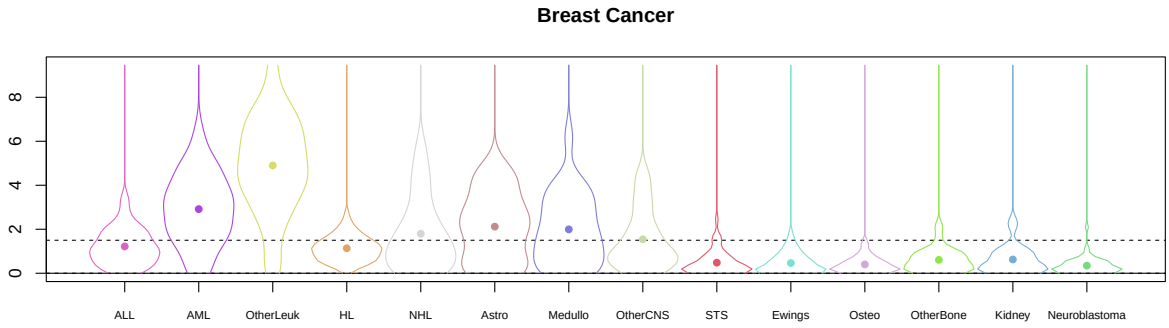
5.1.29 Late Recurrence - Solid

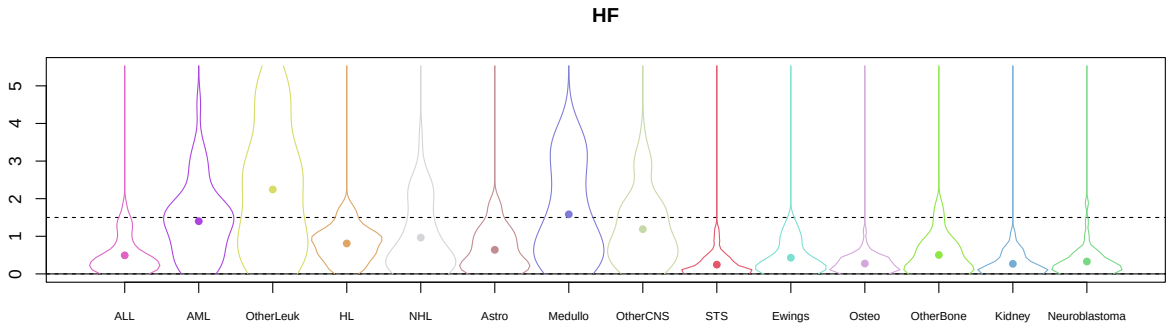


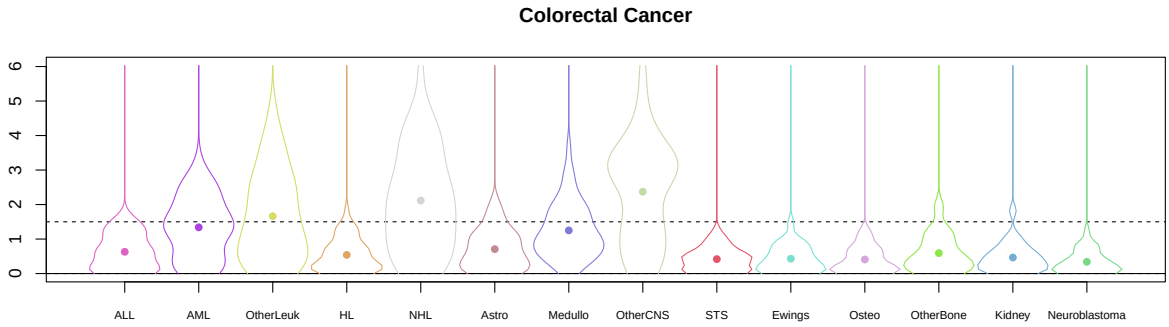
5.1.30 Recurrence-Related Increased Incidence

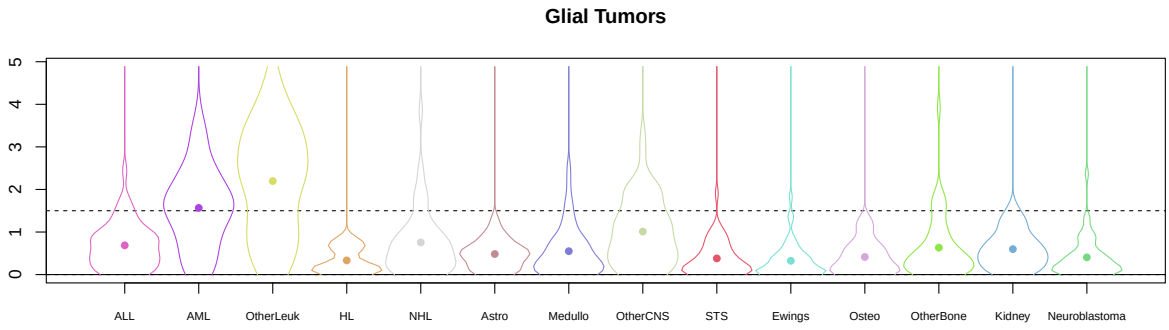
Values plotted are relative rates.

5.1.30.1 Early Recurrence








Glial Tumors
0
1
2
3
4
5
ALL
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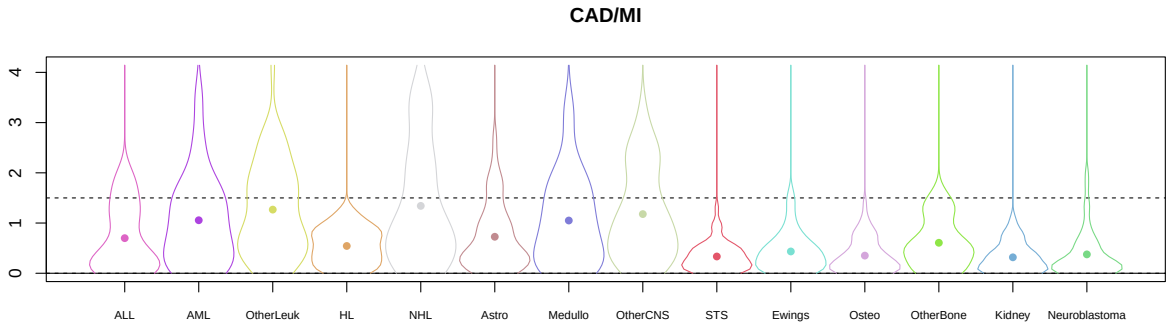
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


CAD/MI
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HL
NHL
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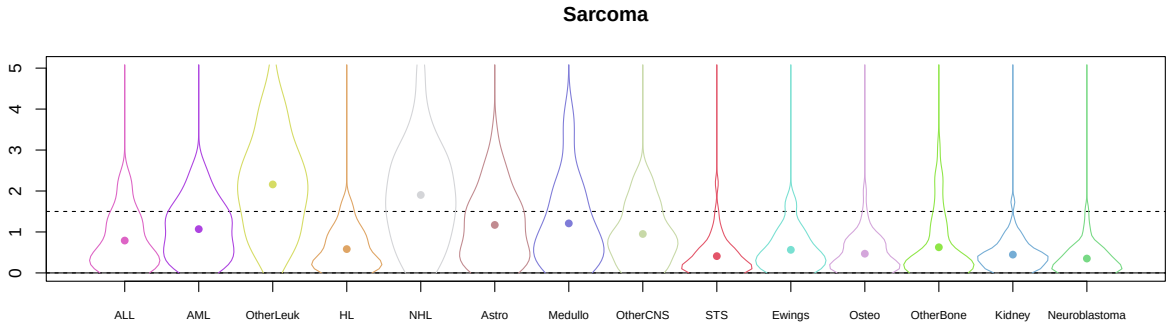
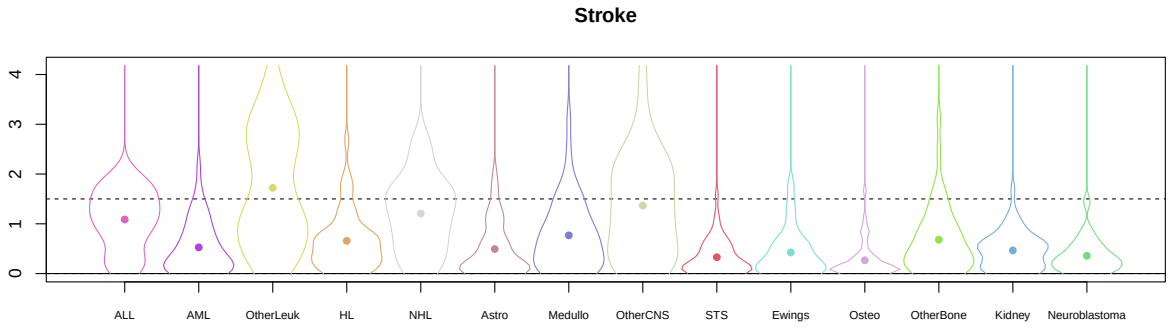
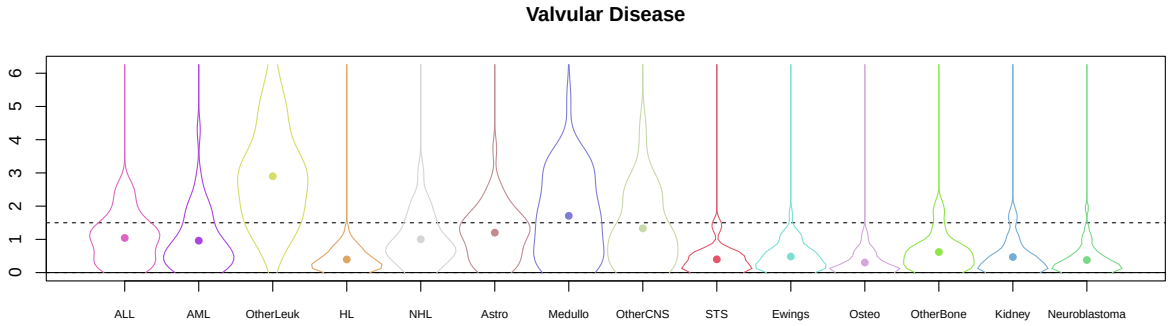
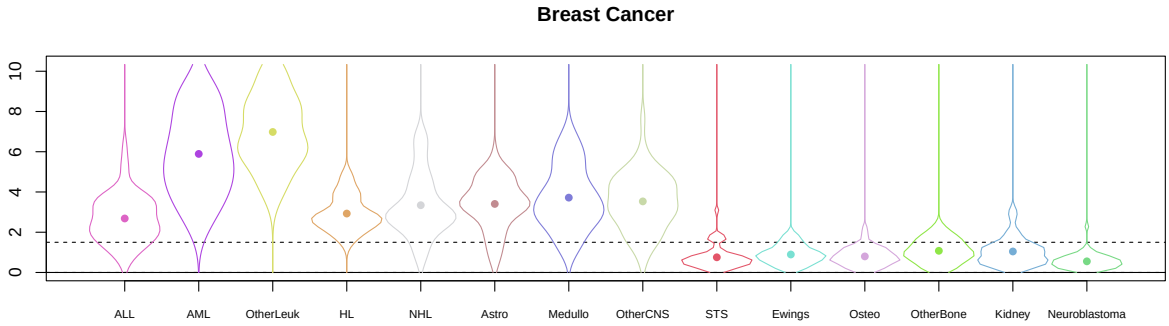
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

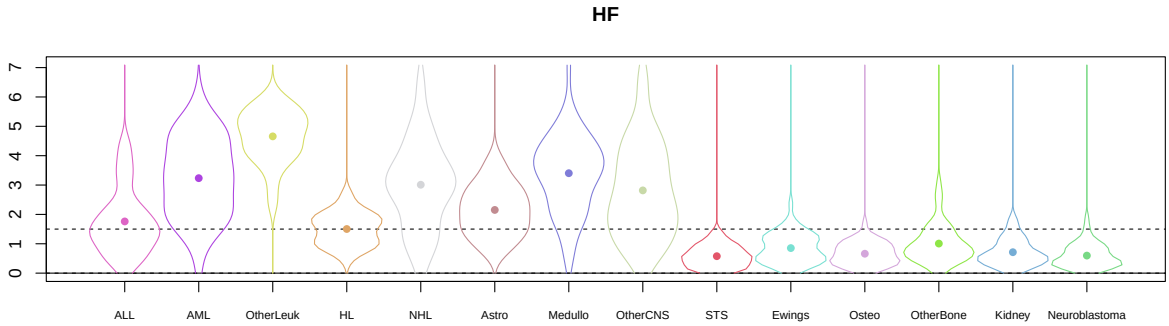

Sarcoma
0
1
2
3
4
5
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


Stroke
0
1
2
3
4
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

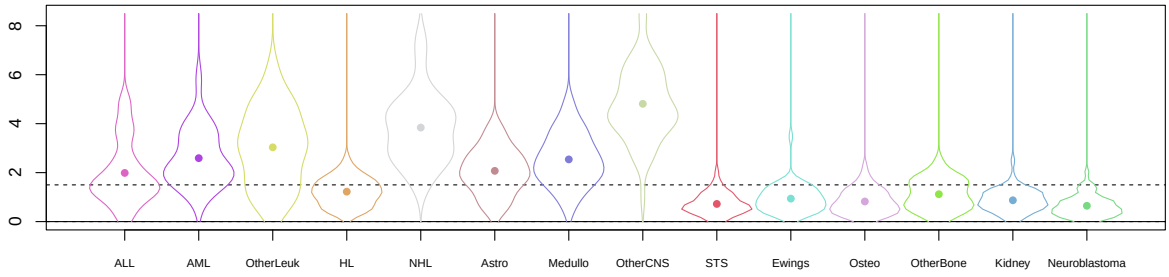


5.1.30.2 Late Recurrence

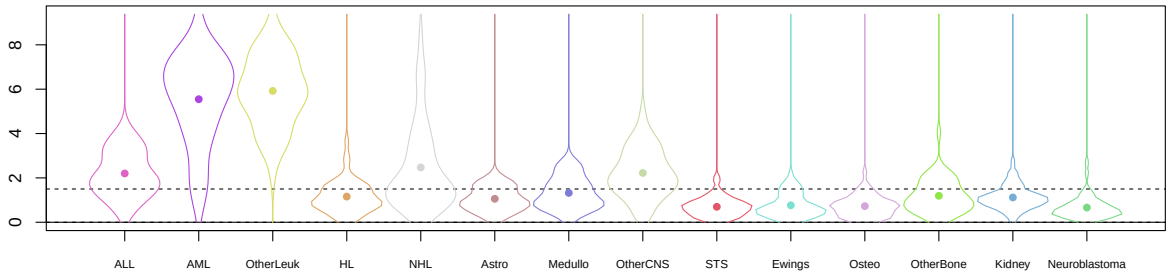




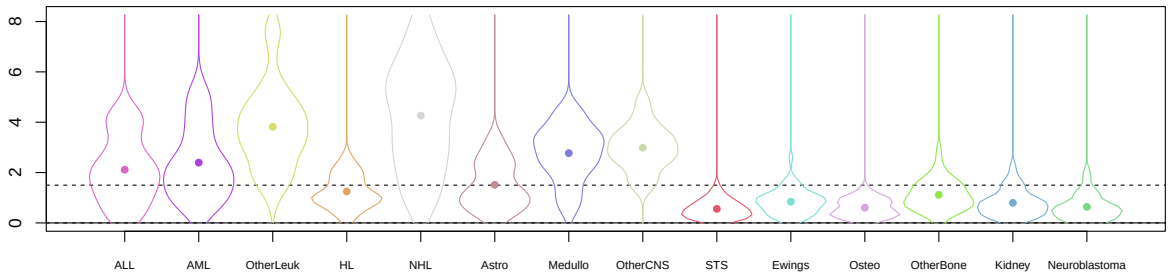
Colorectal Cancer



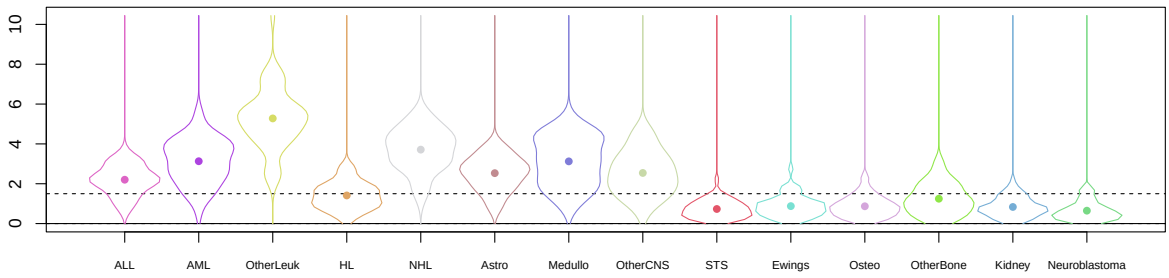
Glial Tumors



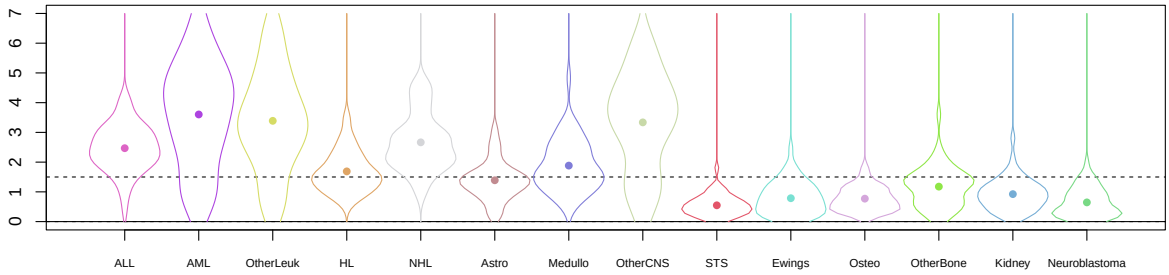
CAD/MI



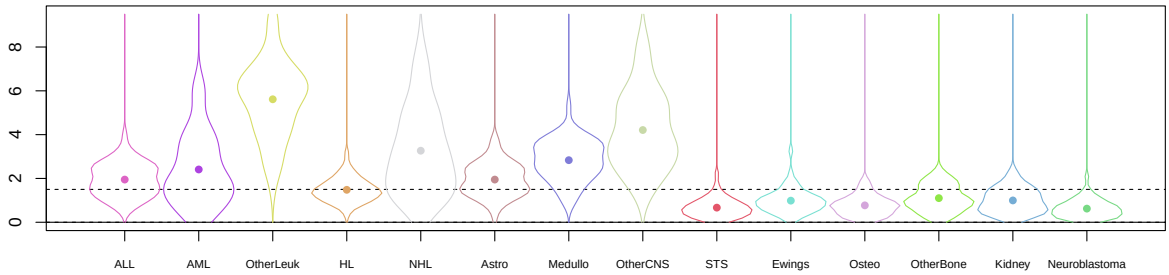
Sarcoma



Stroke

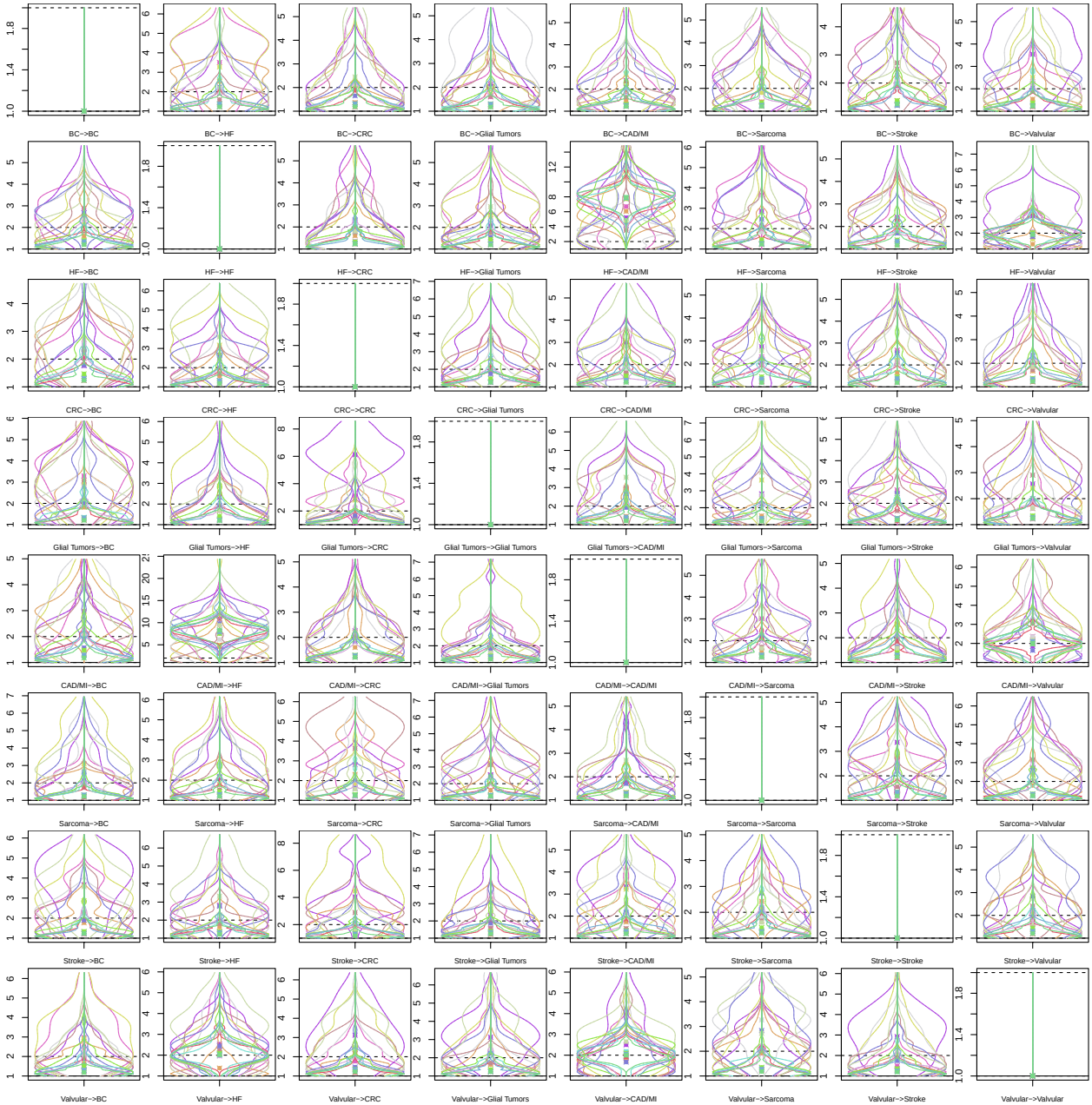


Valvular Disease



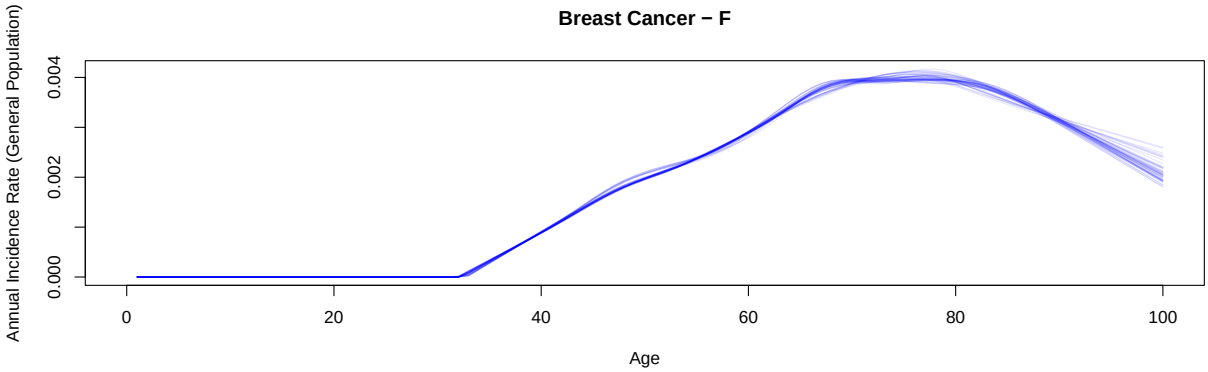
5.2 Joint RRs

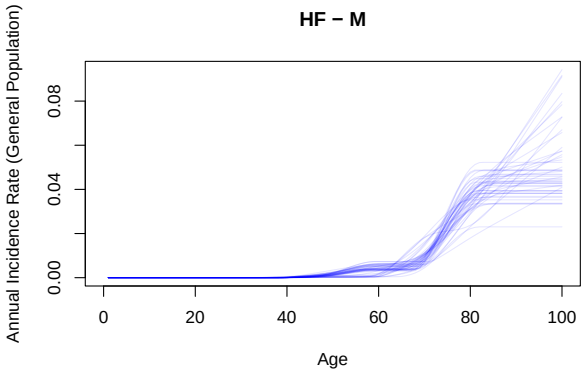
Red dot = Mean

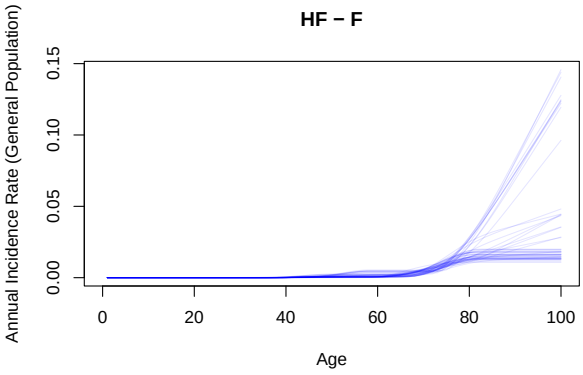


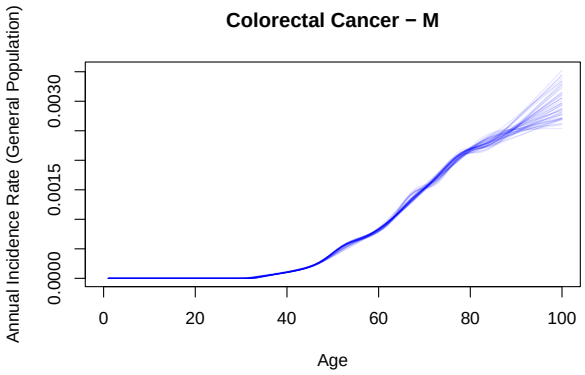
5.3 General Population Incidence

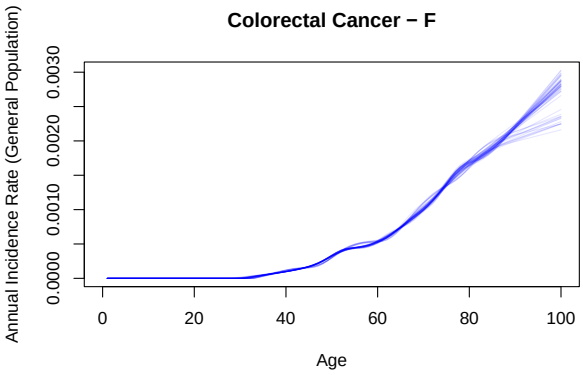
5.3.1 Baseline Incidence

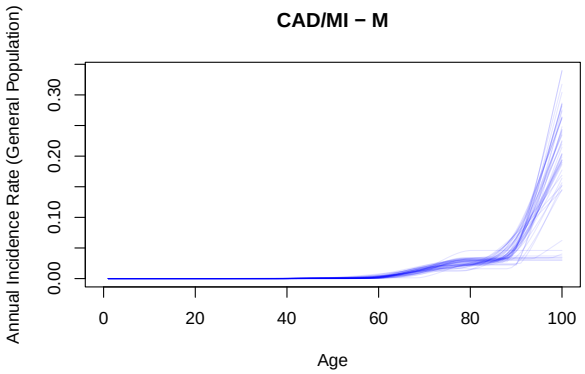


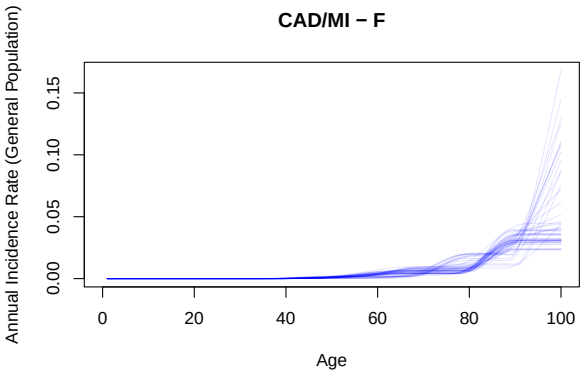


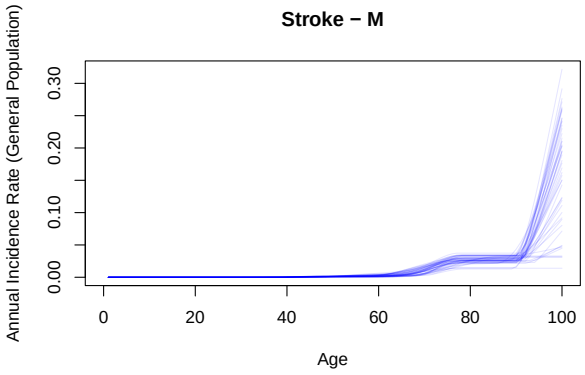


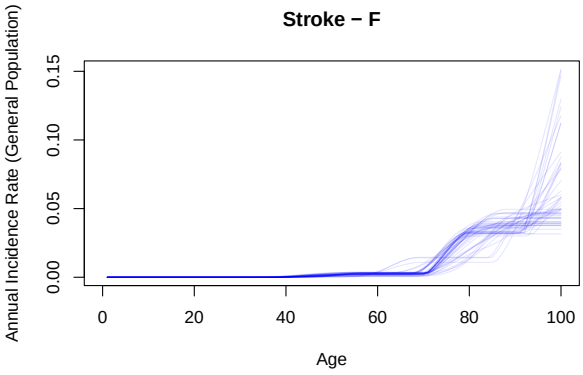


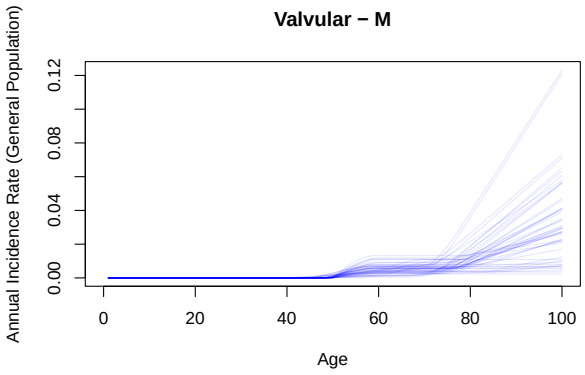


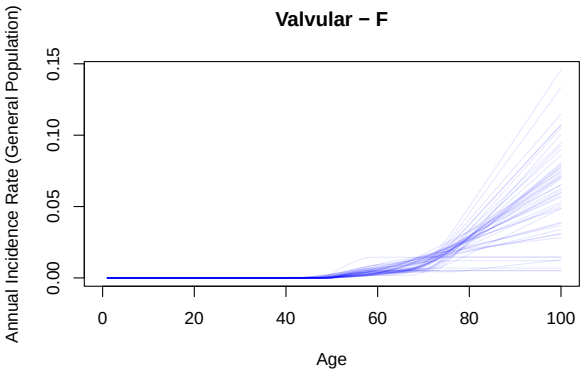

CAD/MI − M
Annual Incidence Rate (General Population)
0.00
0.10
0.20
0.30
0
20
40
60
80
100
Age


CAD/MI − F
Annual Incidence Rate (General Population)
0.00
0.05
0.10
0.15
0
20
40
60
80
100
Age

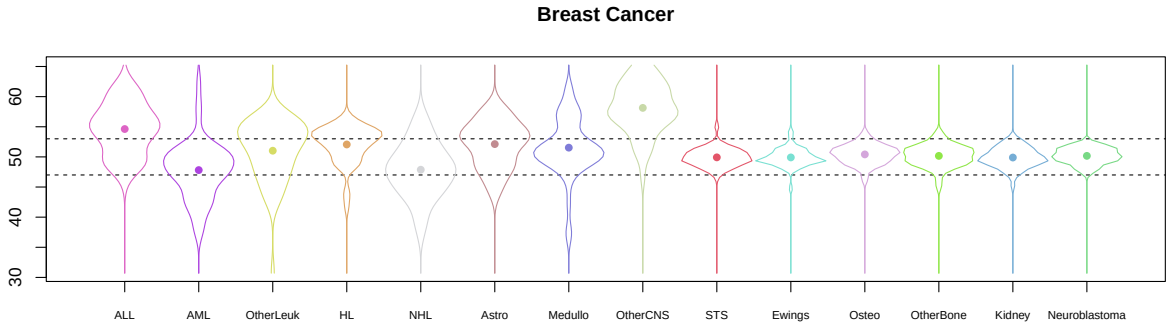

Stroke − M
Annual Incidence Rate (General Population)
0.00
0.10
0.20
0.30
0
20
40
60
80
100
Age

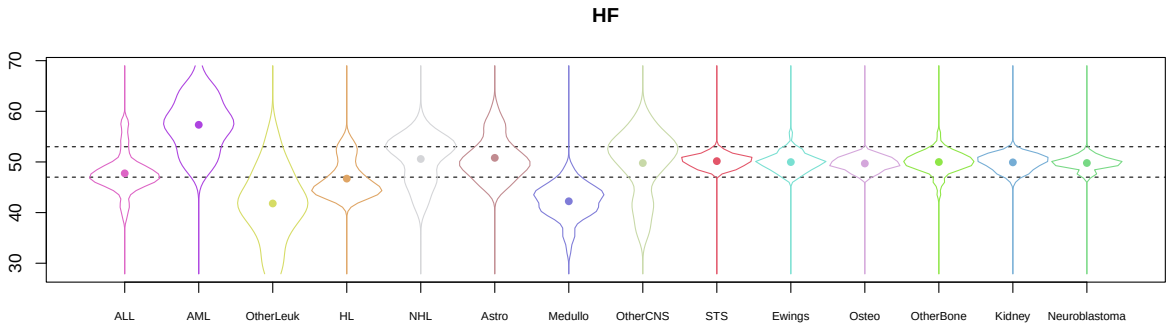

Stroke − F
Annual Incidence Rate (General Population)
0.00
0.05
0.10
0.15
0
20
40
60
80
100
Age

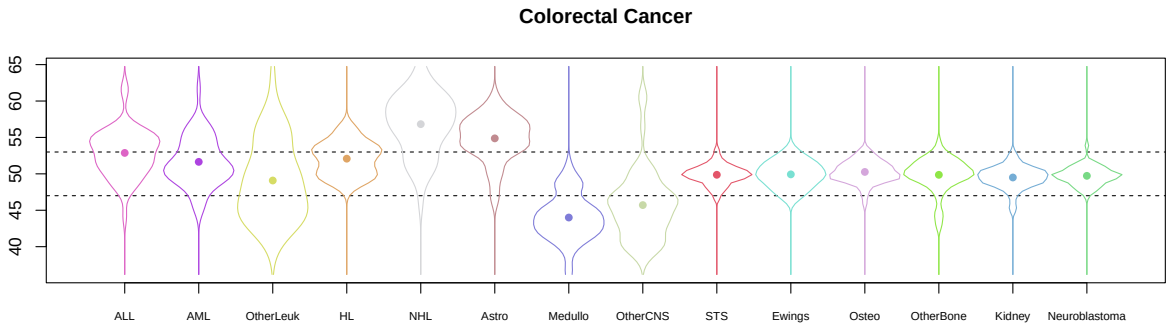

Valvular − M
Annual Incidence Rate (General Population)
0.00
0.04
0.08
0.12
0
20
40
60
80
100
Age

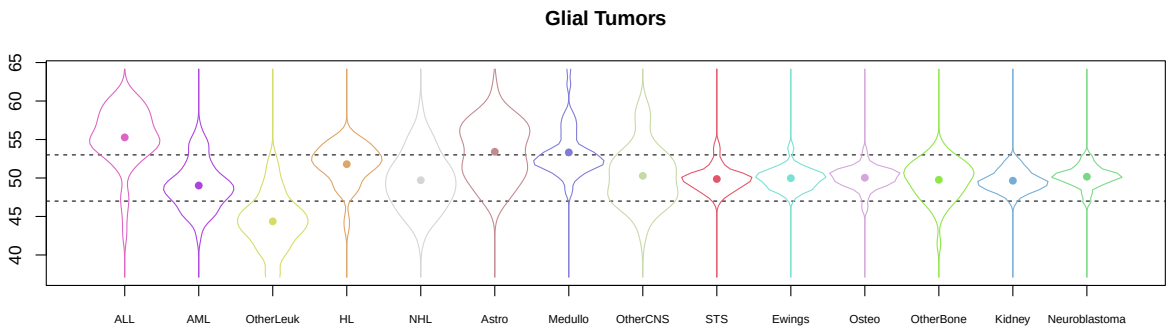

Valvular − F
Annual Incidence Rate (General Population)
0.00
0.05
0.10
0.15
0
20
40
60
80
100
Age

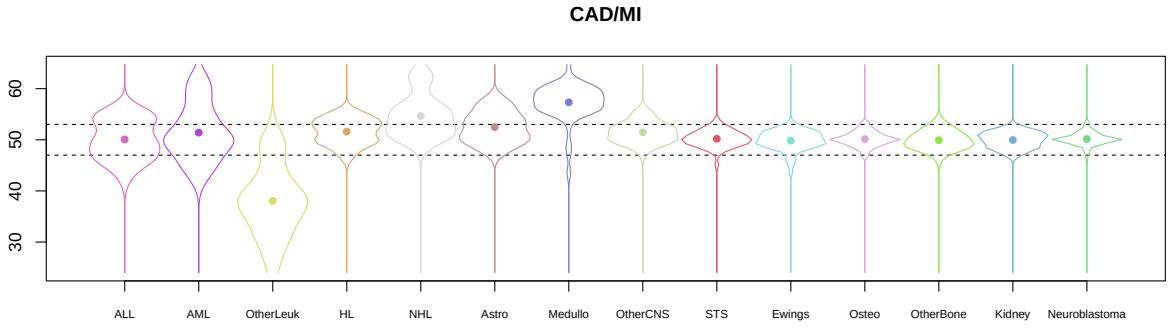
5.3.2 Age of RR

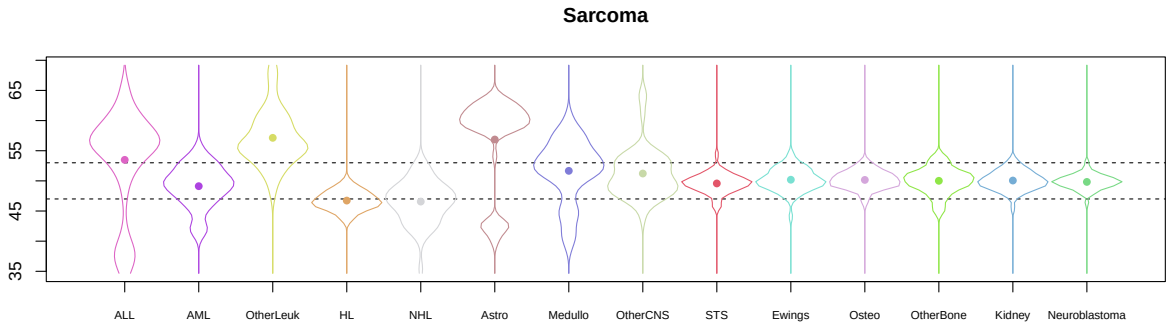

Breast Cancer
30
40
50
60
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

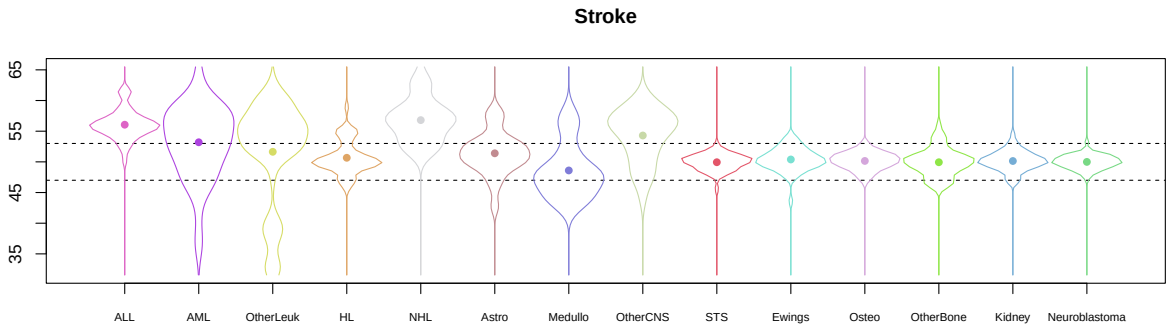

HF
30
40
50
60
70
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

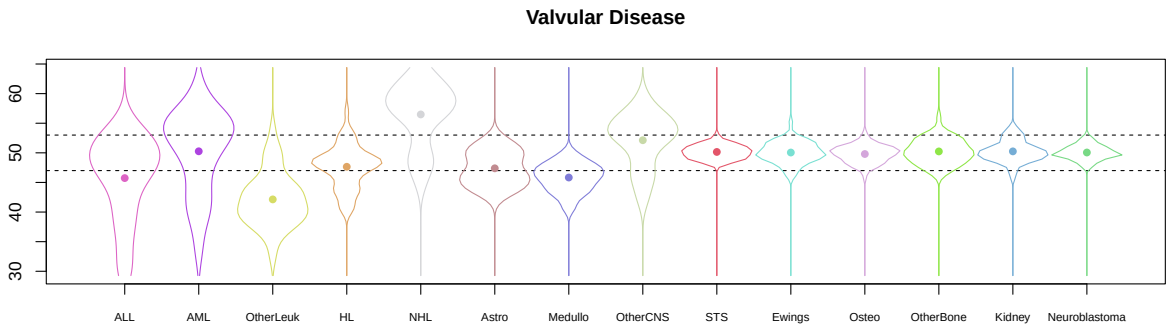

Colorectal Cancer
40
45
50
55
60
65
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


Glial Tumors
40
45
50
55
60
65
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


CAD/MI
30
40
50
60
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


Sarcoma
35
45
55
65
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

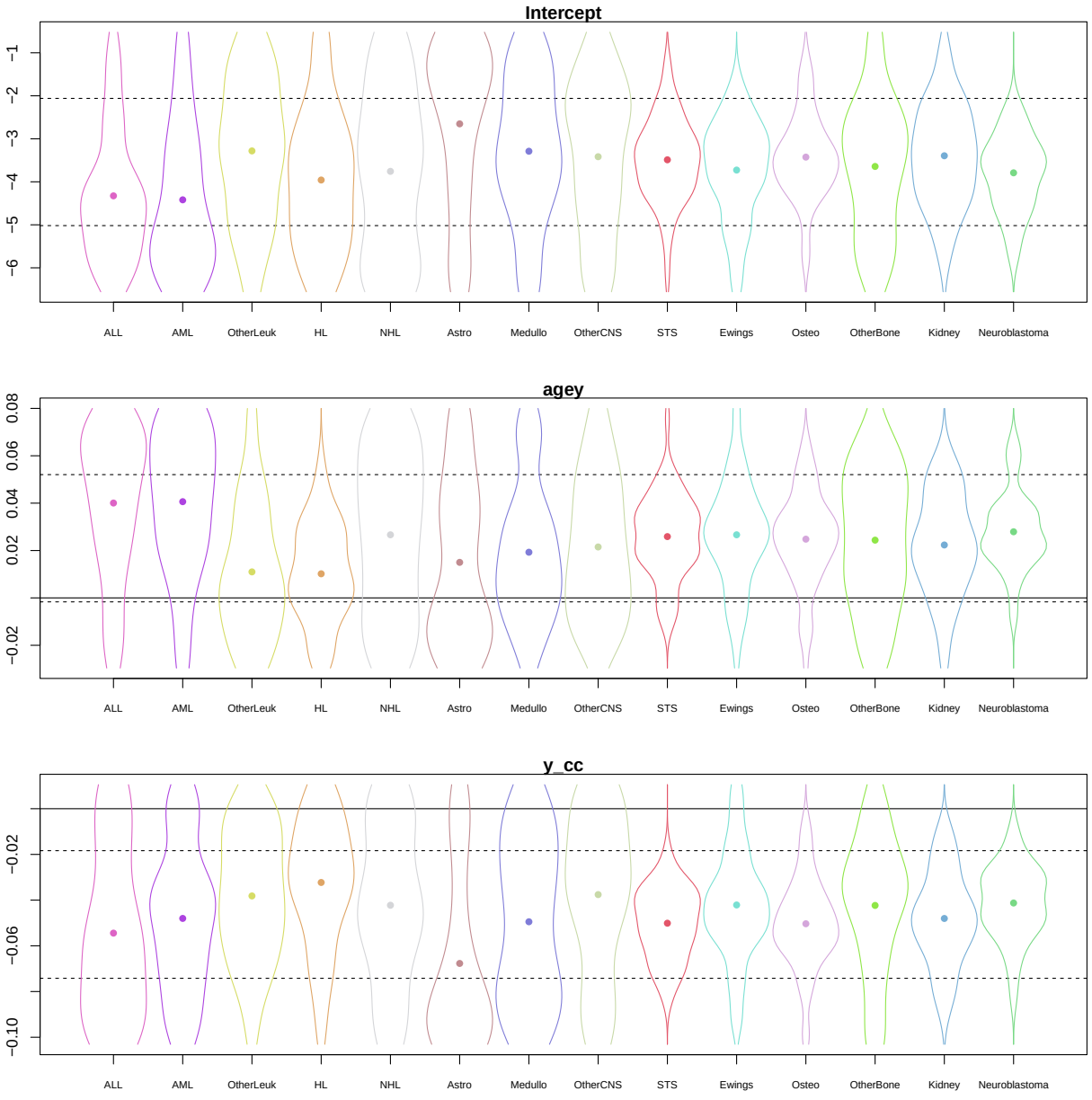

Stroke
35
45
55
65
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


Valvular Disease
30
40
50
60
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

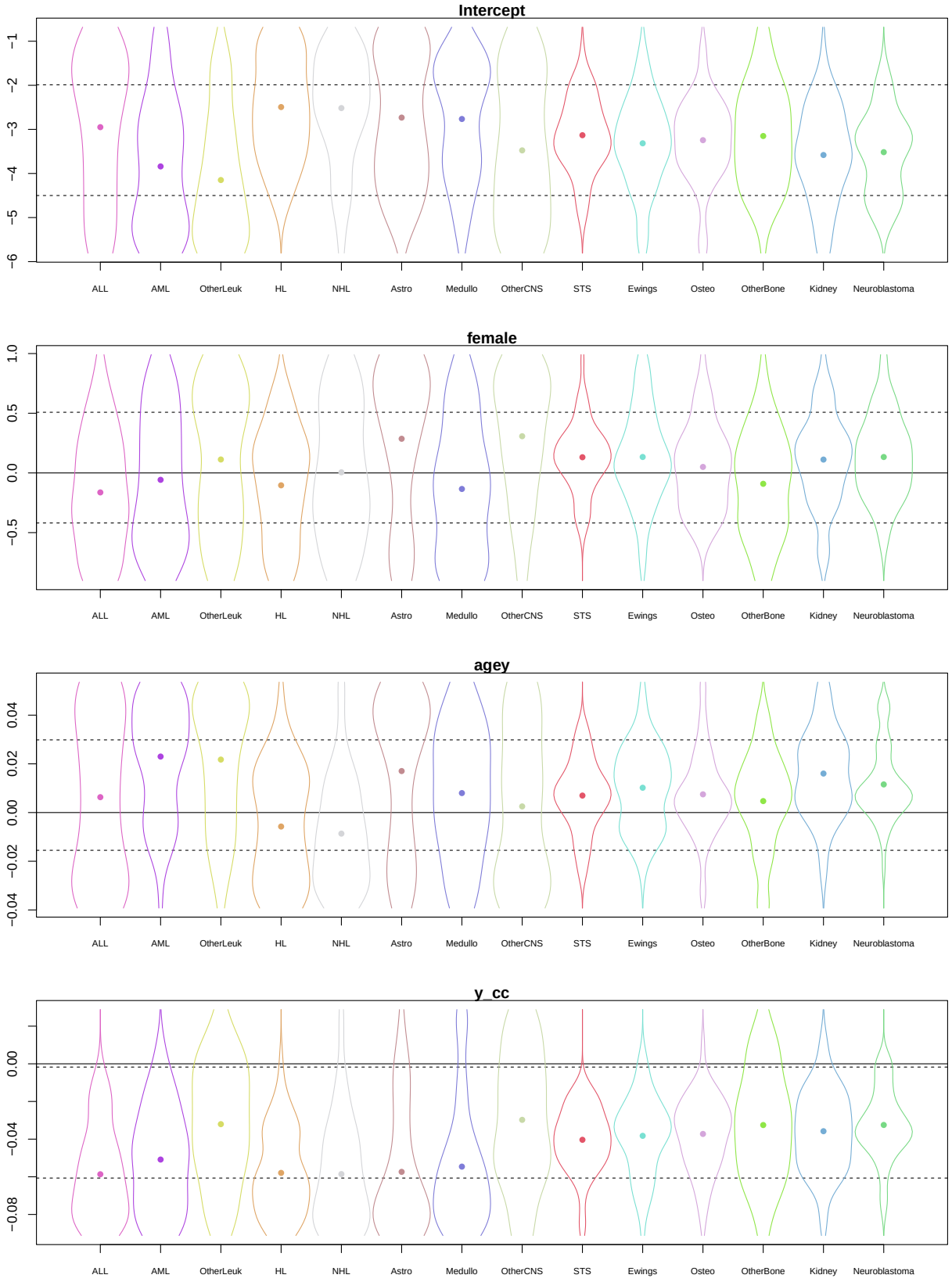
5.4 Mortality Models

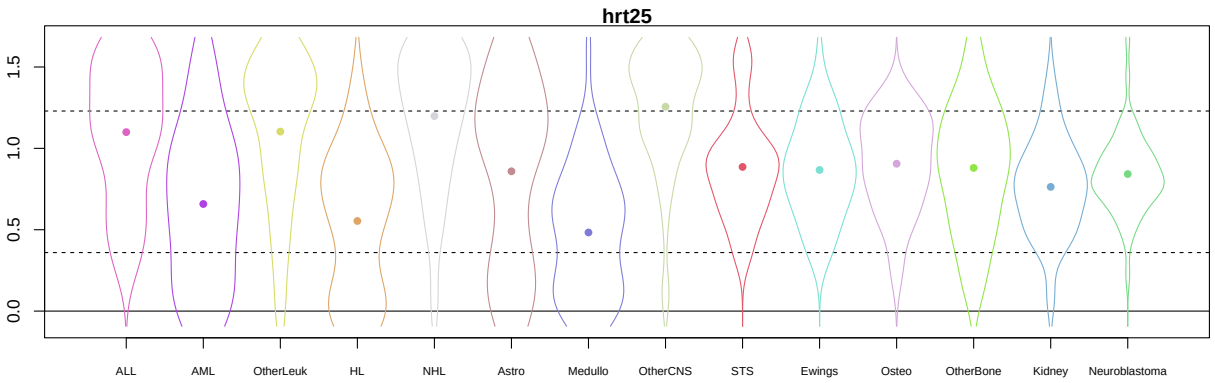
5.4.1 Chronic Condition Mortality

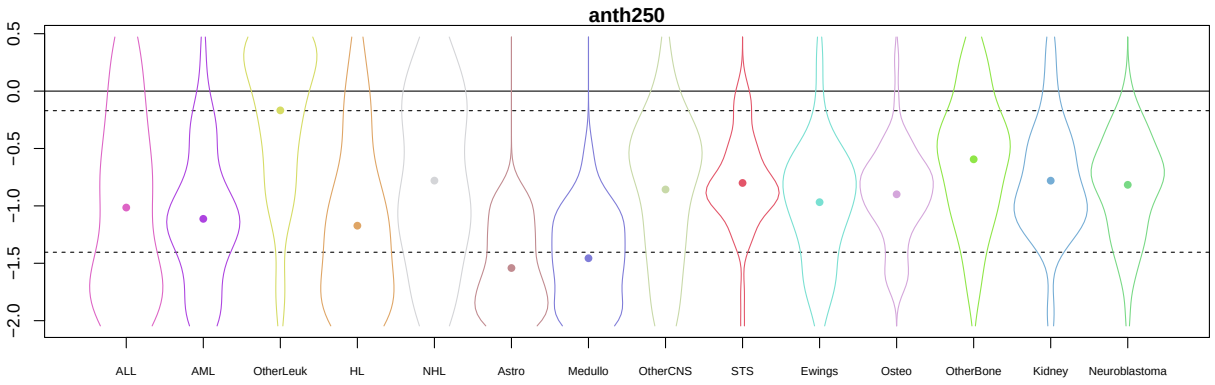
5.4.1.1 Breast



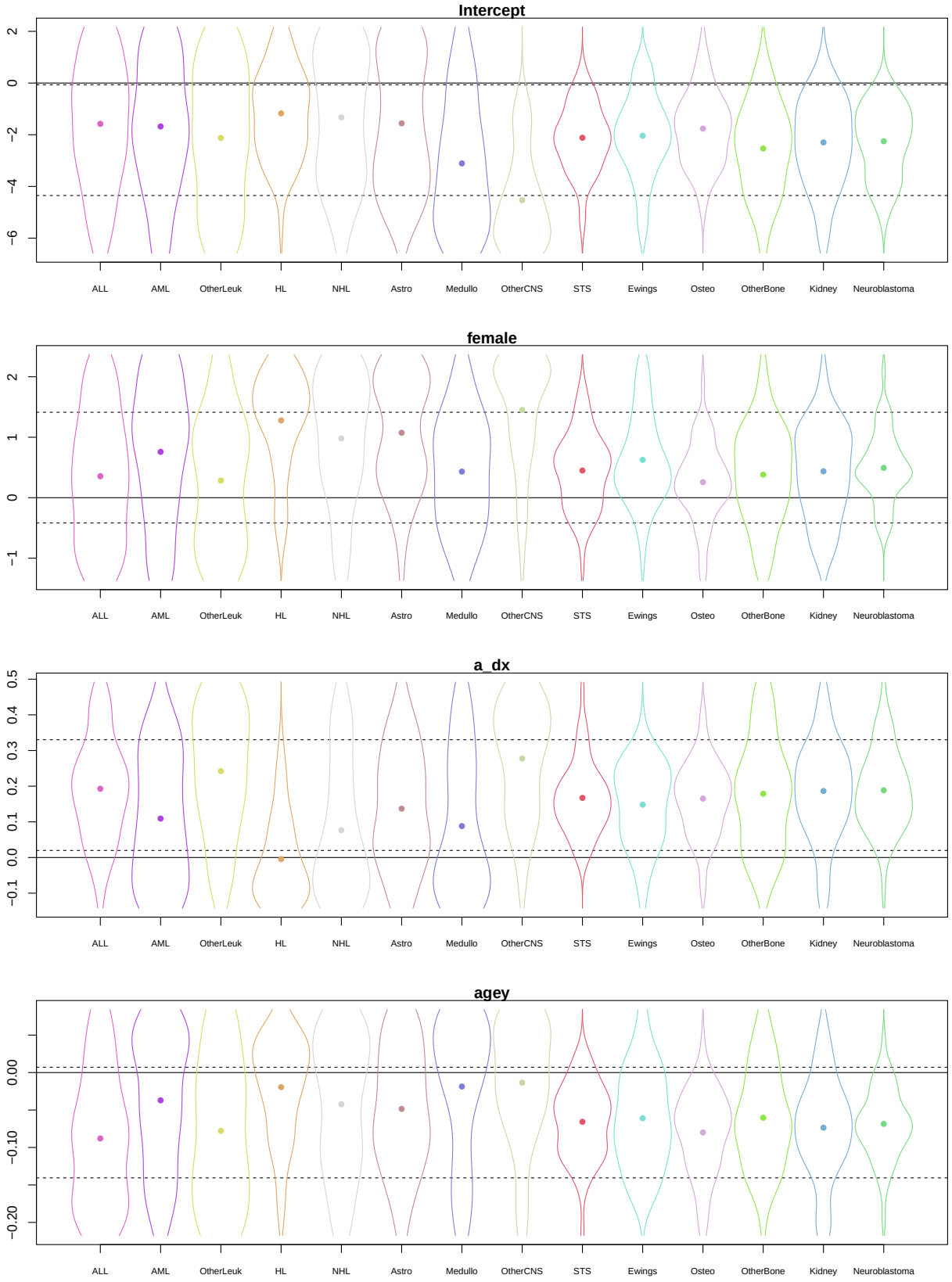
5.4.1.2 HF

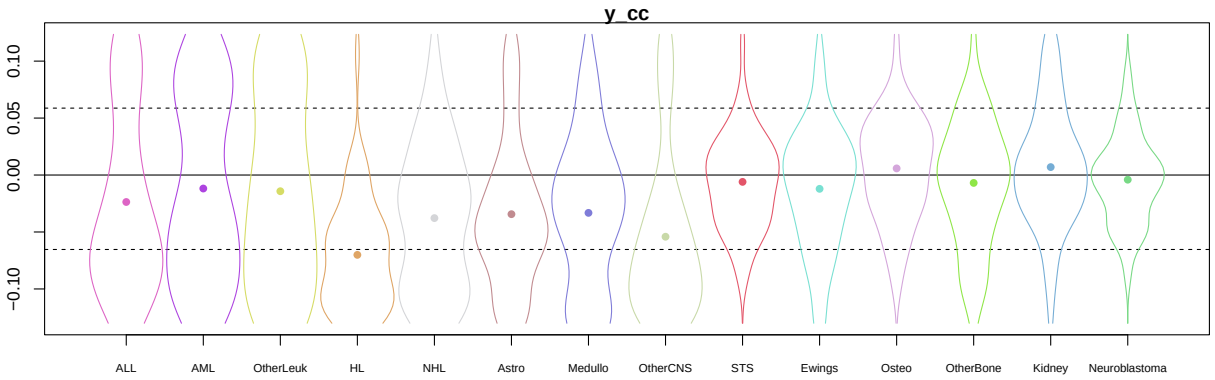

Intercept
female
agey
y_cc
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

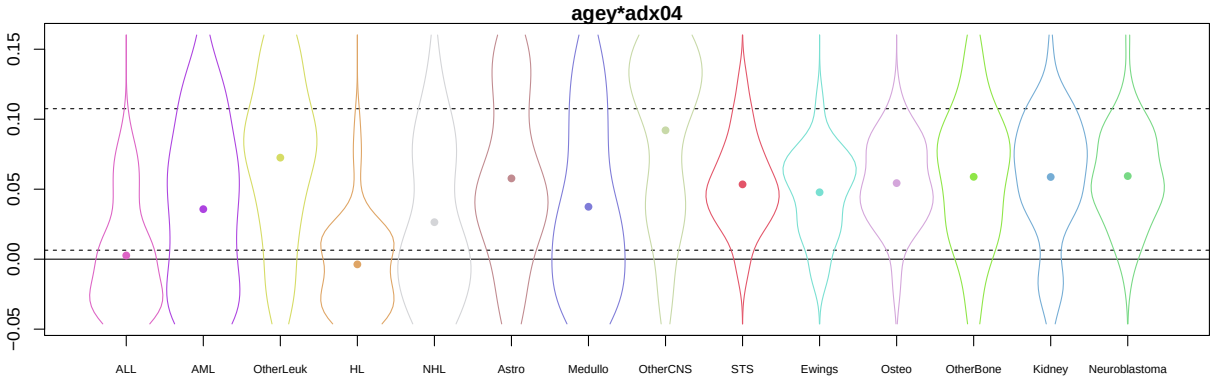

hrt25
1.5
1.0
0.5
0.0
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


anth250
0.5
0.0
−0.5
−1.0
−1.5
−2.0
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

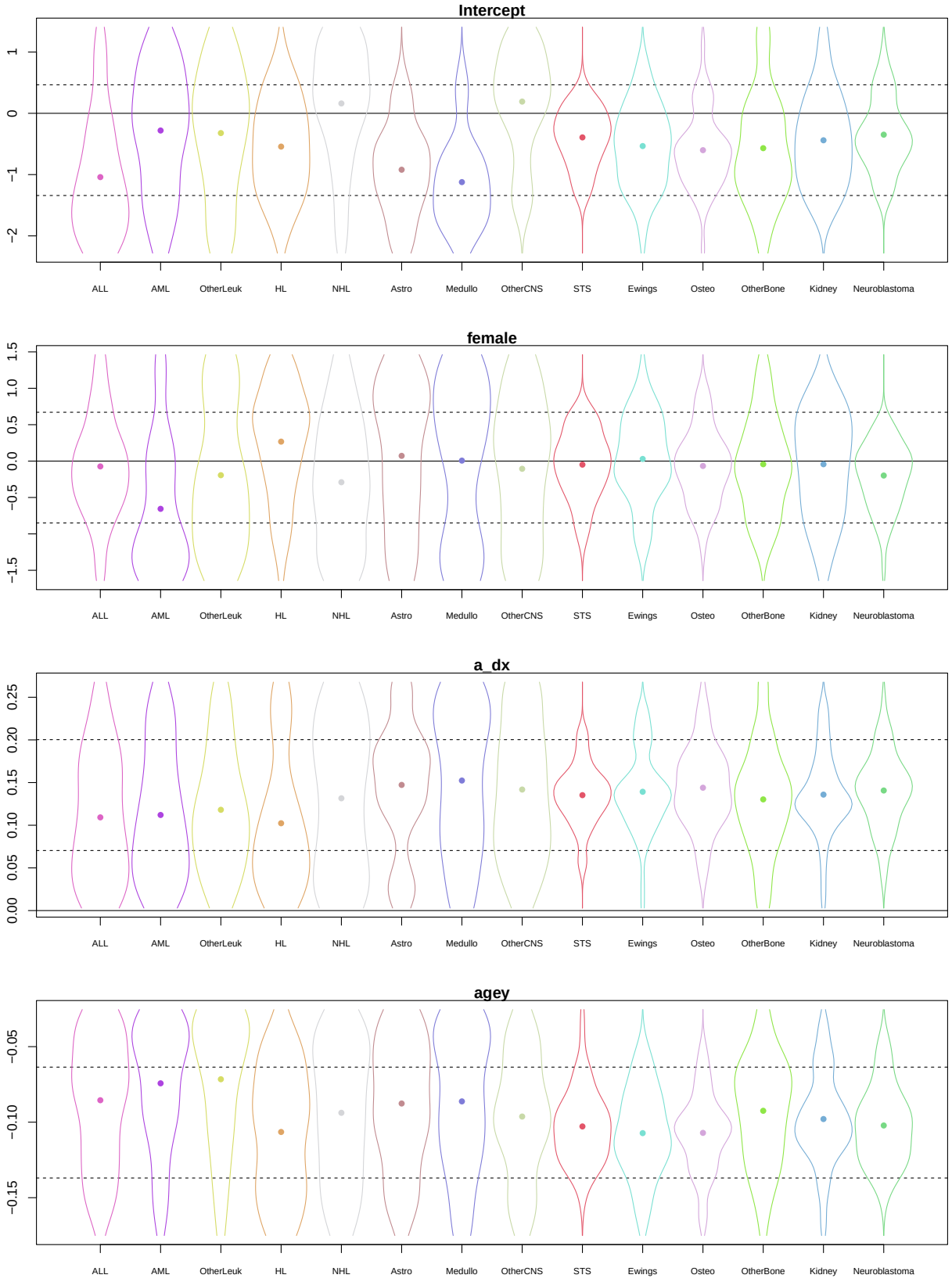
5.4.1.3 Colorectal Cancer

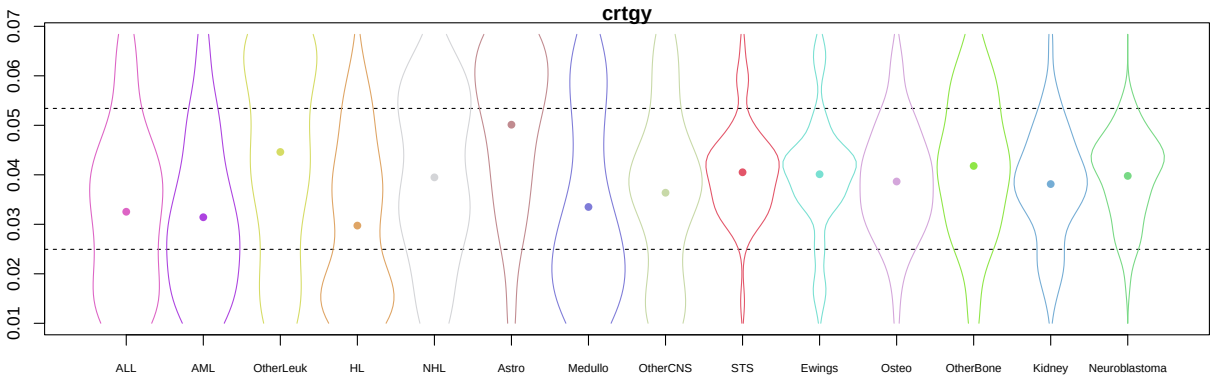


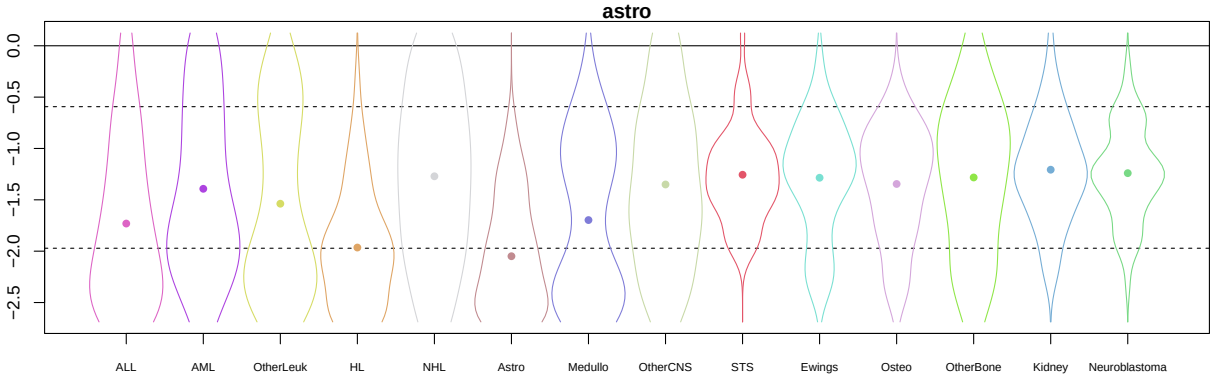

y_cc
0.10
0.05
0.00
−0.10
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

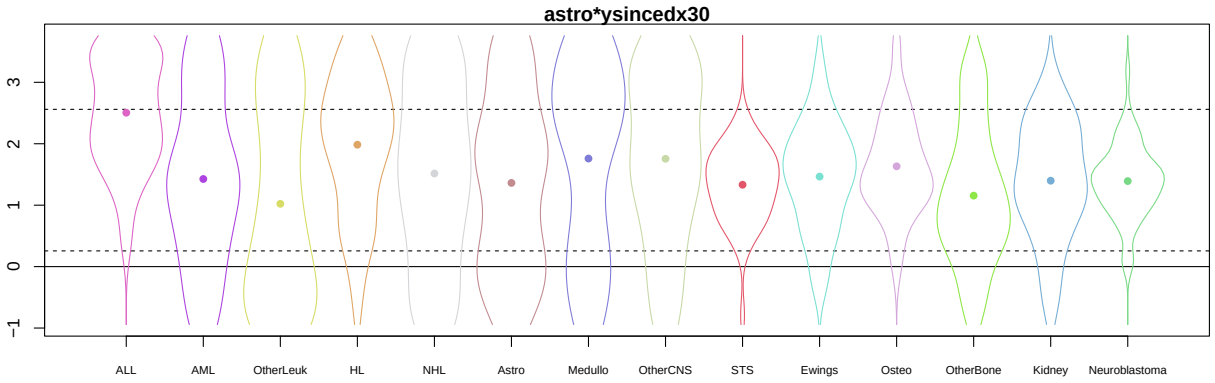

agey*adx04
0.15
0.10
0.05
0.00
−0.05
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

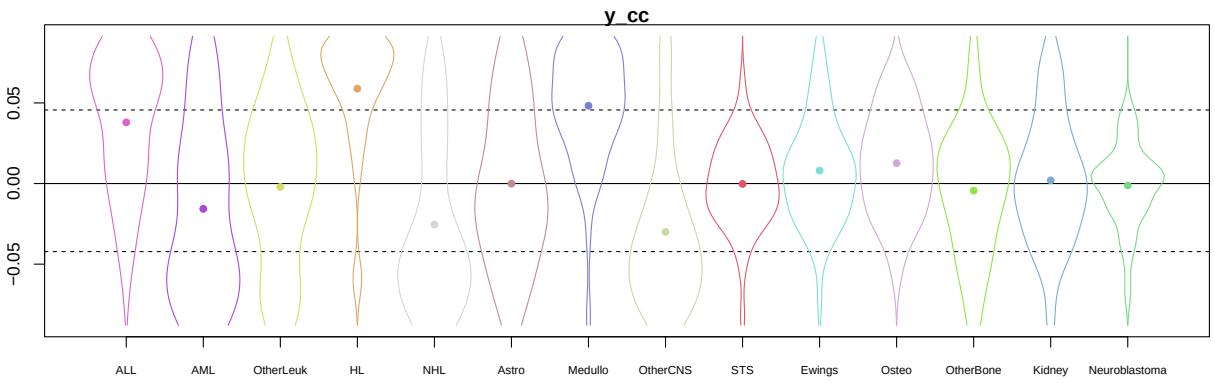
5.4.1.4 Glial Tumors



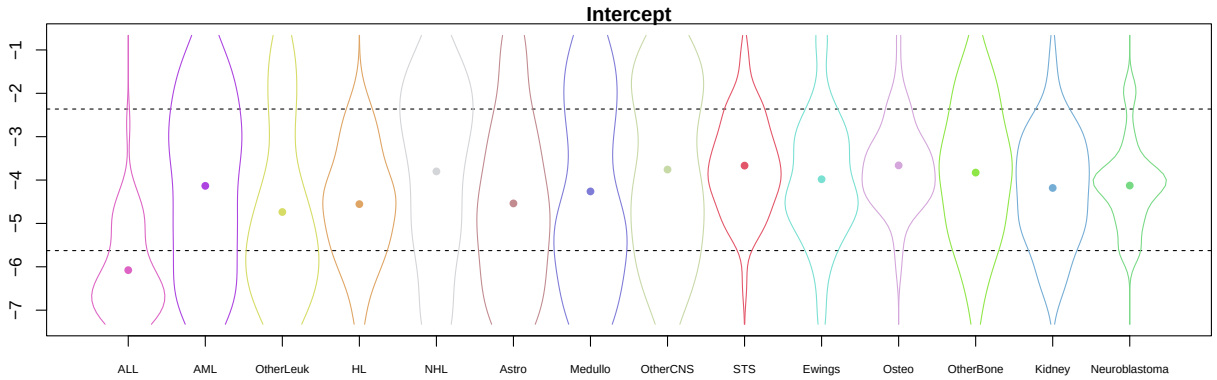

crtgy
0.01
0.02
0.03
0.04
0.05
0.06
0.07
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

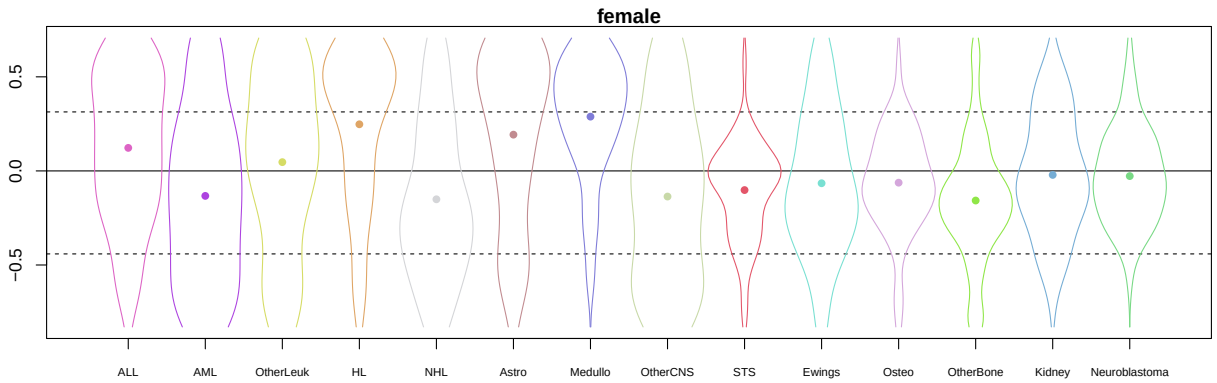

astro
−2.5
−2.0
−1.5
−1.0
−0.5
0.0
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


astro*ysincedx30
−1
0
1
2
3
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


y_cc
−0.05
0.00
0.05
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

5.4.1.5 CAD/MI


Intercept
−1
−2
−3
−4
−5
−6
−7
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma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0.5
0.0
−0.5
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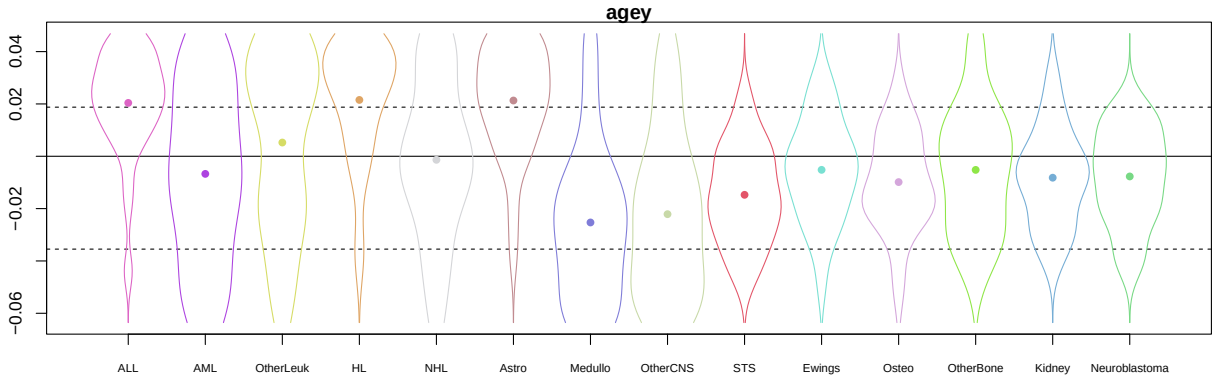
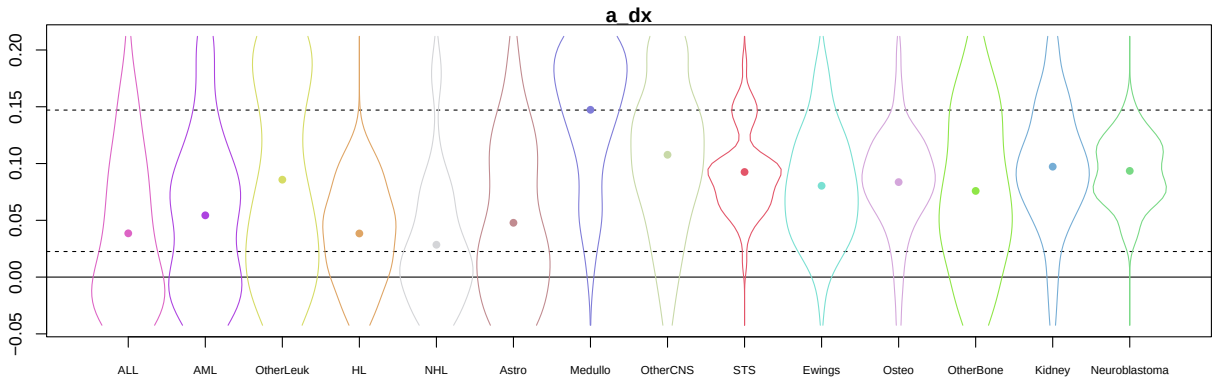
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


agey
0.04
0.02
−0.02
−0.06
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma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0.15
0.10
0.05
0.00
−0.05
ALL
AML
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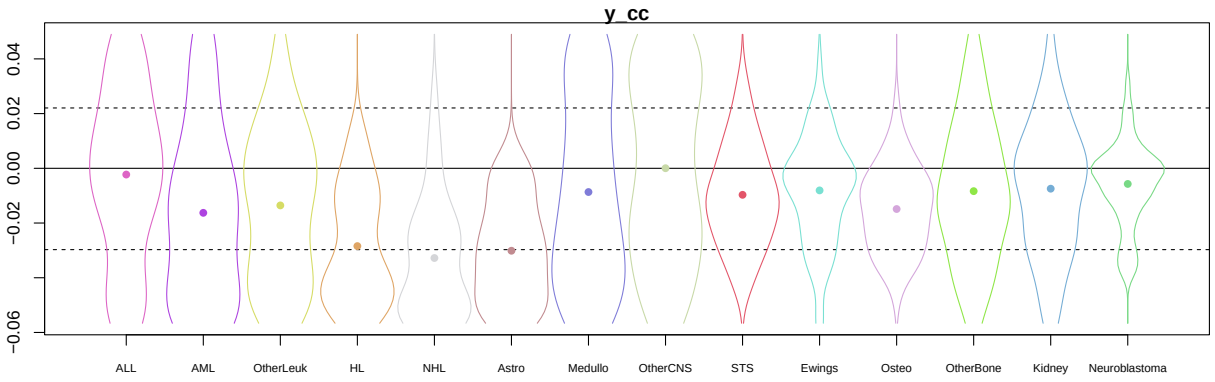
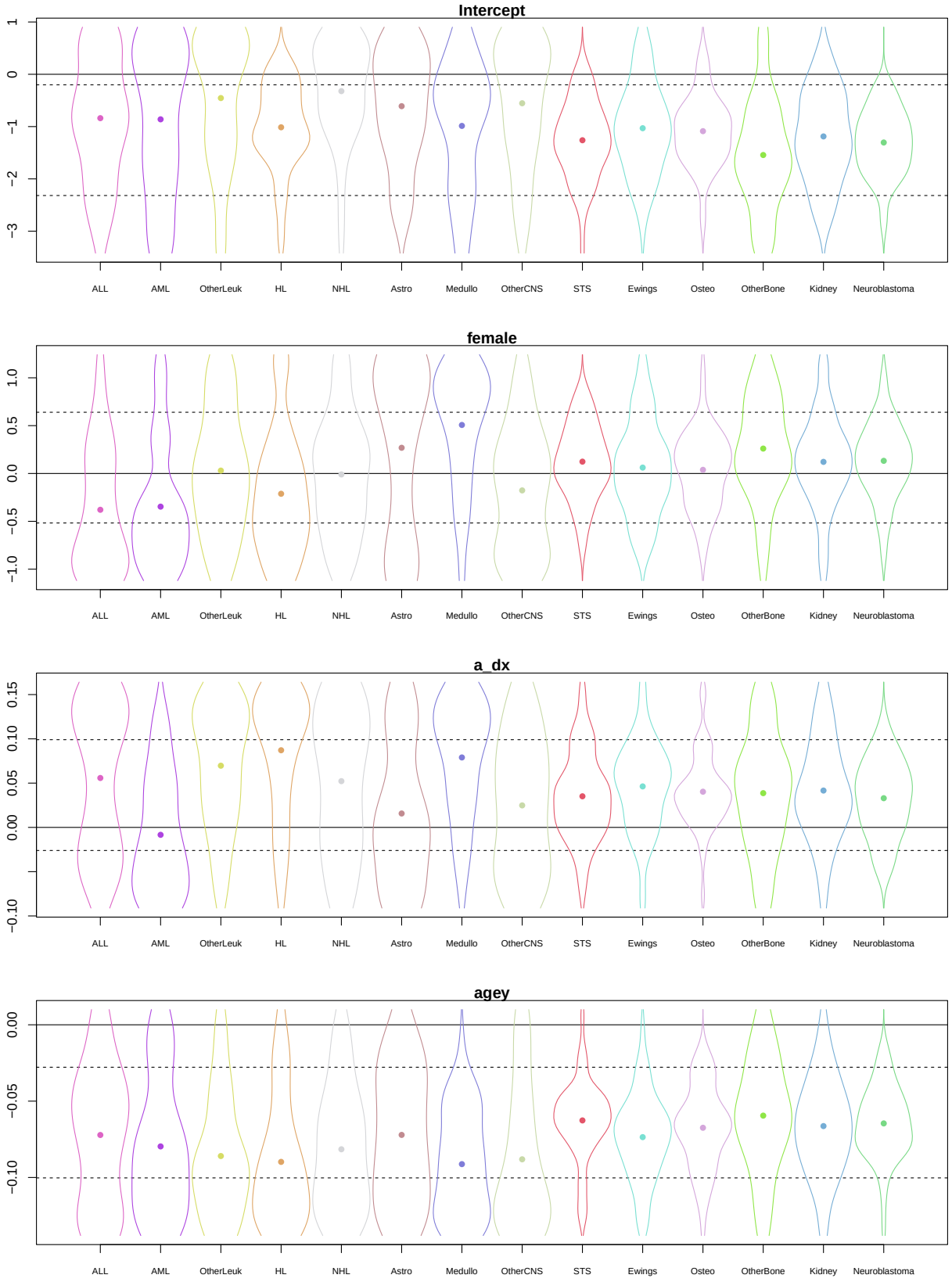
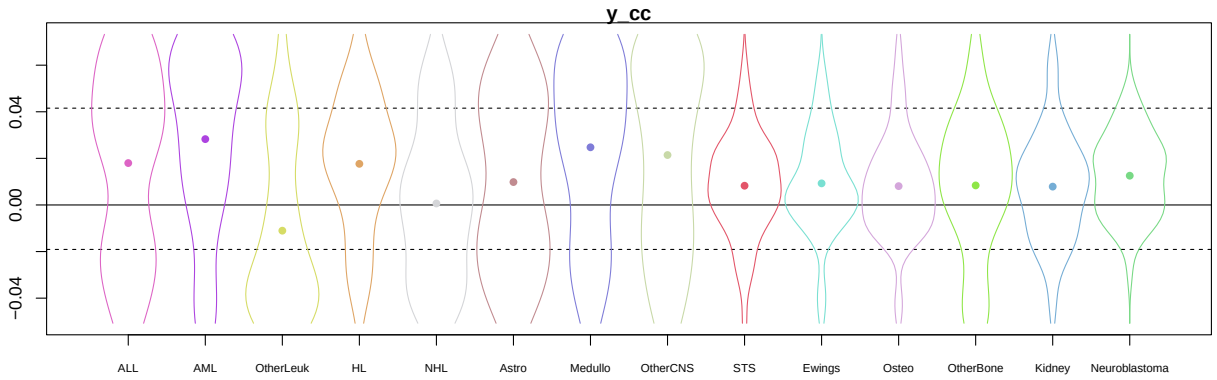
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

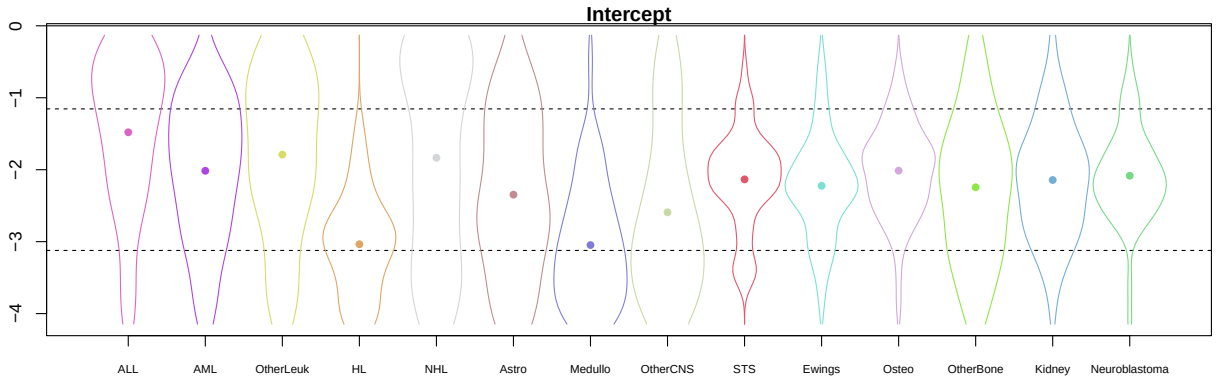

y_cc
0.04
0.02
0.00
−0.02
−0.06
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

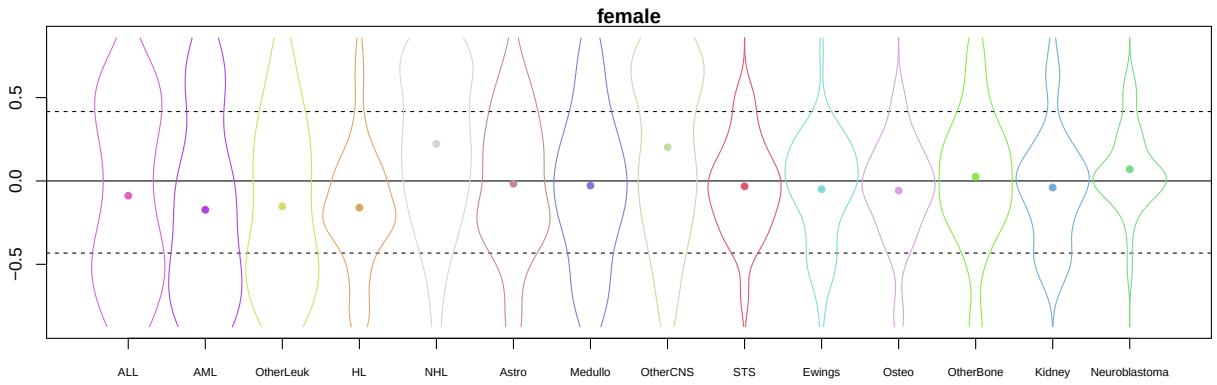
5.4.1.6 Sarcoma

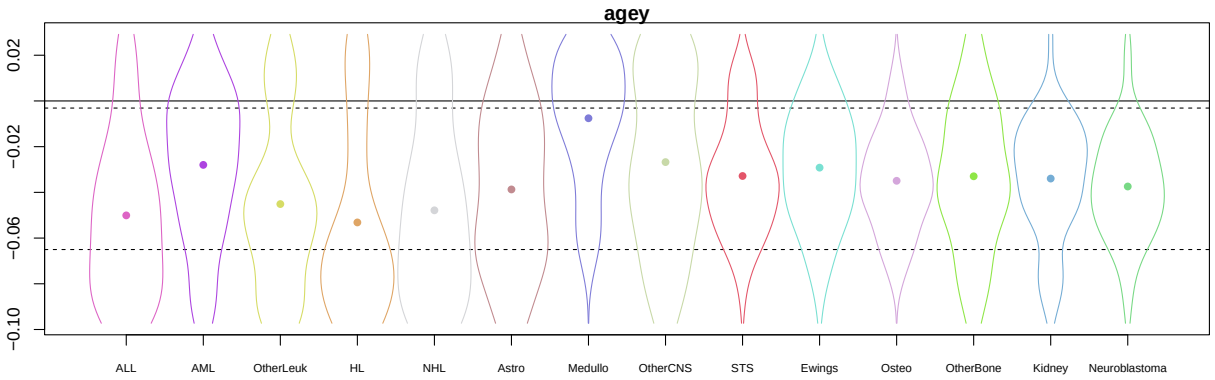


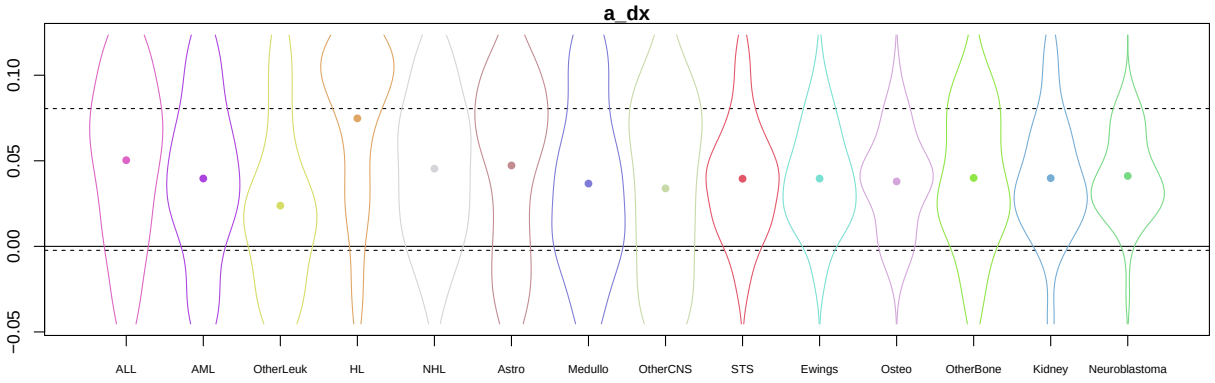

y_cc
0.04
0.00
−0.04
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

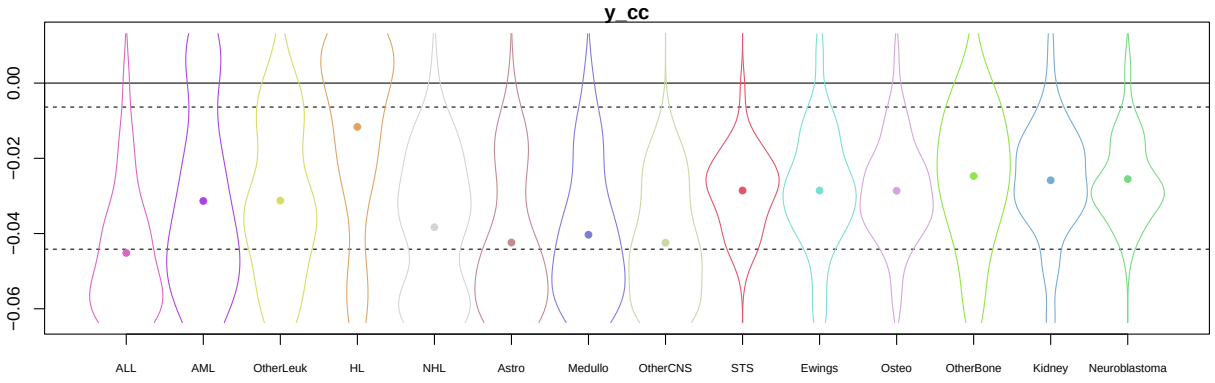
5.4.1.7 Stroke


Intercept
0
−1
−2
−3
−4
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

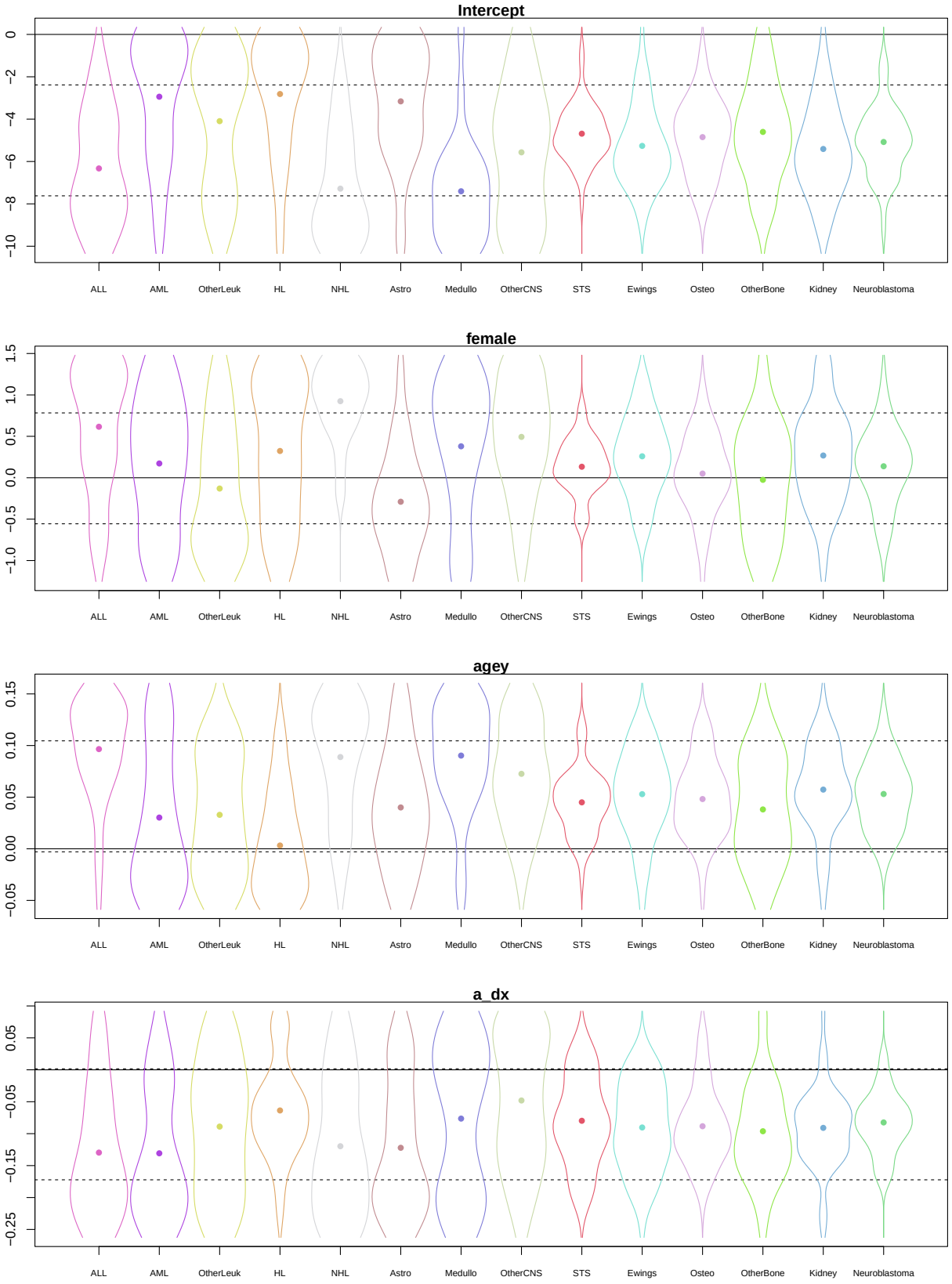

female
0.5
0.0
−0.5
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

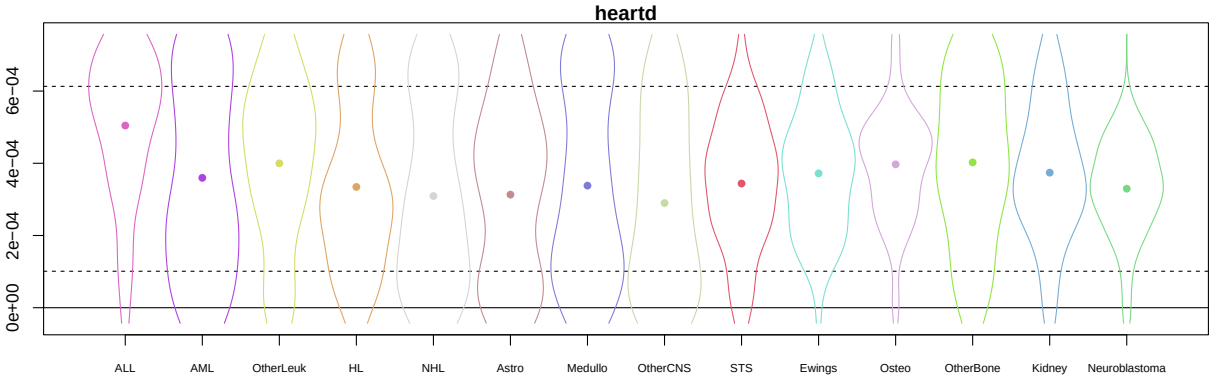

agey
0.02
−0.02
−0.06
−0.10
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

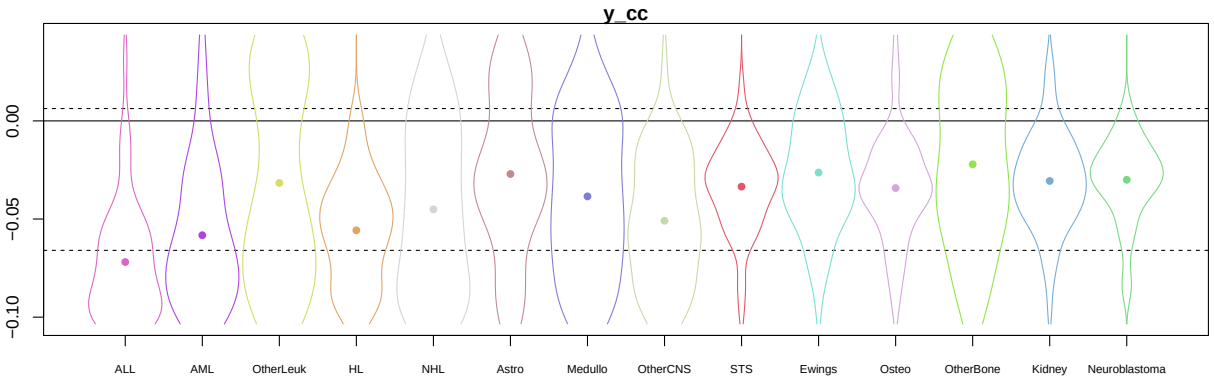

a_dx
0.10
0.05
0.00
−0.05
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


y_cc
0.00
−0.02
−0.04
−0.06
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

5.4.1.8 Valvular Disease




heartd
0e+00
2e−04
4e−04
6e−04
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

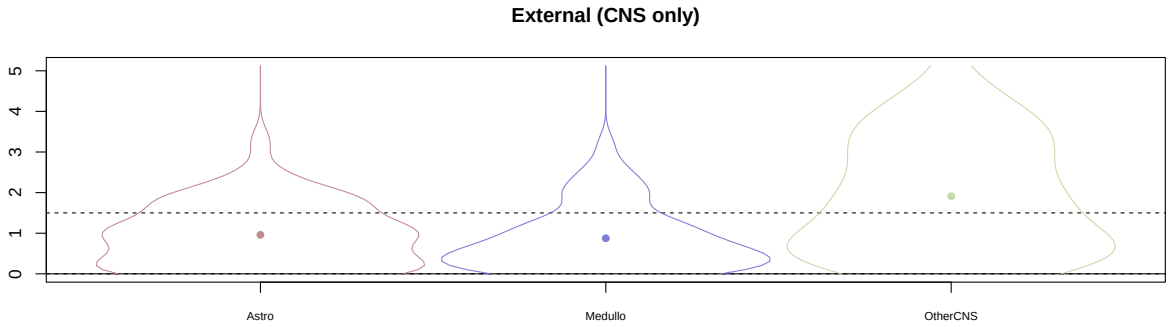

y_cc
0.00
−0.05
−0.10
ALL
AML
OtherLeuk
HL
NHL
Astro
Medullo
OtherCNS
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

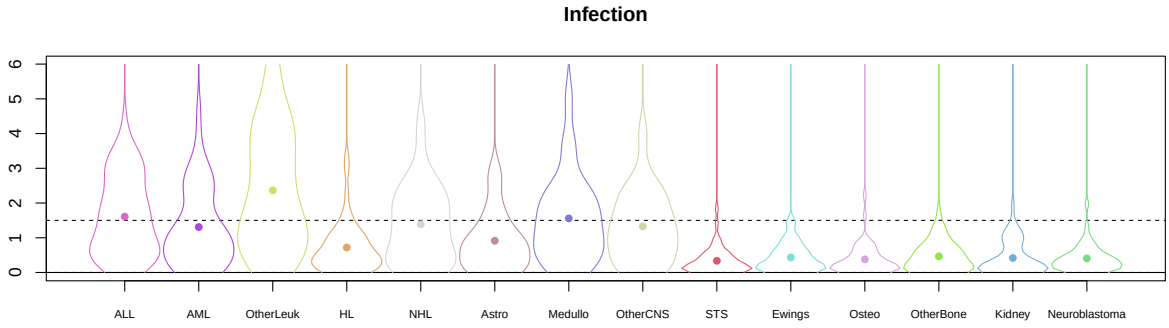
5.4.2 Other Cause Mortality

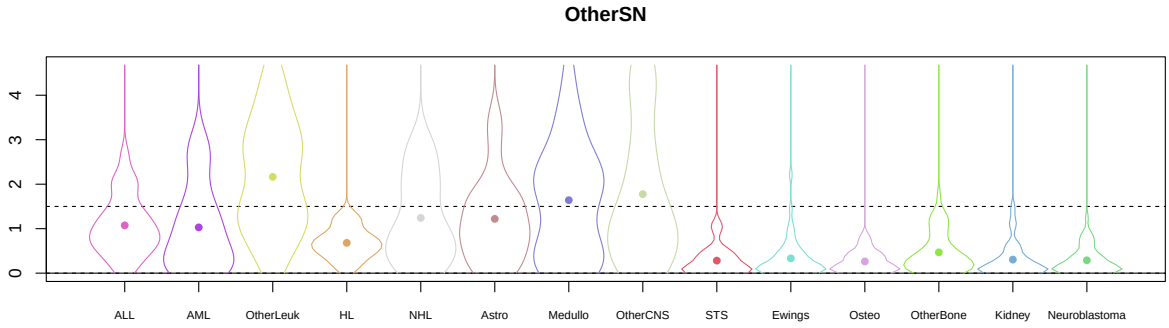
5.4.2.1 Recurrence-Related Increased Mortality

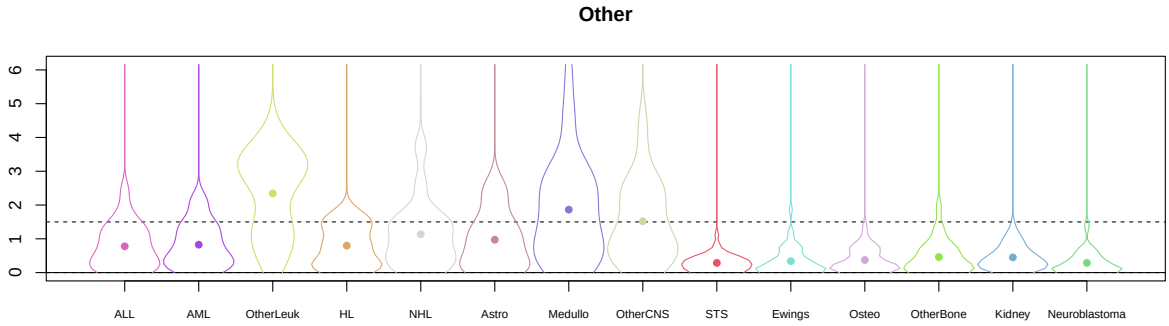
Values plotted are relative rates.

Early Recurrence

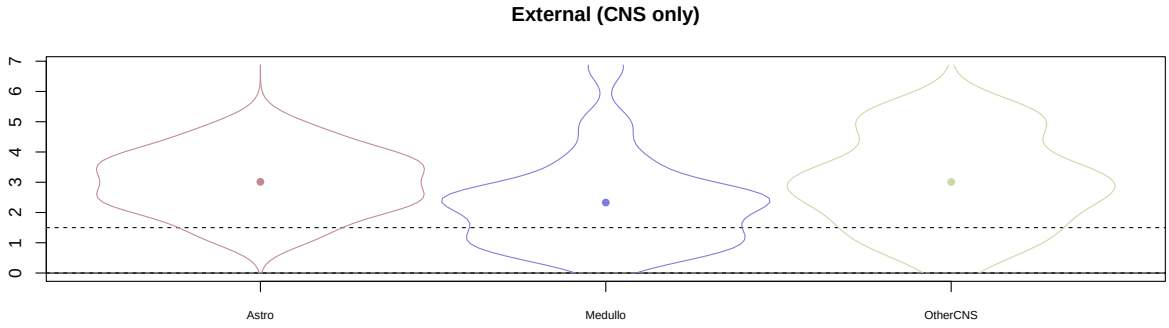


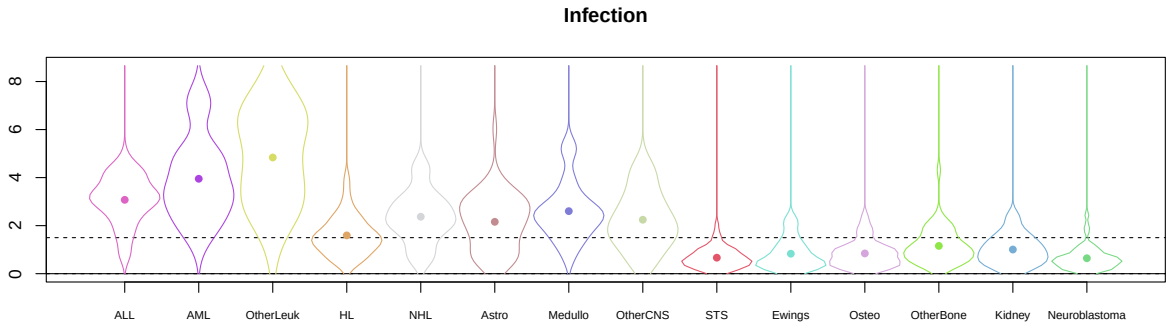




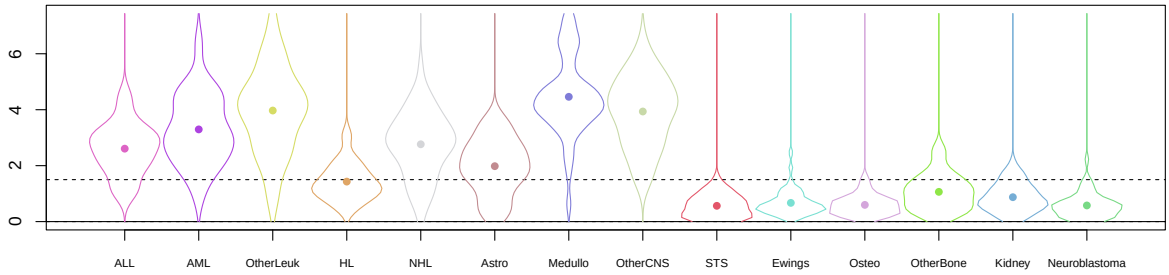


Late Recurrence

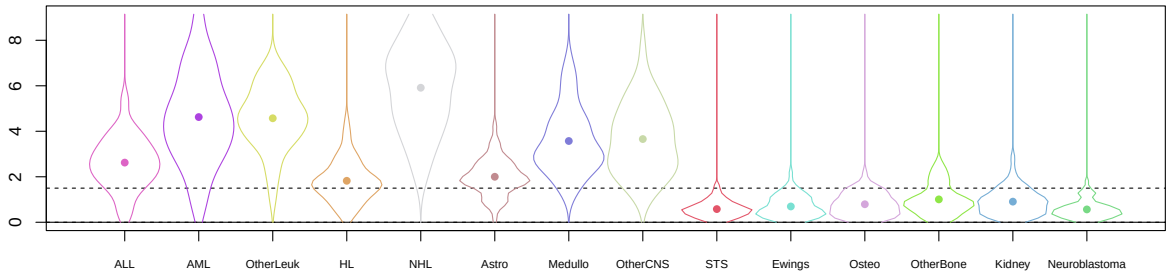




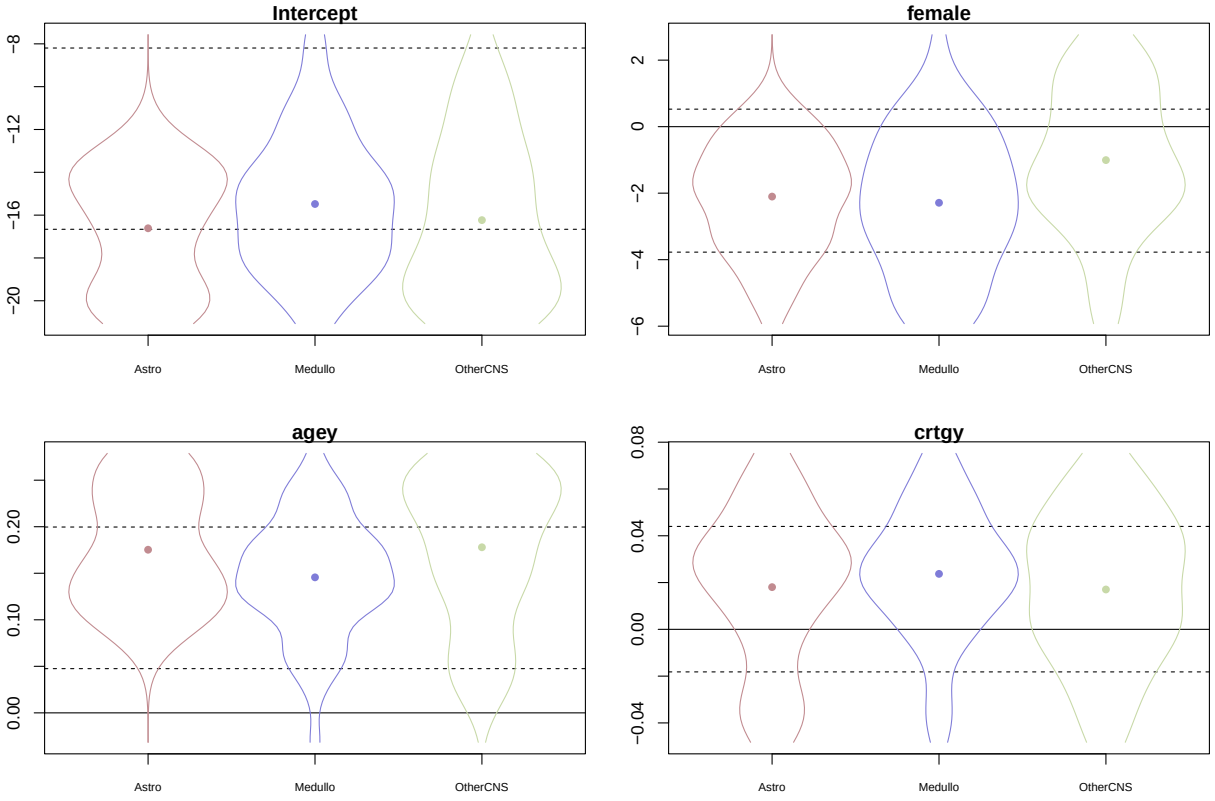
OtherSN



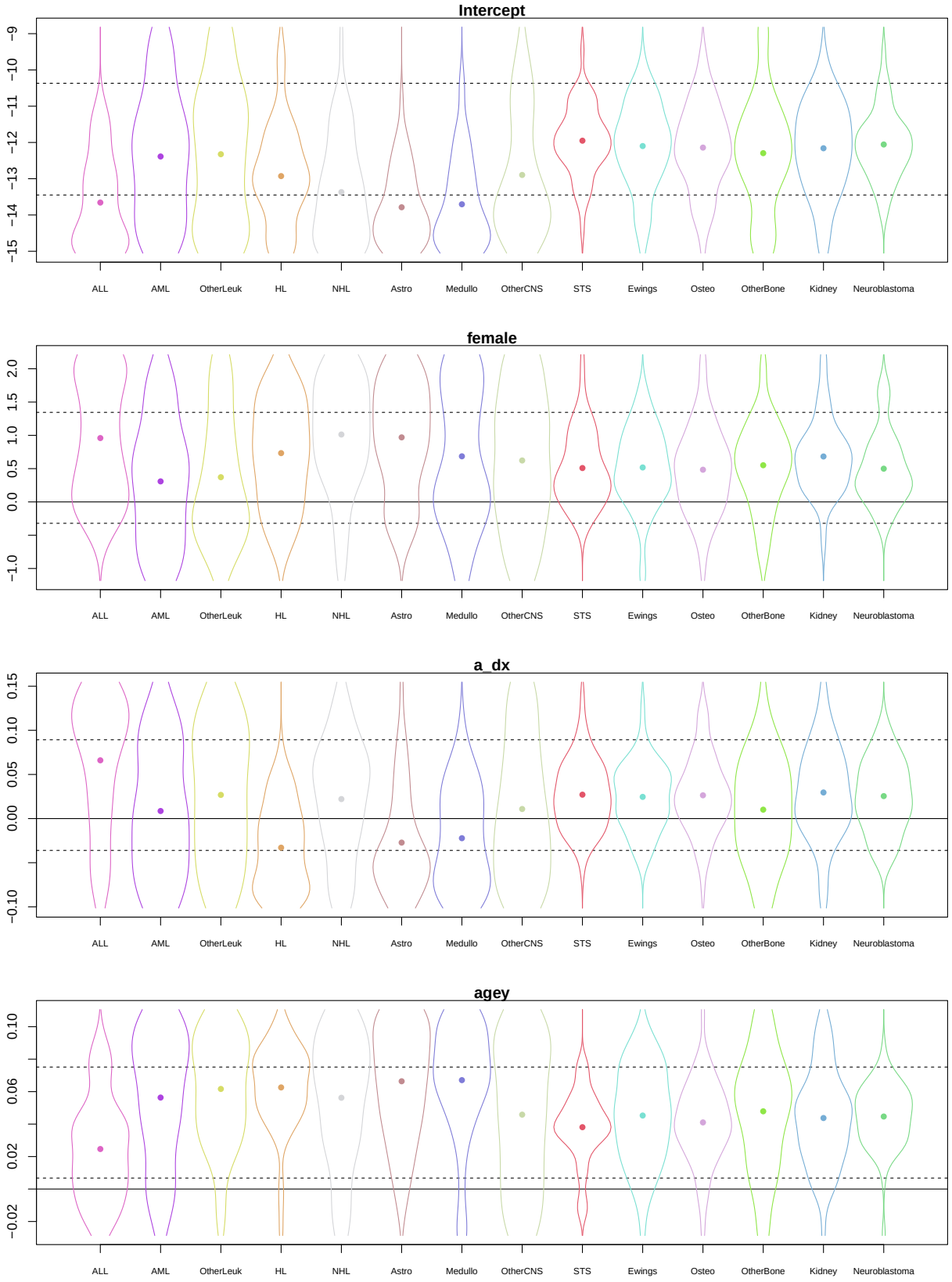
Other

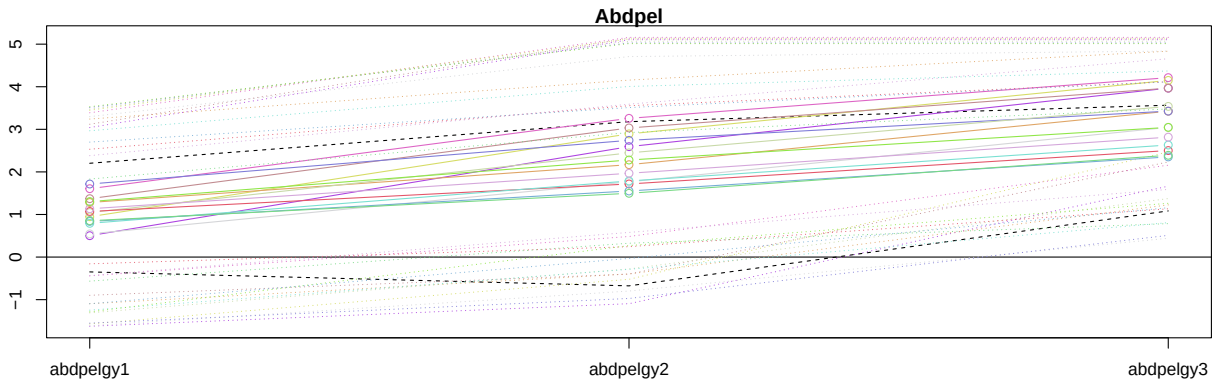


5.4.2.2 External - CNS



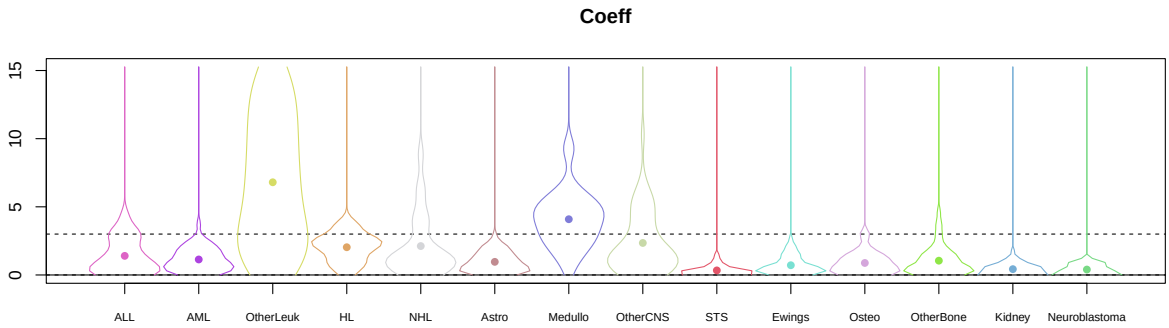
5.4.2.3 Infection

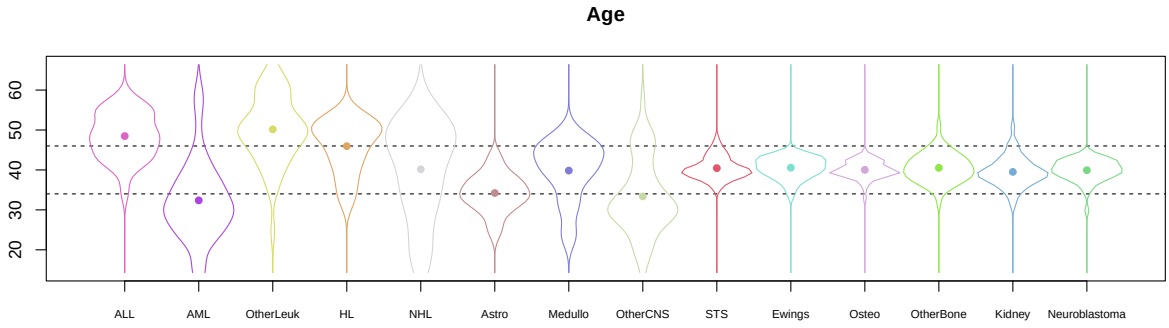



Abdpel
5
4
3
2
1
0
−1
abdpelgy1
abdpelgy2
abdpelgy3

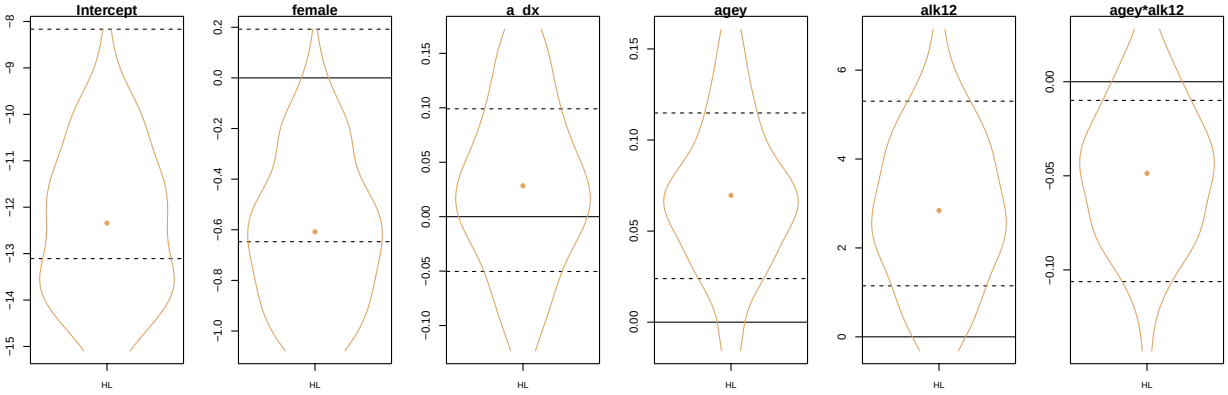
5.4.2.4 Other Neoplasm

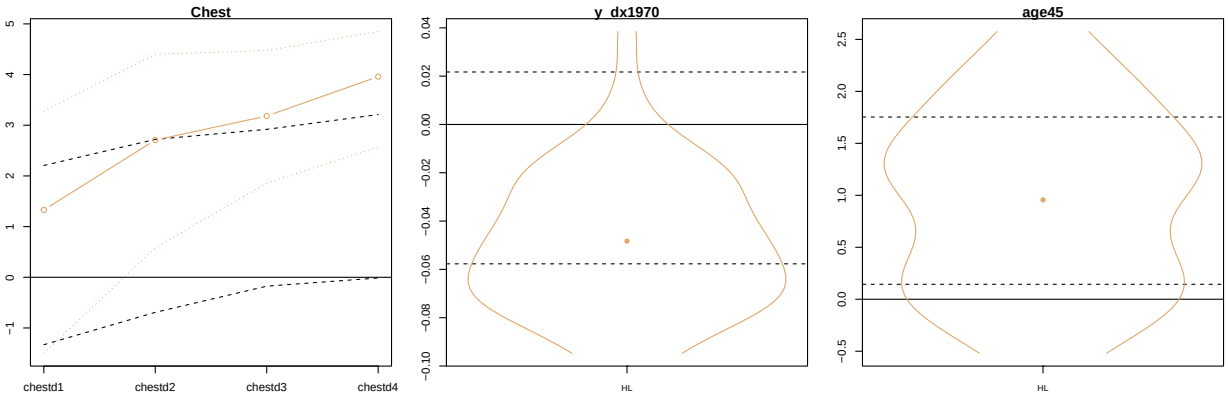
Other Neoplasm - AgeDx 0-4



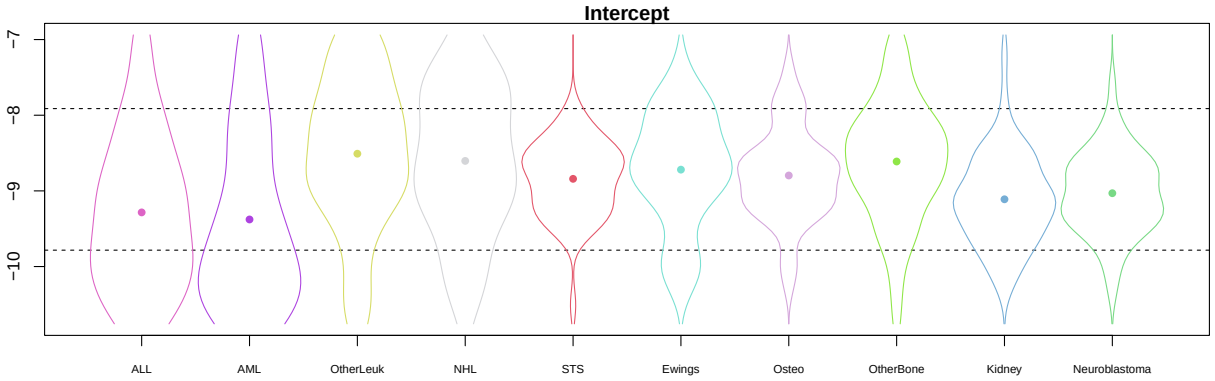


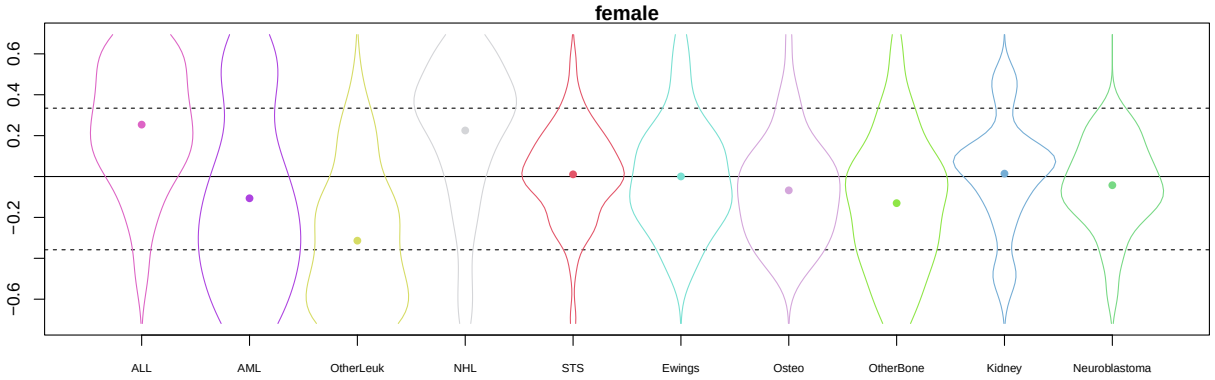
Other Neoplasm - Hodgkins Lymphoma

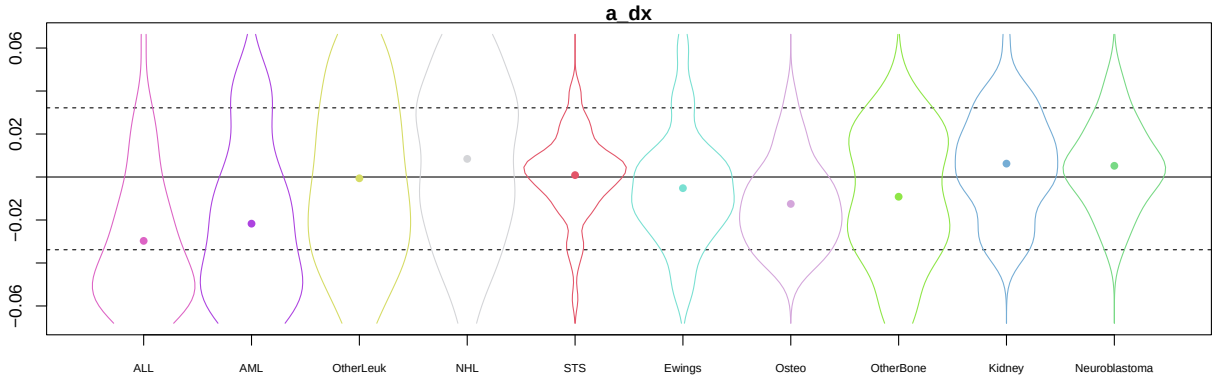


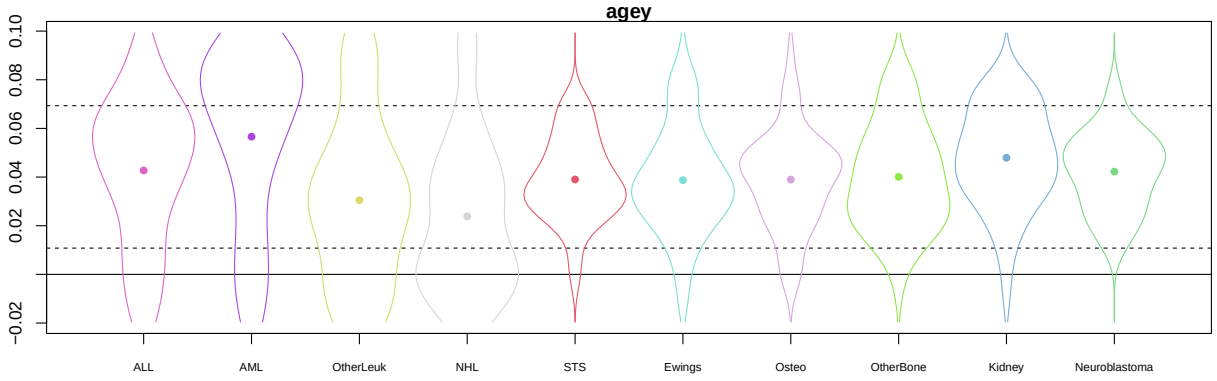


Other Neoplasm - NOT Hodgkins or CNS






a_dx
0.06
0.02
−0.02
−0.06
ALL
AML
OtherLeuk
NHL
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


agey
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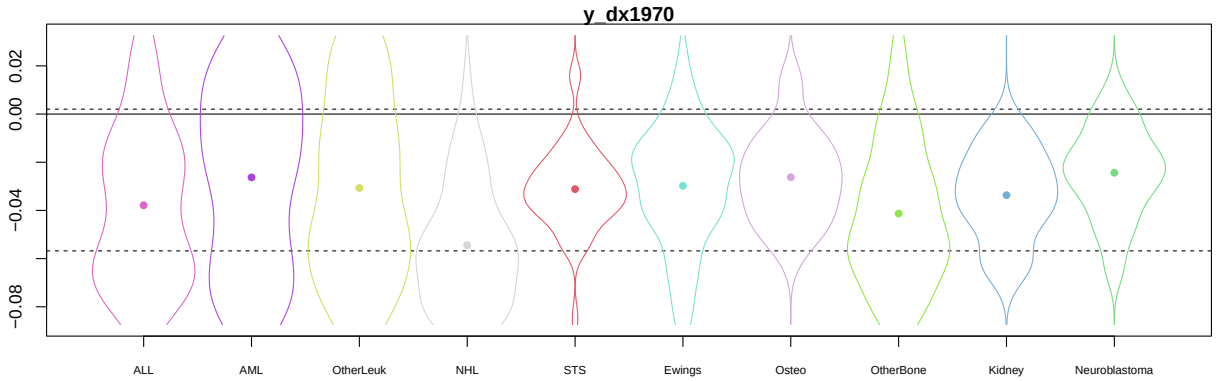
0.08
0.06
0.04
0.02
−0.02
ALL
AML
OtherLeuk
NHL
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


y_dx1970
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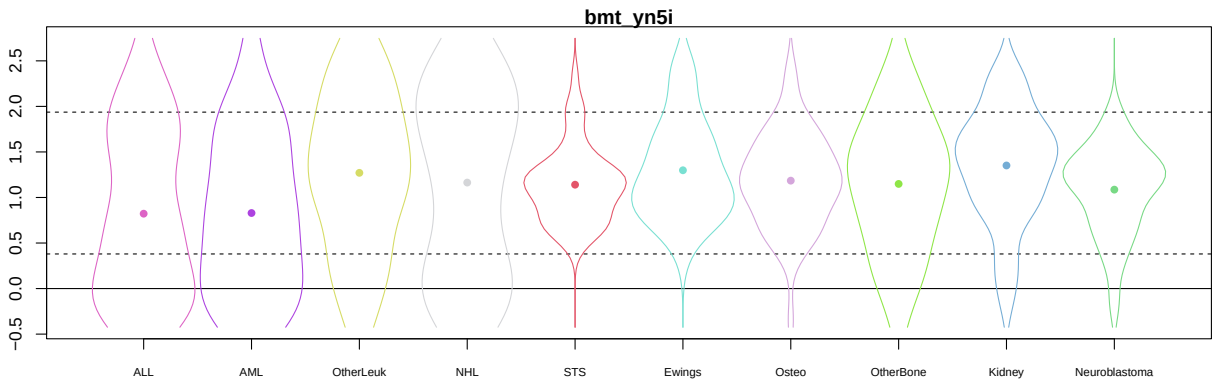
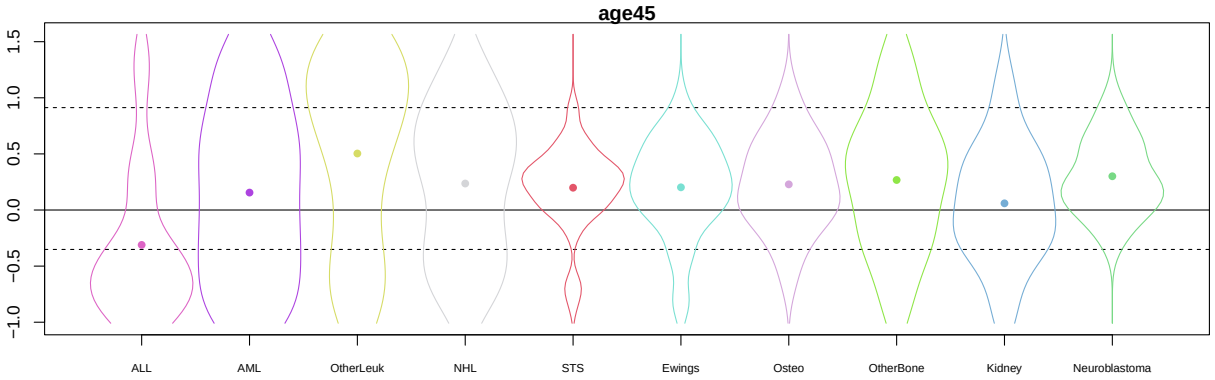
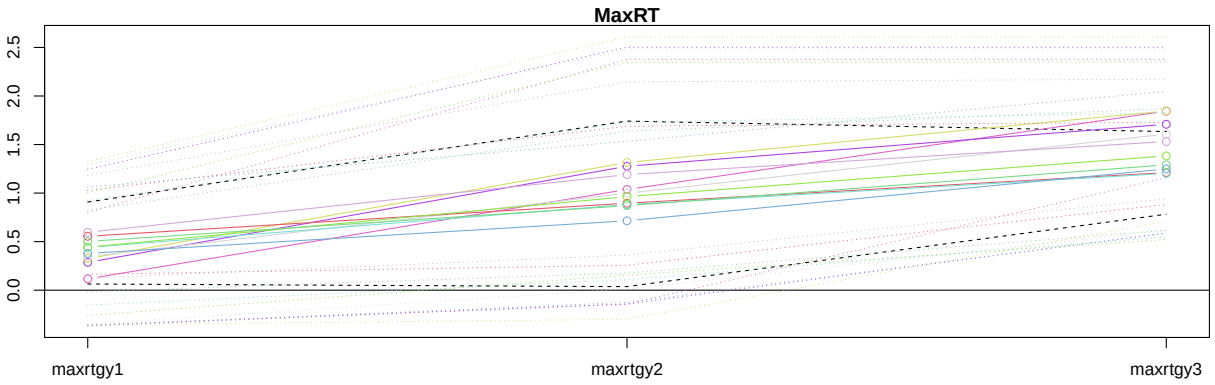
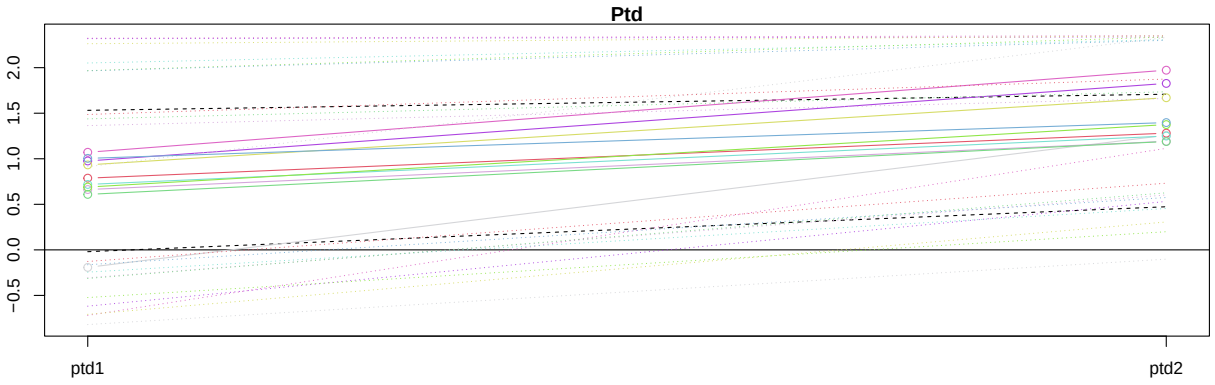
0.00
−0.04
−0.08
ALL
AML
OtherLeuk
NHL
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

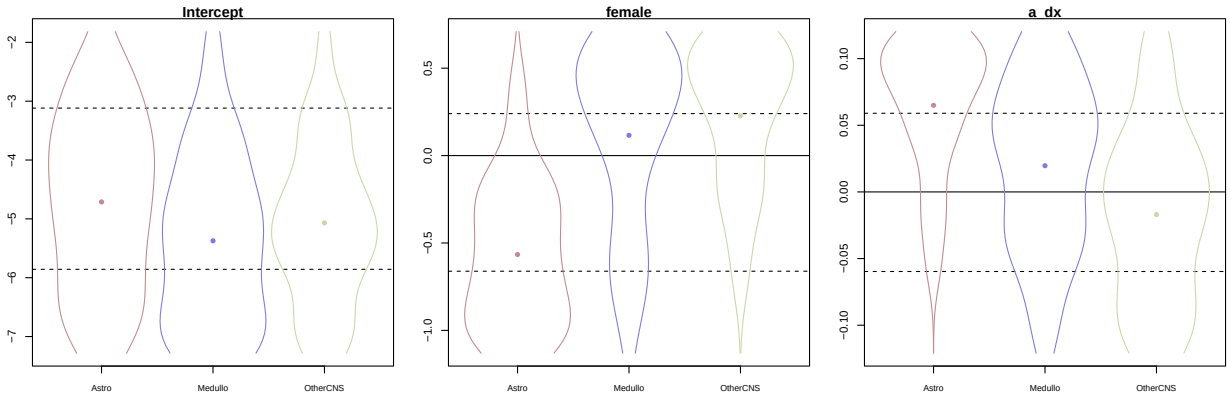

bmt_yn5i
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
ALL
AML
OtherLeuk
NHL
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma

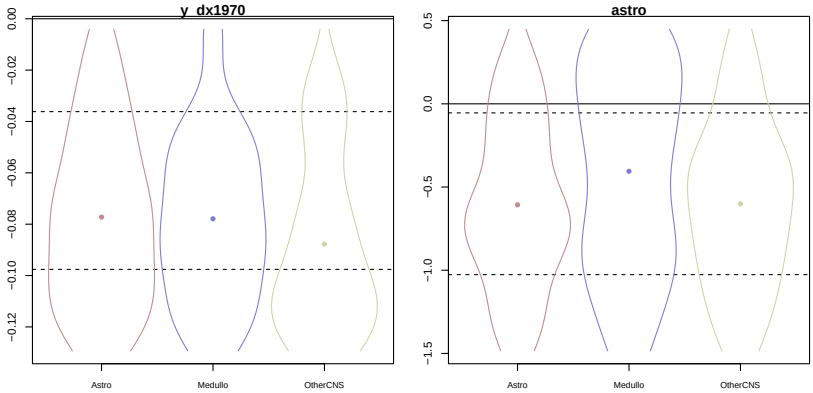


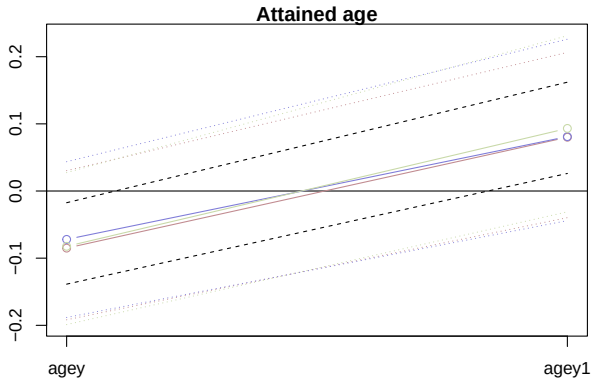


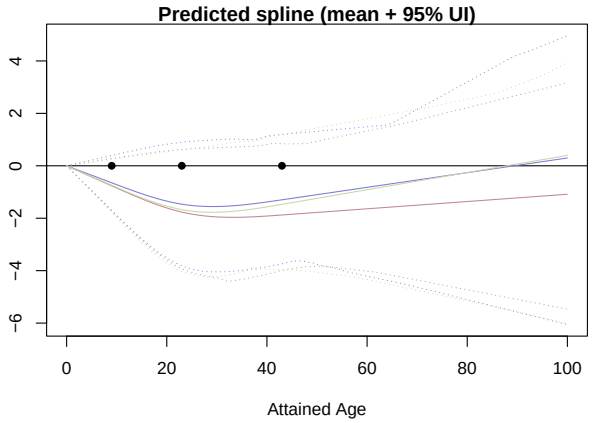


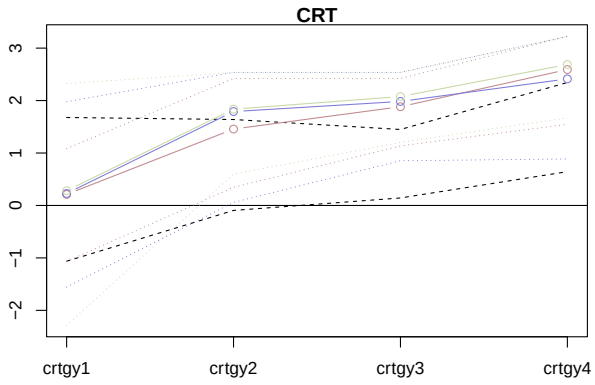
Other Neoplasm - CNS


Intercept
female
a_dx
Astro
Medullo
OtherCNS


y_dx1970
astro
Astro
Medullo
OtherCNS

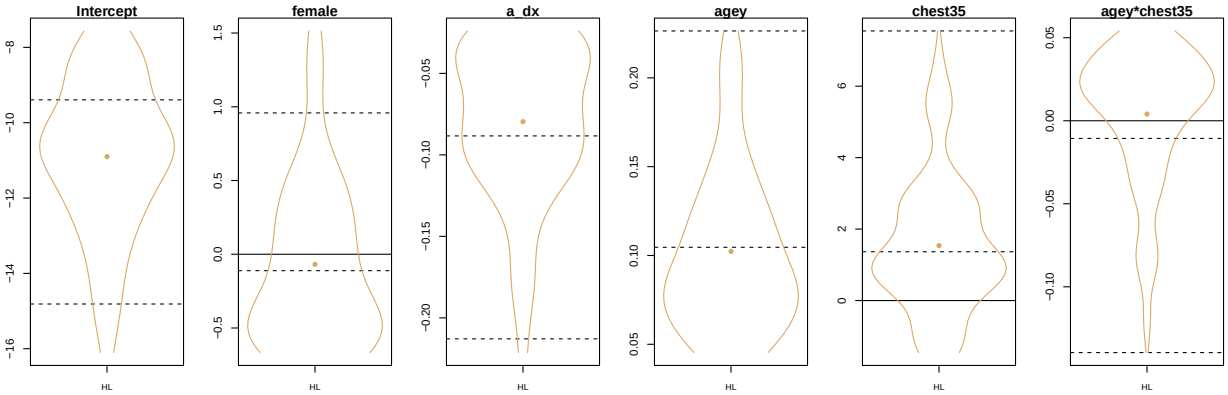

Attained age
agey
agey1


Predicted spline (mean + 95% UI)
Attained Age

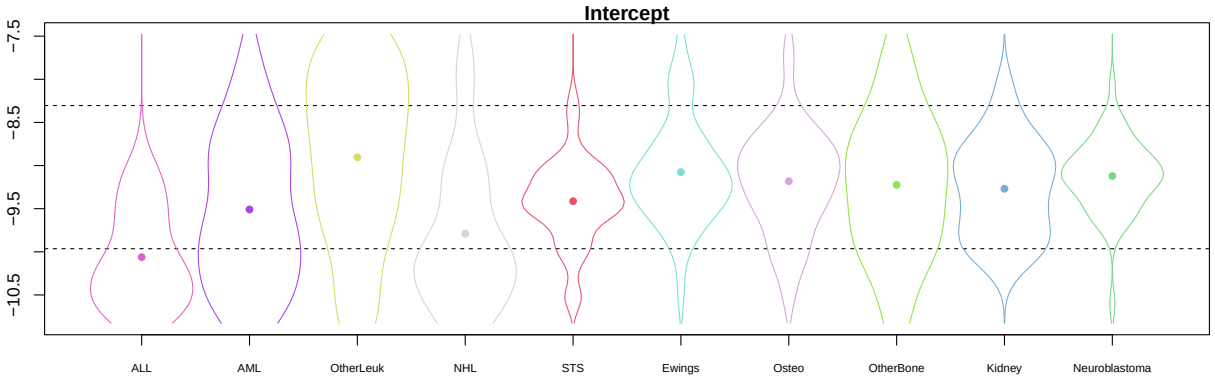

CRT
crtgy1
crtgy2
crtgy3
crtgy4

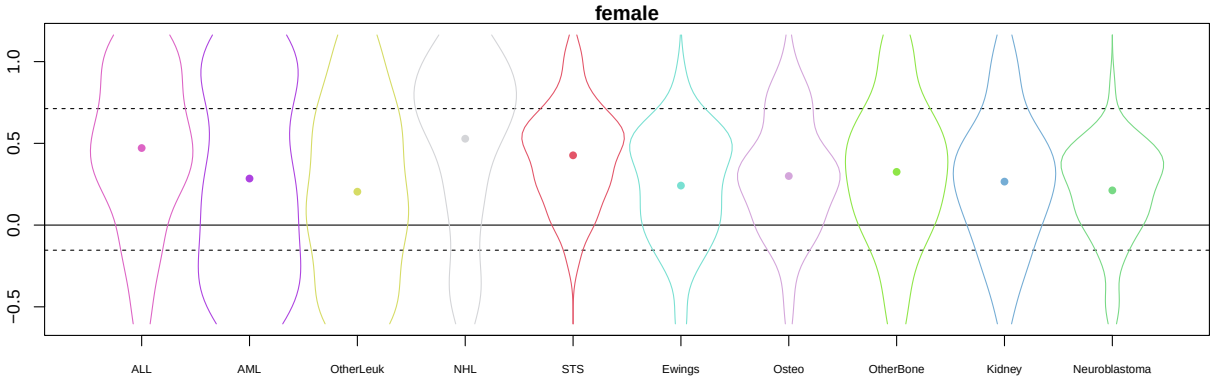
5.4.2.5 Other

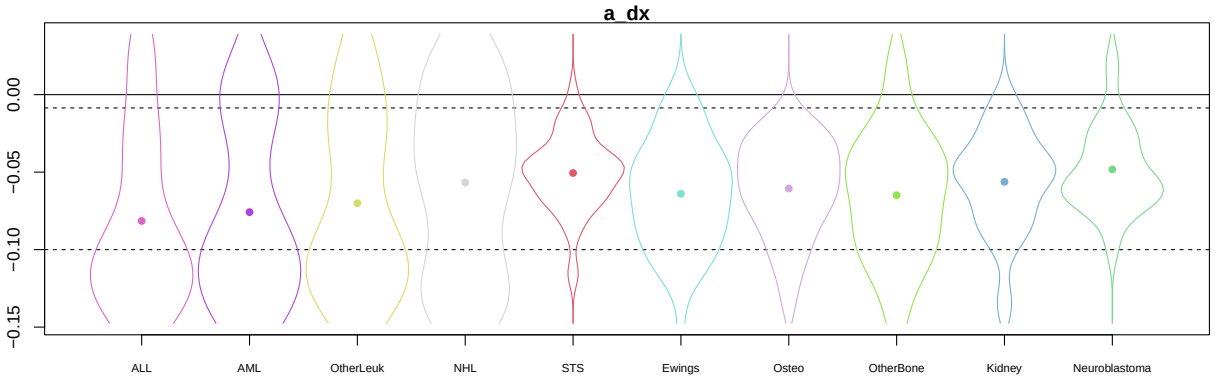
Other - Hodgkins Lymphoma

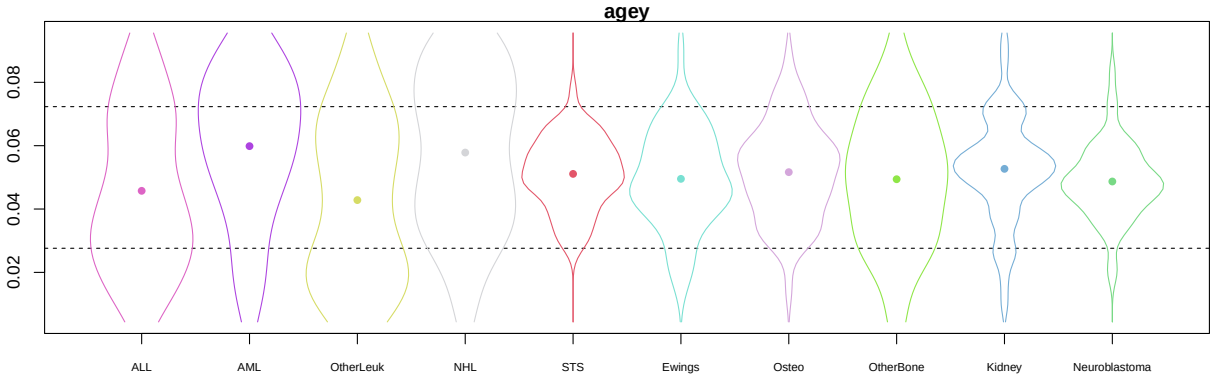


Other - NOT Hodgkins or CNS






a_dx
0.00
−0.05
−0.10
−0.15
ALL
AML
OtherLeuk
NHL
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma


agey
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0.02
ALL
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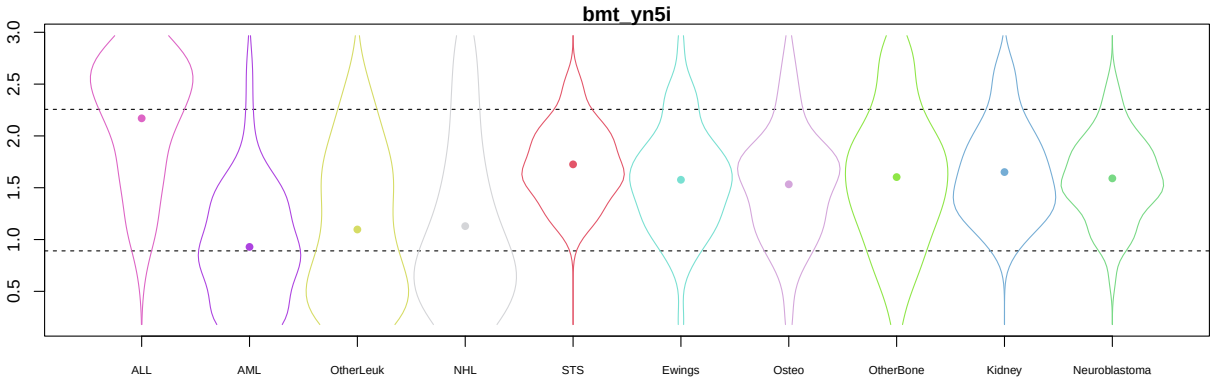
OtherLeuk
NHL
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma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2.5
2.0
1.5
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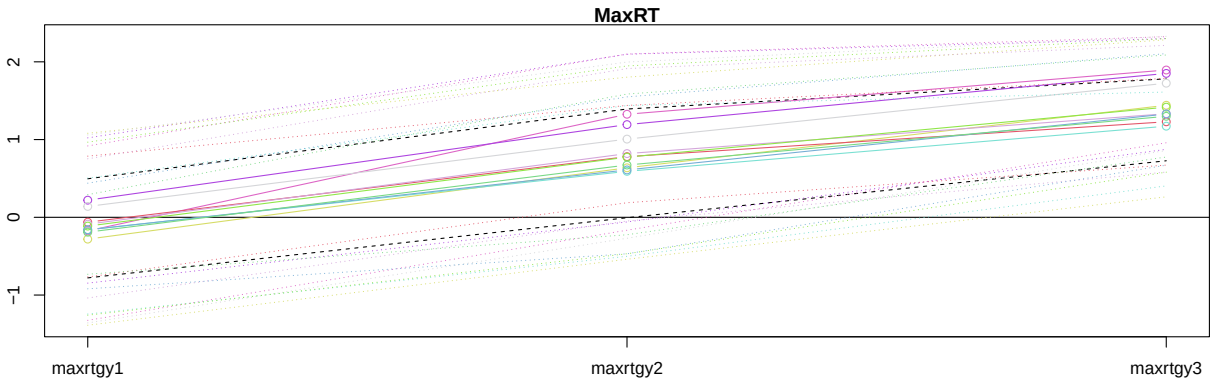
0.5
ALL
AML
OtherLeuk
NHL
STS
Ewings
Osteo
OtherBone
Kidney
Neuroblastoma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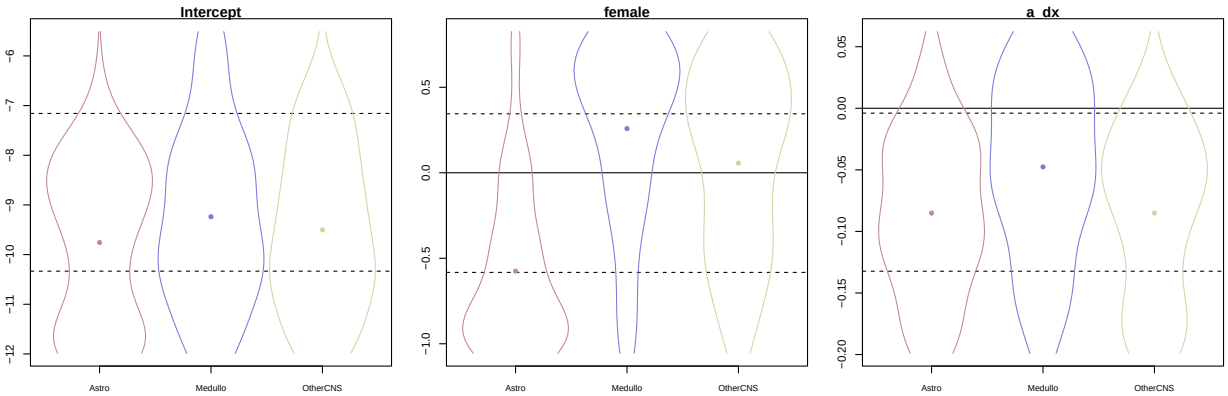
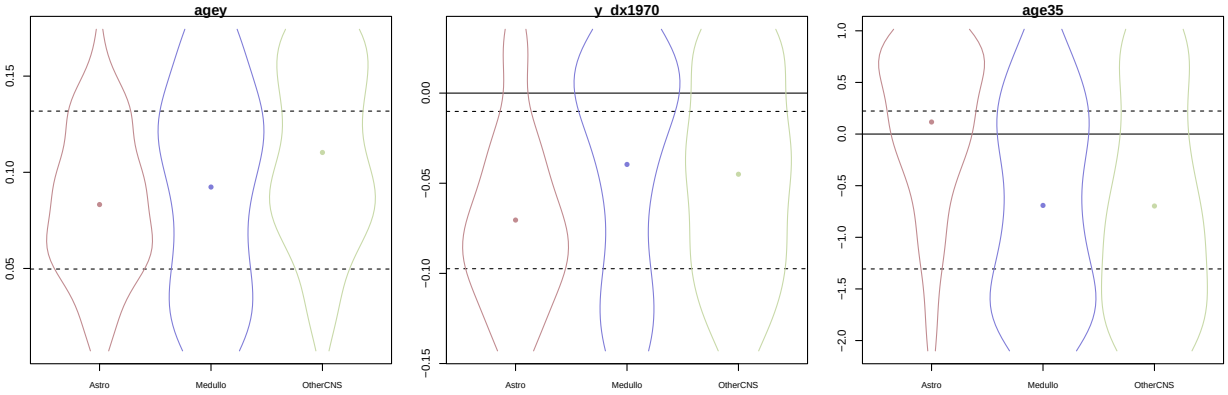
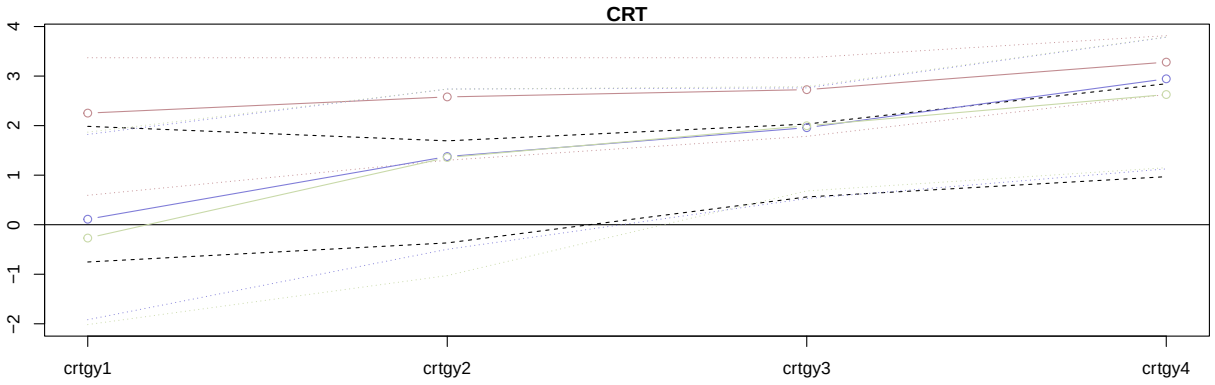
1
0
−1
maxrtgy1
maxrtgy2
maxrtgy3

Other - CNS

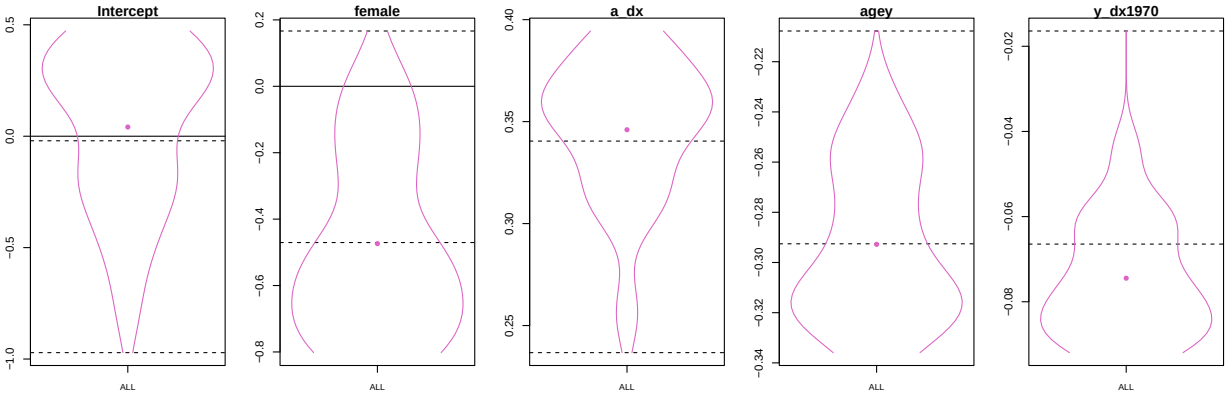

Intercept
female
a_dx
Astro
Medullo
OtherCNS


agey
y_dx1970
age35
Astro
Medullo
OtherCNS

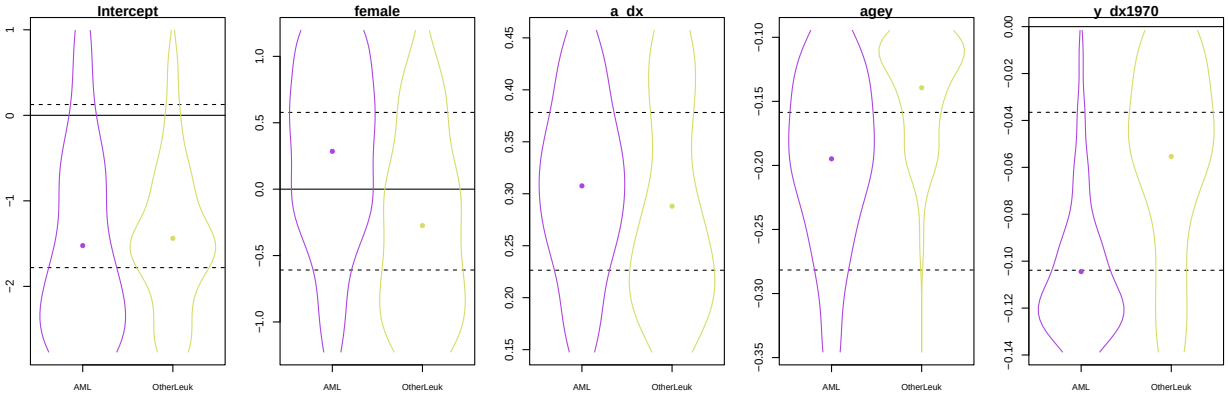

CRT
crtgy1
crtgy2
crtgy3
crtgy4

5.4.3 Late Recurrence Mortality

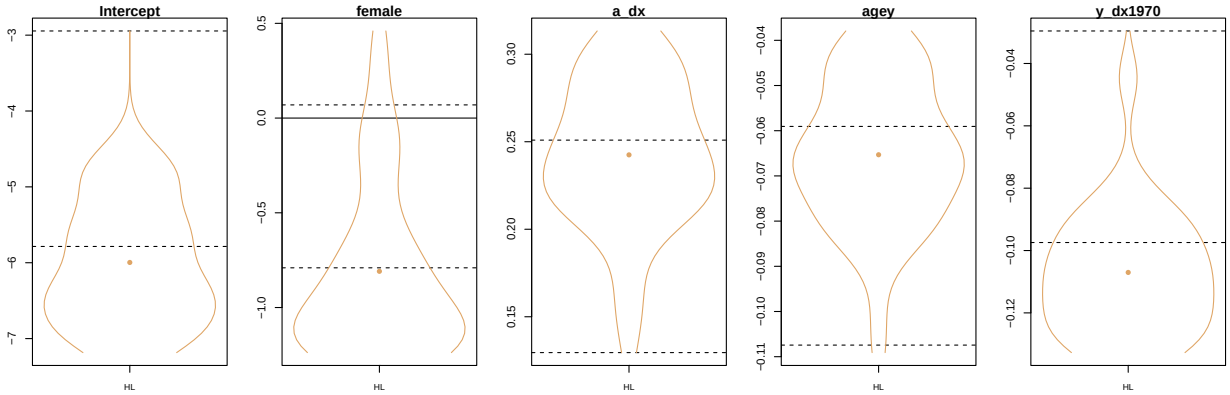
5.4.3.1 Late Recurrence - ALL

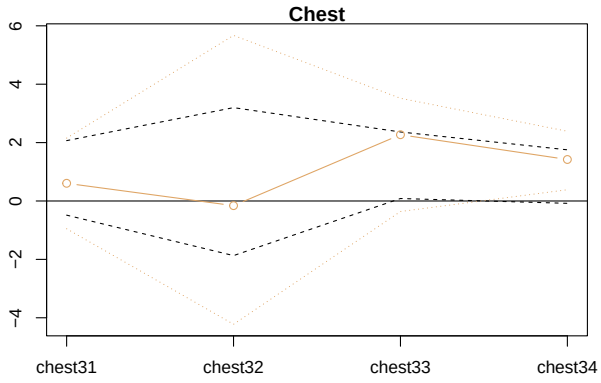


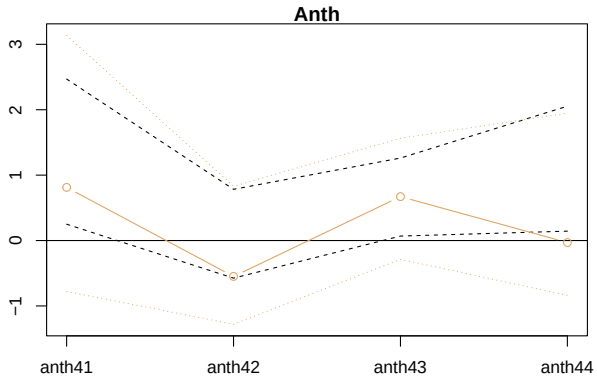
5.4.3.2 Late Recurrence - AML + Other Leuk

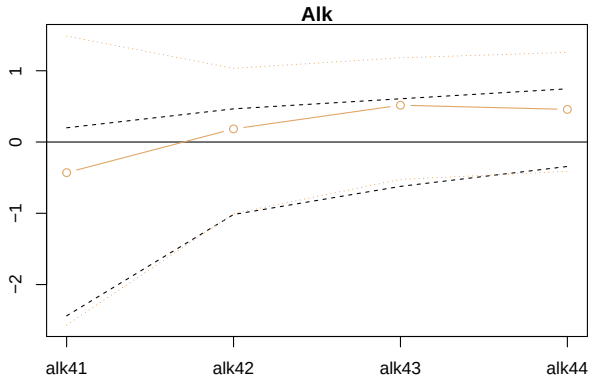


5.4.3.3 Late Recurrence - HL

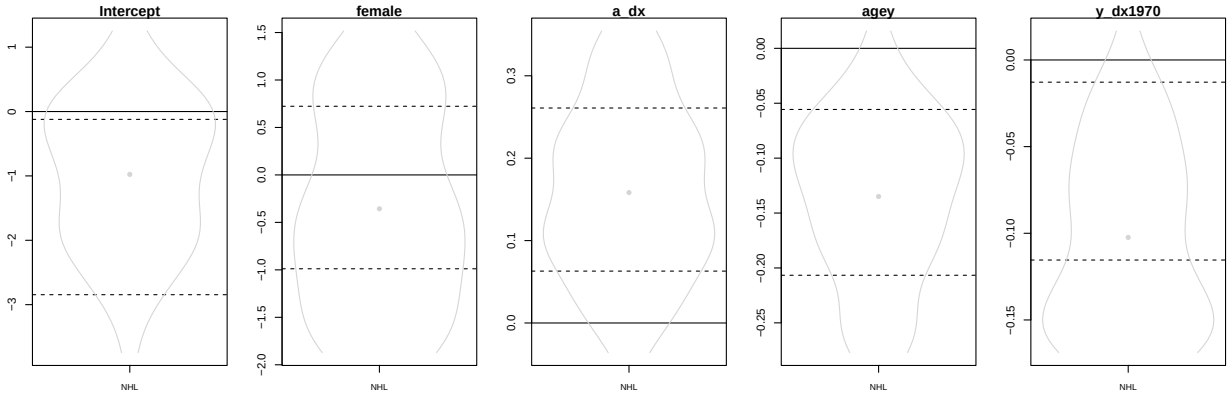




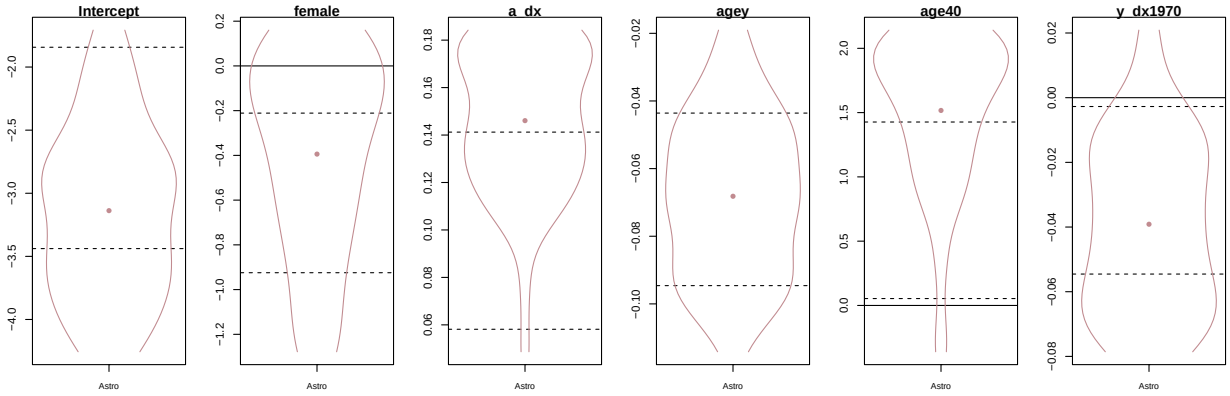


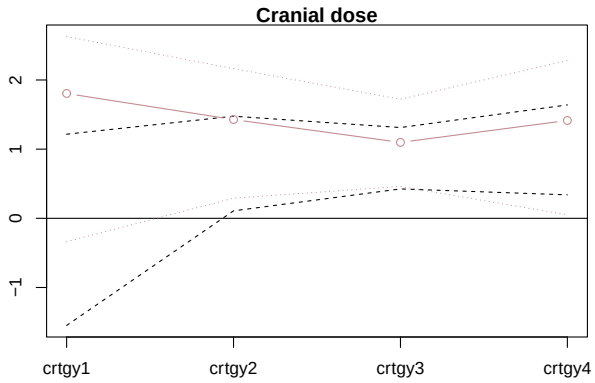


5.4.3.4 Late Recurrence - NHL

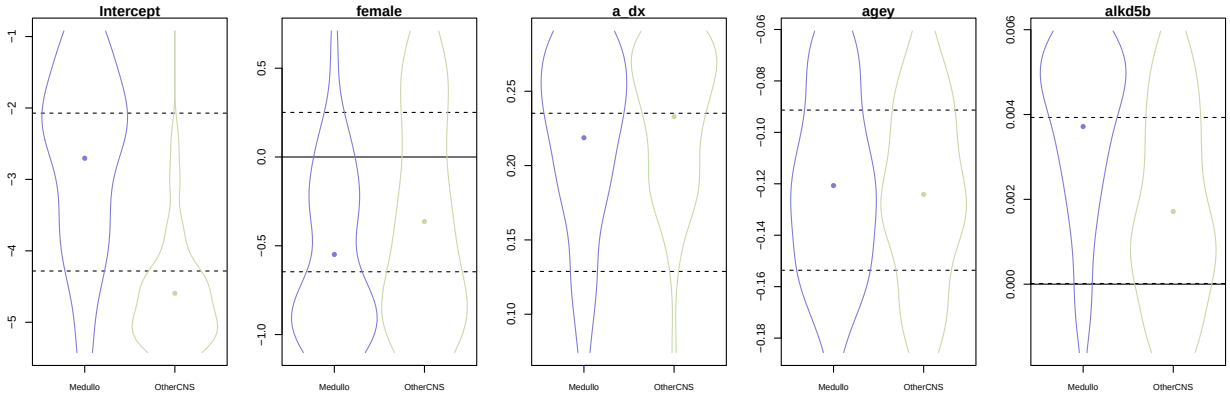


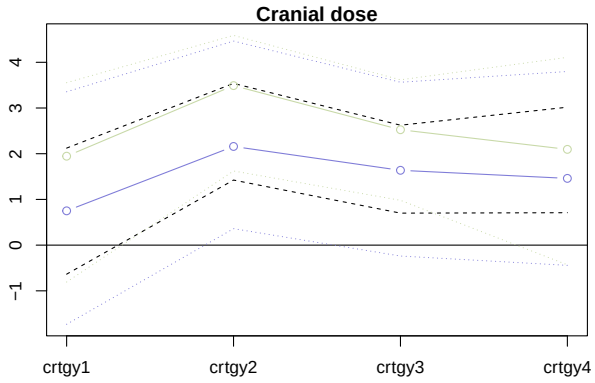
5.4.3.5 Late Recurrence - Astrocytoma



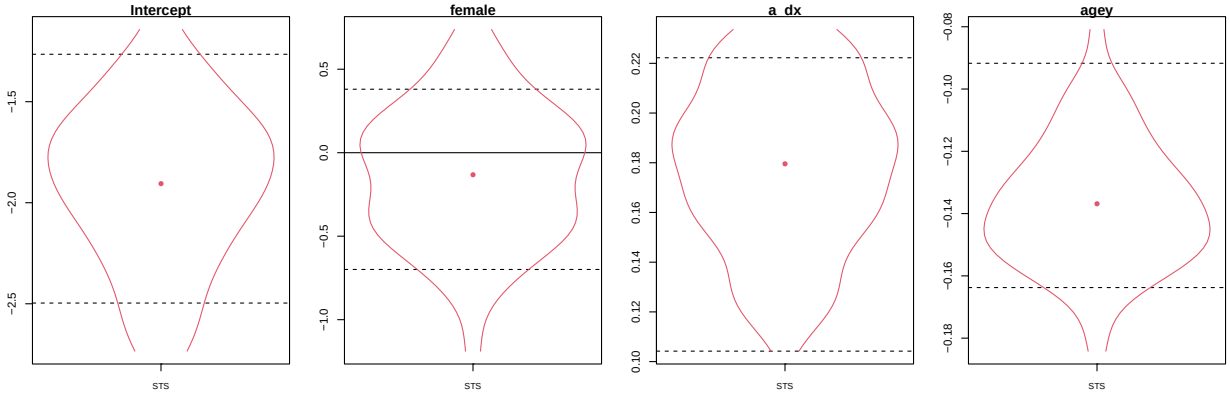


5.4.3.6 Late Recurrence - Other CNS

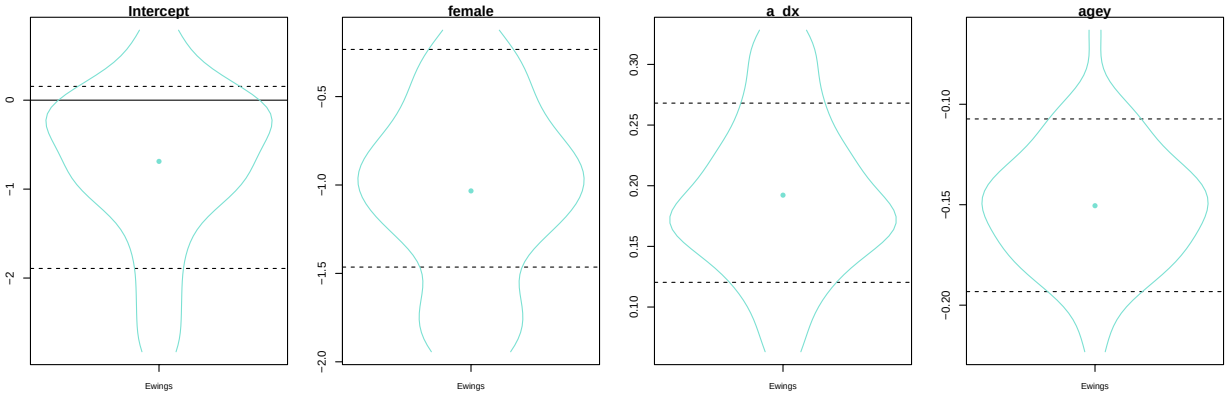




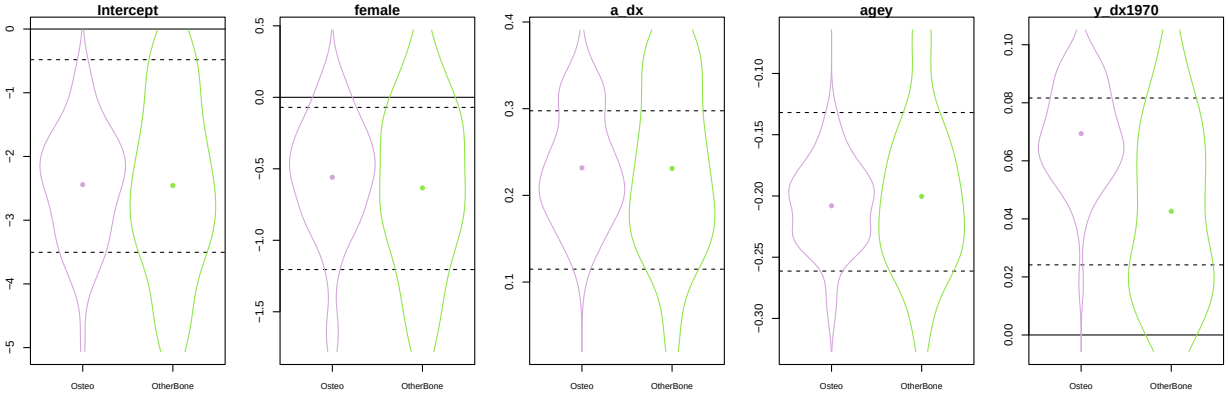
5.4.3.7 Late Recurrence - STS



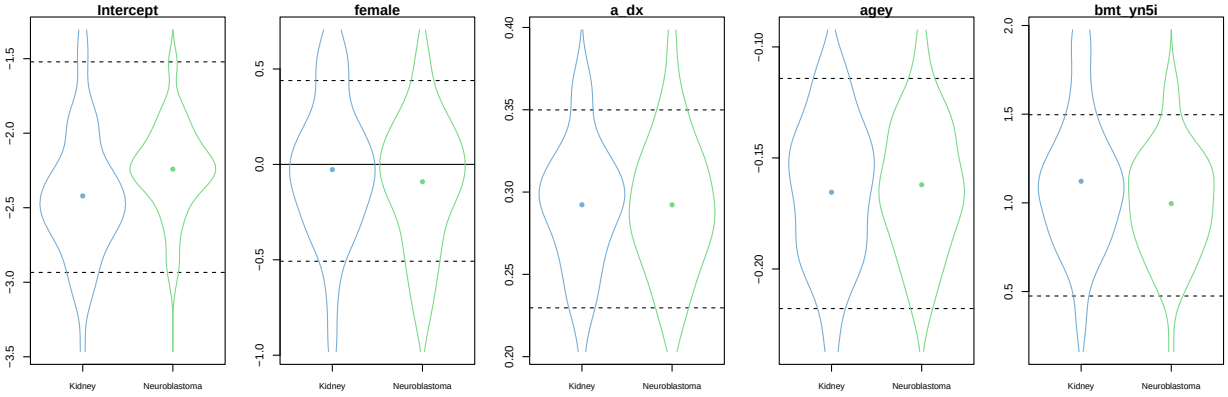
5.4.3.8 Late Recurrence - Ewings



5.4.3.9 Late Recurrence - Other Bone

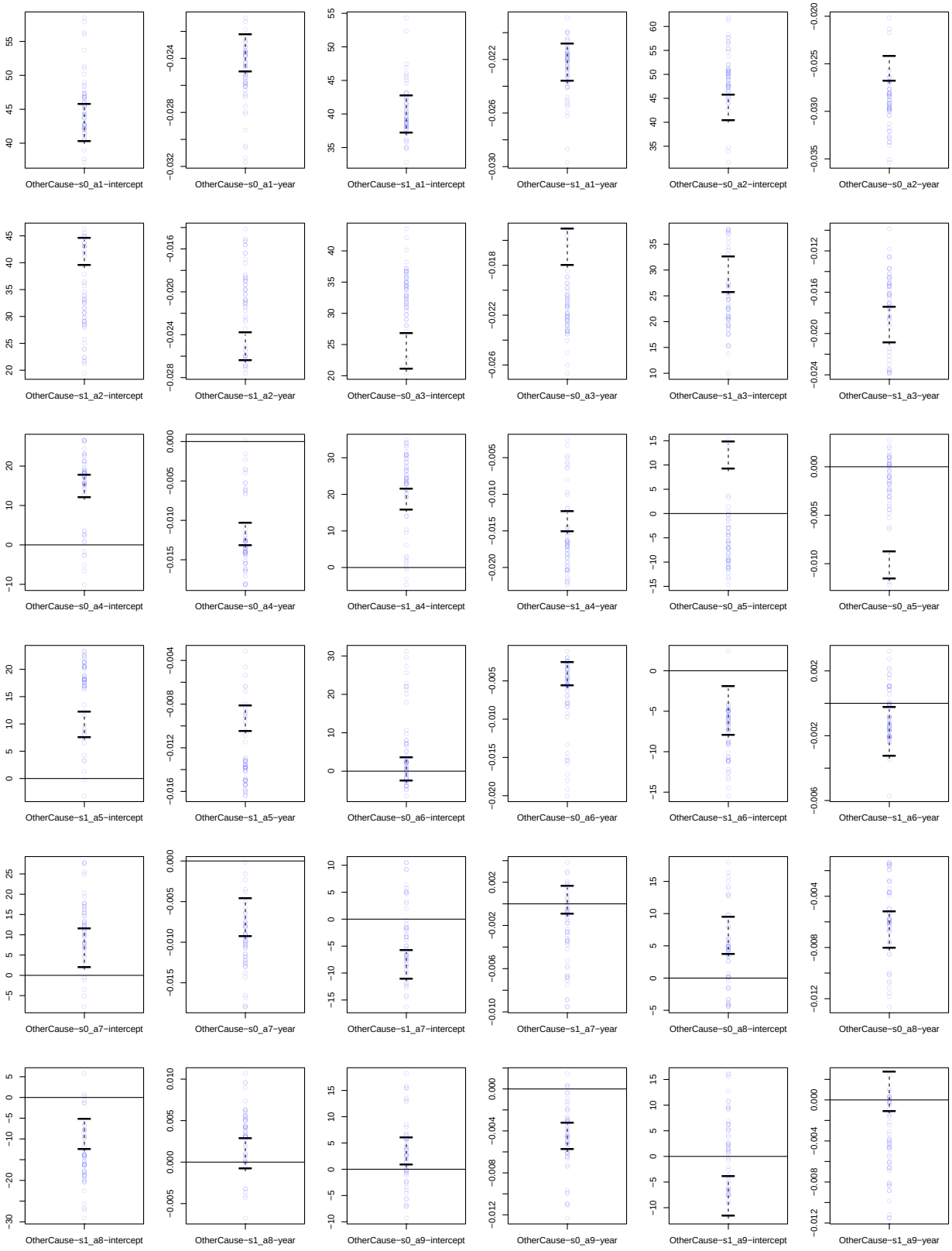


5.4.3.10 Late Recurrence - Solid



5.4.4 Background Mortality

Background mortality rates (per 1,000) were modelled by cause (Other Cause, Other Neoplasm, Infections, External) by sex (s0=Male, s1=Female) and age group (a1=<1 year, a2=1-4 years, a3=10-14 years, a4=15-19 years, a5=20-24 years, a6=25-34 years, a7=35-44 years, a8=45-54 years, a9=55-64 years, a10=65-74 years, a11=75-84 years, a12=85+ years). Secular trends in background mortality rates were modelled using a linear form: intercept+year*y.


OtherCause−s0_a1−intercept
OtherCause−s0_a1−year
OtherCause−s1_a1−intercept
OtherCause−s1_a1−year
OtherCause−s0_a2−intercept
OtherCause−s0_a2−year
OtherCause−s1_a2−intercept
OtherCause−s1_a2−year
OtherCause−s0_a3−intercept
OtherCause−s0_a3−year
OtherCause−s1_a3−intercept
OtherCause−s1_a3−year
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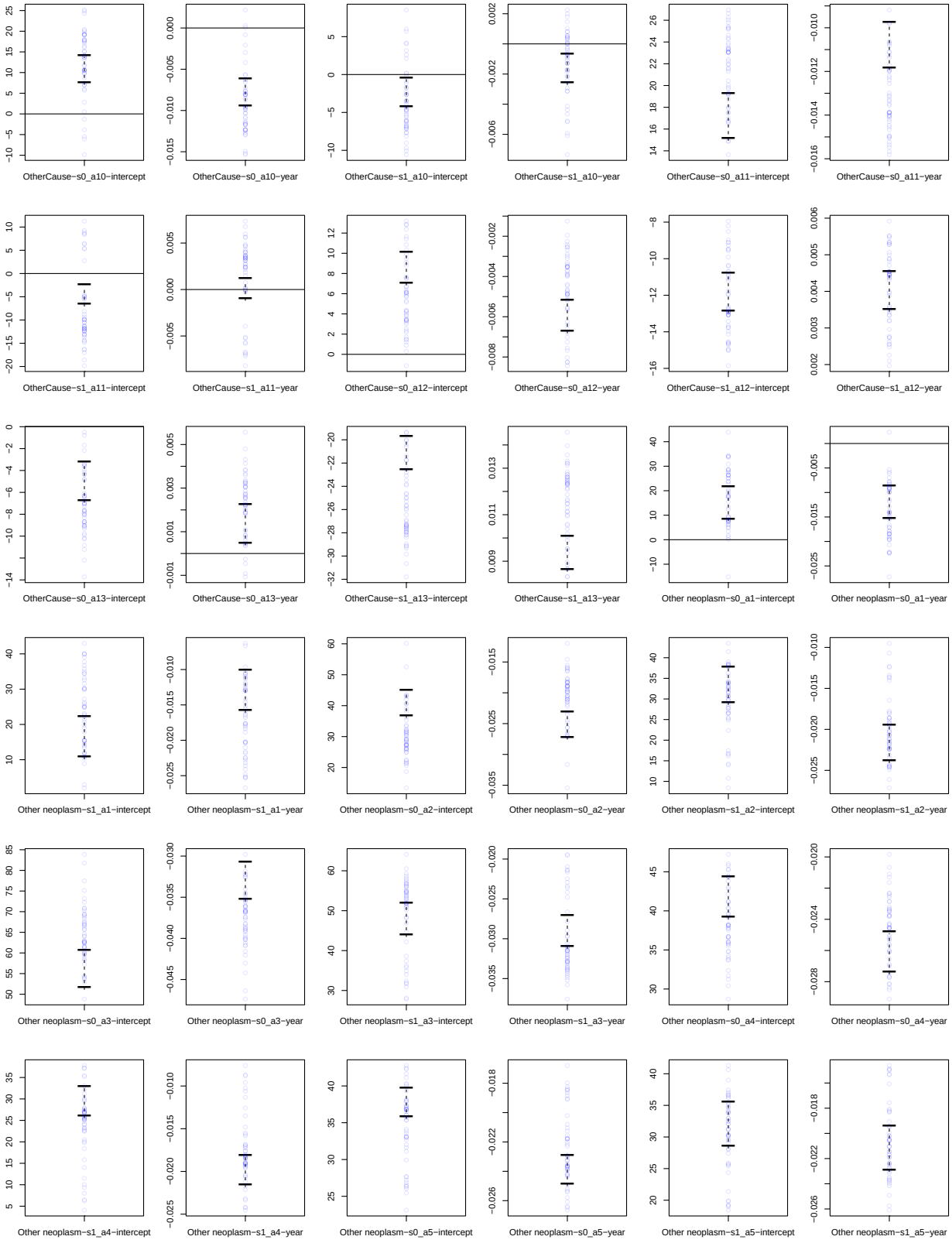
OtherCause−s1_a7−year
OtherCause−s0_a8−intercept
OtherCause−s0_a8−year
OtherCause−s1_a8−intercept
OtherCause−s1_a8−year
OtherCause−s0_a9−intercept
OtherCause−s0_a9−year
OtherCause−s1_a9−intercept
OtherCause−s1_a9−year


OtherCause−s0_a10−intercept
OtherCause−s0_a10−year
OtherCause−s1_a10−intercept
OtherCause−s1_a10−year
OtherCause−s0_a11−intercept
OtherCause−s0_a11−year
OtherCause−s1_a11−intercept
OtherCause−s1_a11−year
OtherCause−s0_a12−intercept
OtherCause−s0_a12−year
OtherCause−s1_a12−intercept
OtherCause−s1_a12−year
OtherCause−s0_a13−intercept
OtherCause−s0_a13−year
OtherCause−s1_a13−intercept
OtherCause−s1_a13−year
Other neoplasm−s0_a1−intercept
Other neoplasm−s0_a1−year
Other neoplasm−s1_a1−intercept
Other neoplasm−s1_a1−year
Other neoplasm−s0_a2−intercept
Other neoplasm−s0_a2−year
Other neoplasm−s1_a2−intercept
Other neoplasm−s1_a2−year
Other neoplasm−s0_a3−intercept
Other neoplasm−s0_a3−year
Other neoplasm−s1_a3−intercept
Other neoplasm−s1_a3−year
Other neoplasm−s0_a4−intercept
Other neoplasm−s0_a4−year
Other neoplasm−s1_a4−intercept
Other neoplasm−s1_a4−year
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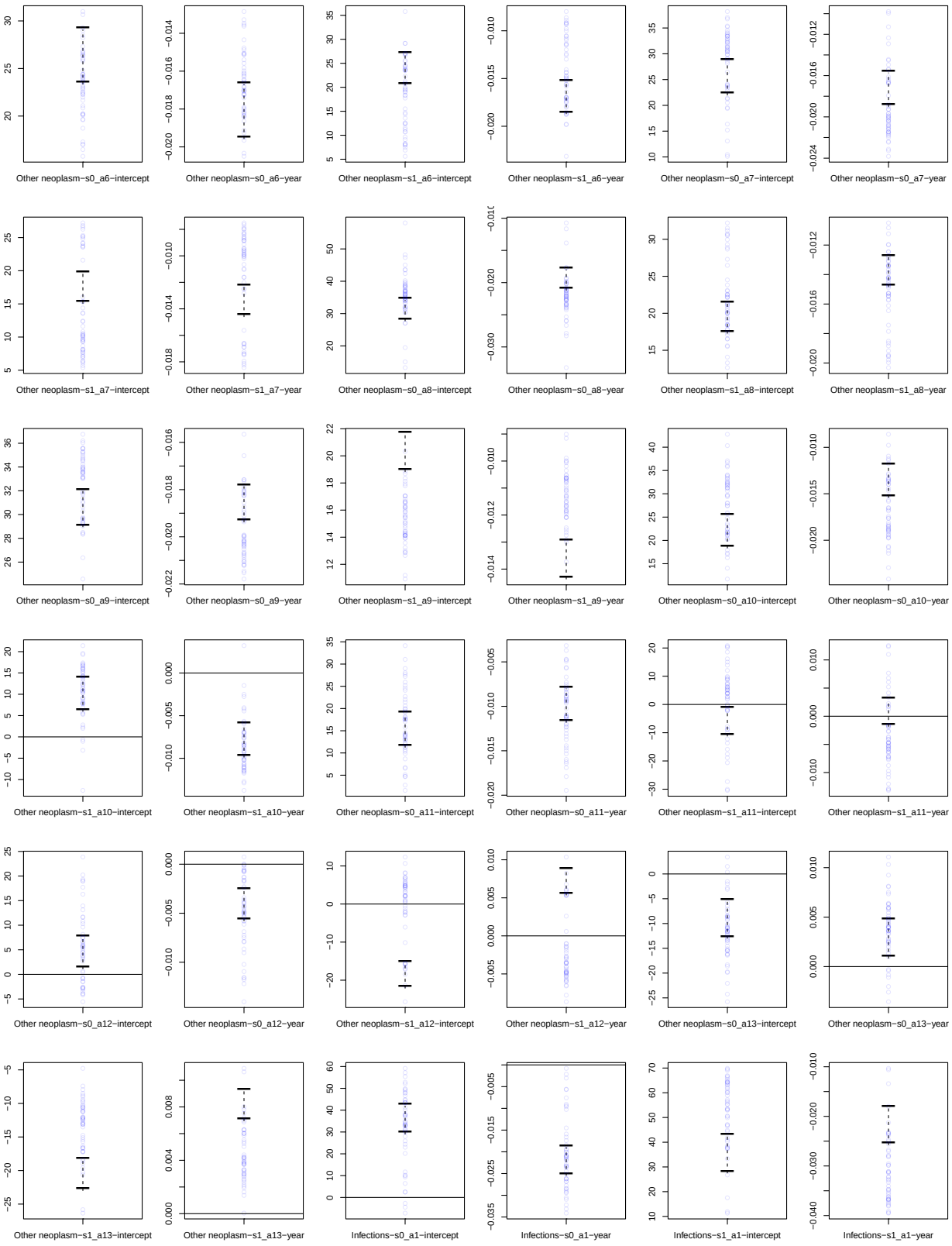
Other neoplasm−s0_a5−year
Other neoplasm−s1_a5−intercept
Other neoplasm−s1_a5−year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Other neoplasm−s0_a6−year
Other neoplasm−s1_a6−intercept
Other neoplasm−s1_a6−year
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Other neoplasm−s0_a7−year
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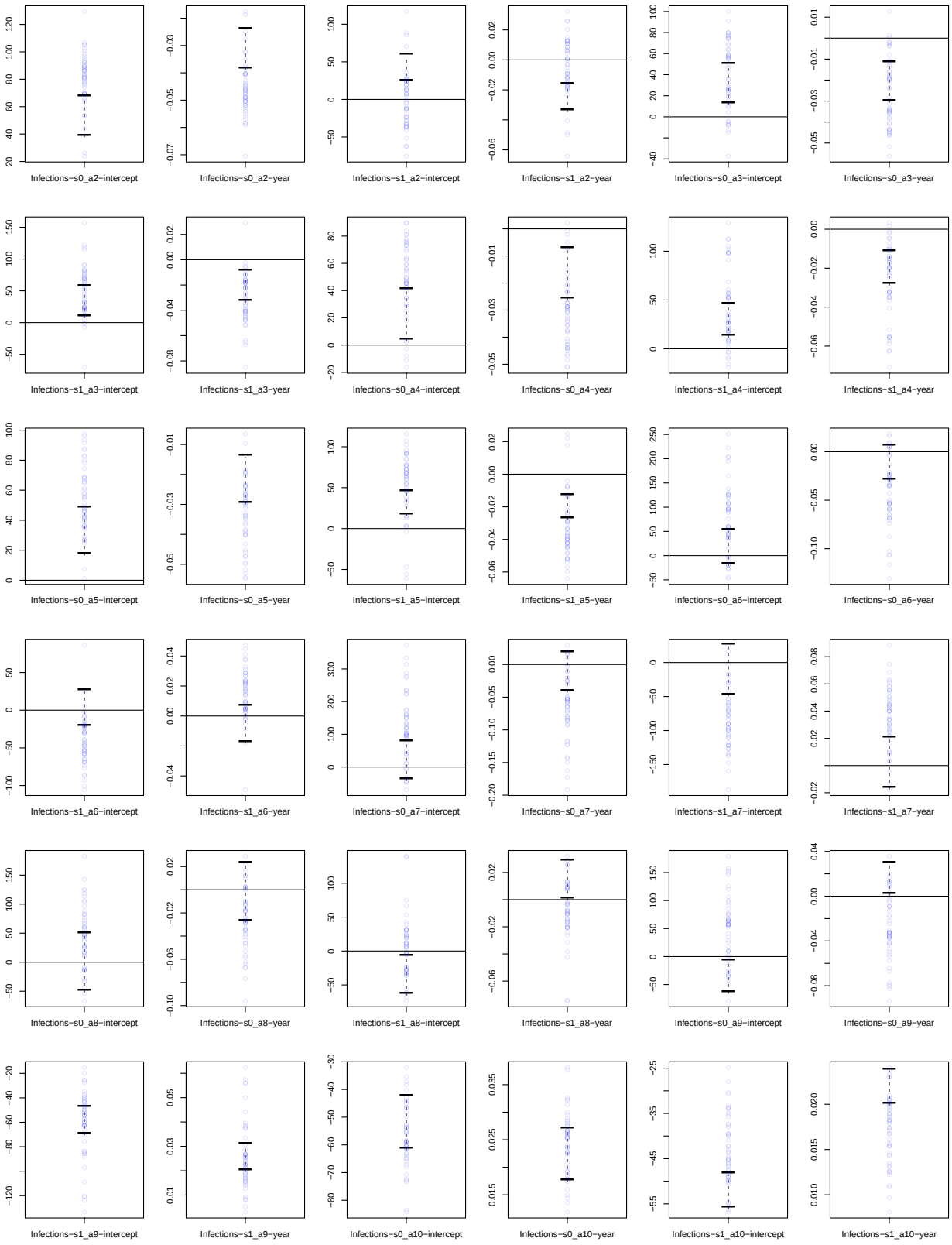
Other neoplasm−s1_a13−intercept
Other neoplasm−s1_a13−year
Infections−s0_a1−intercept
Infections−s0_a1−year
Infections−s1_a1−intercept
Infections−s1_a1−year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Infections~s0_a2~year
Infections~s1_a2~intercept
Infections~s1_a2~year
Infections~s0_a3~intercept
Infections~s0_a3~year
Infections~s1_a3~intercept
Infections~s1_a3~year
Infections~s0_a4~intercept
Infections~s0_a4~year
Infections~s1_a4~intercept
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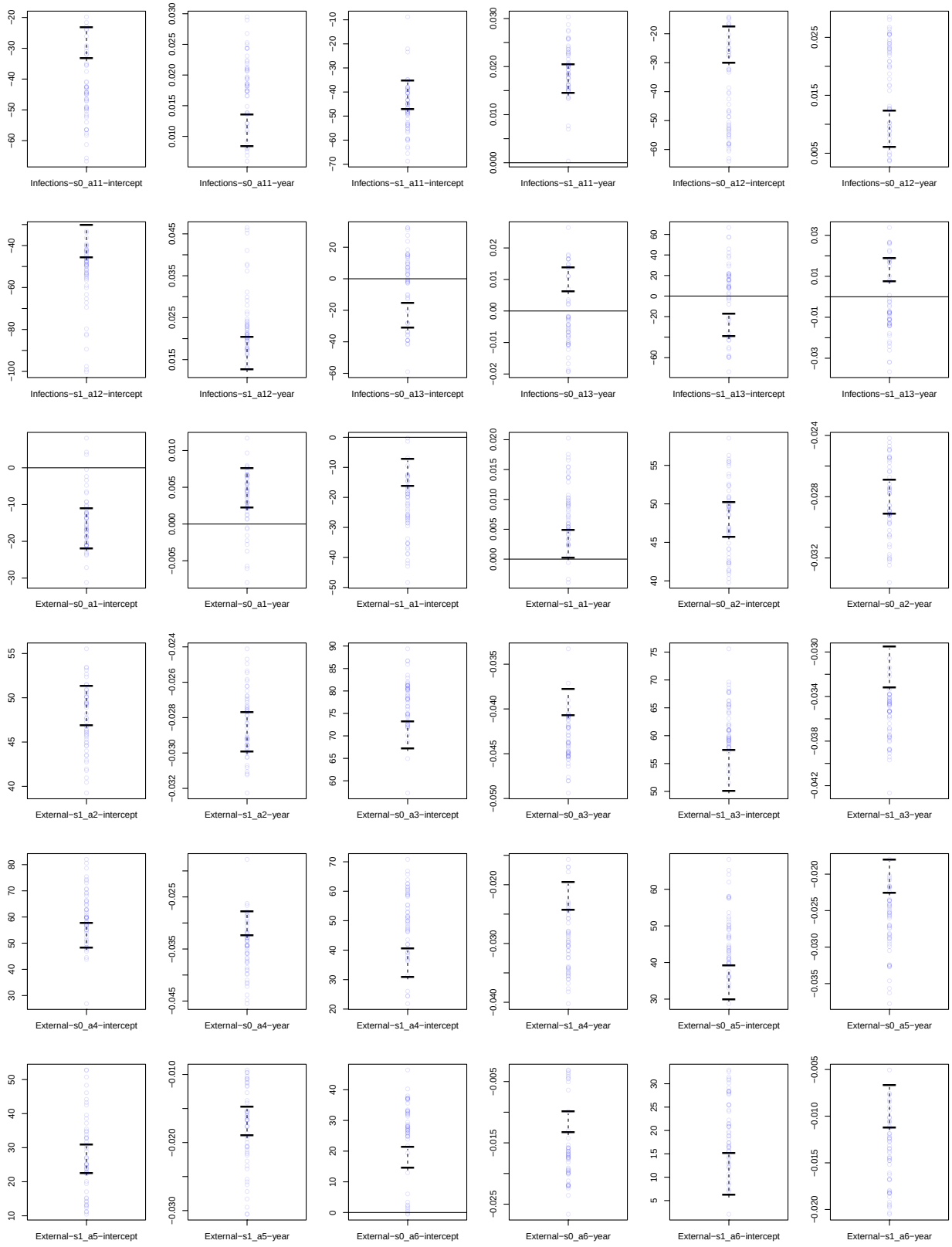
Infections~s0_a10~year
Infections~s1_a10~intercept
Infections~s1_a10~year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Infections−s0_a11−year
Infections−s1_a11−intercept
Infections−s1_a11−year
Infections−s0_a12−intercept
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Infections−s0_a13−year
Infections−s1_a13−intercept
Infections−s1_a13−year
External−s0_a1−intercept
External−s0_a1−year
External−s1_a1−intercept
External−s1_a1−year
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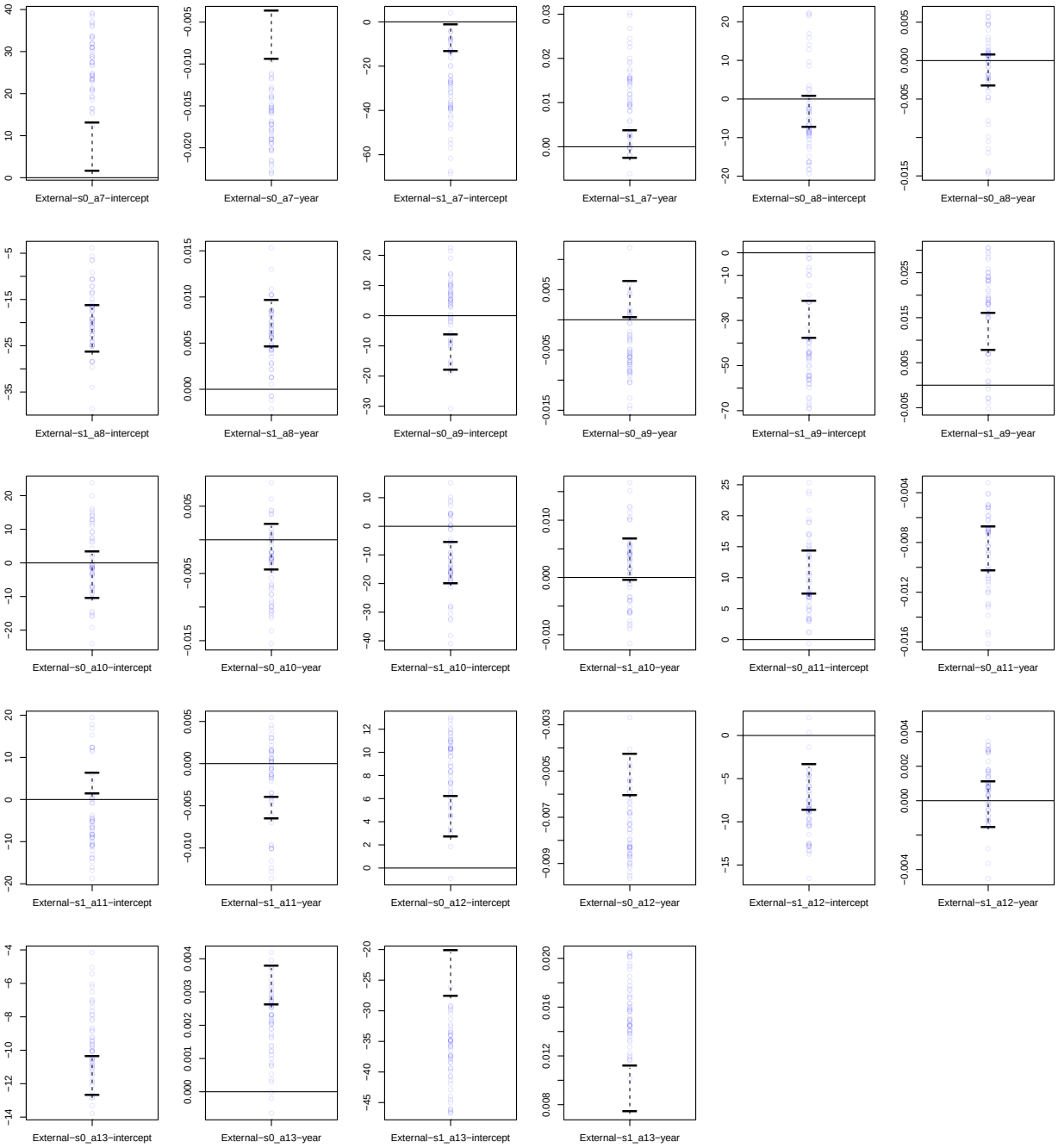
External−s0_a6−year
External−s1_a6−intercept
External−s1_a6−year


External−s0_a7−intercept
External−s0_a7−year
External−s1_a7−intercept
External−s1_a7−year
External−s0_a8−intercept
External−s0_a8−year
External−s1_a8−intercept
External−s1_a8−year
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External−s1_a12−intercept
External−s1_a12−year
External−s0_a13−intercept
External−s0_a13−year
External−s1_a13−intercept
External−s1_a13−year

6 Model Validation

To assess model validity of the calibrated model, we simulated 4,120 CCSS participants (3047 from St Jude, 1073 from Children's Hospital of Orange County, University of Chicago, Ann & Robert H. Lurie Children's Hospital of Chicago and Cook Children's Medical Center) who were not used to calibrate the model. The model produced outcomes that were consistent with observed data on late recurrence and i-CHCs risks, cause-specific mortality and overall survival using the same summary indicators as noted above. Coverage probabilities and mean predicted outcomes fell within the 95% CI of the observed data were similar to the training set used for model calibration.

6.1 Data

The following variables were used for all participants (n=4,120):

Variable	Min	25%	Median	Mean	75%	Max	Missing
SEX	0	0	0	0.47	1	1	0
fweight	1	1	1	1.44	1	3.6	0
a_dx	0	3	6	7.31	12	20	0
anthd5	0	0	50.909	104.76	174.2965	1,185	126
ptd5	0	0	0	80	0	6,308	30
cispd5	0	0	0	28.76	0	6,308	19
procd5	0	0	0	331.74	0	15,268	13
crtd	0	0	20	900.87	1800	12,600	94
chestd	0	0	20	589.52	200	8,500	94
heartd	0	0	0.9	453.92	97	4,990	118
abdpel	0	0	20	602.32	200	7,000	94
anth1	0	0	1	0.5	1	1	126
maxrtgy	0	0	0	15.21	24	126	97
bmt_yn5i	0	0	0	0.07	0	1	0
alk1	0	0	0	0.3	1	1	176
alk2	0	0	0	0.27	1	1	176
yearDx	1970	1984	1991	1989.09	1995	1,999	0
recurei	0	0	0	0.08	0	1	10
chemo	0	1	1	0.89	1	1	33
rad	0	0	1	0.51	1	1	27
surg	0	0	1	0.68	1	1	37

The following variables were used for female participants only (n = 1,938):

Variable	Min	25%	Median	Mean	75%	Max	Missing
minovar	0	0	0	173.47	10	6,610	69
ovar1	0	0	0	0.41	1	1	69
ovar2	0	0	0	0.06	0	1	69
ovar3	0	0	0	0.02	0	1	69
fldchest1	0	0	0	0.27	1	1	39
fldchest2	0	0	0	0.05	0	1	39
fldchest4	0	0	0	0.06	0	1	39
fldchest5	0	0	0	0.03	0	1	39
fldchest6	0	0	0	0	0	0	39
fldchest7	0	0	0	0.01	0	1	39
fldchest8	0	0	0	0.07	0	1	39

The following variables were used for ALL participants only (n = 1,560):

Variable	Min	25%	Median	Mean	75%	Max	Missing
maxsegrtdose	0	0	0	947.37	1800	4,800	32
dexa5	0	0	0	0.24	0	1	17
cyta_risk	1	1	1	1.18	1	2	23
cyclodose5	0	0	1025.641026	4146.5	8373.5587585	30,336	13

6.2 Patient Characteristics and Treatment Exposures

CCSS data used for model validation

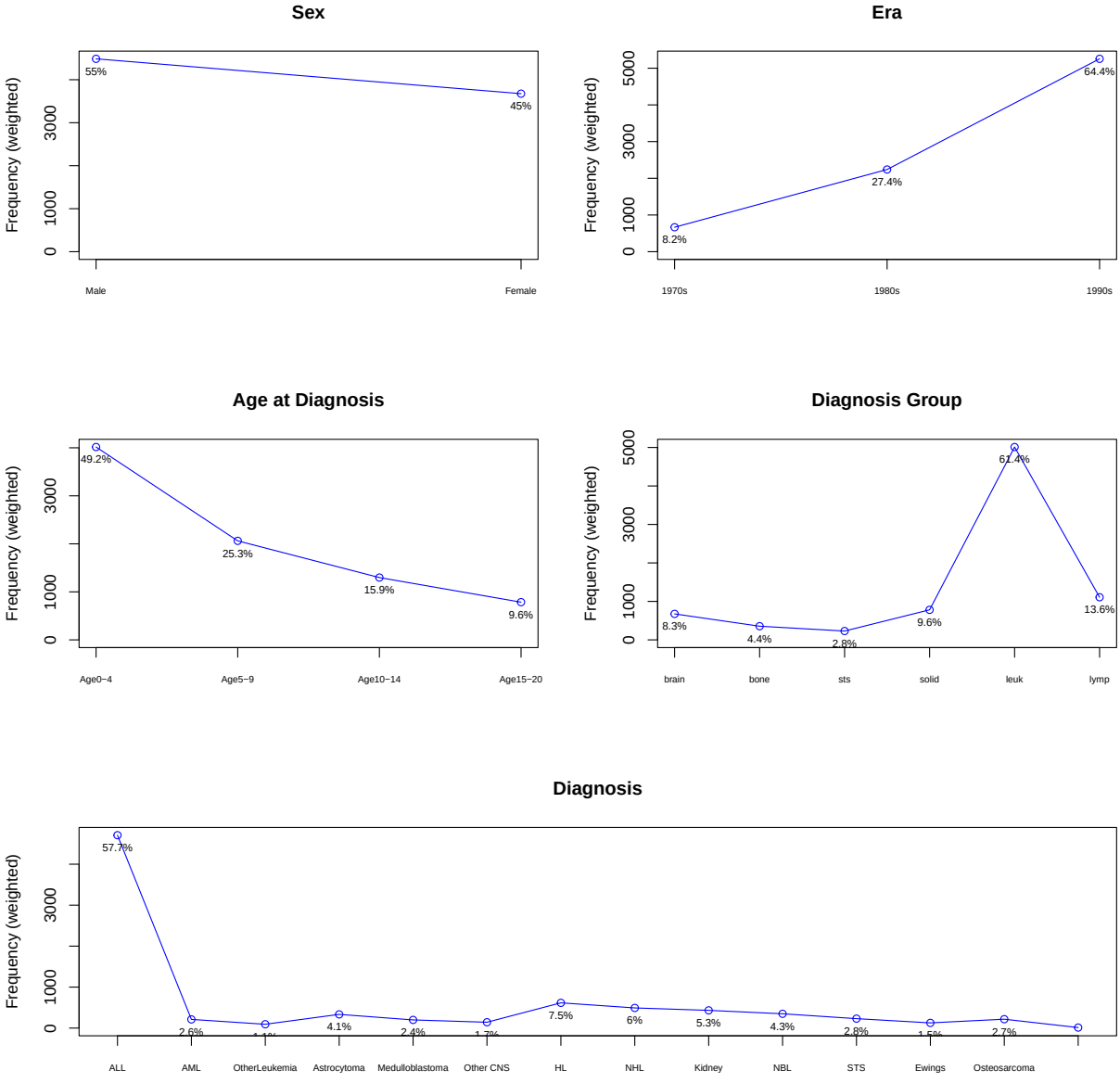
Characteristic	Overall	1970s	1980s	1990s
Total	4120 (100%)	546 (8.2%)	1354 (27.4%)	2220 (64.4%)
Males	2182 (55.0%)	287 (53.9%)	705 (52.7%)	1190 (56.0%)
Females	1938 (45.0%)	259 (46.1%)	649 (47.3%)	1030 (44.0%)
Age at diagnosis				
0-4 years	1732 (49.2%)	236 (43.4%)	615 (50.6%)	881 (49.4%)
5-9 years	951 (25.3%)	121 (22.0%)	284 (21.7%)	546 (27.2%)
10-14 years	858 (15.9%)	112 (20.5%)	267 (16.5%)	479 (15.0%)
15-20 years	559 (9.3%)	72 (13.2%)	182 (10.9%)	305 (8.1%)
Missing age	20 (0.3%)	5 (0.9%)	6 (0.3%)	9 (0.3%)
Mean age, years	7.3 (0-20)	7.3 (0-20)	7.0 (0-20)	7.5 (0-20)
Diagnosis				
Acute lymphoblastic leukemia	1560 (57.7%)	241 (43.8%)	548 (53.8%)	771 (61.1%)
Acute myeloid leukemia	158 (2.6%)	15 (2.7%)	44 (2.4%)	99 (2.7%)
Other leukemia	59 (1.1%)	3 (0.5%)	18 (1.6%)	38 (1.0%)
Hodgkin lymphoma	473 (7.5%)	83 (15.3%)	147 (8.0%)	243 (6.3%)
Non-Hodgkin lymphoma	361 (6.0%)	44 (8.0%)	140 (8.0%)	177 (4.9%)
Astrocytoma	252 (4.1%)	1 (0.2%)	48 (2.9%)	203 (5.1%)
Medulloblastoma or PNET	145 (2.4%)	2 (0.4%)	30 (1.7%)	113 (3.0%)
Other CNS	108 (1.7%)	2 (0.4%)	10 (0.5%)	96 (2.4%)
Wilms' tumor	319 (5.3%)	38 (6.9%)	118 (6.8%)	163 (4.4%)
Neuroblastoma	252 (4.3%)	34 (6.3%)	85 (4.8%)	133 (3.8%)
Rhabdomyosarcoma	174 (2.8%)	38 (7.0%)	70 (4.0%)	66 (1.8%)
Ewing's sarcoma	90 (1.5%)	23 (4.4%)	41 (2.3%)	26 (0.9%)
Osteosarcoma	164 (2.7%)	22 (4.0%)	55 (3.1%)	87 (2.3%)
Other bone tumor	5 (0.2%)	0 (0.0%)	0 (0.0%)	5 (0.2%)
Follow-up, years since diagnosis				
Mean (range)	22.7 (5.0-46.3)	32.2 (5.0-46.3)	25.3 (5.1-36.4)	18.8 (5.1-27.3)
Attained age, years				
Mean (range)	30.0 (6.0-61.0)	39.5 (6.0-61.0)	32.4 (6.0-55.0)	26. (6.0-45.0)
Radiation				
Any	2093 (40.8%)	460 (81.1%)	753 (52.3%)	880 (30.3%)
None	2000 (58.3%)	85 (14.9%)	596 (47.0%)	1319 (68.5%)
Missing	27 (1.0%)	1 (0.2%)	5 (0.7%)	21 (1.2%)
Cranial RT				
None	2000 (58.3%)	85 (15.5%)	596 (47.0%)	1319 (68.5%)
<20 Gy	1261 (25.4%)	182 (33.5%)	523 (37.1%)	556 (19.4%)
20+ Gy	765 (13.6%)	272 (59.7%)	209 (13.0%)	284 (9.3%)
Missing	94 (2.7%)	7 (1.4%)	26 (3.0%)	61 (2.8%)
Chest RT				
None	2000 (58.3%)	85 (15.5%)	596 (47.0%)	1319 (68.5%)
<10 Gy	1122 (22.6%)	307 (56.0%)	451 (32.6%)	364 (14.1%)
10-19 Gy	274 (6.5%)	8 (1.5%)	90 (7.2%)	176 (6.7%)
20-29 Gy	338 (5.2%)	57 (10.4%)	103 (5.6%)	178 (4.4%)
30+ Gy	292 (4.6%)	83 (15.4%)	88 (4.7%)	121 (3.2%)
Missing	94 (2.8%)	6 (1.2%)	26 (3.0%)	62 (3.0%)
Heart RT				
None	1992 (58.0%)	85 (15.5%)	596 (47.0%)	1311 (68.1%)
<5 Gy	82 (1.9%)	3 (0.5%)	37 (2.3%)	42 (1.9%)
5-14 Gy	313 (7.6%)	9 (1.6%)	174 (14.0%)	130 (5.6%)

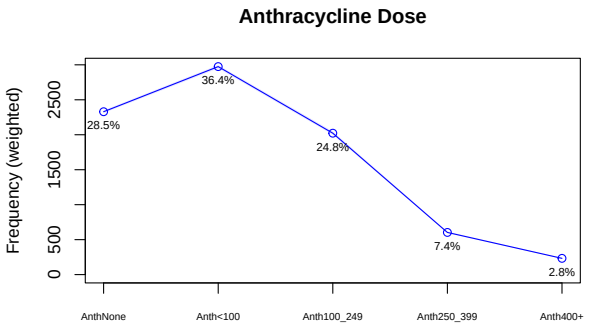
Characteristic	Overall	1970s	1980s	1990s
15-34 Gy	345 (6.6%)	91 (16.4%)	162 (11.8%)	92 (3.1%)
35+ Gy	1270 (22.5%)	350 (64.5%)	356 (21.6%)	564 (17.5%)
Missing	118 (3.4%)	8 (1.5%)	29 (3.3%)	81 (3.7%)
Ovarian RT				
None	955 (27.2%)	38 (6.7%)	295 (23.4%)	622 (31.3%)
<10 Gy	762 (13.6%)	192 (34.2%)	285 (19.2%)	285 (8.6%)
10-19 Gy	108 (2.1%)	6 (1.1%)	41 (2.9%)	61 (1.9%)
20+ Gy	38 (0.6%)	21 (3.8%)	6 (0.3%)	11 (0.3%)
Missing	2251 (56.5%)	289 (54.3%)	721 (54.0%)	1241 (57.8%)
Abdominal/pelvic RT				
None	2000 (58.3%)	85 (15.5%)	596 (47.0%)	1319 (68.5%)
<15 Gy	1333 (27.2%)	277 (50.6%)	484 (35.4%)	572 (20.7%)
15-24 Gy	290 (5.3%)	55 (10.1%)	129 (8.0%)	106 (3.5%)
25-34 Gy	123 (1.9%)	53 (19.6%)	22 (1.2%)	48 (1.2%)
35+ Gy	280 (4.5%)	70 (13.1%)	97 (5.4%)	113 (3.1%)
Missing	94 (2.9%)	6 (1.2%)	26 (3.0%)	62 (3.0%)
Max RT				
None	2014 (58.9%)	86 (15.7%)	599 (47.1%)	1329 (69.3%)
<20 Gy	546 (13.5%)	20 (3.6%)	276 (23.7%)	250 (10.5%)
20-29 Gy	700 (12.1%)	243 (44.1%)	218 (12.7%)	239 (7.8%)
30+ Gy	763 (12.6%)	190 (35.3%)	235 (13.5%)	338 (9.3%)
Missing	97 (2.9%)	7 (1.4%)	26 (3.0%)	64 (3.1%)
Anthracycline dose				
None	1462 (27.7%)	261 (47.8%)	478 (30.2%)	723 (24.1%)
<250 mg/m2	1999 (59.2%)	163 (39.7%)	630 (53.6%)	1206 (65.3%)
250+ mg/m2	533 (9.8%)	94 (17.4%)	206 (12.7%)	233 (7.6%)
Missing	126 (3.4%)	28 (5.2%)	40 (3.5%)	58 (3.1%)
Alkylator dose, CED				
None	1667 (39.8%)	177 (32.2%)	509 (40.7%)	981 (40.4%)
<8000 mg/m2	1199 (31.7%)	134 (24.4%)	408 (26.5%)	657 (34.9%)
8000+ mg/m2	1078 (24.2%)	196 (36.1%)	369 (27.6%)	513 (21.1%)
Missing	176 (4.3%)	39 (7.3%)	68 (5.2%)	69 (3.5%)
Platinum dose				
None	3610 (91.3%)	542 (99.2%)	1223 (92.5%)	1845 (89.8%)
<400 mg/m2	178 (2.9%)	1 (0.2%)	56 (3.2%)	121 (3.1%)
400+ mg/m2	302 (5.2%)	1 (0.2%)	63 (3.5%)	238 (6.6%)
Missing	30 (0.6%)	2 (0.4%)	12 (0.8%)	16 (0.5%)
Cisplatin dose				
None	3814 (94.8%)	542 (99.2%)	1230 (92.9%)	2042 (95.0%)
<400 mg/m2	163 (2.7%)	1 (0.2%)	58 (3.3%)	104 (2.7%)
400+ mg/m2	124 (2.1%)	1 (0.2%)	58 (3.2%)	65 (1.9%)
Missing	19 (0.4%)	2 (0.4%)	8 (0.5%)	9 (0.3%)
Bone marrow transplant	287 (100%)	0 (100%)	50 (100%)	237 (100%)

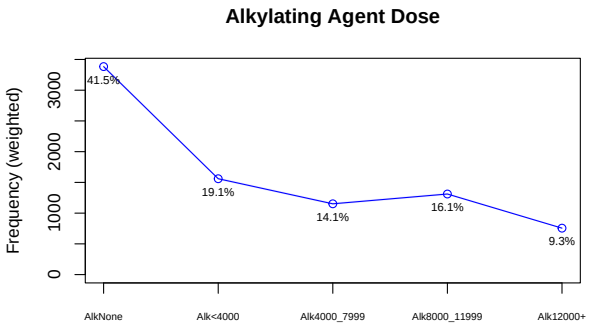
CED, cyclophosphamide equivalent dose; Gy, Gray; PNET, Primitive Neuro-Ectodermal Tumors; RT, radiotherapy

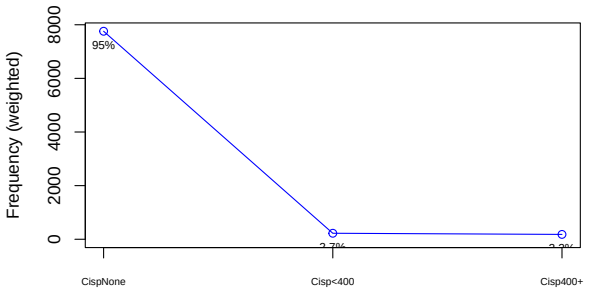
6.3 Subgroups

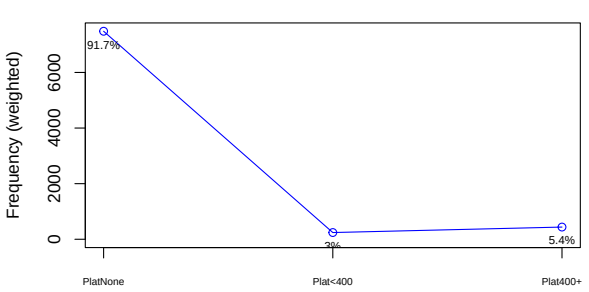
Here we plot the (weighted) frequencies of subgroups.

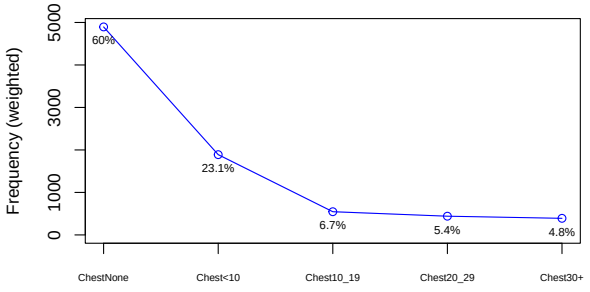


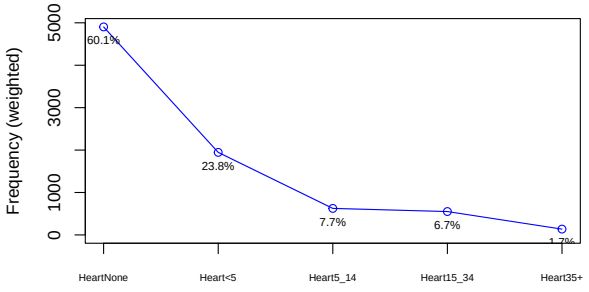

Anthracycline Dose
Frequency (weighted)
0
500
1500
2500
28.5%
36.4%
24.8%
7.4%
2.8%
AnthNone
Anth<100
Anth100_249
Anth250_399
Anth400+

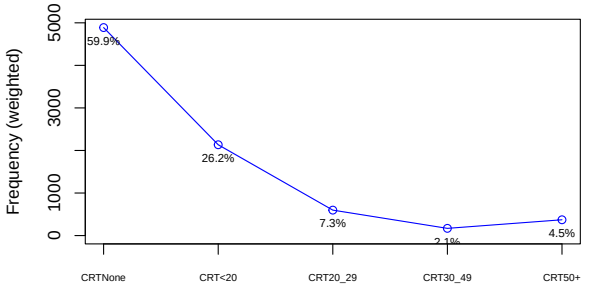

Alkylating Agent Dose
Frequency (weighted)
0
1000
2000
3000
41.5%
19.1%
14.1%
16.1%
9.3%
AlkNone
Alk<4000
Alk4000_7999
Alk8000_11999
Alk12000+

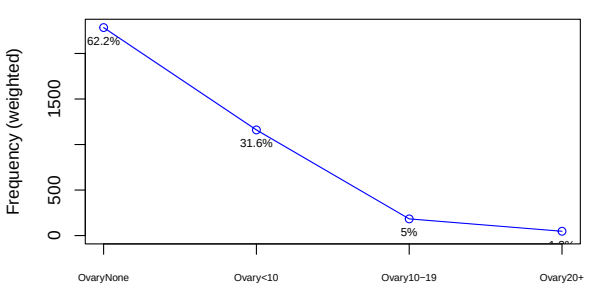

Cisplatin
Frequency (weighted)
0
2000
4000
6000
8000
95%
CispNone
Cisp<400
Cisp400+

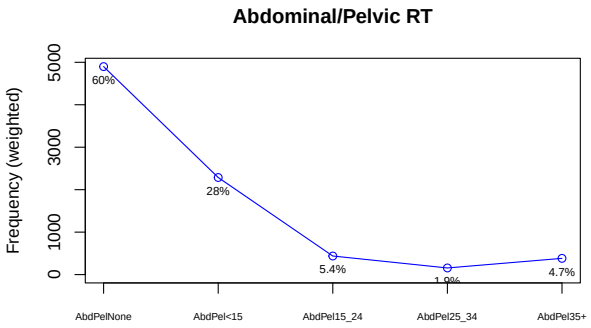

Platinum
Frequency (weighted)
0
2000
4000
6000
91.7%
5.4%
PlatNone
Plat<400
Plat400+

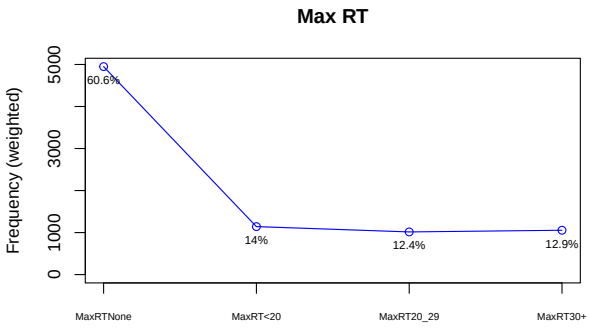

Chest RT
Frequency (weighted)
0
1000
3000
5000
60%
23.1%
6.7%
5.4%
4.8%
ChestNone
Chest<10
Chest10_19
Chest20_29
Chest30+

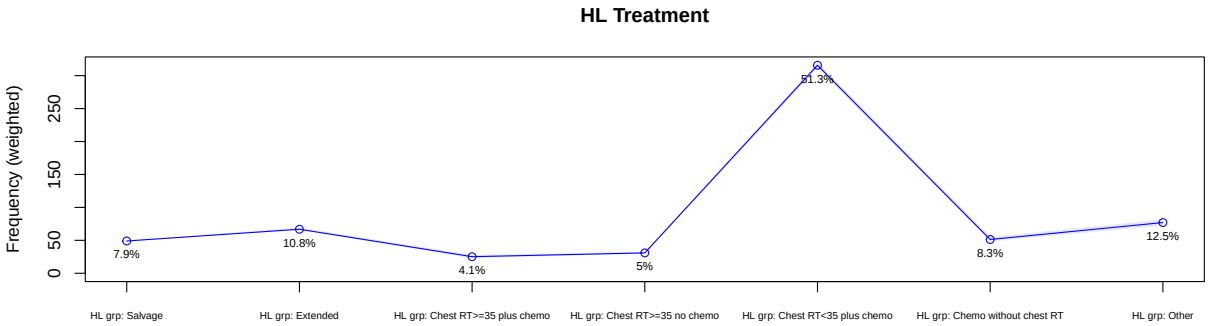

Heart RT
Frequency (weighted)
0
1000
3000
5000
60.1%
23.8%
7.7%
6.7%
HeartNone
Heart<5
Heart5_14
Heart15_34
Heart35+

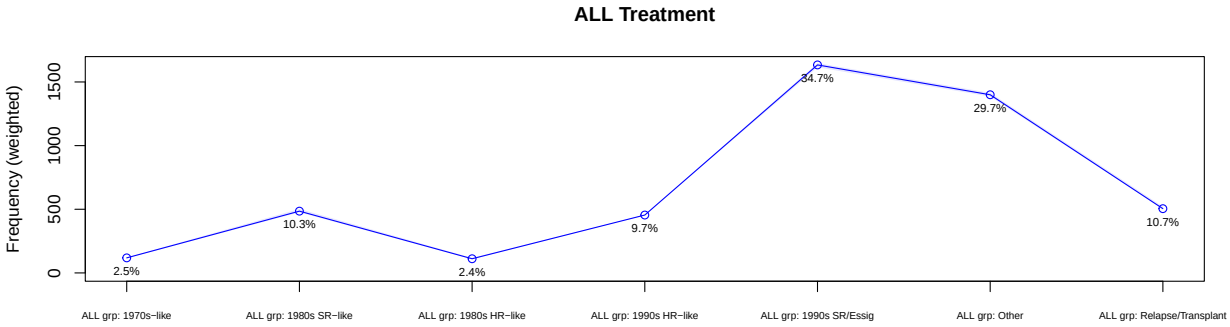

Cranial RT
Frequency (weighted)
0
1000
3000
5000
59.9%
26.2%
7.3%
4.5%
CRTNone
CRT<20
CRT20_29
CRT30_49
CRT50+


Ovary RT
Frequency (weighted)
0
500
1500
62.2%
31.6%
5%
OvaryNone
Ovary<10
Ovary10−19
Ovary20+


Abdominal/Pelvic RT
Frequency (weighted)
0
1000
3000
5000
60%
28%
5.4%
1.9%
4.7%
AbdPelNone
AbdPel<15
AbdPel15_24
AbdPel25_34
AbdPel35+


Max RT
Frequency (weighted)
0
1000
3000
5000
60.6%
14%
12.4%
12.9%
MaxRTNone
MaxRT<20
MaxRT20_29
MaxRT30+

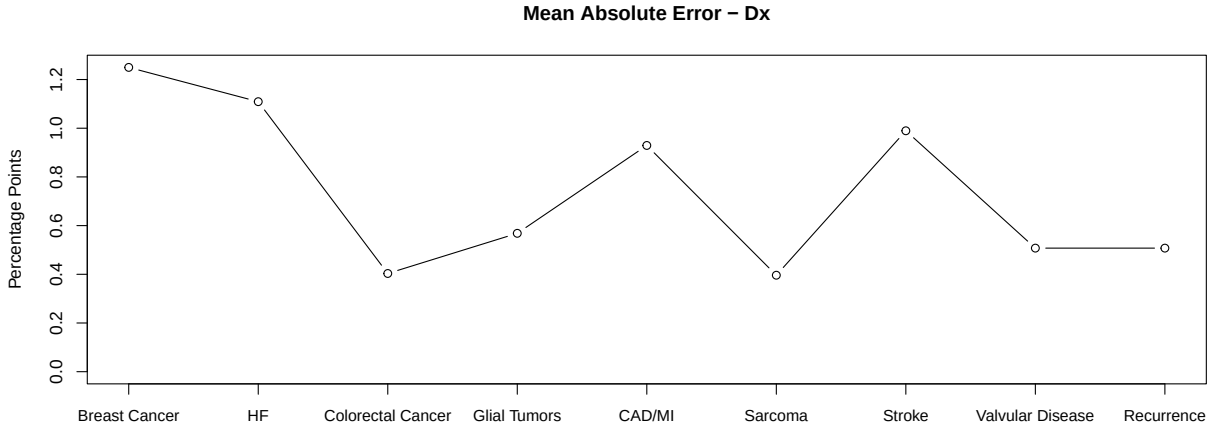

HL Treatment
Frequency (weighted)
0
50
150
250
7.9%
10.8%
4.1%
5%
31.3%
8.3%
12.5%
HL grp: Salvage
HL grp: Extended
HL grp: Chest RT>=35 plus chemo
HL grp: Chest RT>=35 no chemo
HL grp: Chest RT<35 plus chemo
HL grp: Chemo without chest RT
HL grp: Other

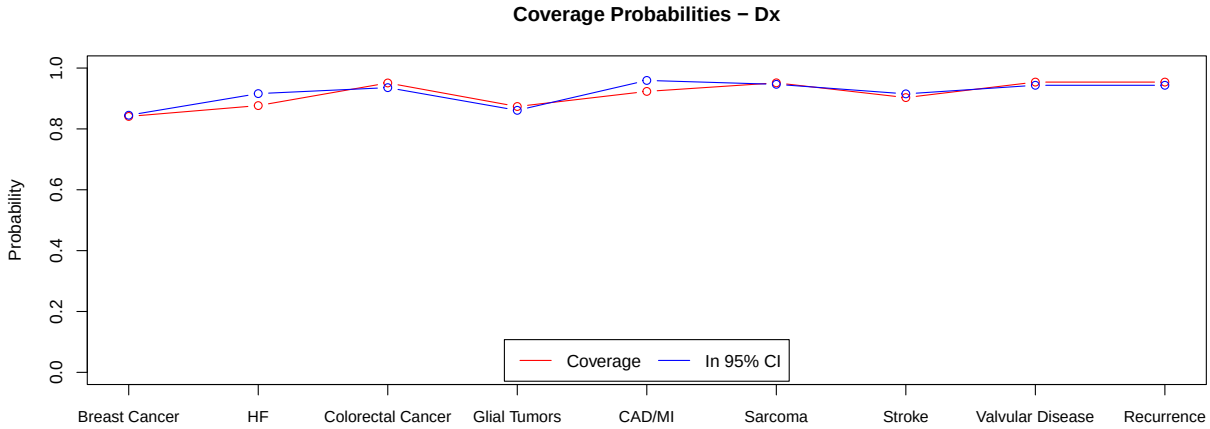

ALL Treatment
Frequency (weighted)
0
500
1000
1500
2.5%
10.3%
2.4%
9.7%
34.7%
29.7%
10.7%
ALL grp: 1970s−like
ALL grp: 1980s SR−like
ALL grp: 1980s HR−like
ALL grp: 1990s HR−like
ALL grp: 1990s SR/Essig
ALL grp: Other
ALL grp: Relapse/Transplant

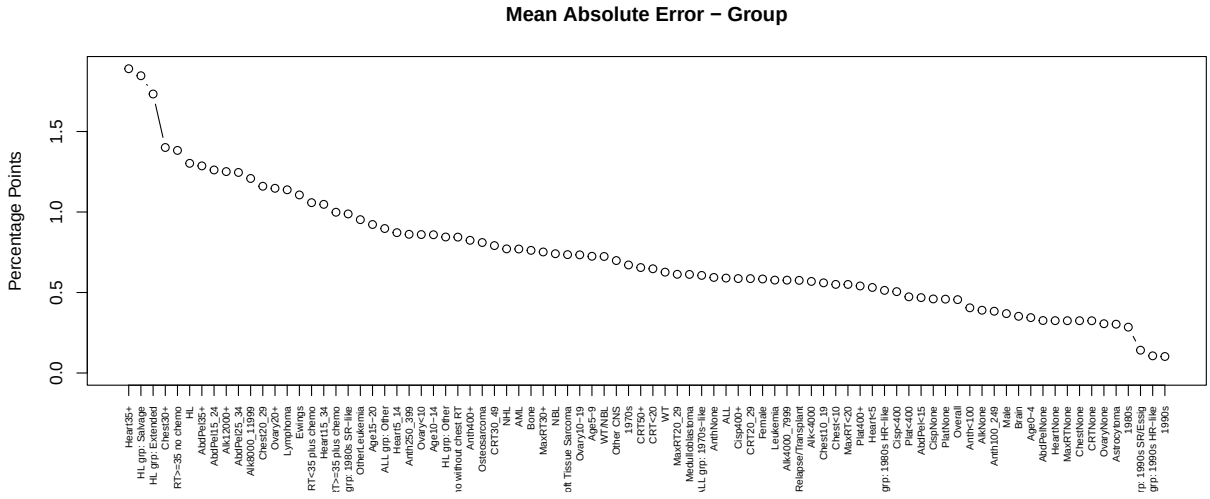
6.4 Summary Indicators

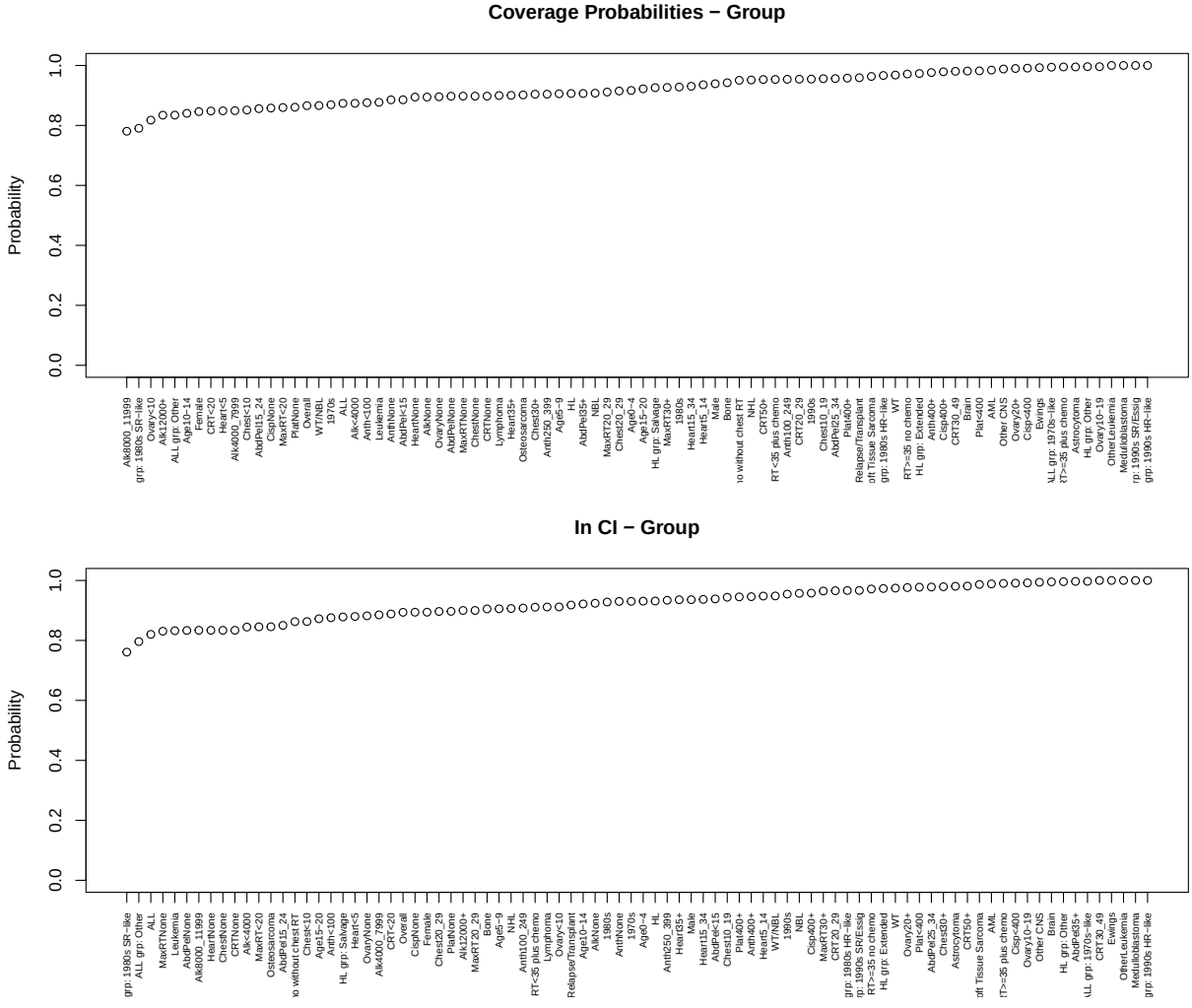
6.4.1 Incidence

[1] “Overall Incidence” [1] “Mean Absolute Error: 0.733” [1] “Coverage %: 91.5” [1] “In CI %: 91.9”



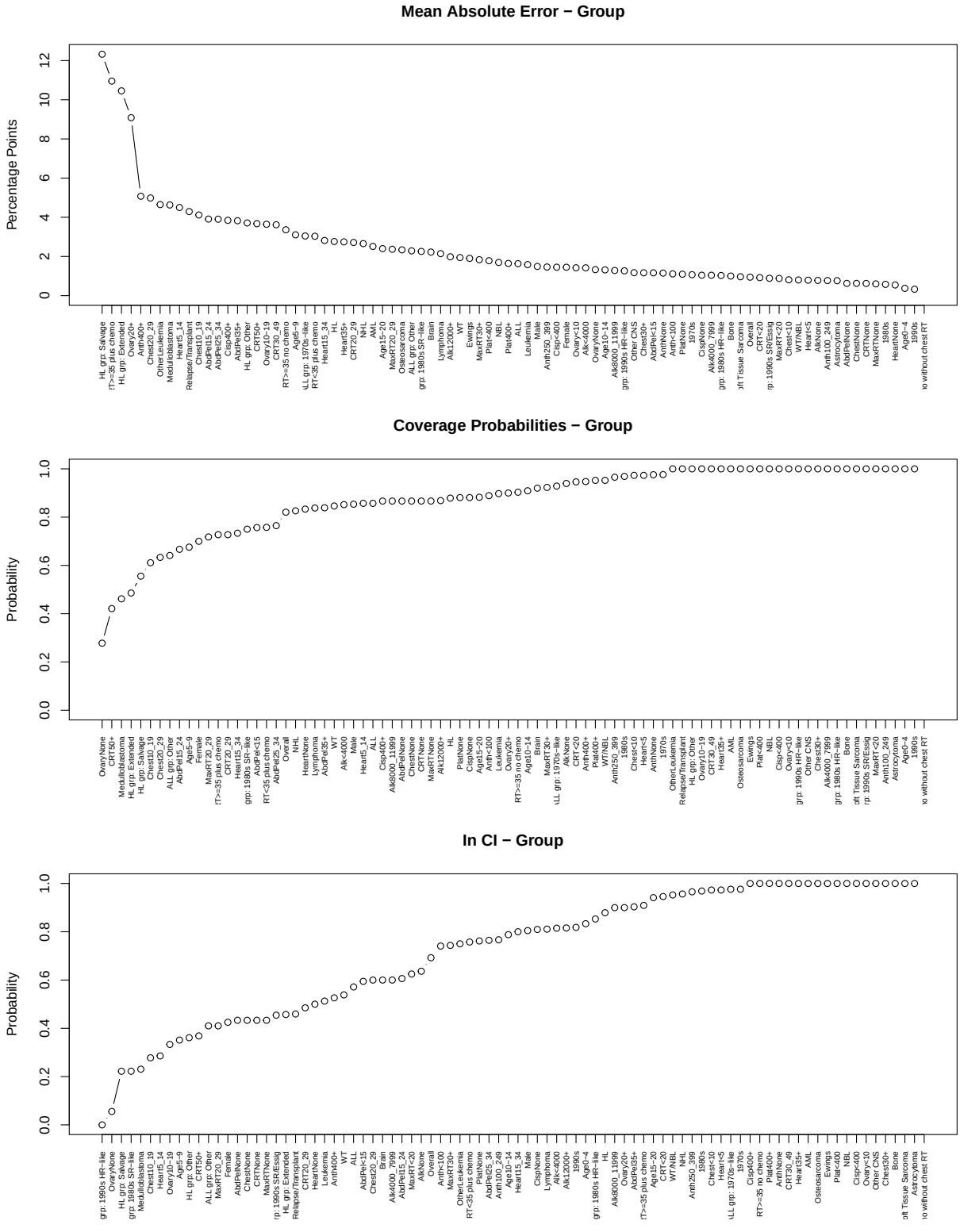





Coverage Probabilities − Group
Probability
0.0
0.2
0.4
0.6
0.8
1.0
In CI − Group
Probability
0.0
0.2
0.4
0.6
0.8
1.0

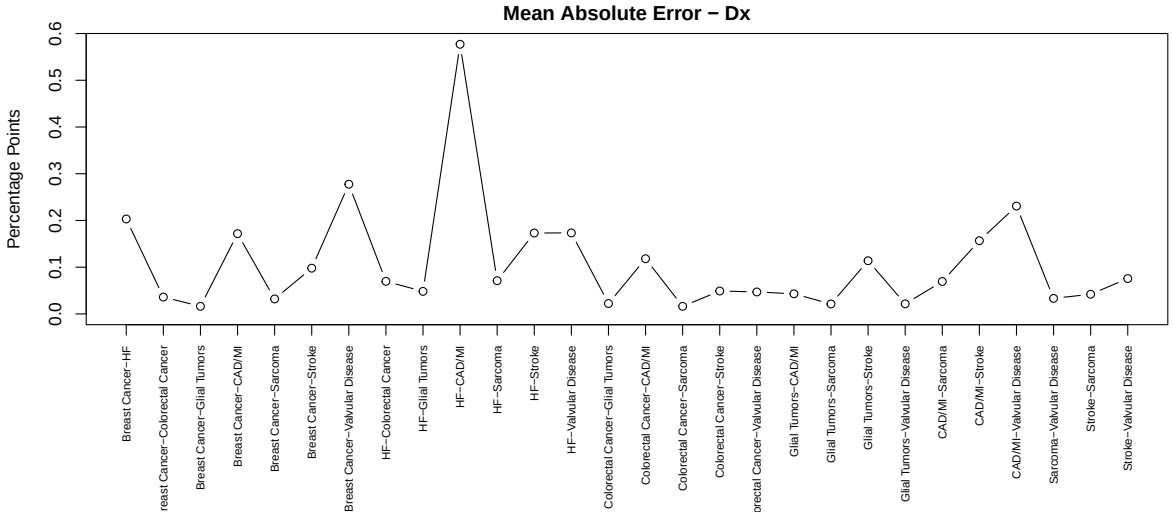
6.4.2 Survival

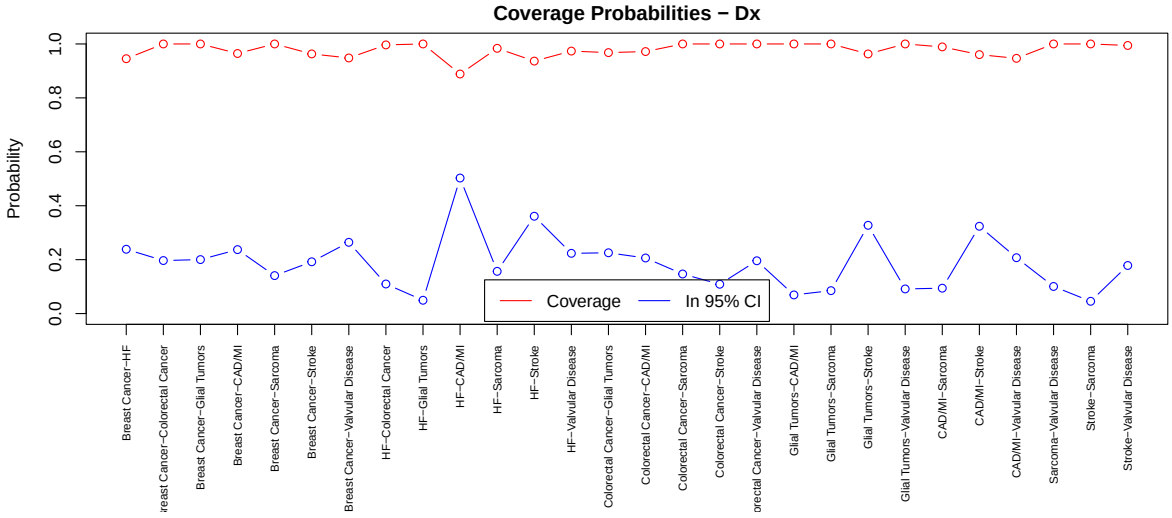
[1] "Overall Survival" [1] "Mean Absolute Error: 2.303" [1] "Coverage %: 86.7" [1] "In CI %: 71"

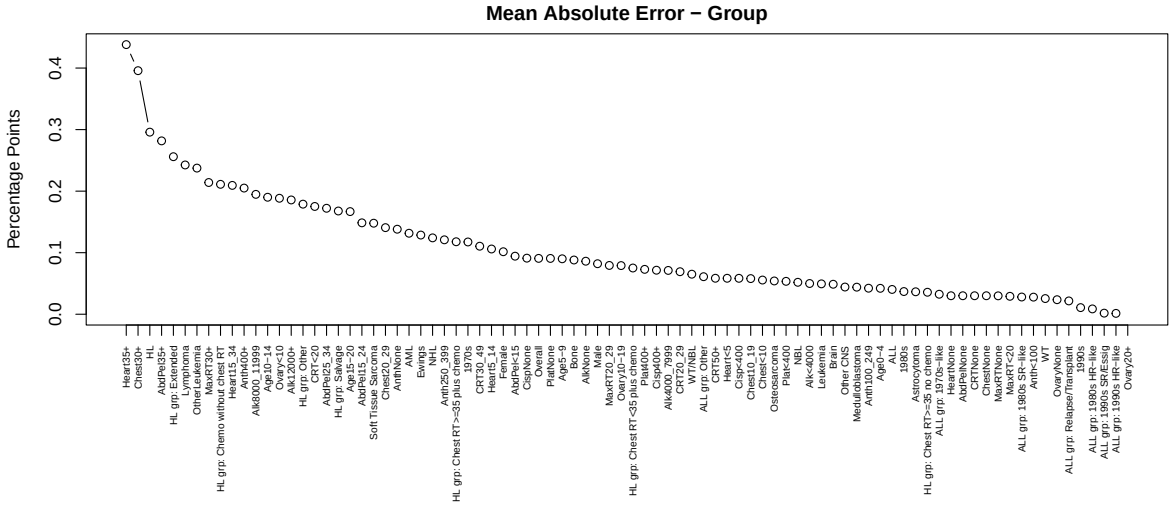


6.4.3 Joint Incidence

[1] “Overall Joint Incidence” [1] “Mean Absolute Error: 0.107” [1] “Coverage %: 97.8” [1] “In CI %: 18.8”



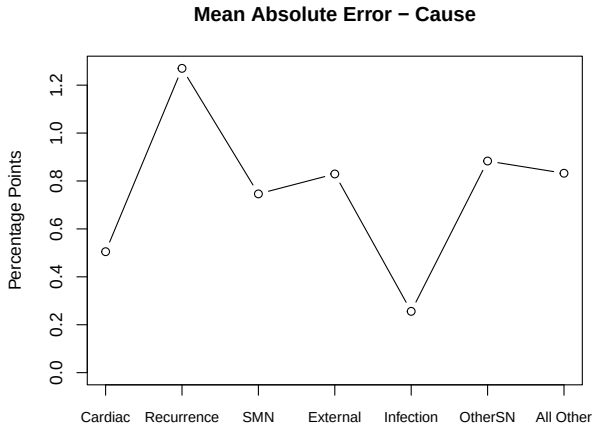


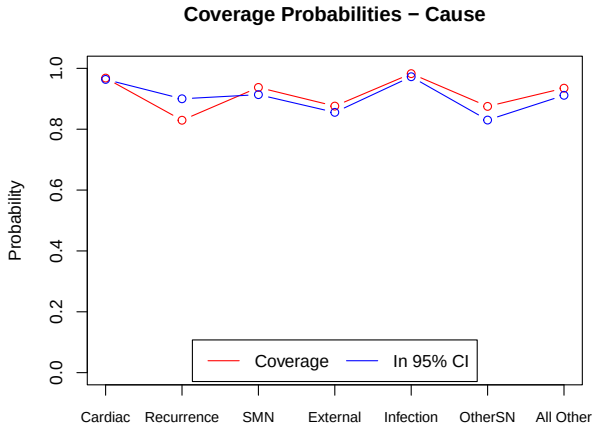


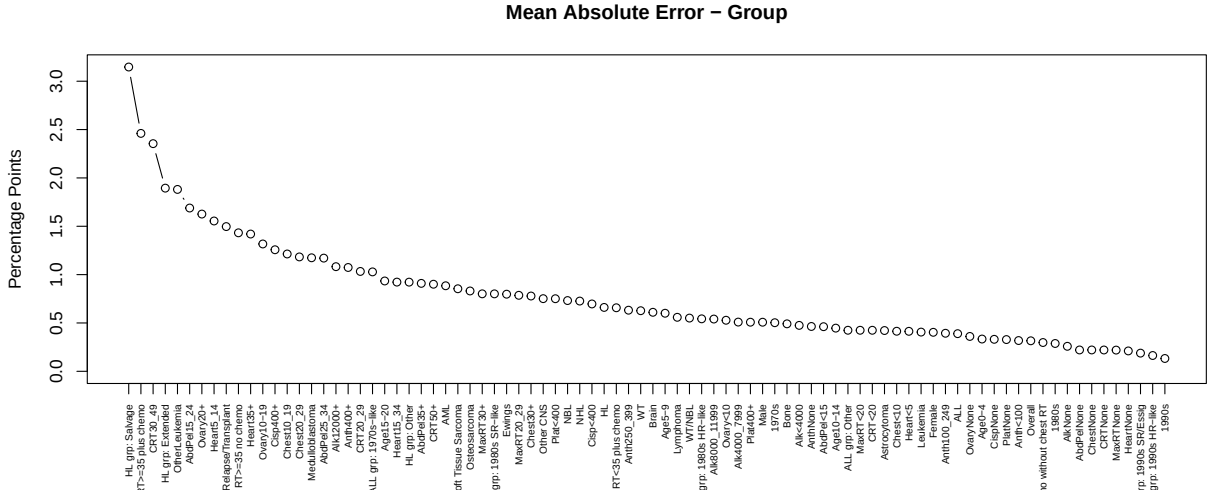
Coverage Probabilities − Group
Probability
0.0
0.2
0.4
0.6
0.8
1.0
HL grp: Chemo without chest RT
Age10−14
HeartNone
AbdPelNone
AnthNone
CRTNone
ChestNone
MaxRTNone
NHL
ALL grp: Other
Alk4000_7999
HL
Lymphoma
Soft Tissue Sarcoma
Alk8000_11999
PlatNone
CispNone
AlkNone
Heart35+
Anth400+
Overall
1980s
Ovary<10
Male
AnthNone
HL grp: Other
Chest30+
MaxRT30+
CRT<20
Anth250_389
ALL grp: 1980s SR−like
AbdPel15_24
1970s
Bone
ALL
Anth<100
Heart15_24
Age0−4
HL grp: Extended
Heart<5
AbdPel35+
HL grp: Salvage
Osteosarcoma
Anth100_249
Leukemia
AbdPel<15
Age15−20
Alk<4000
Plat400+
Anth100_249
Ewings
Female
OvaryNone
Chest<10
AML
Alk12000+
1990s
Cisp400+
Astrocytoma
MaxRT20_29
Chest10_19
Other Leukemia
Heart15_24
WT/NBL
CRT30_49
Brain
CRT20_29
CRT<20
Chest20_29
HL grp: Chest RT>=35 plus chemo
HL grp: Chest RT<35 plus chemo
NBL
WT
AbdPel25_34
Ovary10−19
Cisp<400
Plat<400
Other CNS
Medulloblastoma
HL grp: Chest RT>=35 no chemo
ALL grp: 1970s−like
MaxRT<20
ALL grp: Relapse/Transplant
ALL grp: 1980s HR−like
ALL grp: 1990s SR/Essig
ALL grp: 1990s HR−like
Ovary20+
In CI − Group
Probability
0.0
0.2
0.4
0.6
0.8
1.0
Ovary10−19
OtherLeukemia
Alk<4000
Chest20_29
Heart15_24
CRT20_29
Brain
MaxRT<20
Chest10_19
Heart15_24
MaxRT20_29
Anth<100
CRT30_49
Plat<400
Alk8000_11999
AML
Medulloblastoma
Other CNS
Alk4000_7999
1990s
AbdPel15_24
Plat400+
Leukemia
Cisp<400
Age0−4
OvaryNone
Chest<10
HeartNone
Heart<5
AbdPelNone
CRTNone
ChestNone
MaxRTNone
NHL
Anth250_389
ALL
Age15−20
Age10−14
Anth400+
AbdPel35+
Anth100_249
CRT<20
1970s
AbdPel25_34
Cisp400+
Age5−9
AnthNone
Ewings
ALL grp: Relapse/Transplant
ALL grp: 1970s−like
AlkNone
Bone
Female
HL grp: Chest RT<35 plus chemo
Lymphoma
Ovary<10
Alk12000+
1980s
Heart35+
HL
AbdPel<15
Astrocytoma
ALL grp: Other
Chest30+
Soft Tissue Sarcoma
WT/NBL
CRT<20
MaxRT30+
HL grp: Extended
HL grp: Salvage
PlatNone
CispNone
Male
Osteosarcoma
Overall
ALL grp: 1980s SR−like
WT
HL grp: Chest RT>=35 plus chemo
NBL
HL grp: Other
ALL grp: 1990s SR/Essig
ALL grp: 1980s HR−like
HL grp: Chest RT>=35 no chemo
ALL grp: 1990s HR−like
HL grp: Chemo without chest RT
Ovary20+

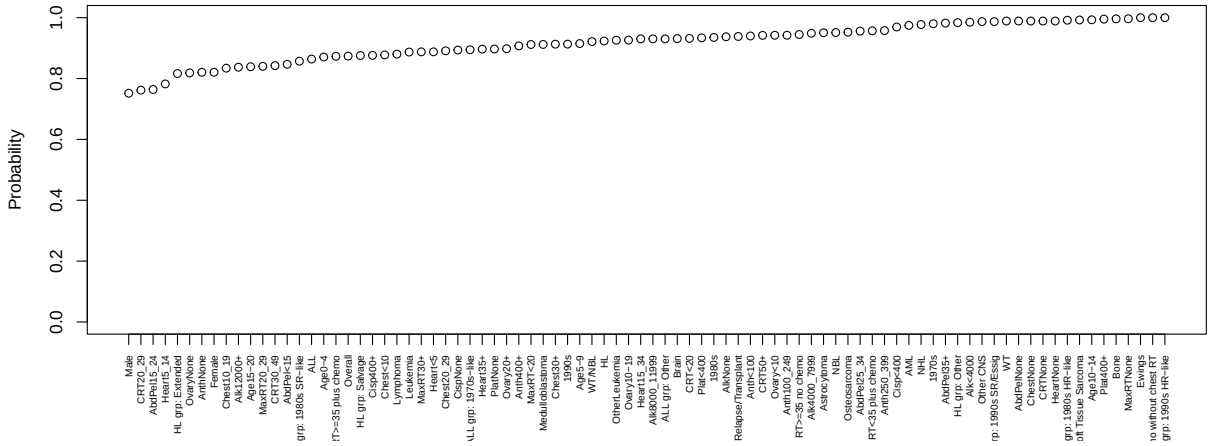
6.4.4 Cumulative Mortality

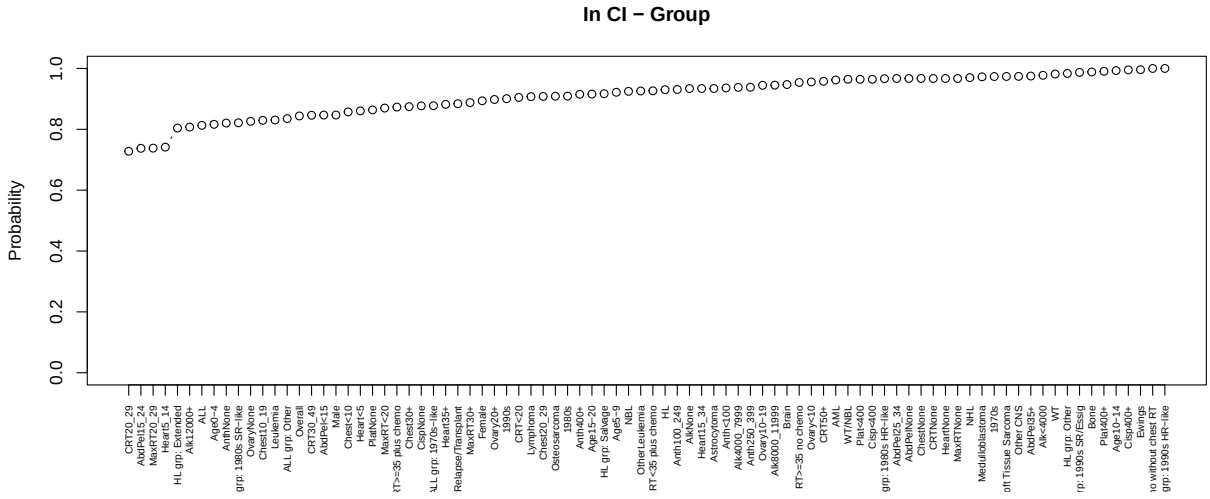
[1] “Overall Cum. Mortality” [1] “Mean Absolute Error: 0.76” [1] “Coverage %: 91.5” [1] “In CI %: 90.7”









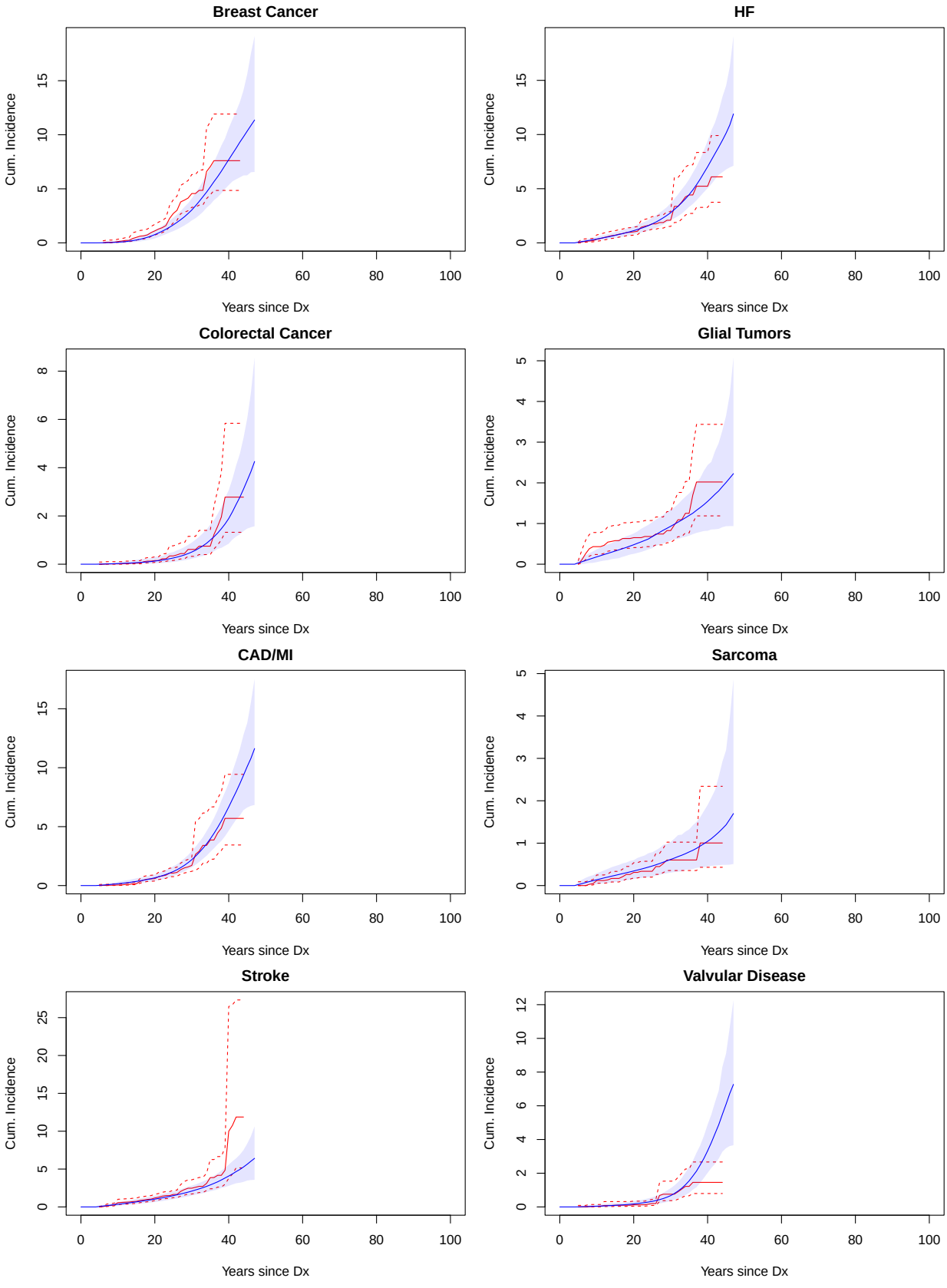

ln CI − Group
Probability
0.0
0.2
0.4
0.6
0.8
1.0
CRT20_29
AbdPel15_24
MaxRT20_29
Heart5_14
HL grp: Extended
Alk12000+
ALL
Age0–4
AnthNone
grp: 1980s SR−like
OvaryNone
Chest10_19
Leukemia
ALL grp: Other
Overall
CRT30_49
AbdPel<15
Male
Chest<10
Heart<5
PlatNone
MaxRT<20
RT>=35 plus chemo
Chest30+
CispNone
ALL grp: 1970s−like
Heart35+
Relapse/Transplant
MaxRT30+
FemaleNone
Ovary20+
1990s
CRT<20
Lymphoma
Chest20_29
Osteosarcoma
1980s
Anth<100
Age15−20
HL grp: Salvage
Age5−9
NBL
OtherLeukemia
RT<35 plus chemo
ALL
Anth100_249
AlkNone
Heart15_34
Astrocytoma
Anth<100
Alk4000_7999
Anth250_399
Ovary10−19
Alk8000_11999
Brain
RT>=35 no chemo
Ovary<10
CRT50+
AML
WT/NBL
Plat<400
Cisp<400
grp: 1980s HR−like
AbdPel25_34
AbdPelNone
ChestNone
CRTNone
HeartNone
MaxRT/None
NHL
Medulloblastoma
1970s
oft Tissue Sarcoma
Other CNS
AbdPel35+
Alk<4000
WT
HL grp: Other
rp: 1990s SR/Essig
Bone
Plat400+
Age10−14
Cisp400+
Ewings
no without chest RT
grp: 1990s HR−like

6.5 Validation Comparisons

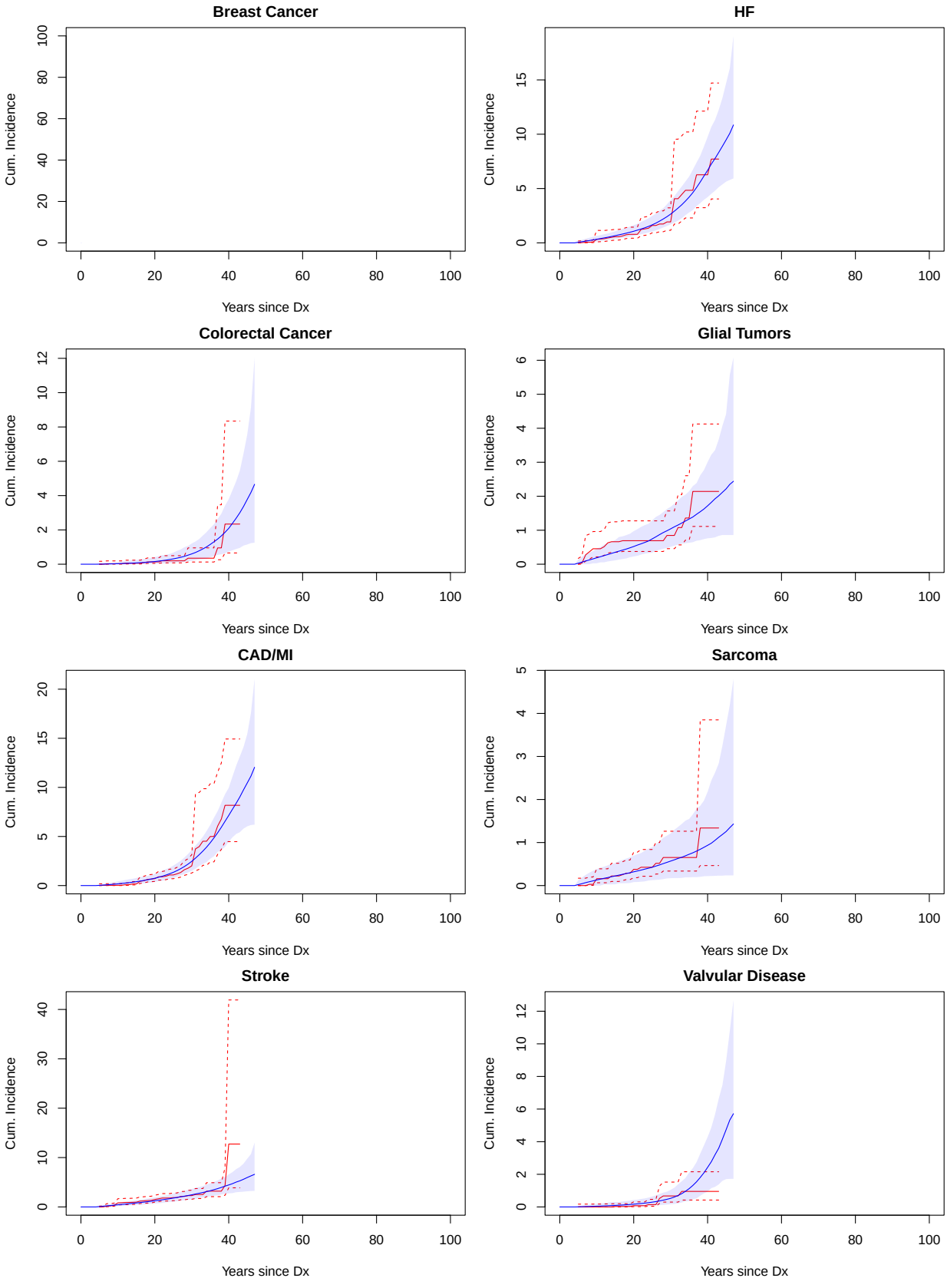
6.5.1 Cumulative Incidence

Here we plot cumulative incidence for each disease by subgroup.

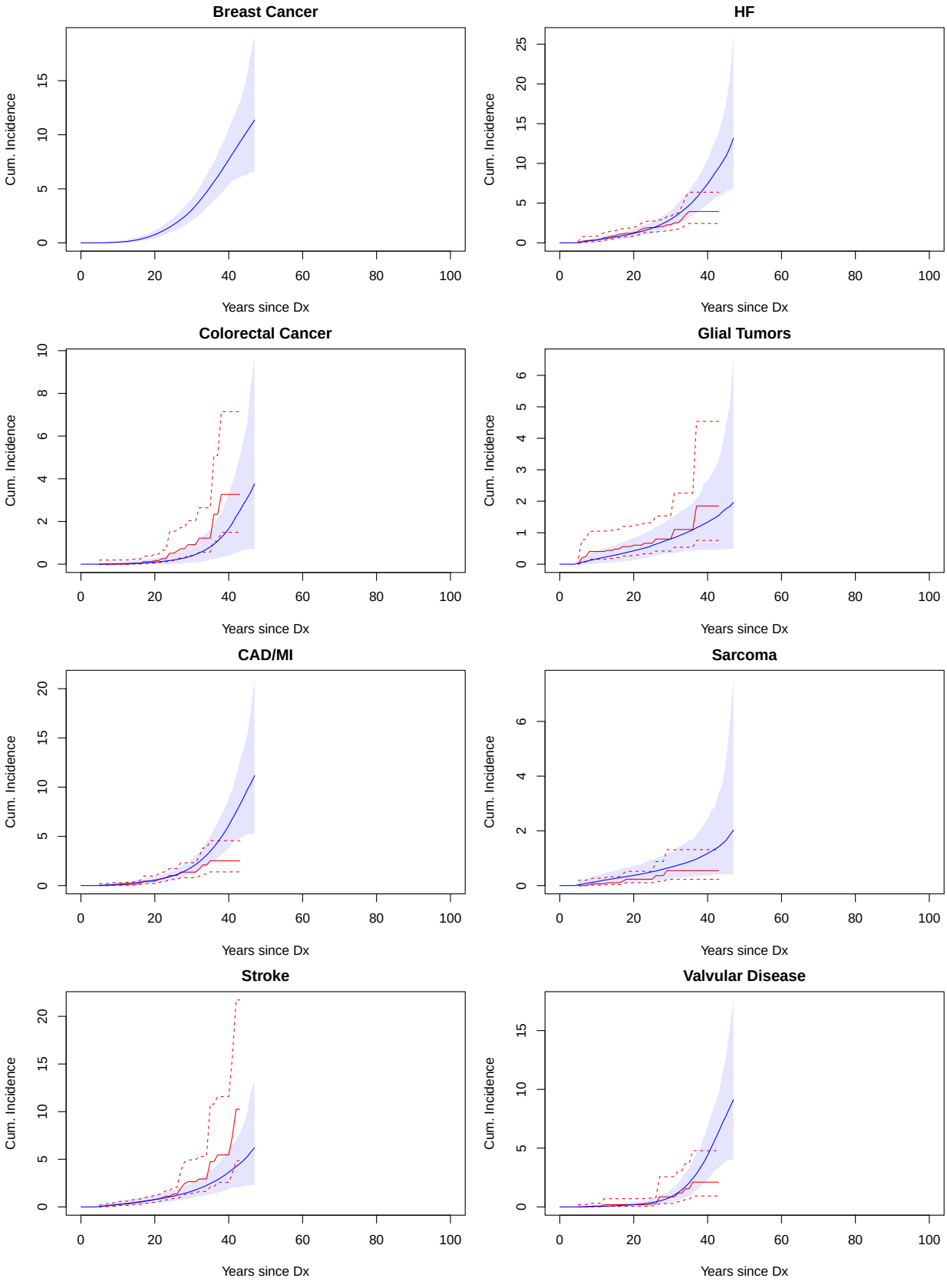
6.5.1.1 Overall



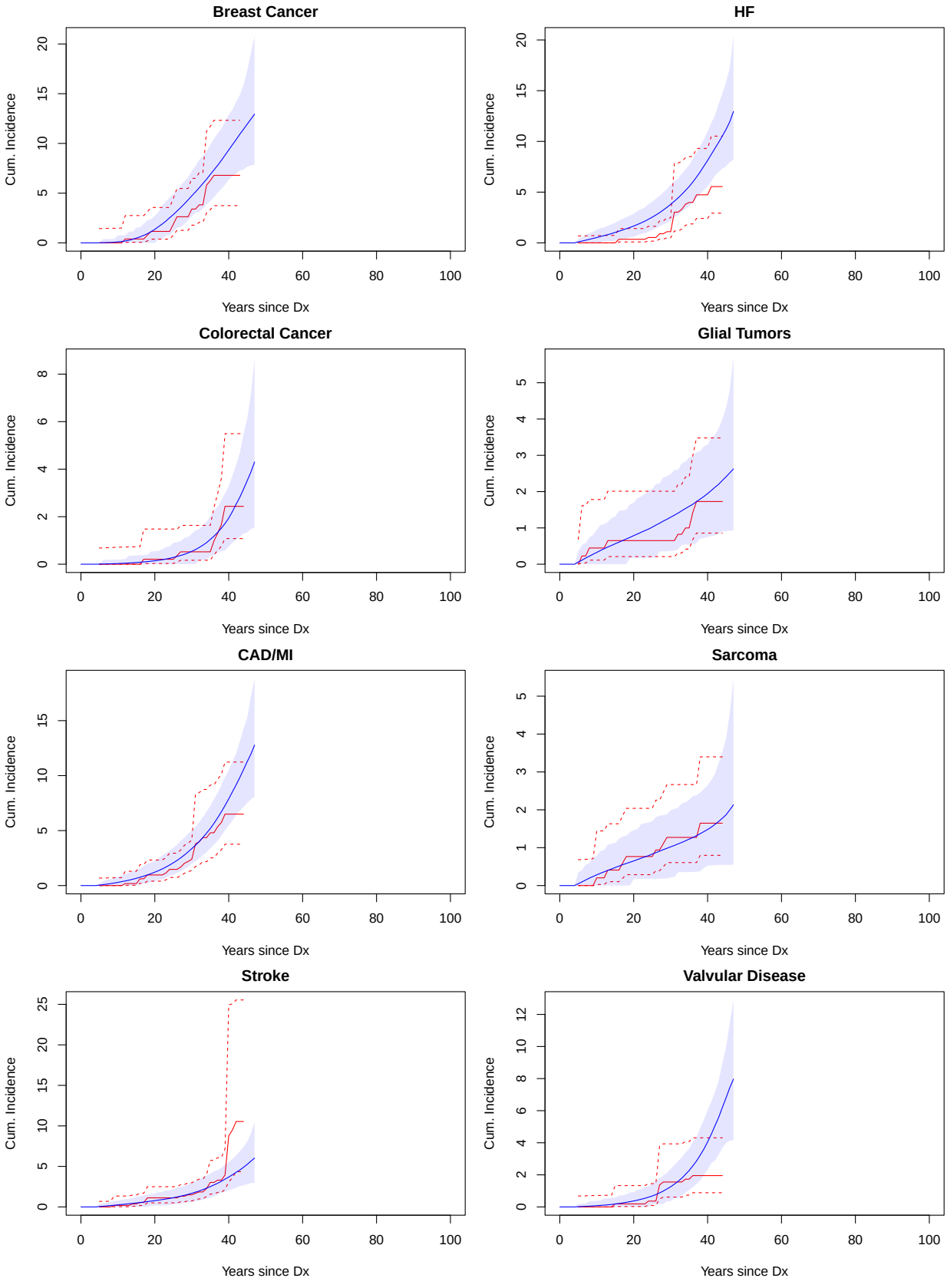
6.5.1.2 Male


Breast Cancer
Cum. Incidence
Years since Dx
HF
Cum. Incidence
Years since Dx
Colorectal Cancer
Cum. Incidence
Years since Dx
Glial Tumors
Cum. Incidence
Years since Dx
CAD/MI
Cum. Incidence
Years since Dx
Sarcoma
Cum. Incidence
Years since Dx
Stroke
Cum. Incidence
Years since Dx
Valvular Disease
Cum. Incidence
Years since Dx

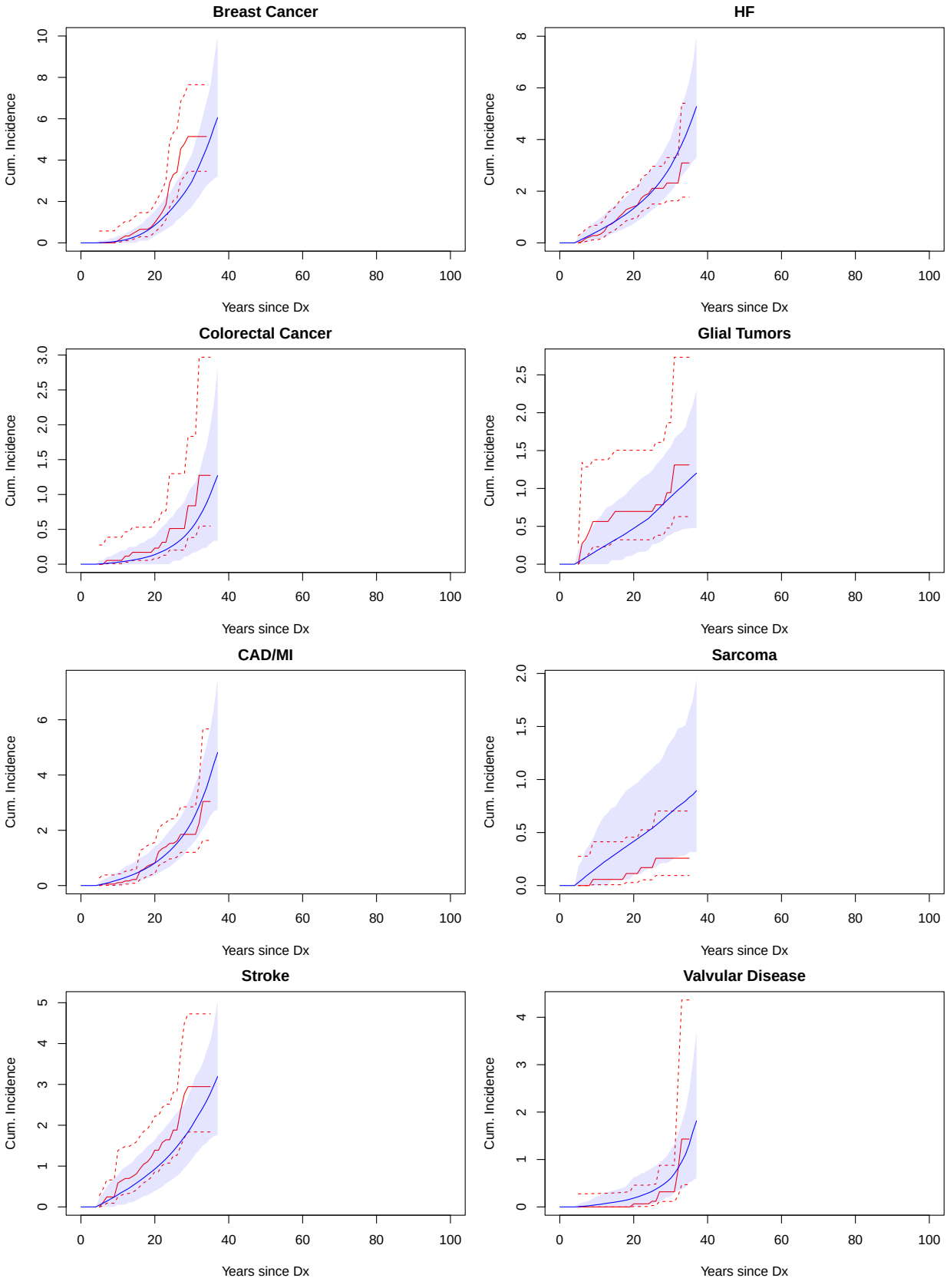
6.5.1.3 Female


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

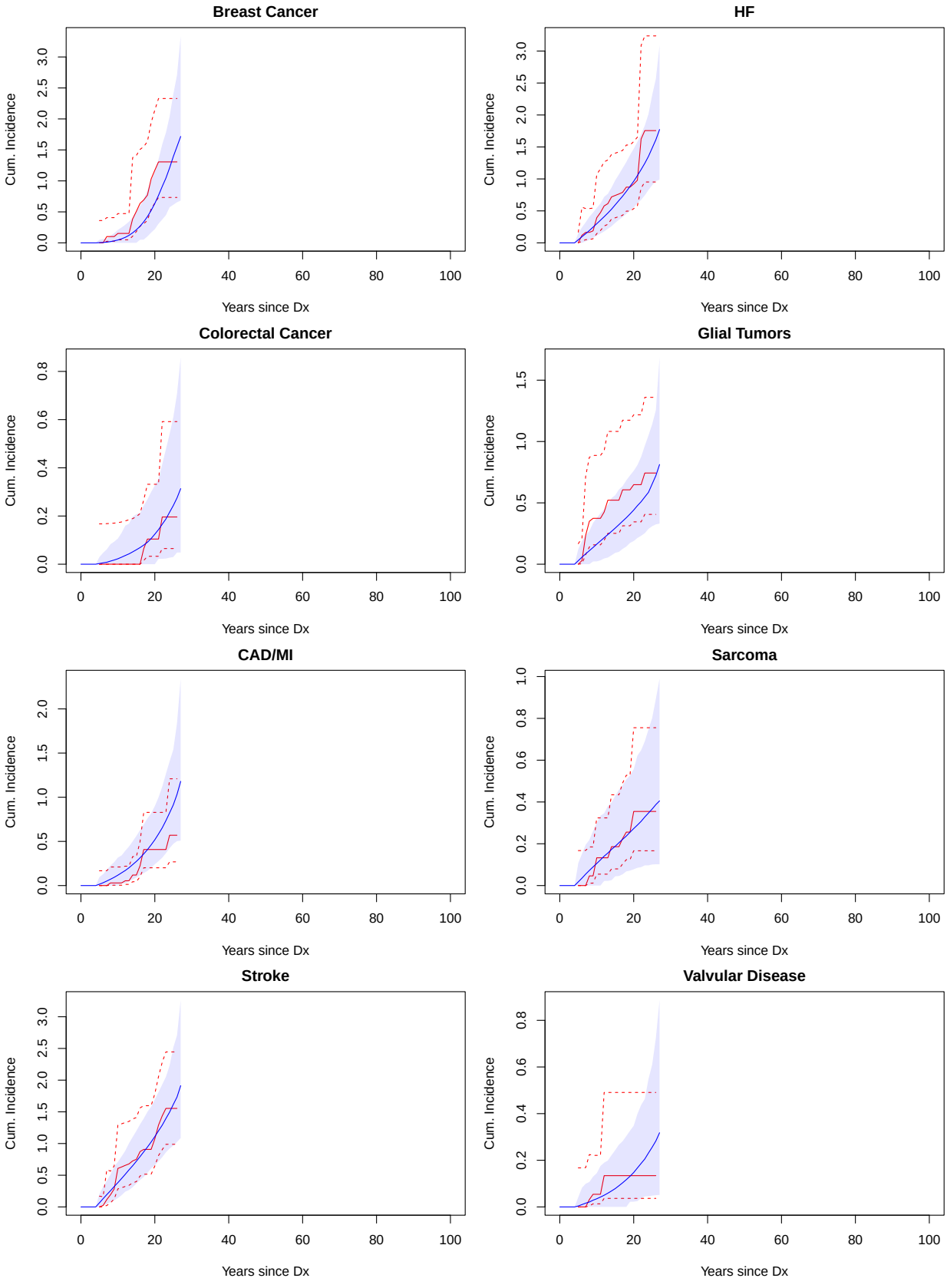
6.5.1.4 1970s


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

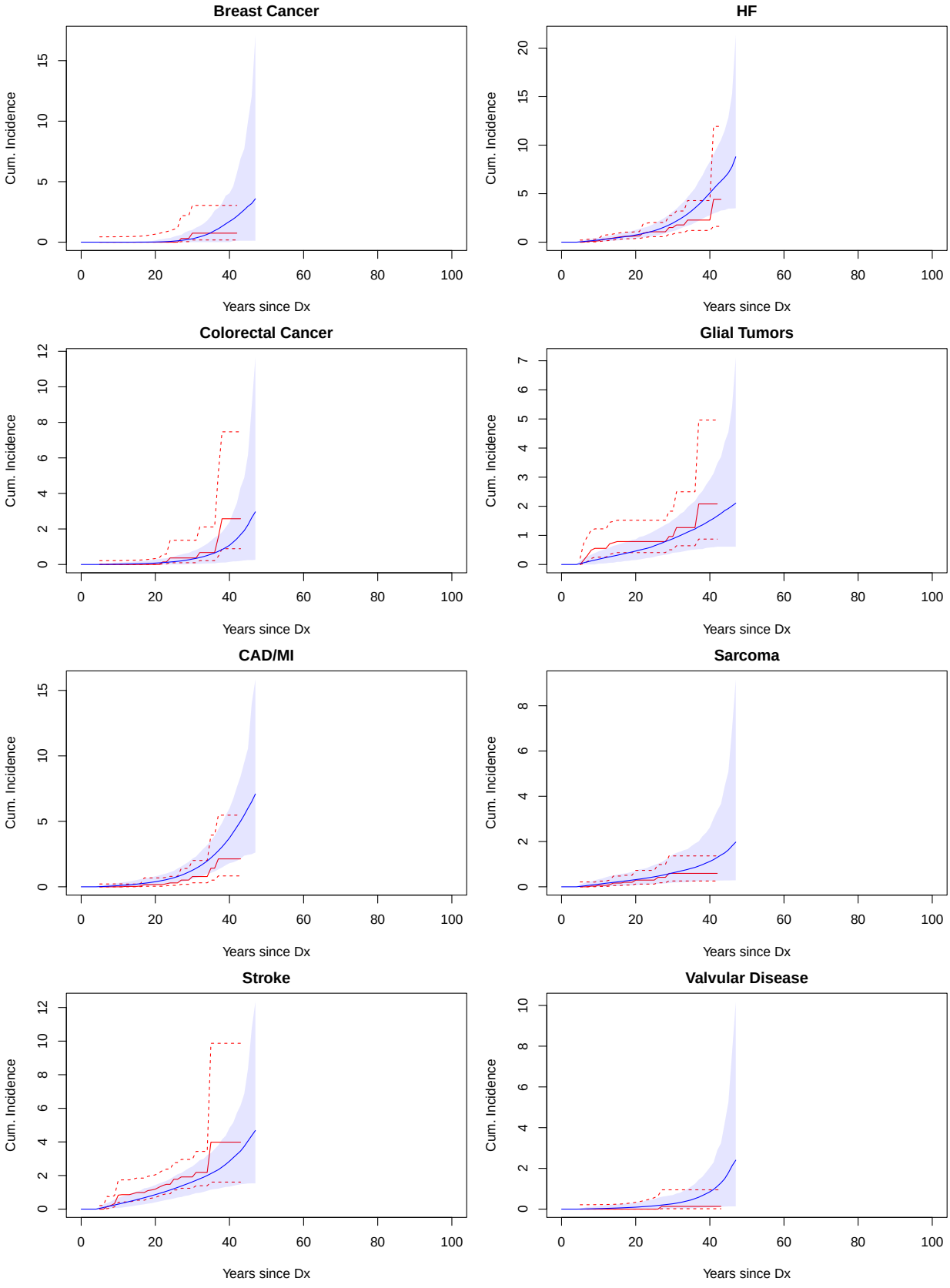
6.5.1.5 1980s


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

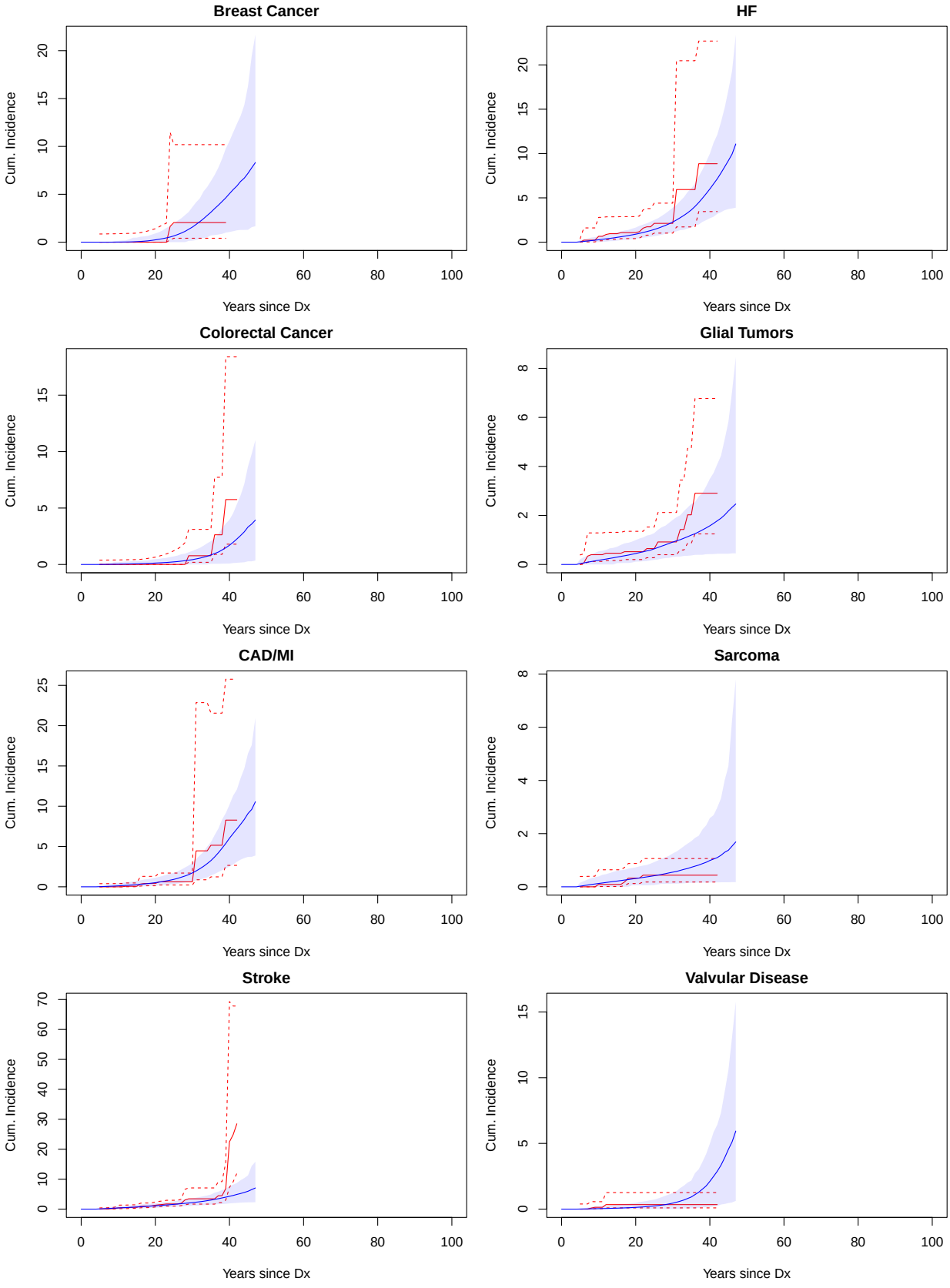
6.5.1.6 1990s


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

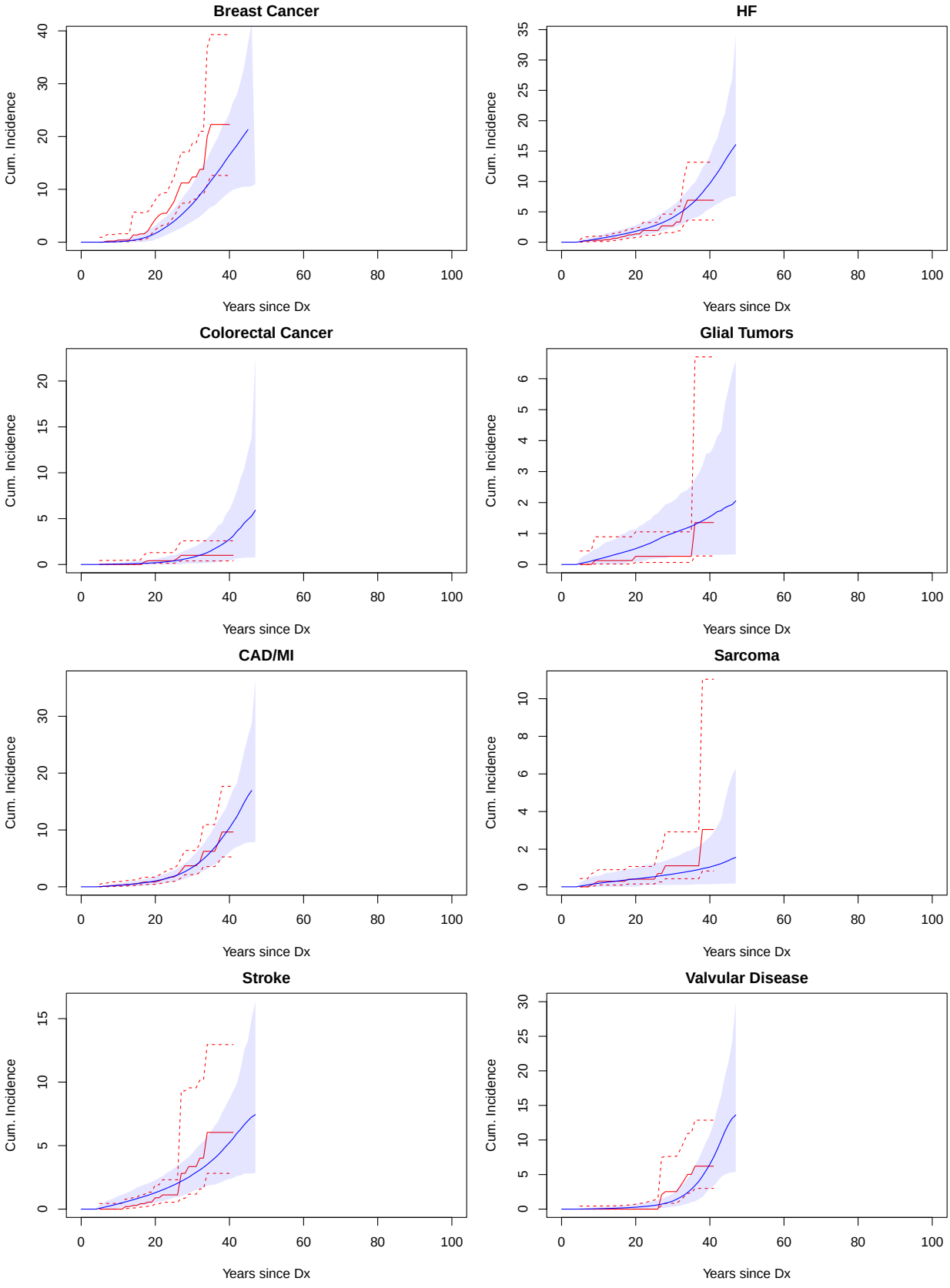
6.5.1.7 Age0-4


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

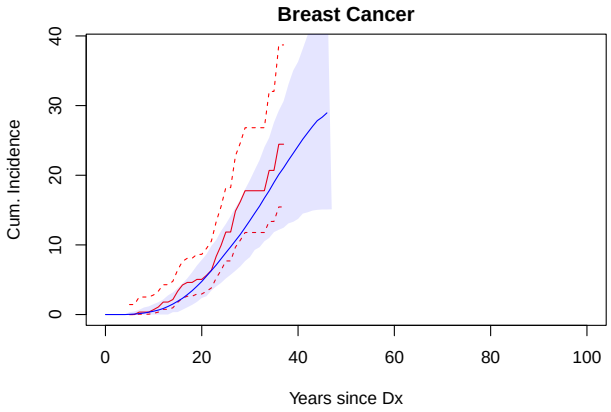
6.5.1.8 Age5-9

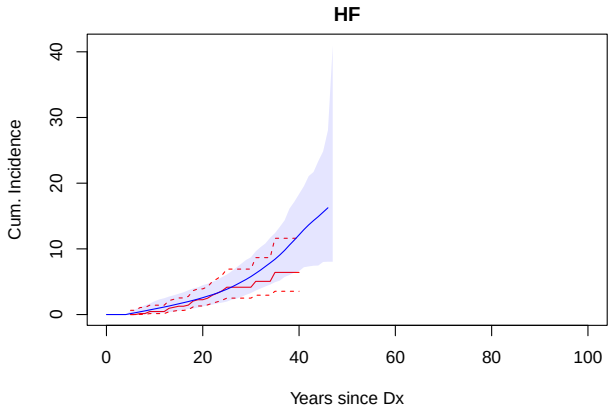

Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

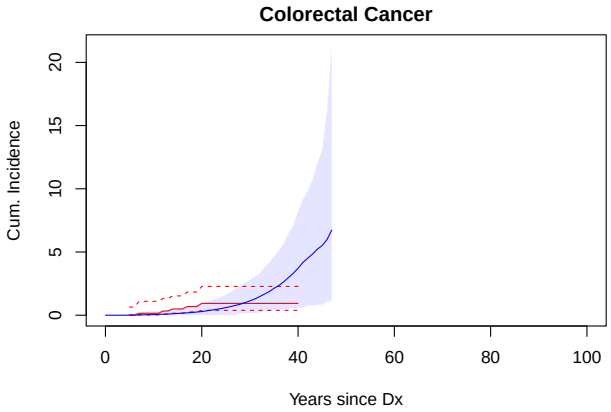
6.5.1.9 Age10-14

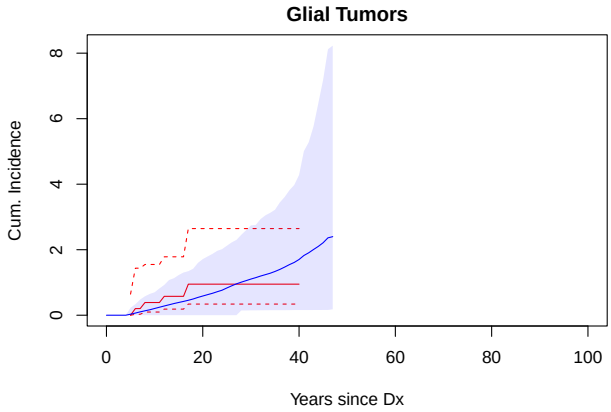


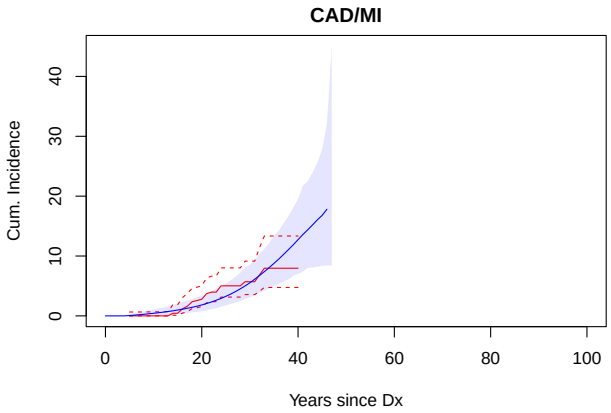
6.5.1.10 Age15-20

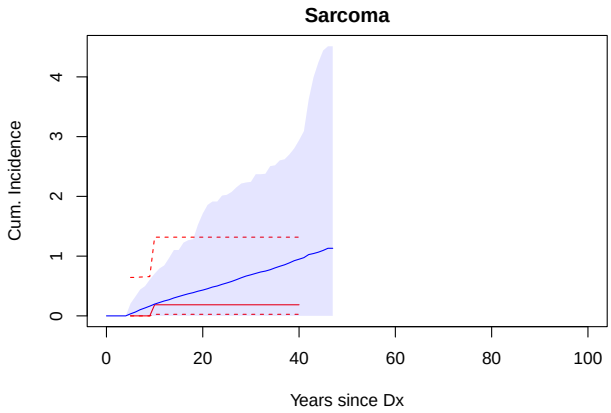


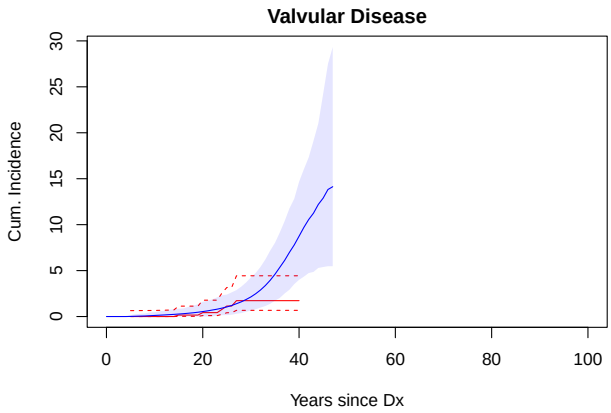




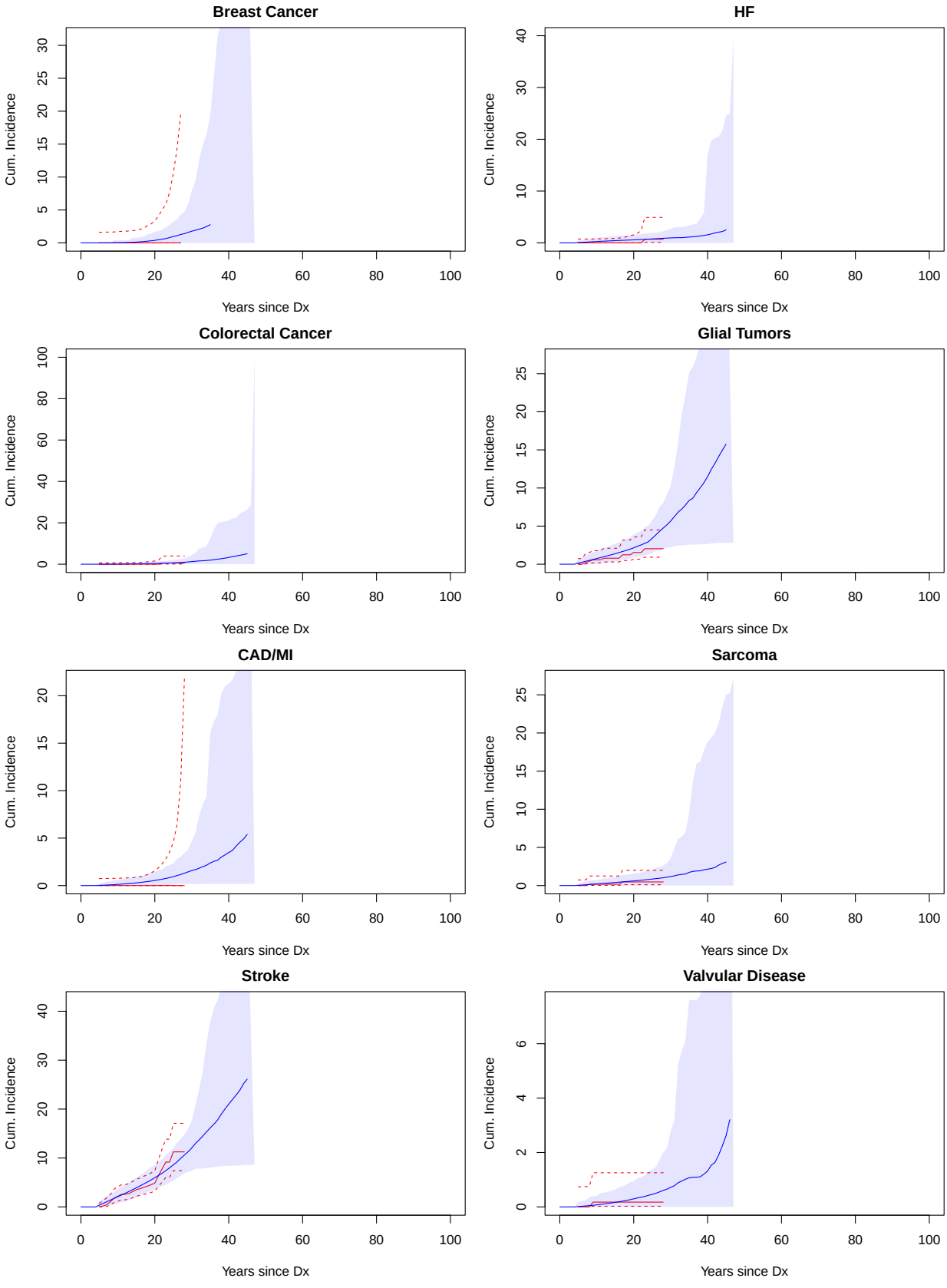




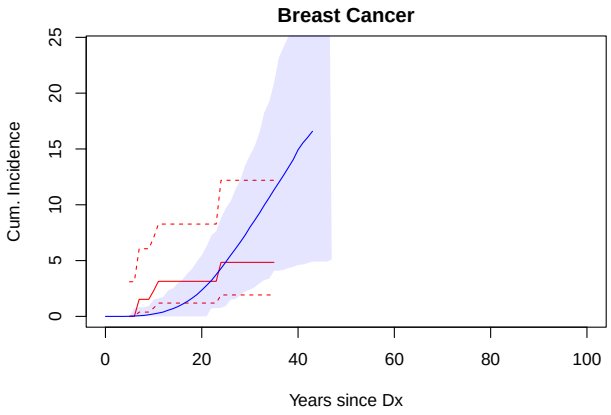


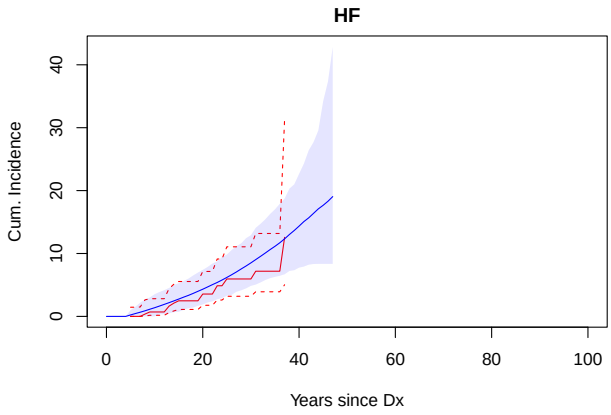


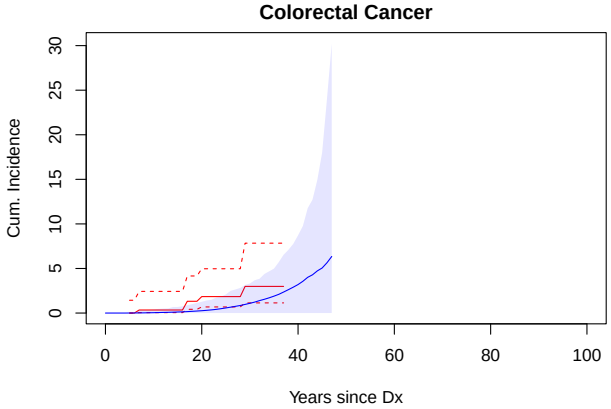
6.5.1.11 Brain

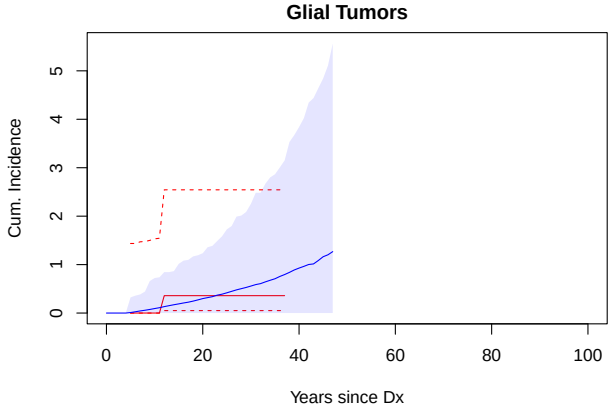

Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

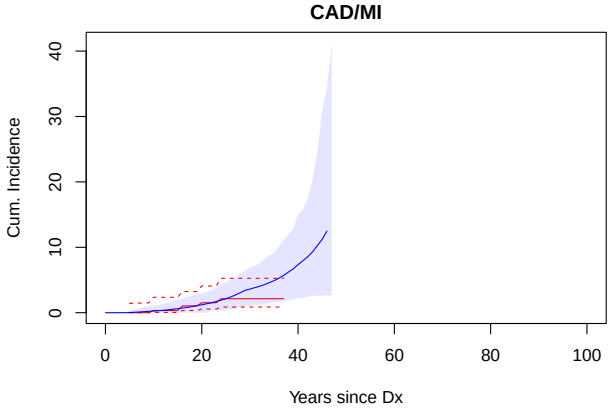
6.5.1.12 Bone

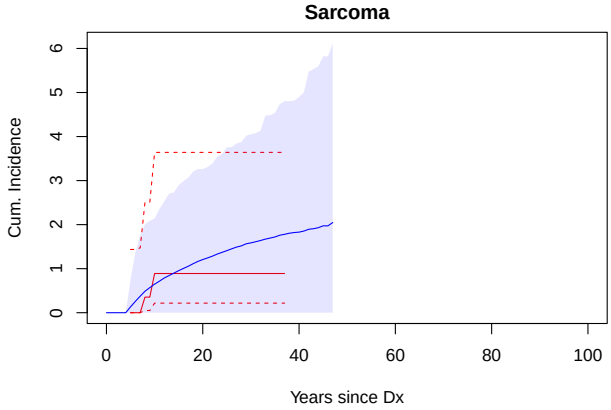

Breast Cancer
Cum. Incidence
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx

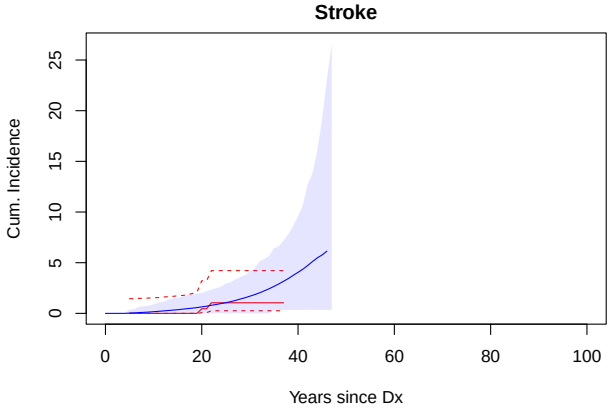

HF
Cum. Incidence
0
10
20
30
40
0
20
40
60
80
100
Years since Dx

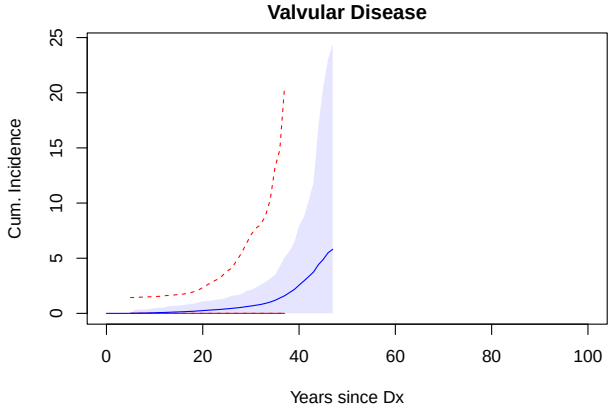

Colorectal Cancer
Cum. Incidence
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx


Glial Tumors
Cum. Incidence
0
1
2
3
4
5
0
20
40
60
80
100
Years since Dx

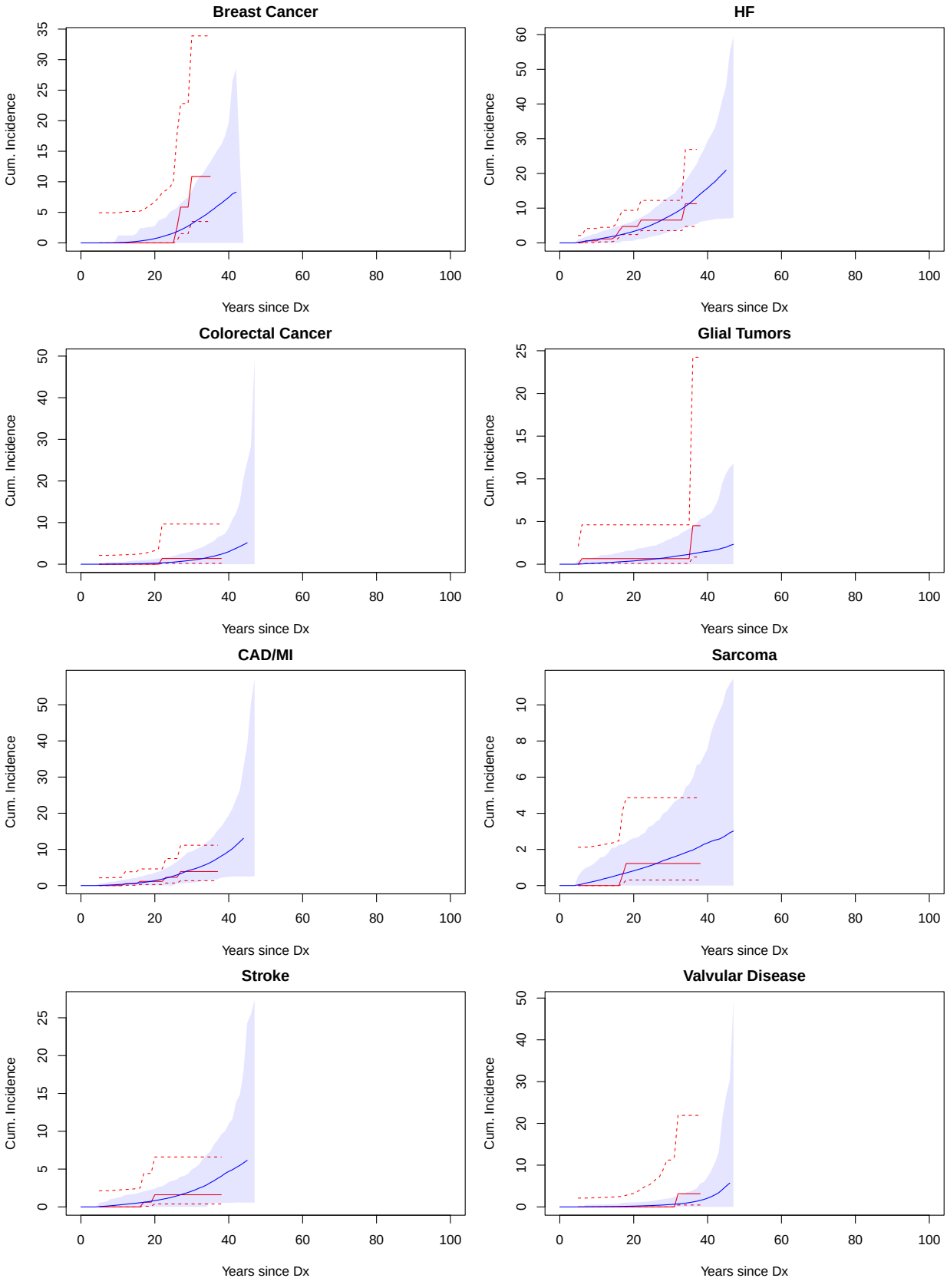

CAD/MI
Cum. Incidence
0
10
20
30
40
0
20
40
60
80
100
Years since Dx


Sarcoma
Cum. Incidence
0
1
2
3
4
5
6
0
20
40
60
80
100
Years since Dx

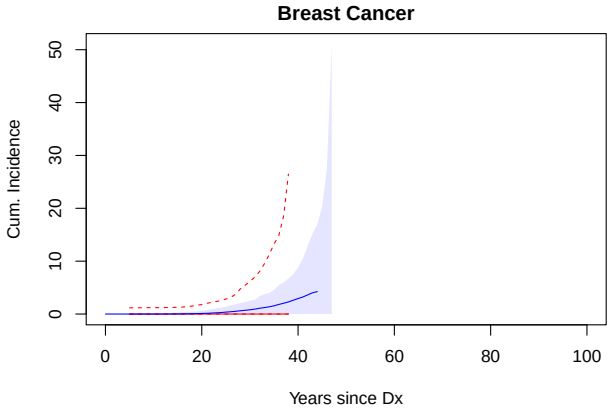

Stroke
Cum. Incidence
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx

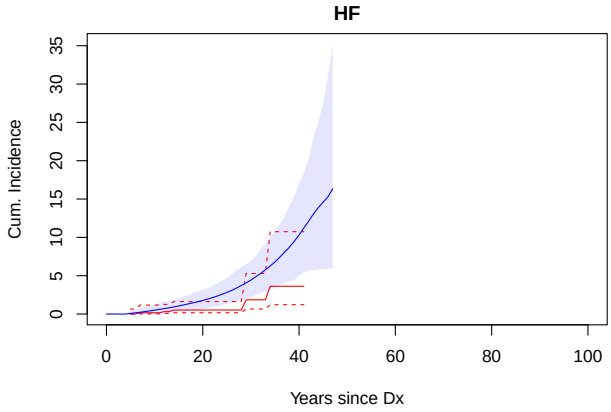

Valvular Disease
Cum. Incidence
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx

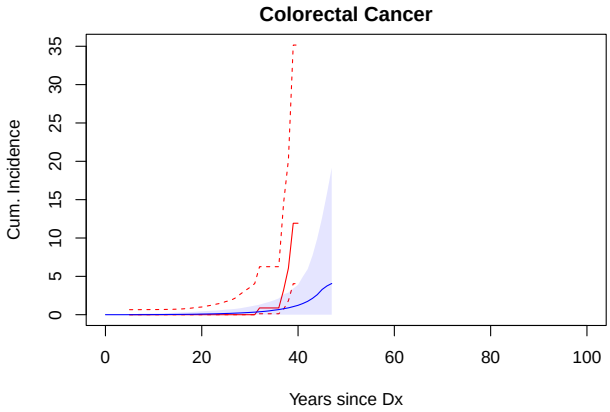
6.5.1.13 Soft Tissue Sarcoma

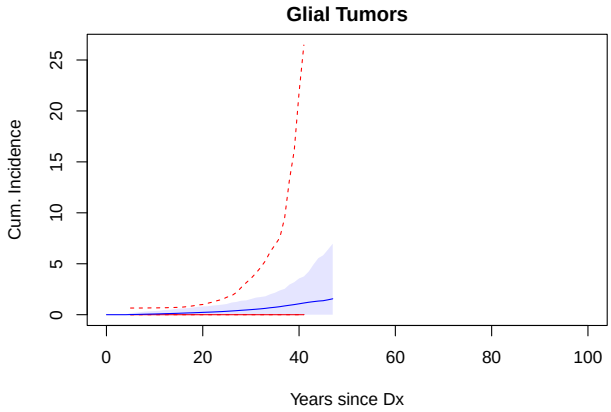


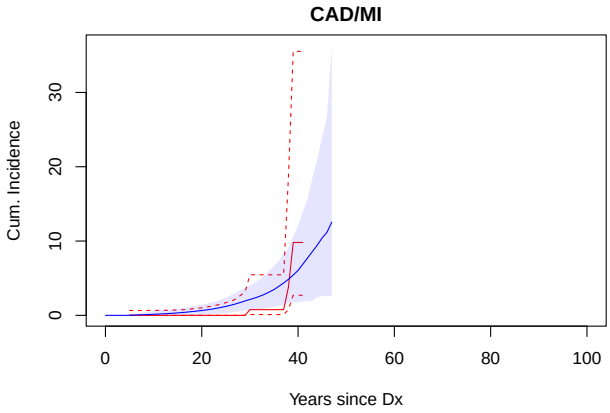
6.5.1.14 WT/NBL

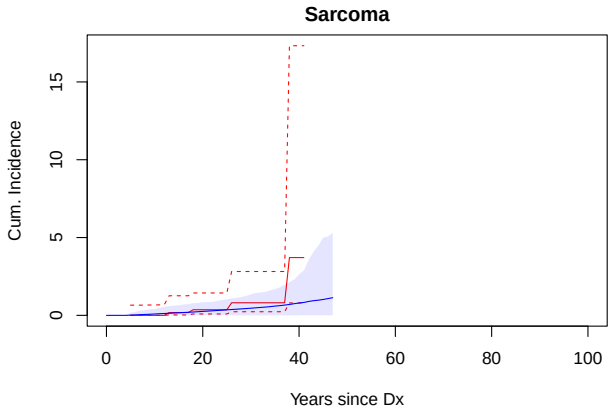

Breast Cancer
Cum. Incidence
Years since Dx

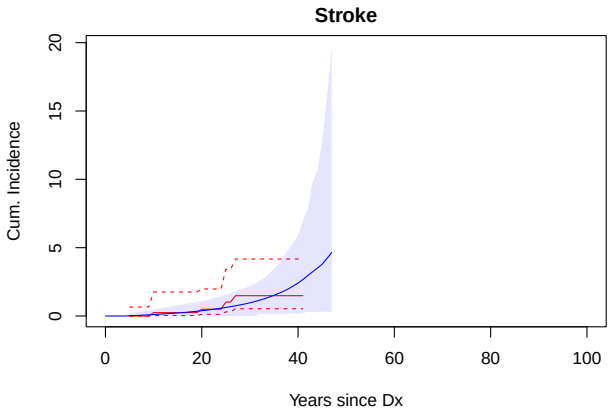

HF
Cum. Incidence
Years since Dx

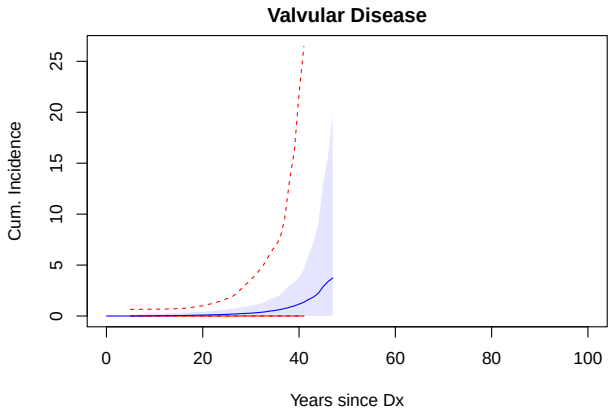

Colorectal Cancer
Cum. Incidence
Years since Dx


Glial Tumors
Cum. Incidence
Years since Dx

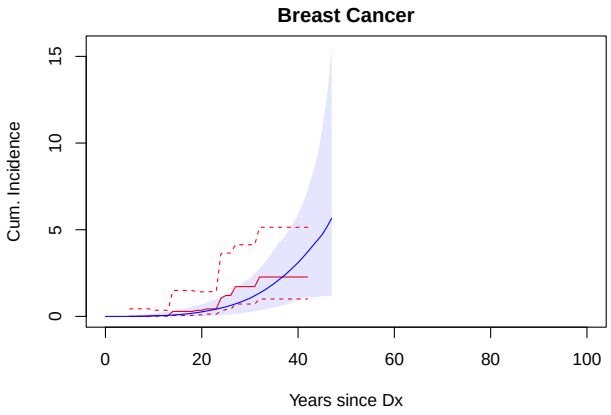

CAD/MI
Cum. Incidence
Years since Dx

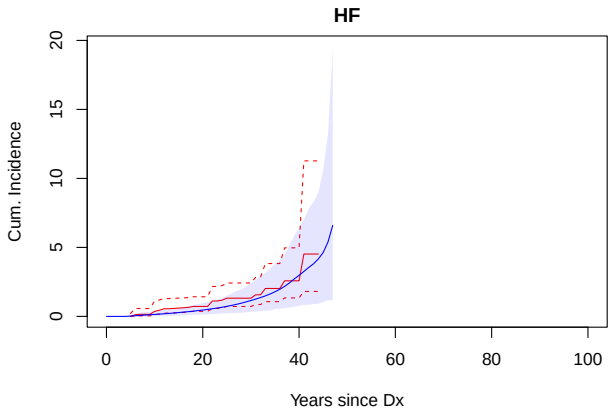

Sarcoma
Cum. Incidence
Years since Dx

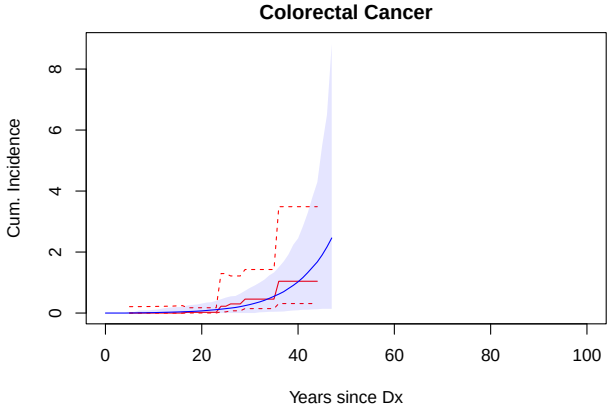

Stroke
Cum. Incidence
Years since Dx

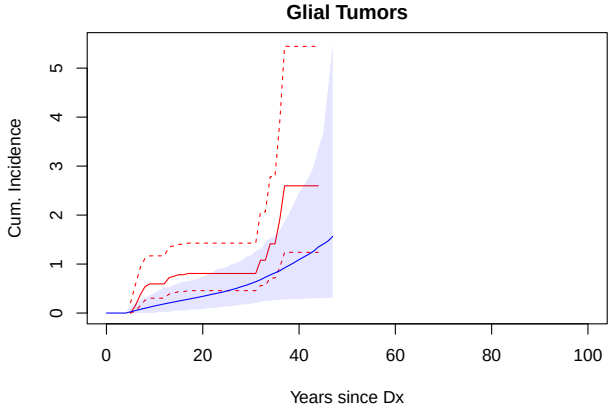

Valvular Disease
Cum. Incidence
Years since Dx

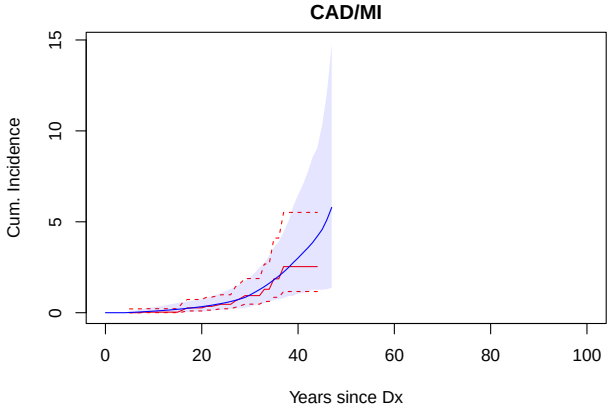
6.5.1.15 Leukemia

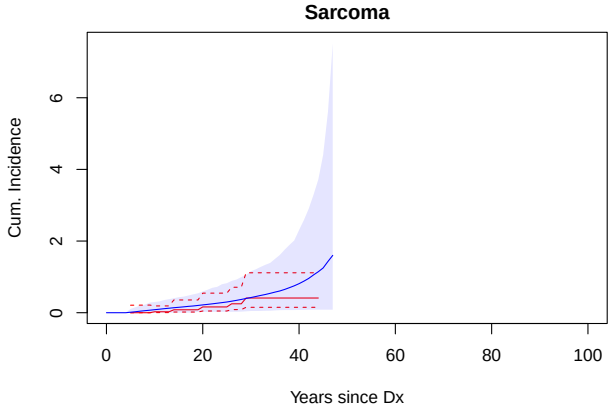


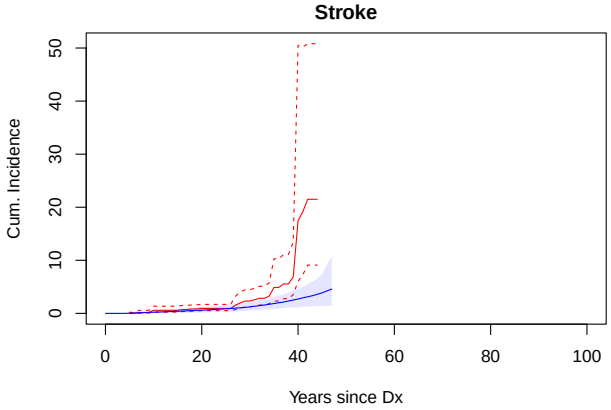


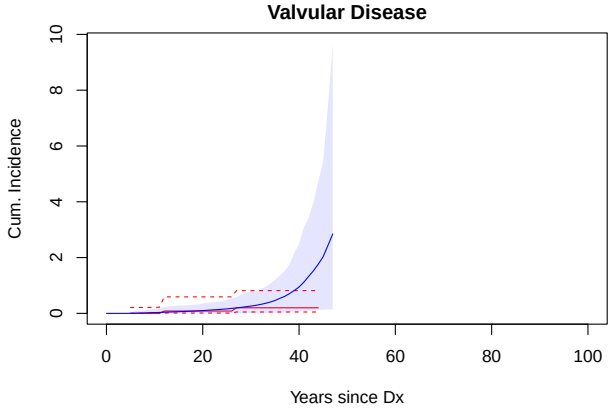




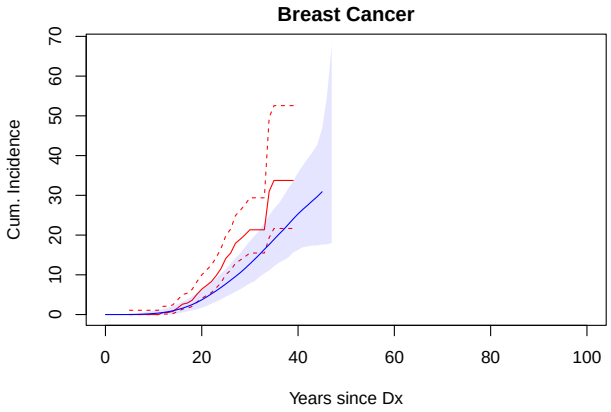


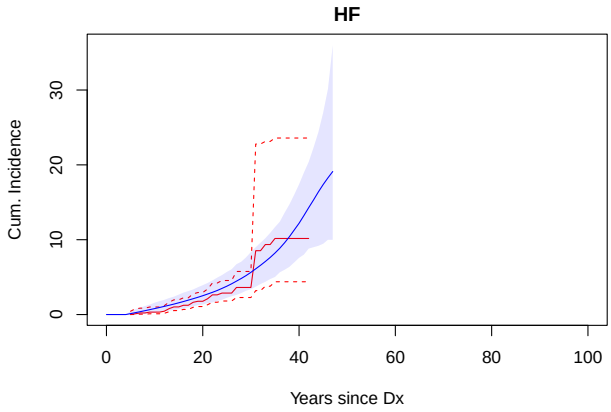


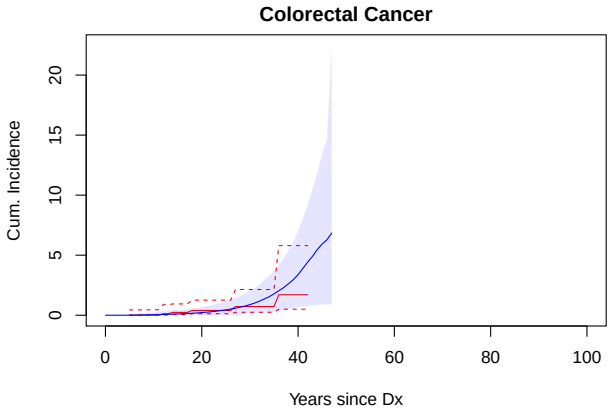


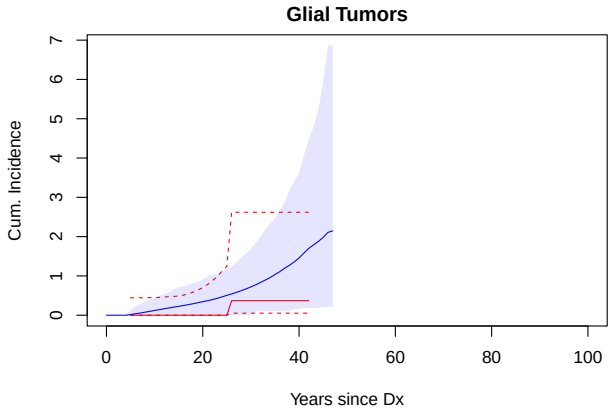


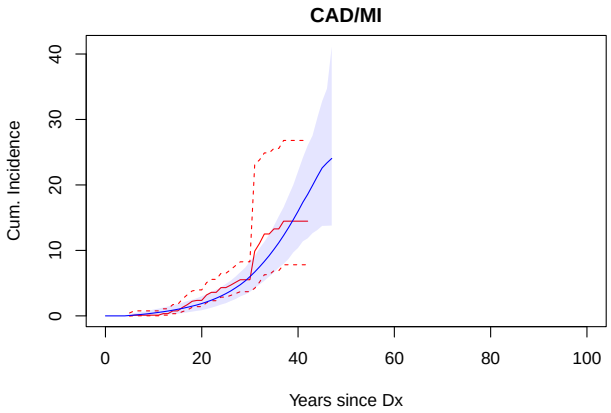
6.5.1.16 Lymphoma

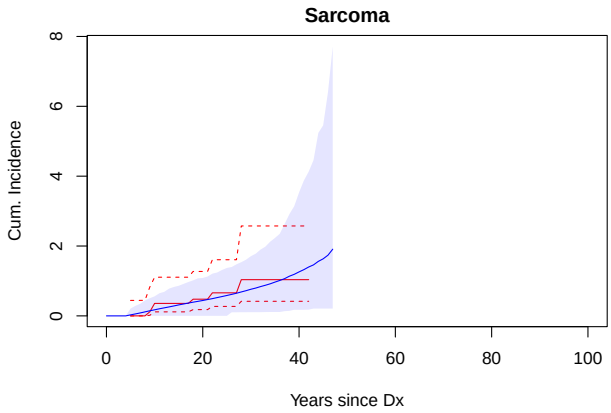


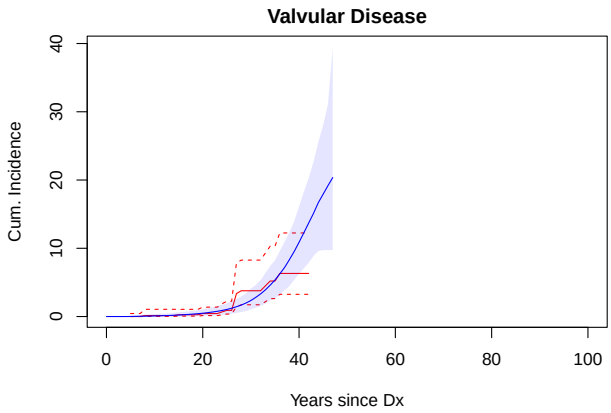




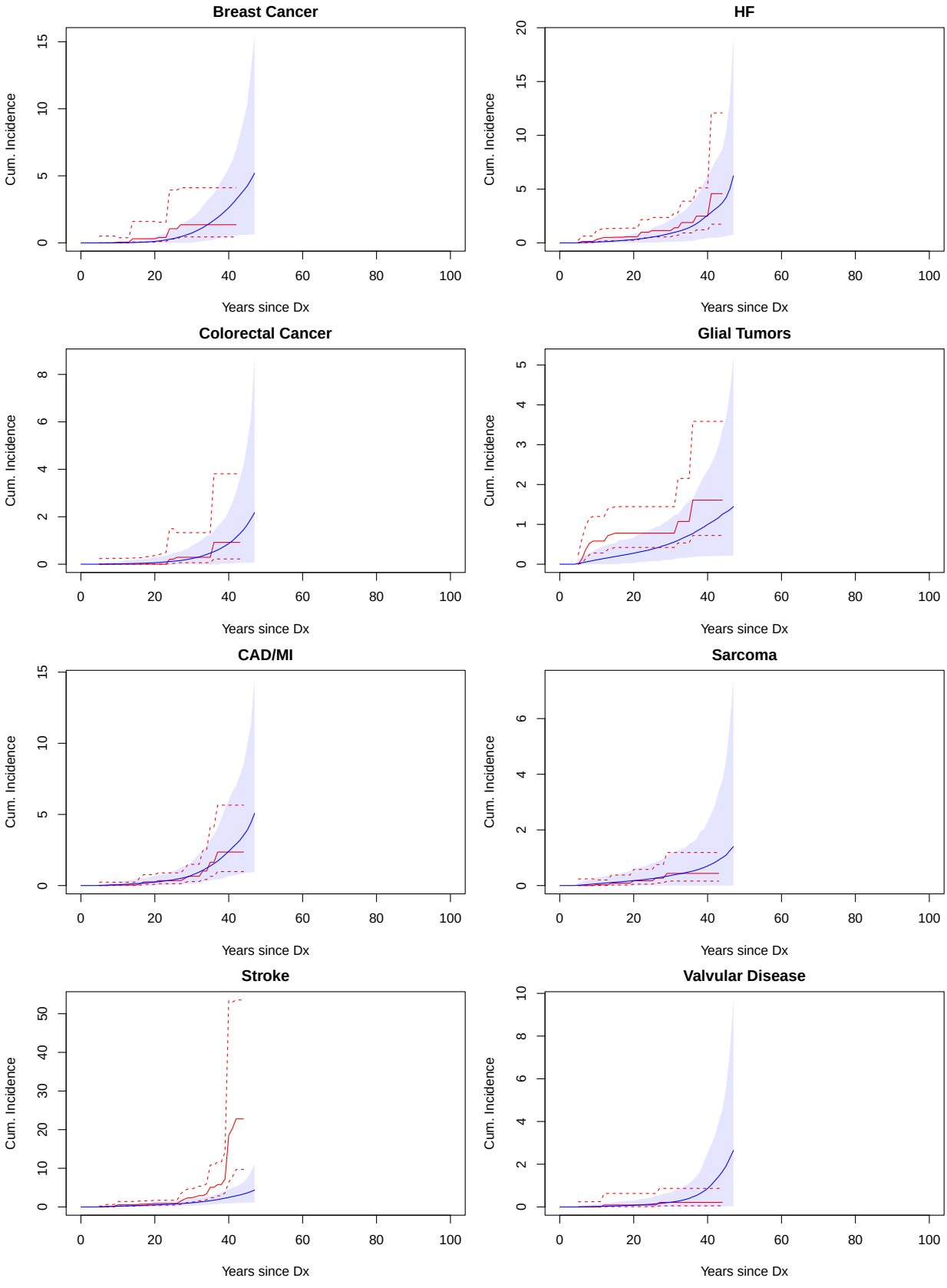




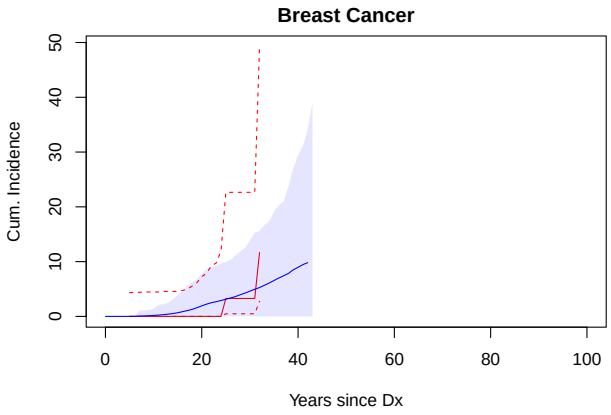


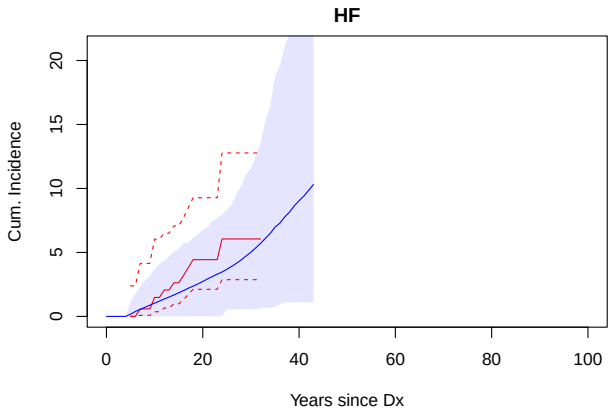


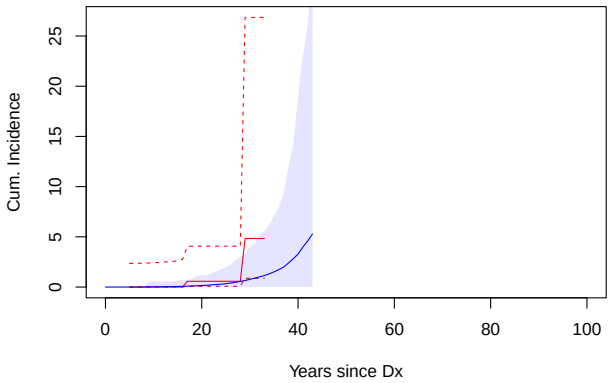
6.5.1.17 ALL

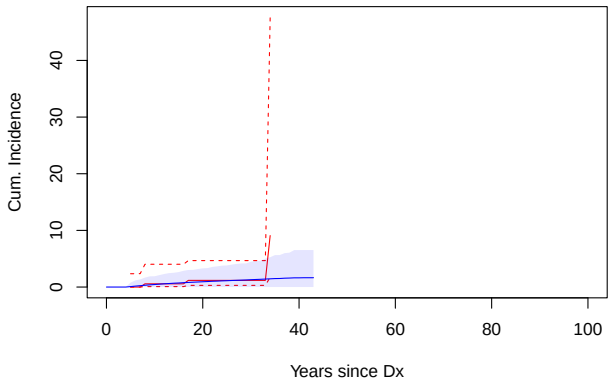

Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

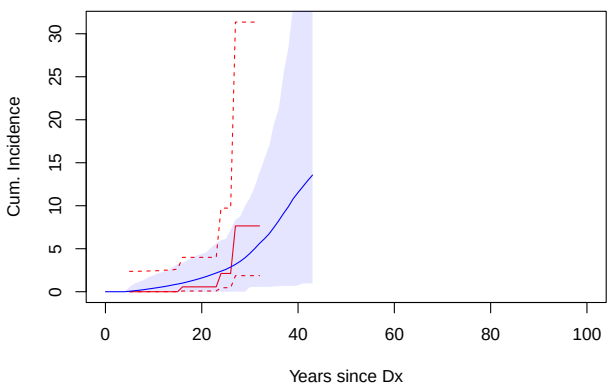
6.5.1.18 AML

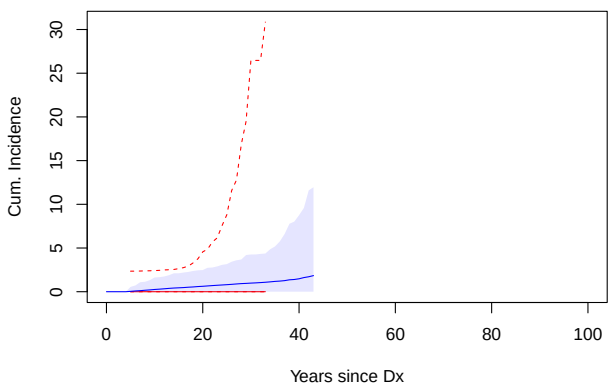

Breast Cancer
Cum. Incidence
0
10
20
30
40
50
0
20
40
60
80
100
Years since Dx

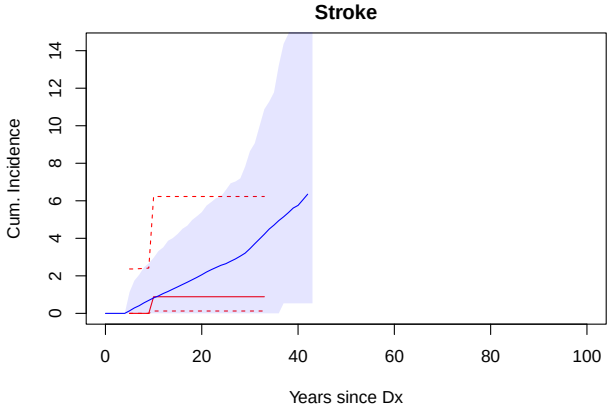

HF
Cum. Incidence
0
5
10
15
20
0
20
40
60
80
100
Years since Dx

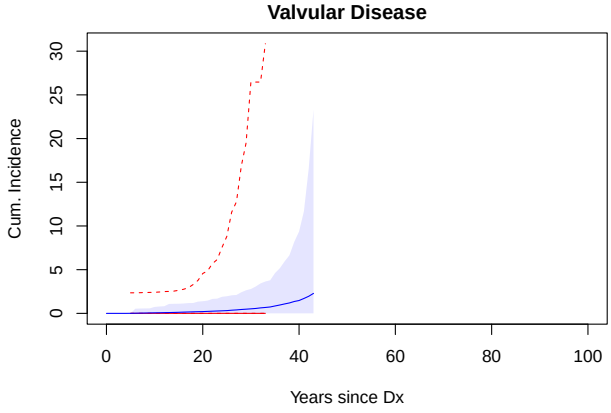

Colorectal Cancer
Cum. Incidence
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx


Glial Tumors
Cum. Incidence
0
10
20
30
40
0
20
40
60
80
100
Years since Dx

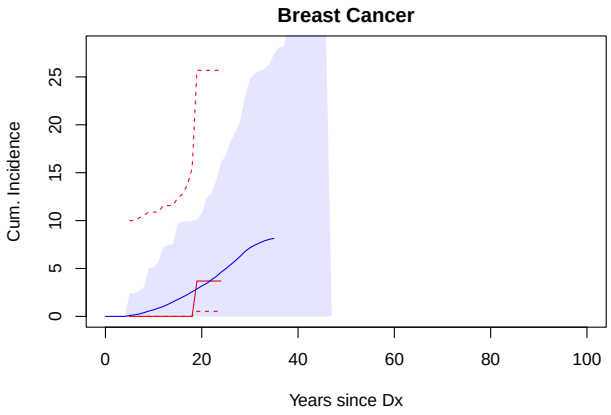

CAD/MI
Cum. Incidence
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx

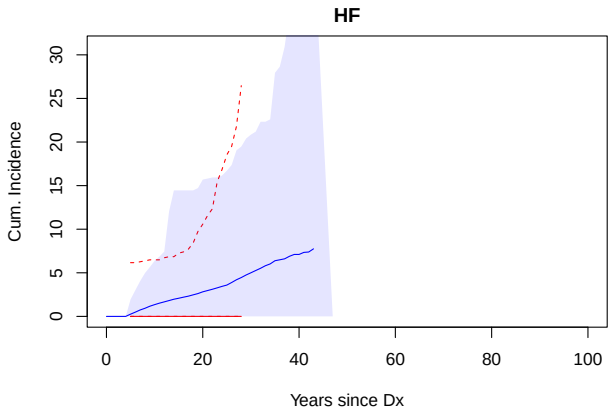

Sarcoma
Cum. Incidence
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx

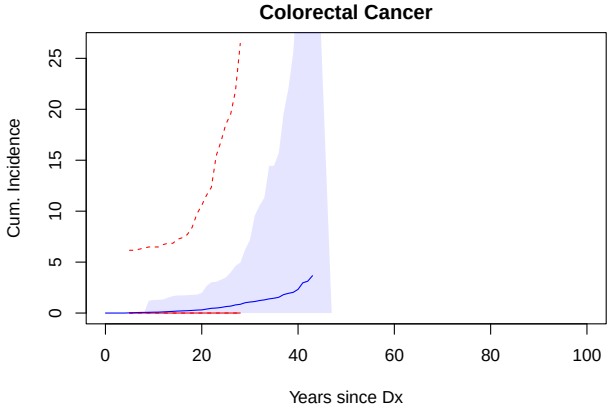

Stroke
Cum. Incidence
0
2
4
6
8
10
12
14
0
20
40
60
80
100
Years since Dx

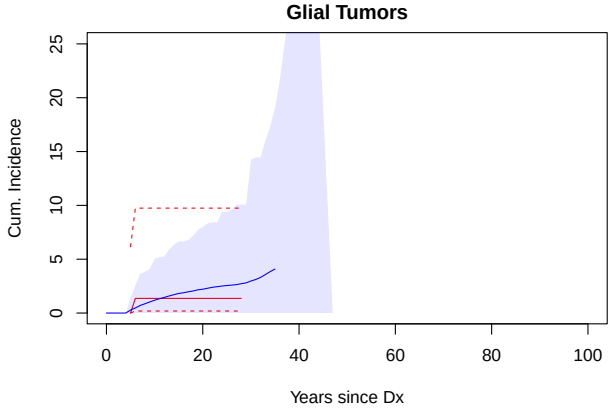

Valvular Disease
Cum. Incidence
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx

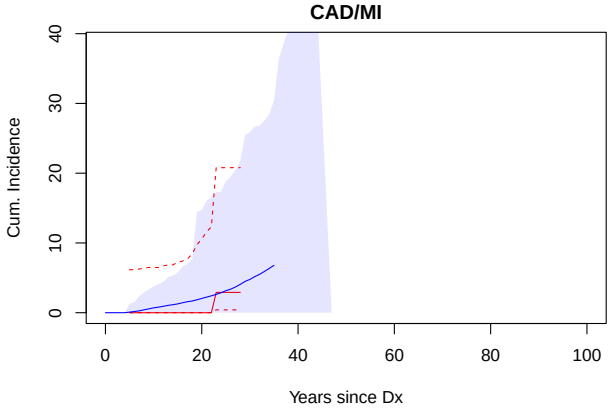
6.5.1.19 OtherLeukemia

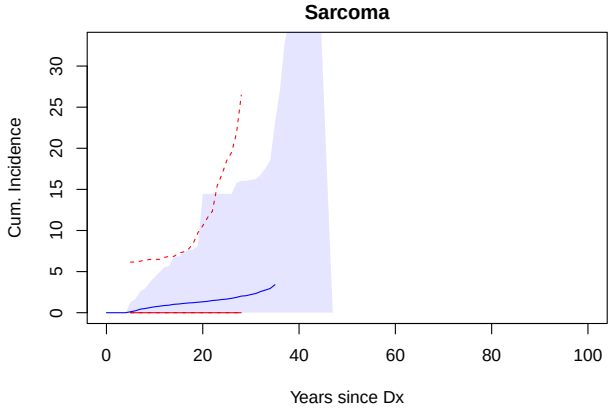


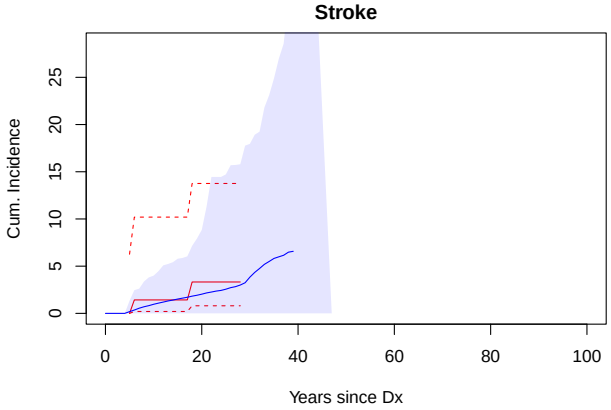


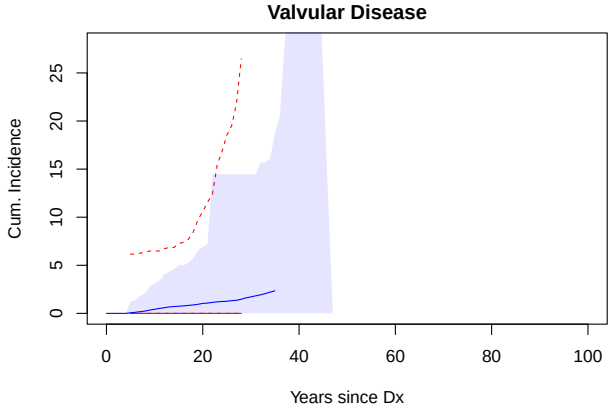




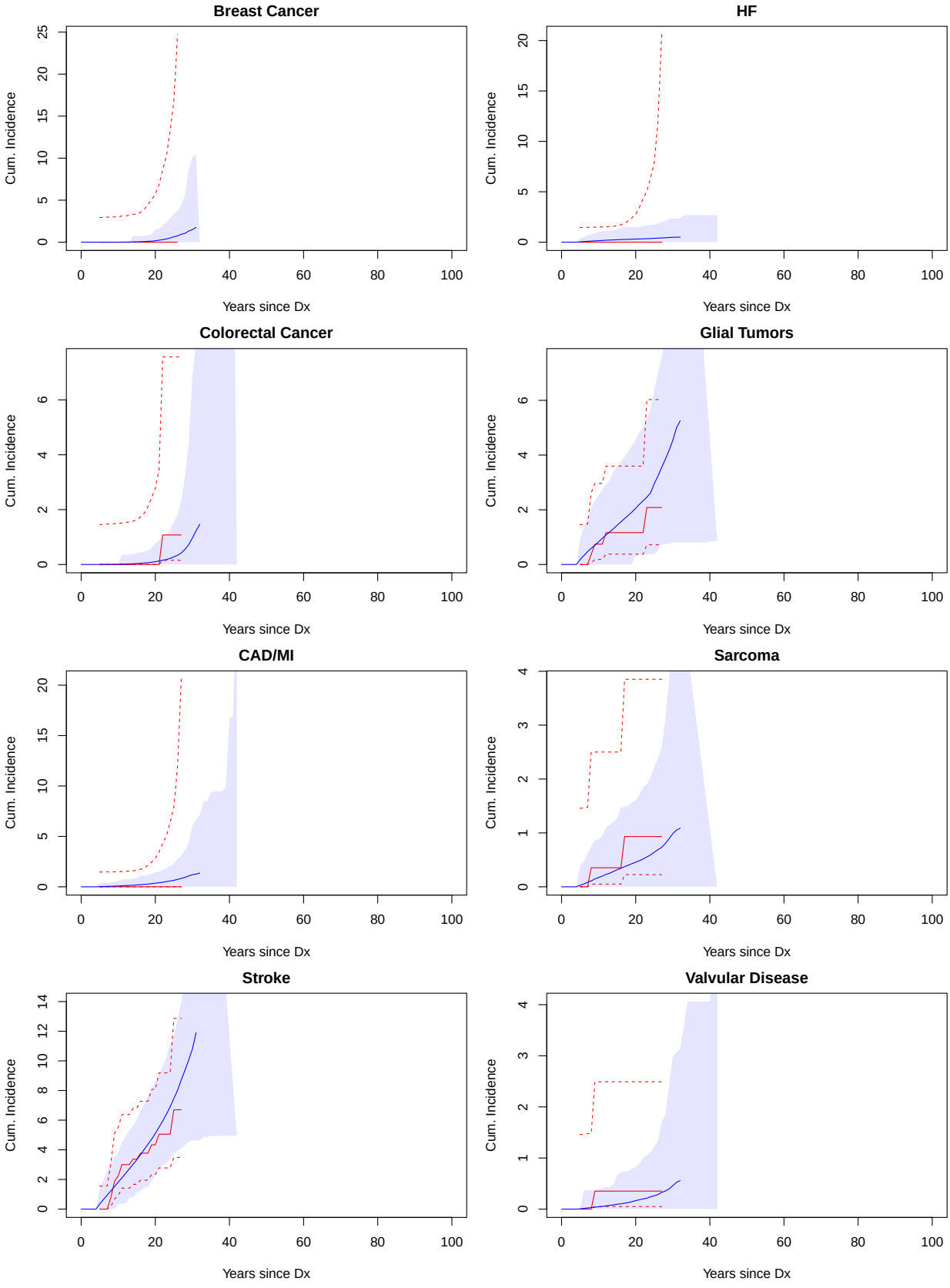




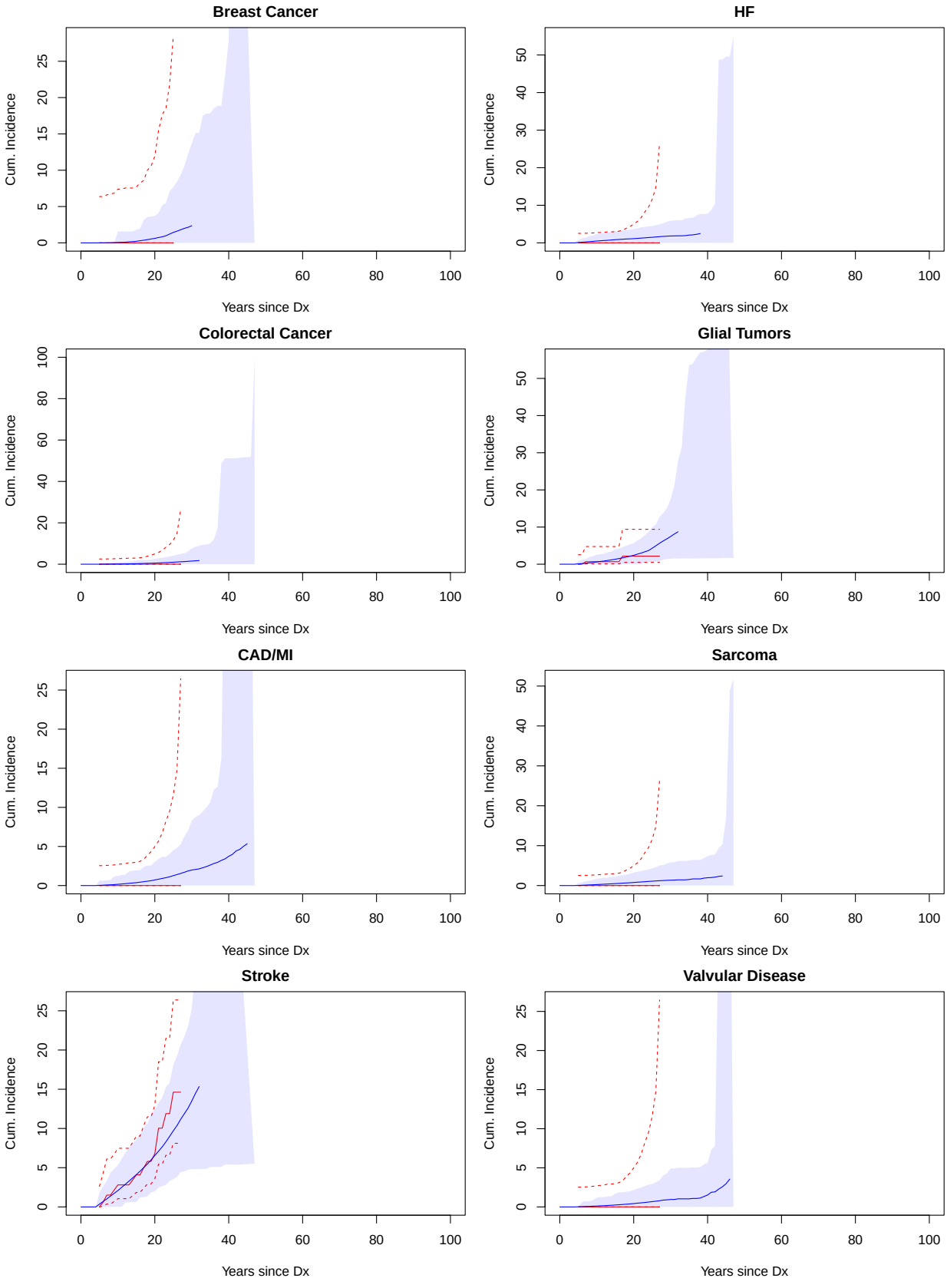




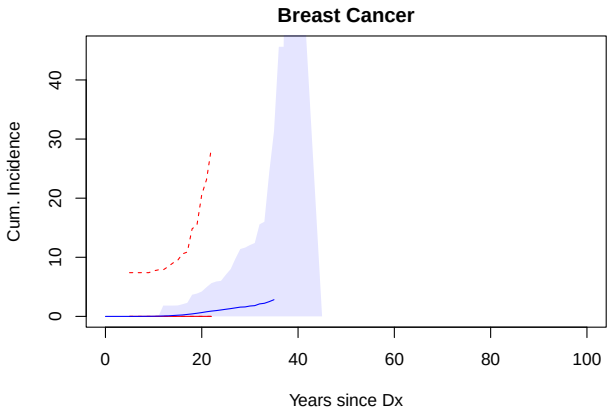
6.5.1.20 Astrocytoma

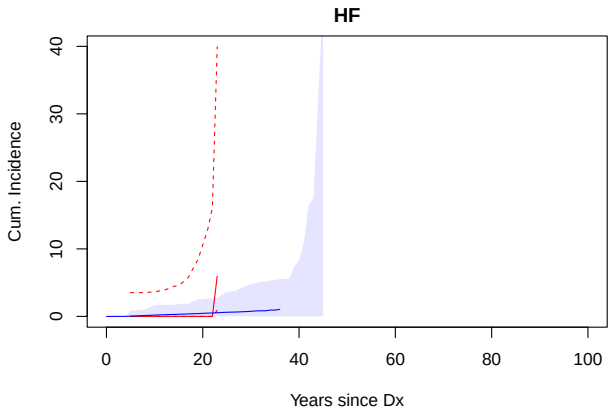


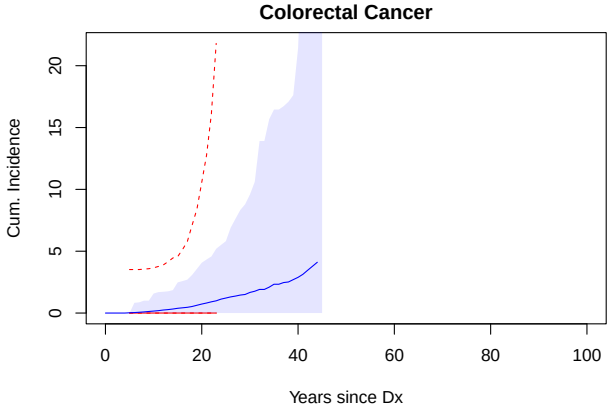
6.5.1.21 Medulloblastoma

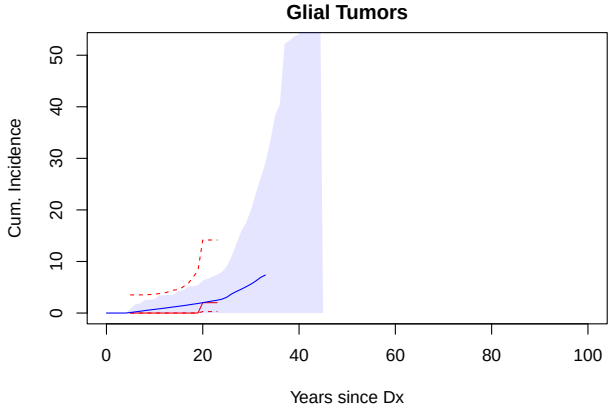


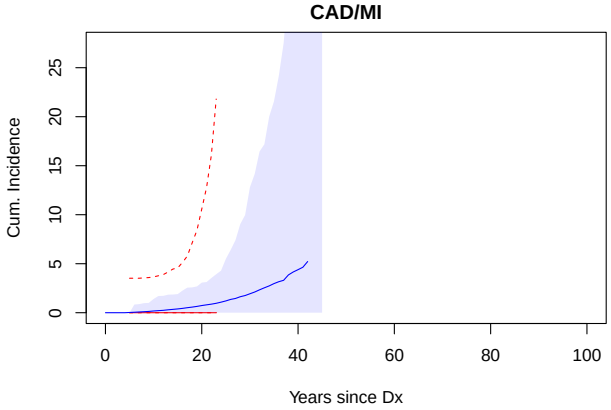
6.5.1.22 Other CNS

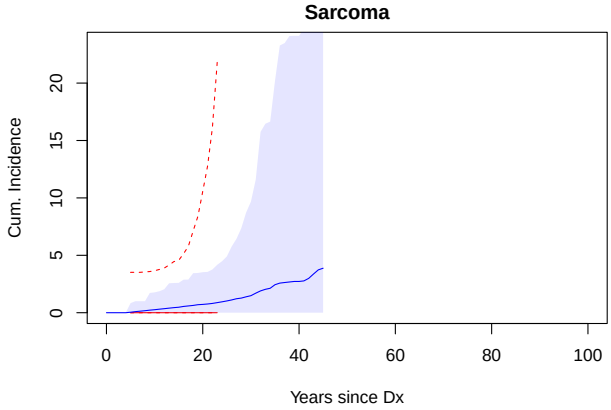


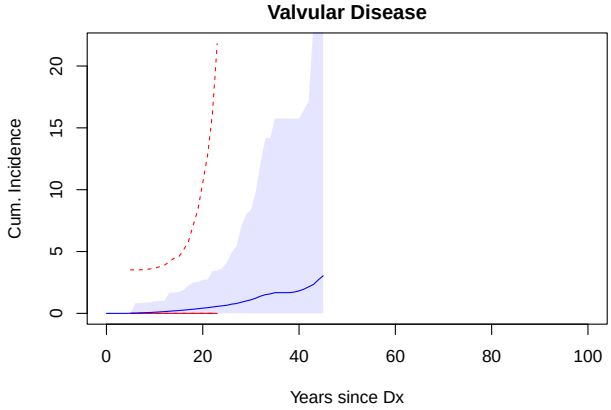




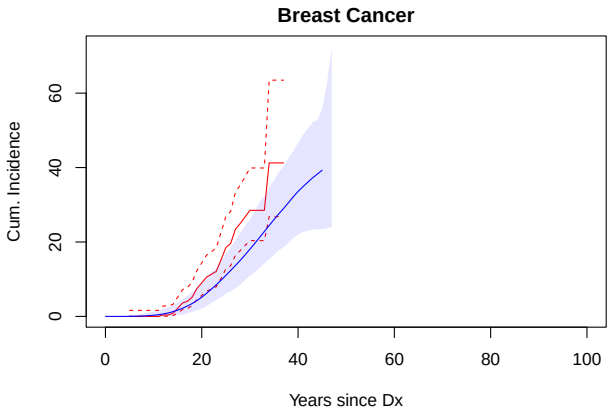


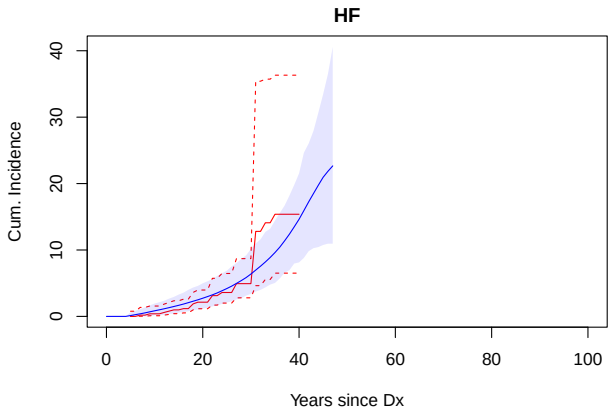


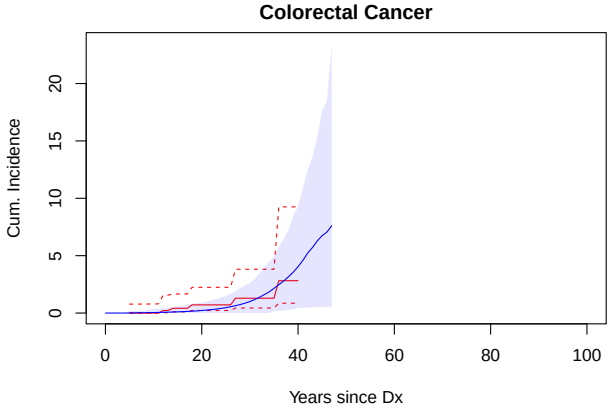


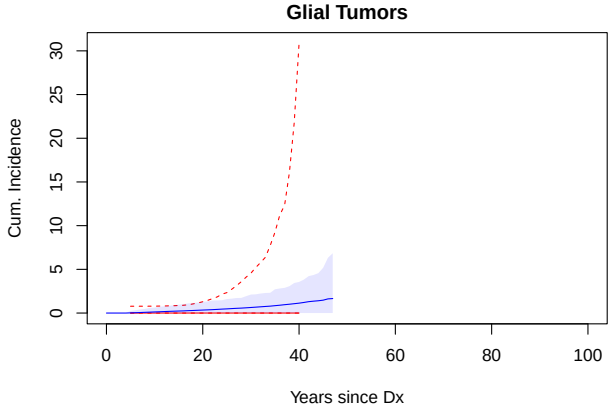


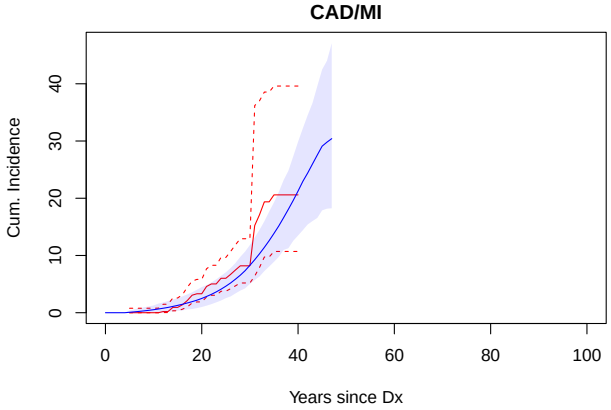
6.5.1.23 HL

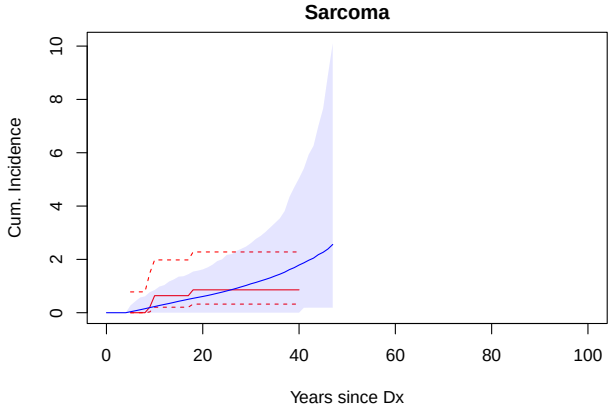

Breast Cancer
Cum. Incidence
0
20
40
60
0
20
40
60
80
100
Years since Dx

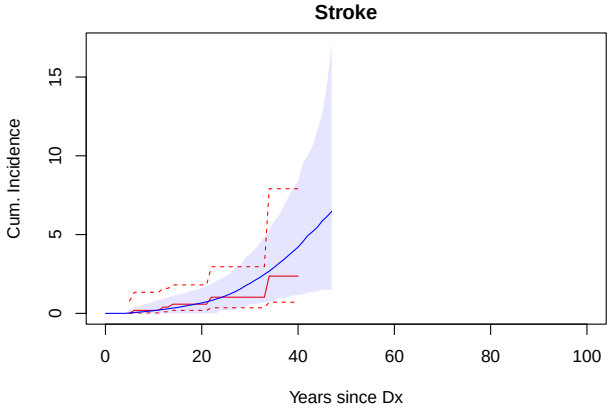

HF
Cum. Incidence
0
10
20
30
40
0
20
40
60
80
100
Years since Dx

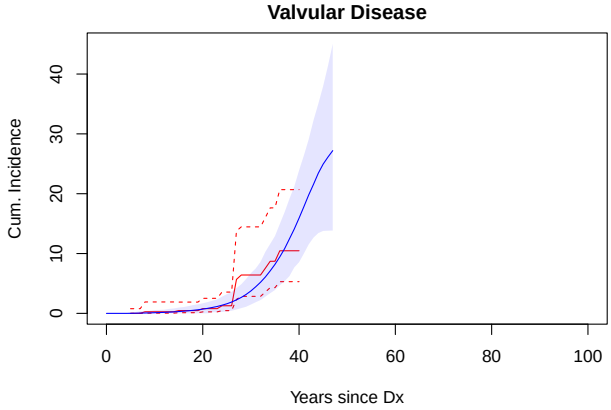

Colorectal Cancer
Cum. Incidence
0
5
10
15
20
0
20
40
60
80
100
Years since Dx


Glial Tumors
Cum. Incidence
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx

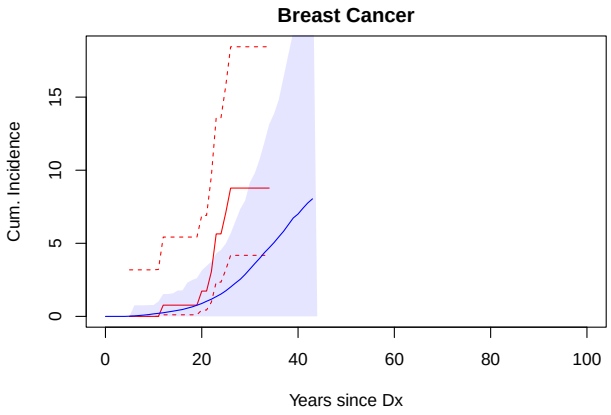

CAD/MI
Cum. Incidence
0
10
20
30
40
0
20
40
60
80
100
Years since Dx

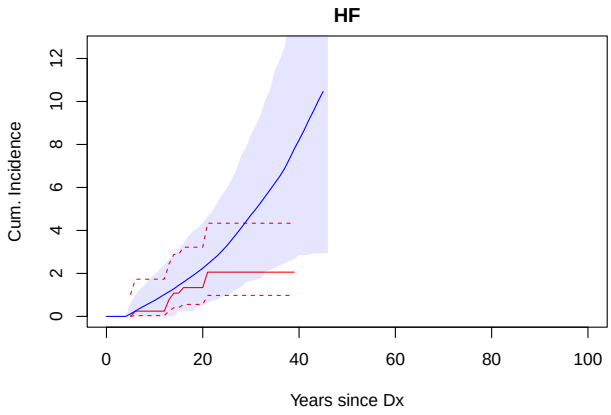

Sarcoma
Cum. Incidence
0
2
4
6
8
10
0
20
40
60
80
100
Years since Dx

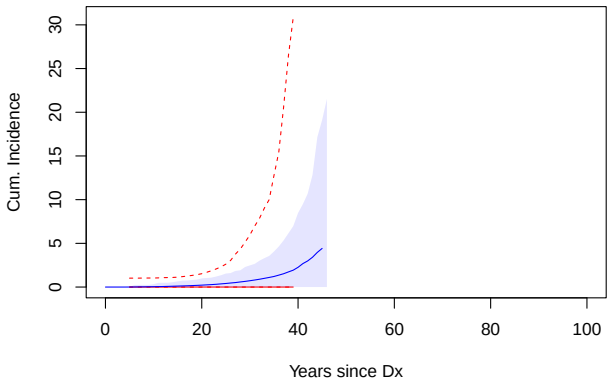

Stroke
Cum. Incidence
0
5
10
15
0
20
40
60
80
100
Years since Dx

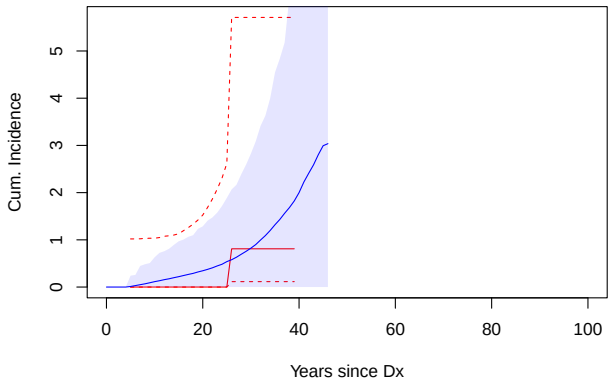

Valvular Disease
Cum. Incidence
0
10
20
30
40
0
20
40
60
80
100
Years since Dx

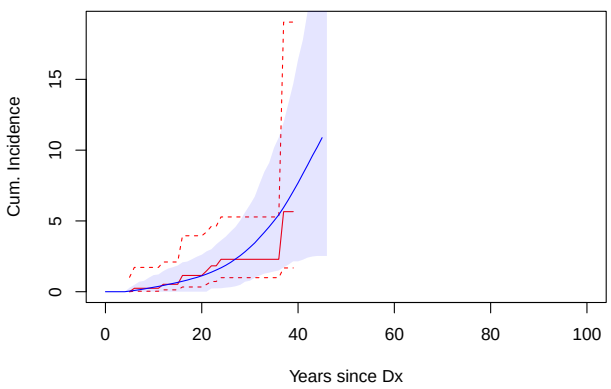
6.5.1.24 NHL

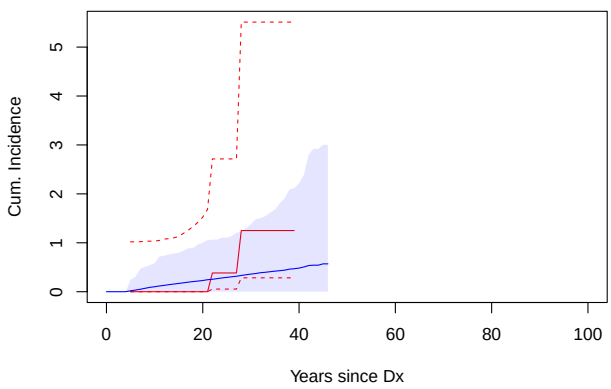

Breast Cancer
Cum. Incidence
0
5
10
15
0
20
40
60
80
100
Years since Dx

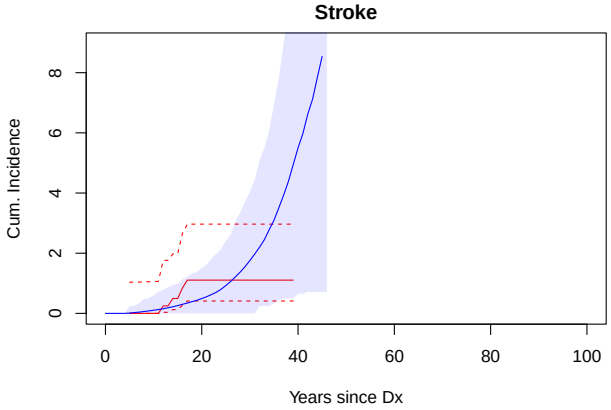

HF
Cum. Incidence
0
2
4
6
8
10
12
0
20
40
60
80
100
Years since Dx

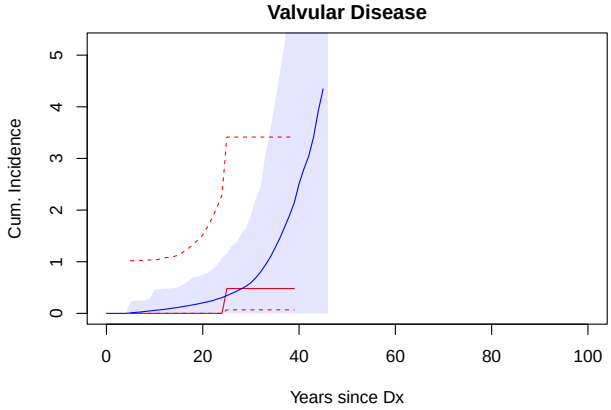

Colorectal Cancer
Cum. Incidence
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx


Glial Tumors
Cum. Incidence
0
1
2
3
4
5
0
20
40
60
80
100
Years since Dx

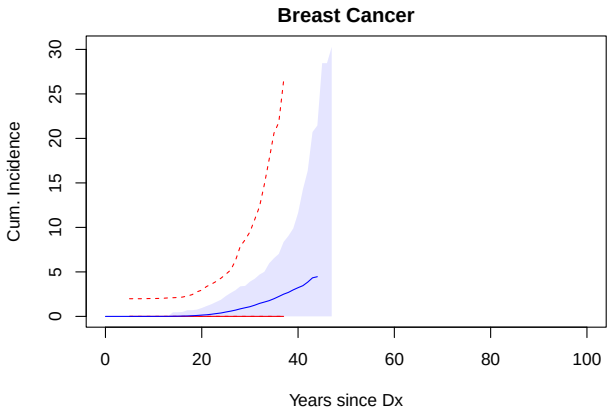

CAD/MI
Cum. Incidence
0
5
10
15
0
20
40
60
80
100
Years since Dx

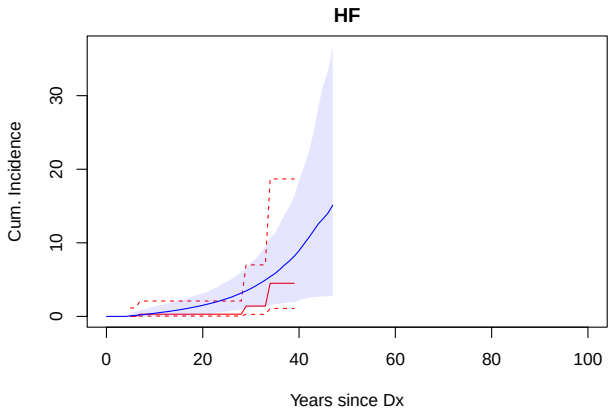

Sarcoma
Cum. Incidence
0
1
2
3
4
5
0
20
40
60
80
100
Years since Dx

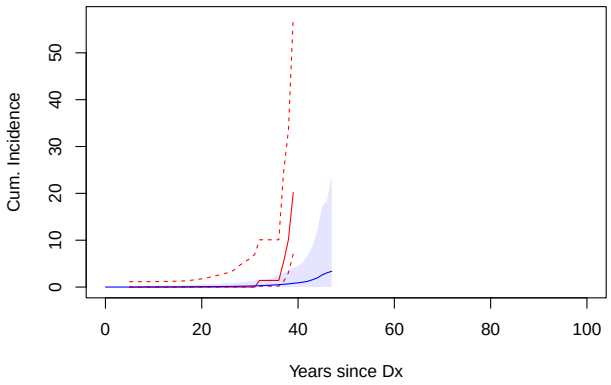

Stroke
Cum. Incidence
0
2
4
6
8
0
20
40
60
80
100
Years since Dx

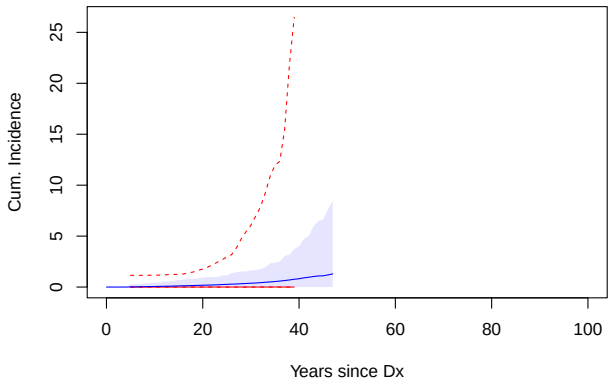

Valvular Disease
Cum. Incidence
0
1
2
3
4
5
0
20
40
60
80
100
Years since Dx

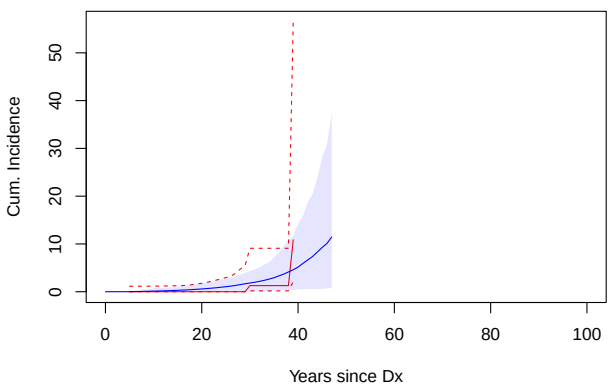
6.5.1.25 WT

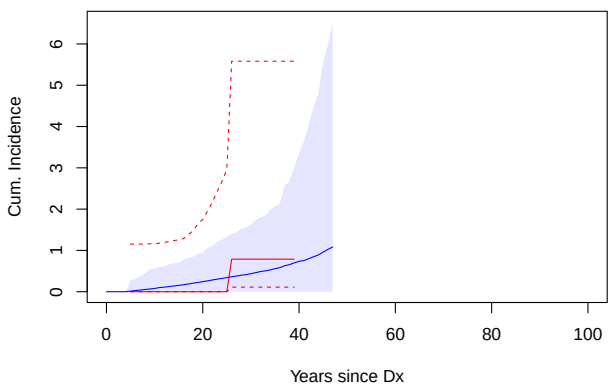

Breast Cancer
Cum. Incidence
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx

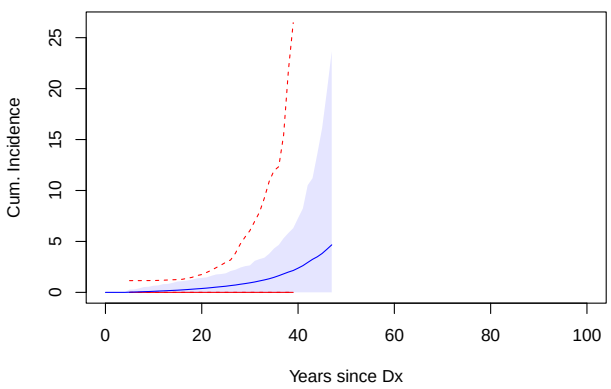

HF
Cum. Incidence
0
10
20
30
0
20
40
60
80
100
Years since Dx

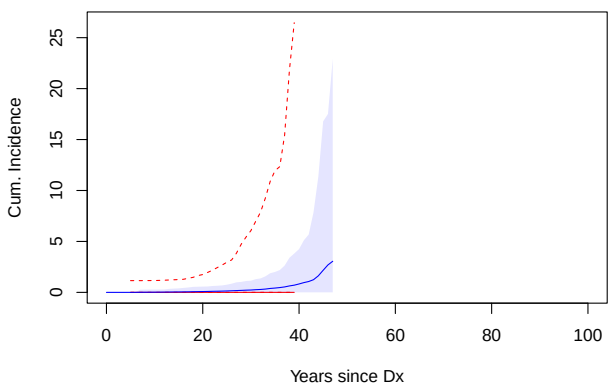

Colorectal Cancer
Cum. Incidence
0
10
20
30
40
50
0
20
40
60
80
100
Years since Dx


Glial Tumors
Cum. Incidence
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx

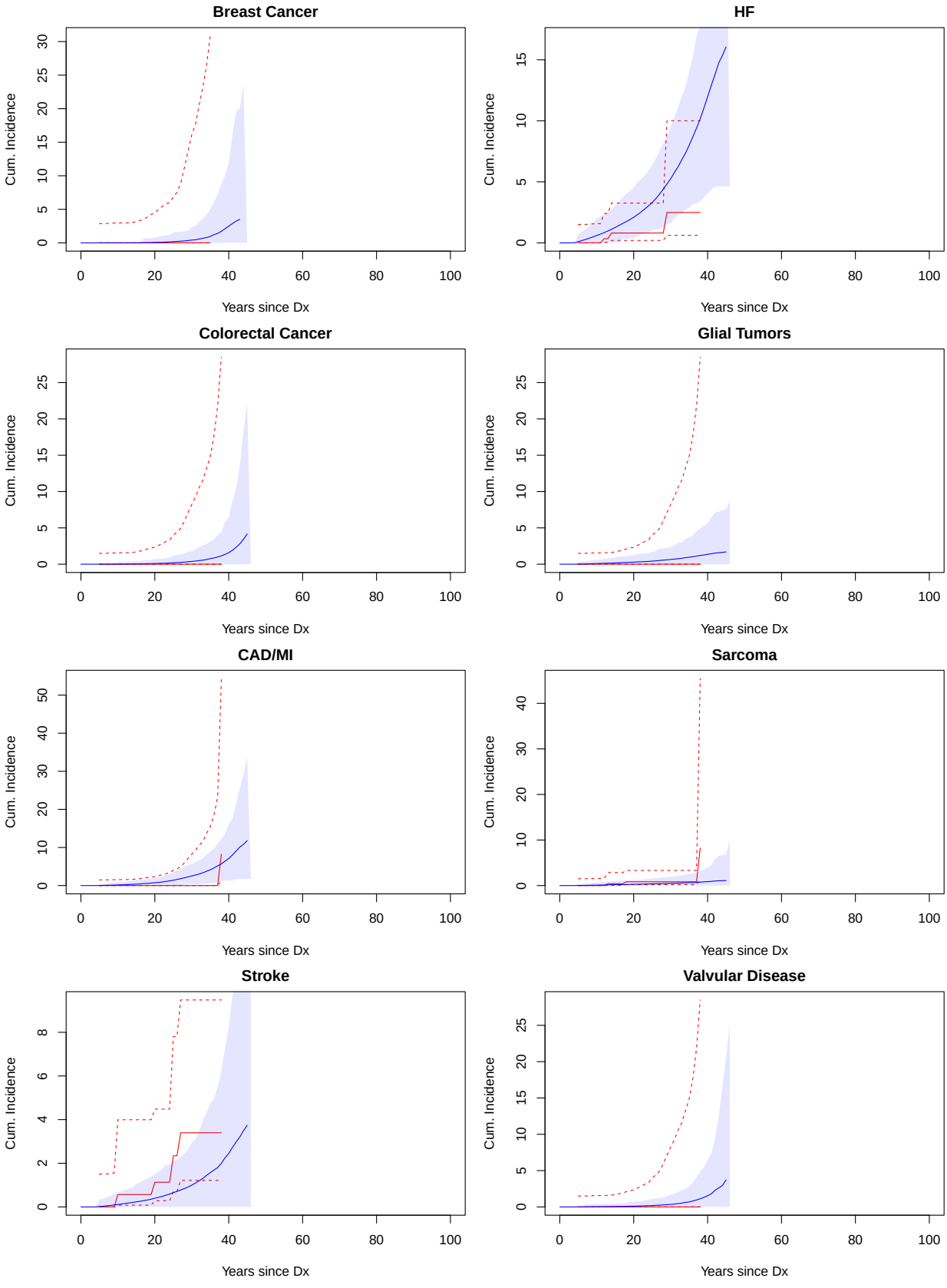

CAD/MI
Cum. Incidence
0
10
20
30
40
50
0
20
40
60
80
100
Years since Dx


Sarcoma
Cum. Incidence
0
1
2
3
4
5
6
0
20
40
60
80
100
Years since Dx

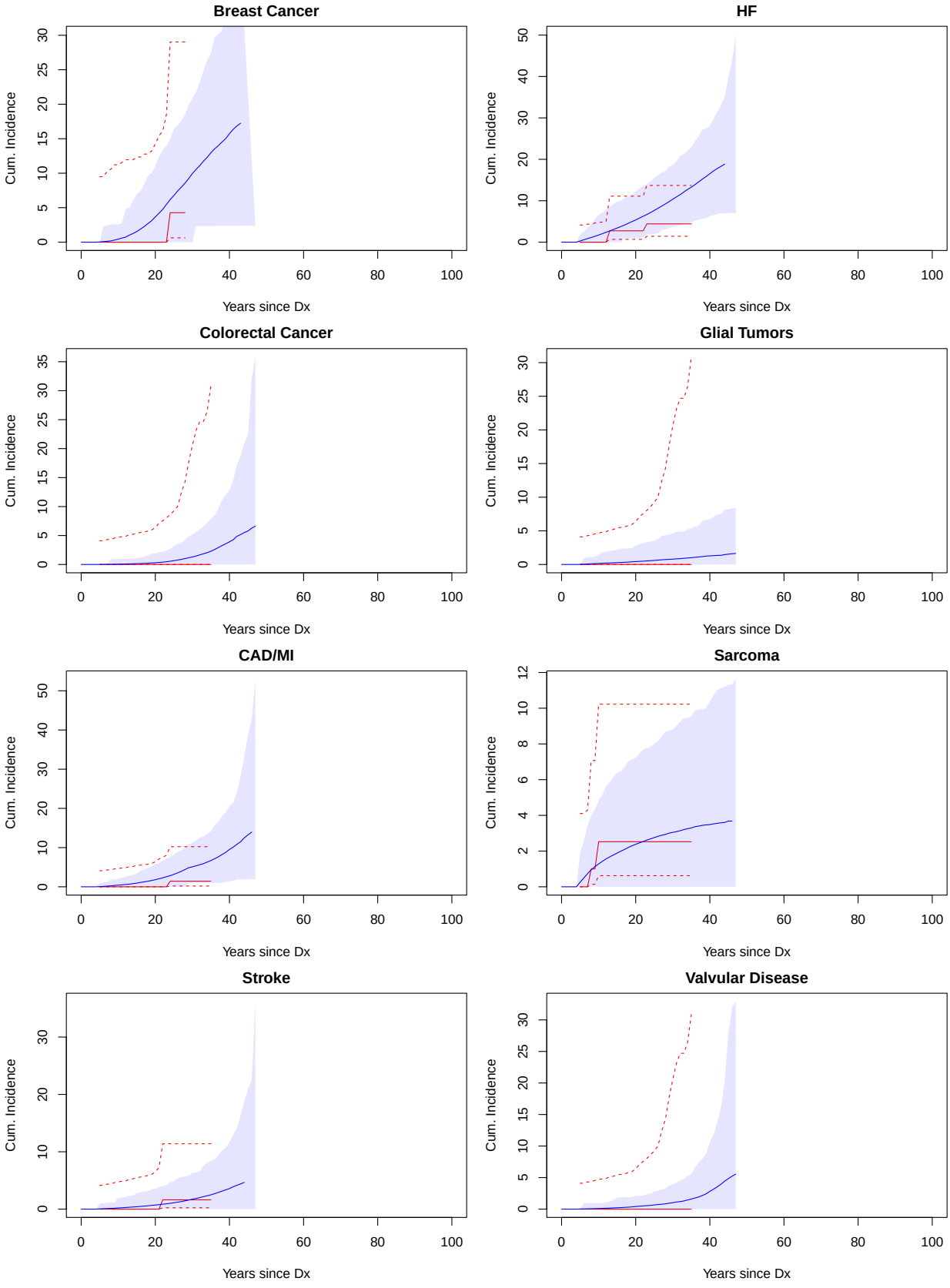

Stroke
Cum. Incidence
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx


Valvular Disease
Cum. Incidence
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx

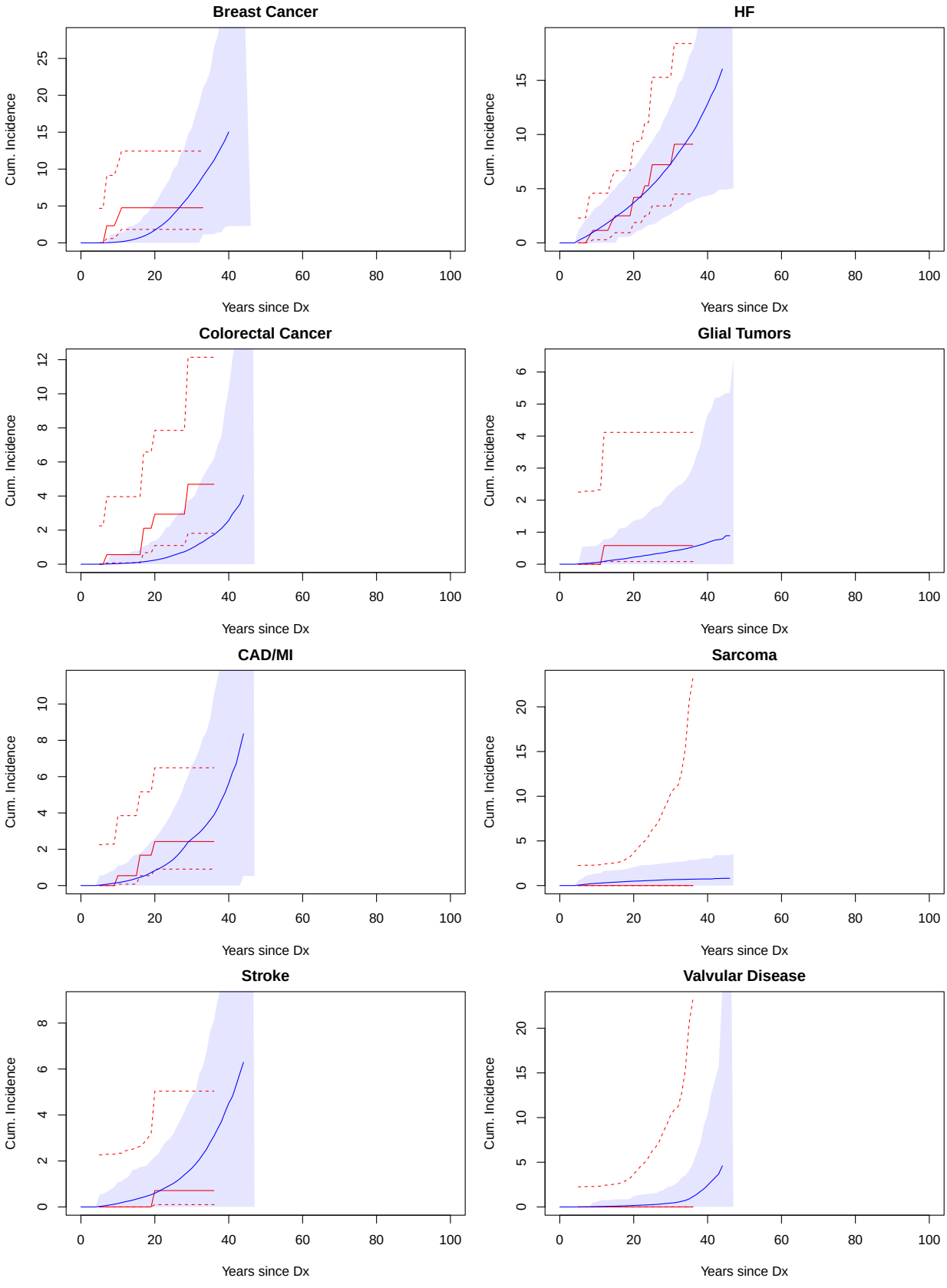
6.5.1.26 NBL


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

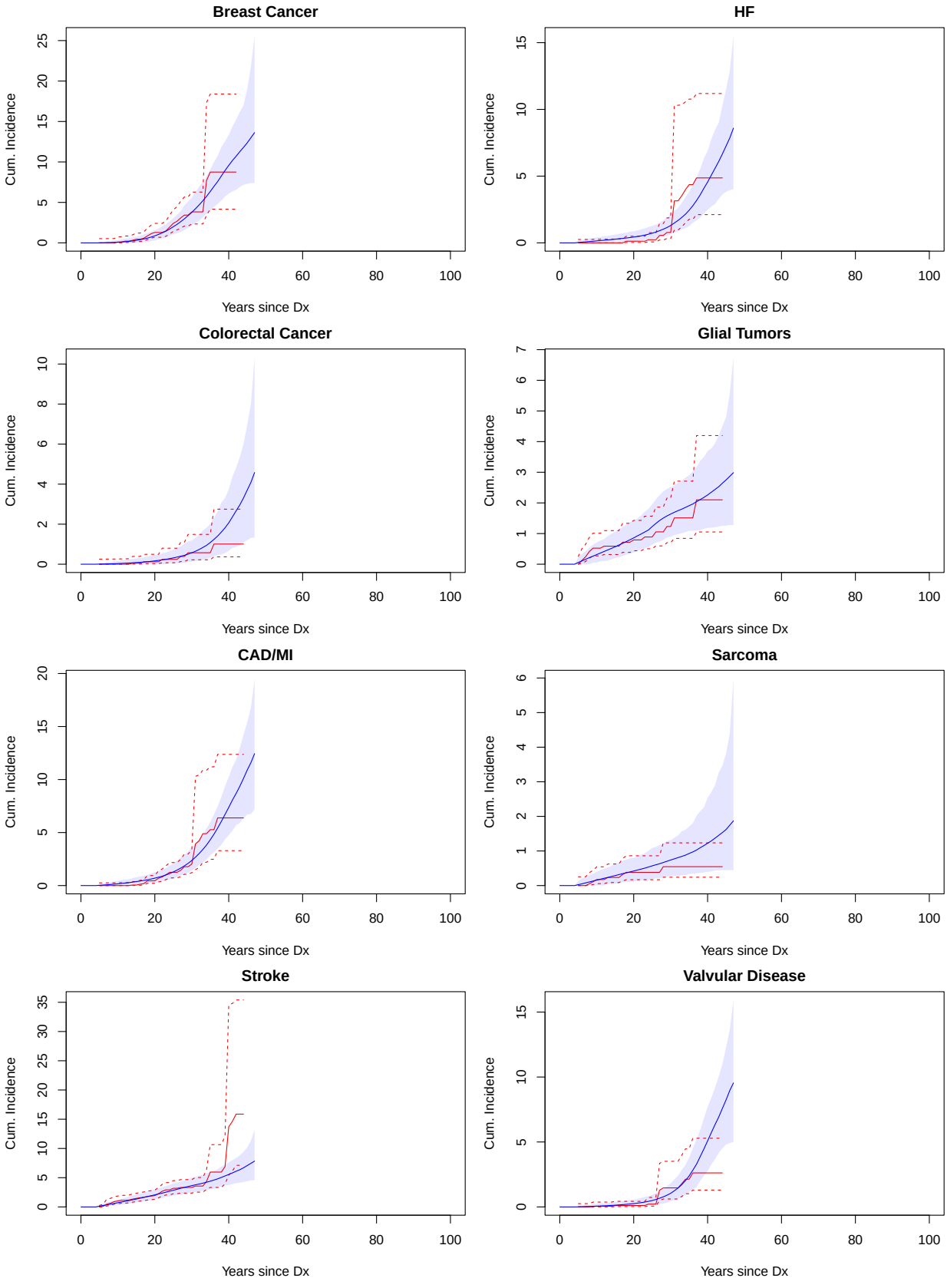
6.5.1.27 Ewings



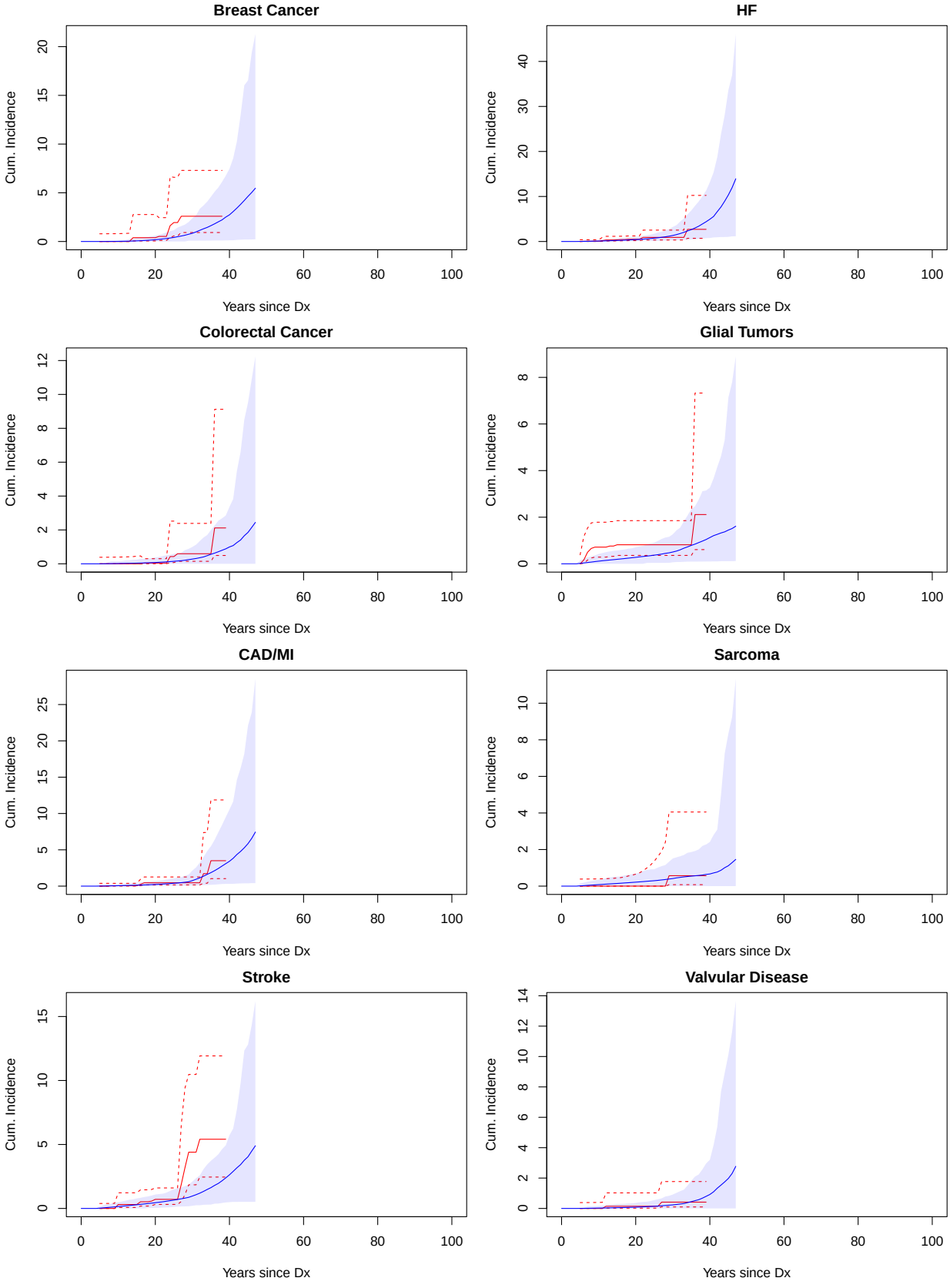
6.5.1.28 Osteosarcoma



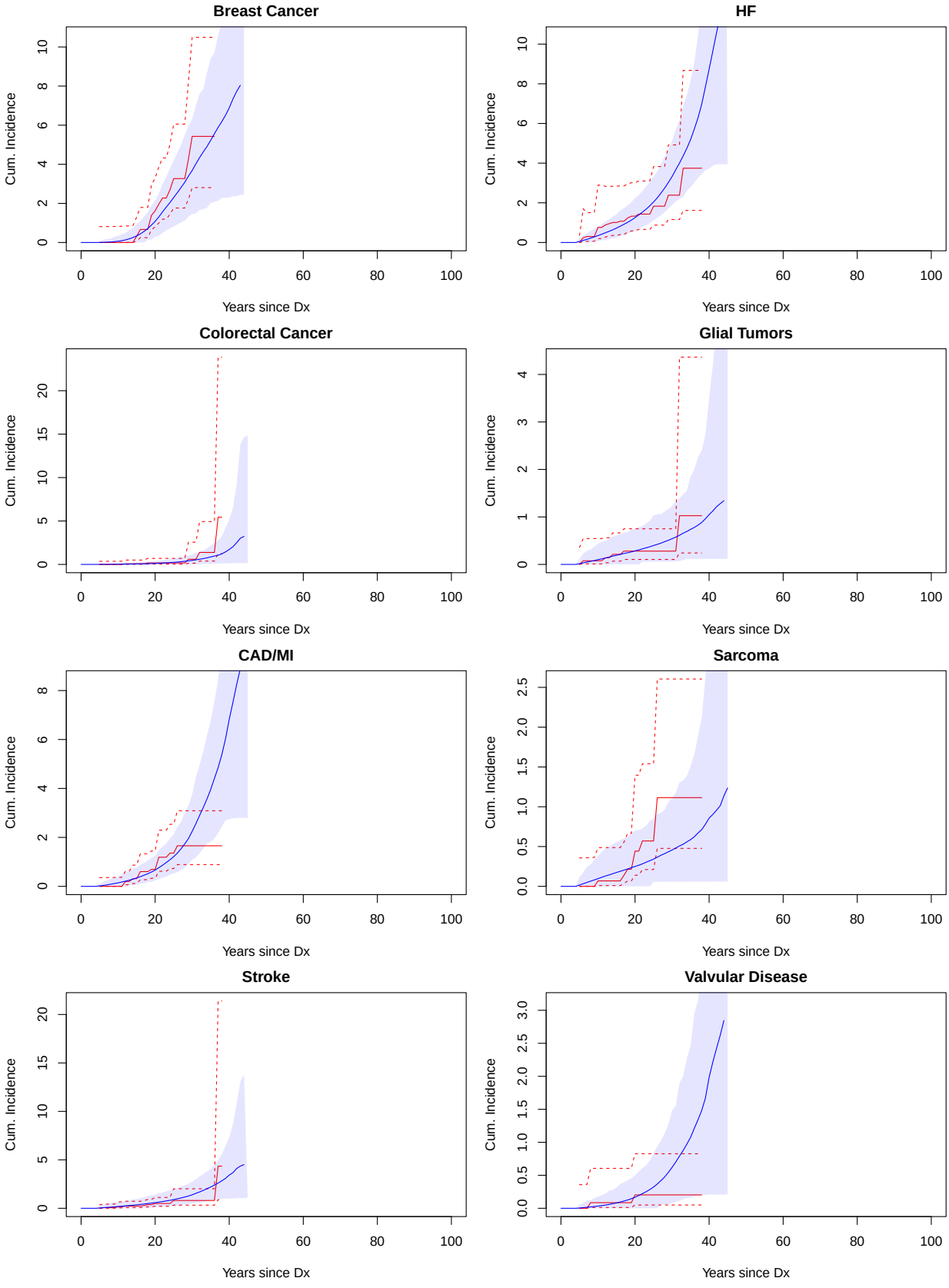
6.5.1.29 AnthNone



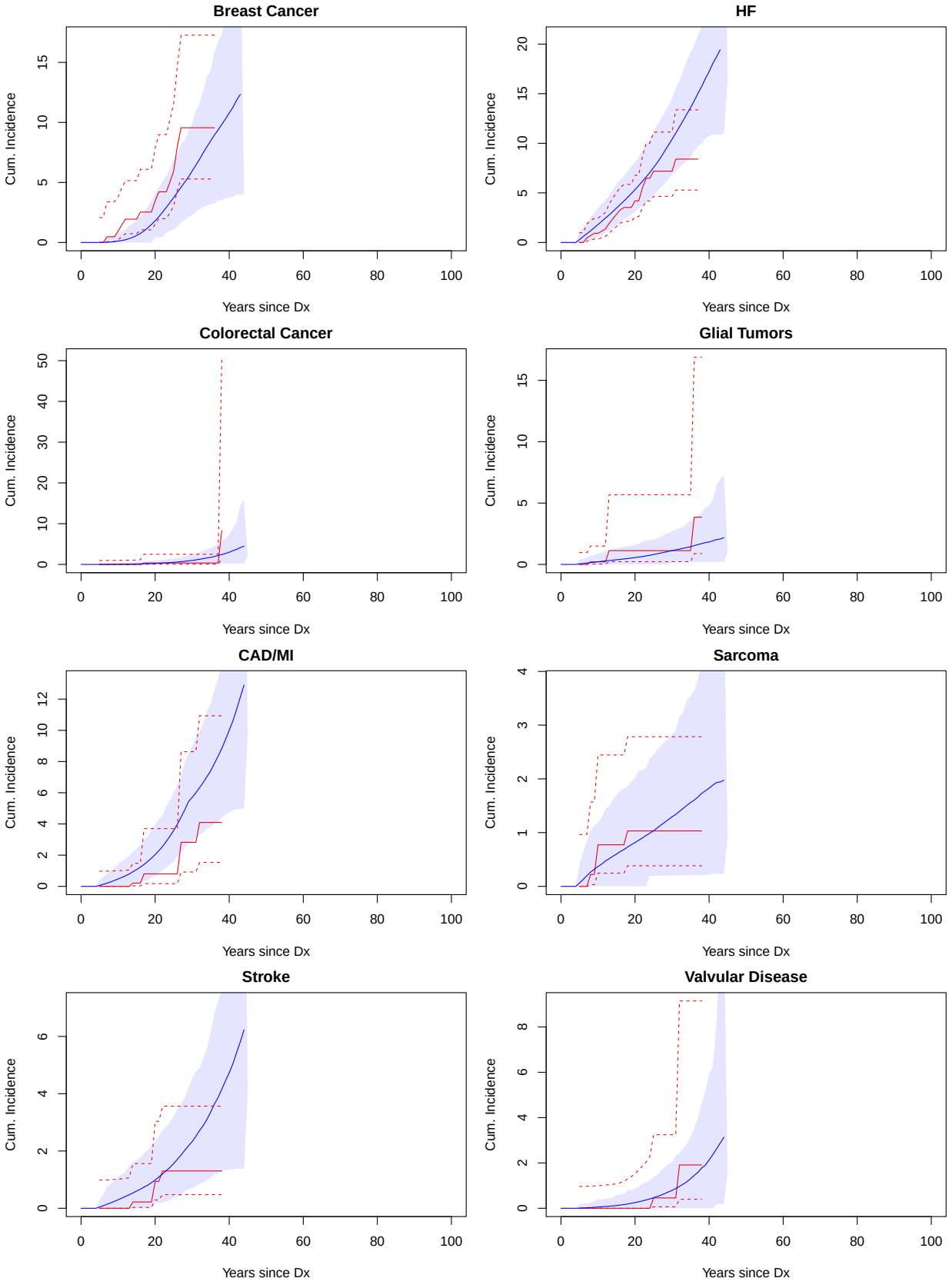
6.5.1.30 Anth<100



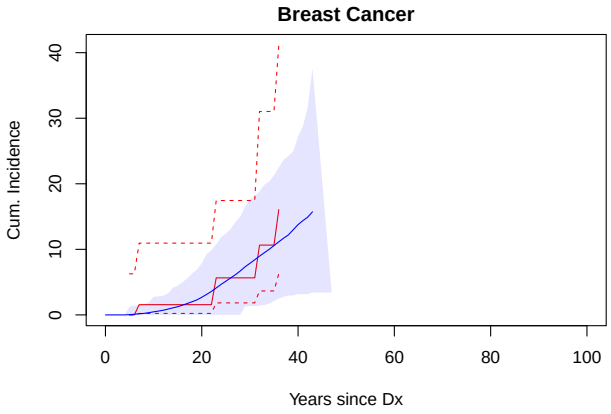
6.5.1.31 Anth100_249

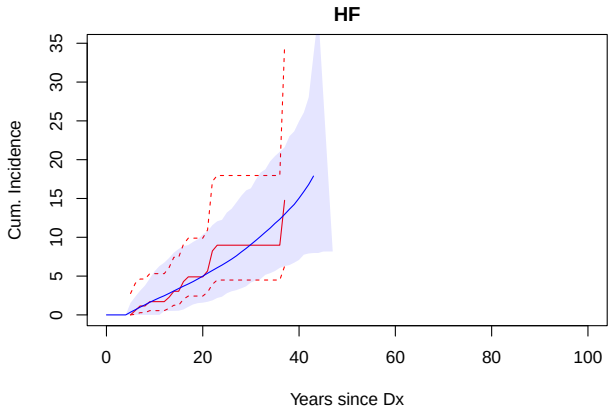


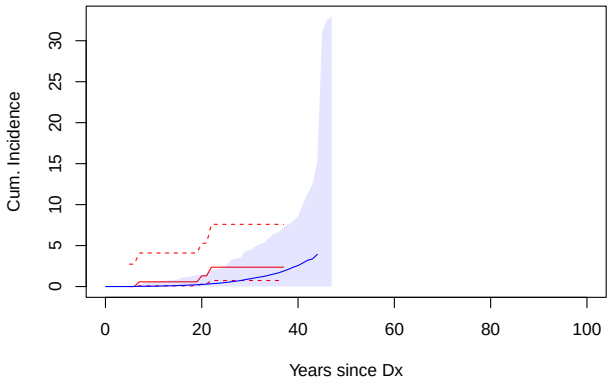
6.5.1.32 Anth250_399

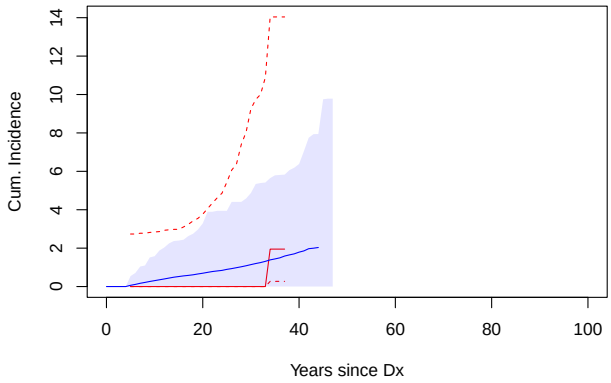


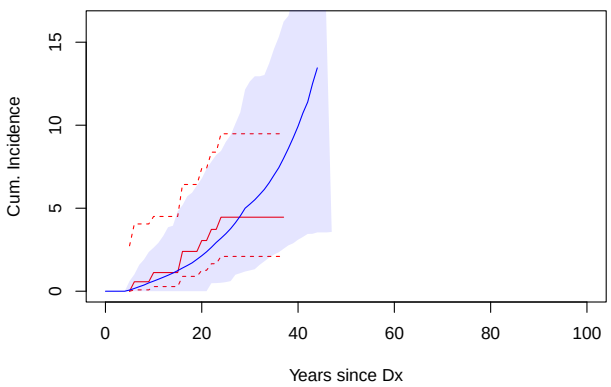
6.5.1.33 Anth400+

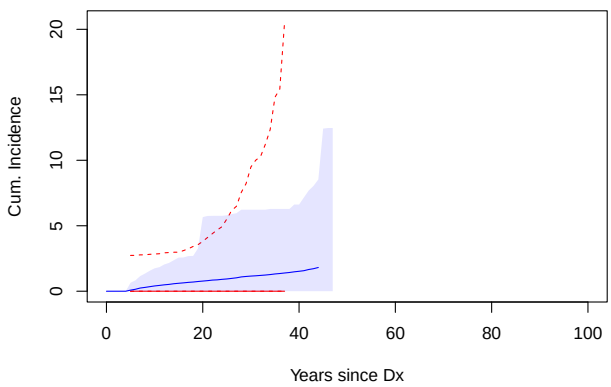


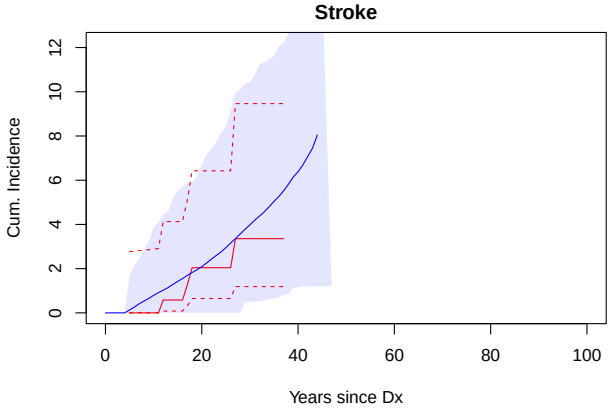


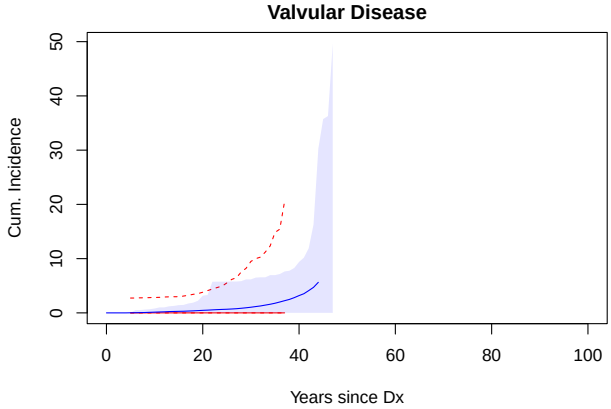




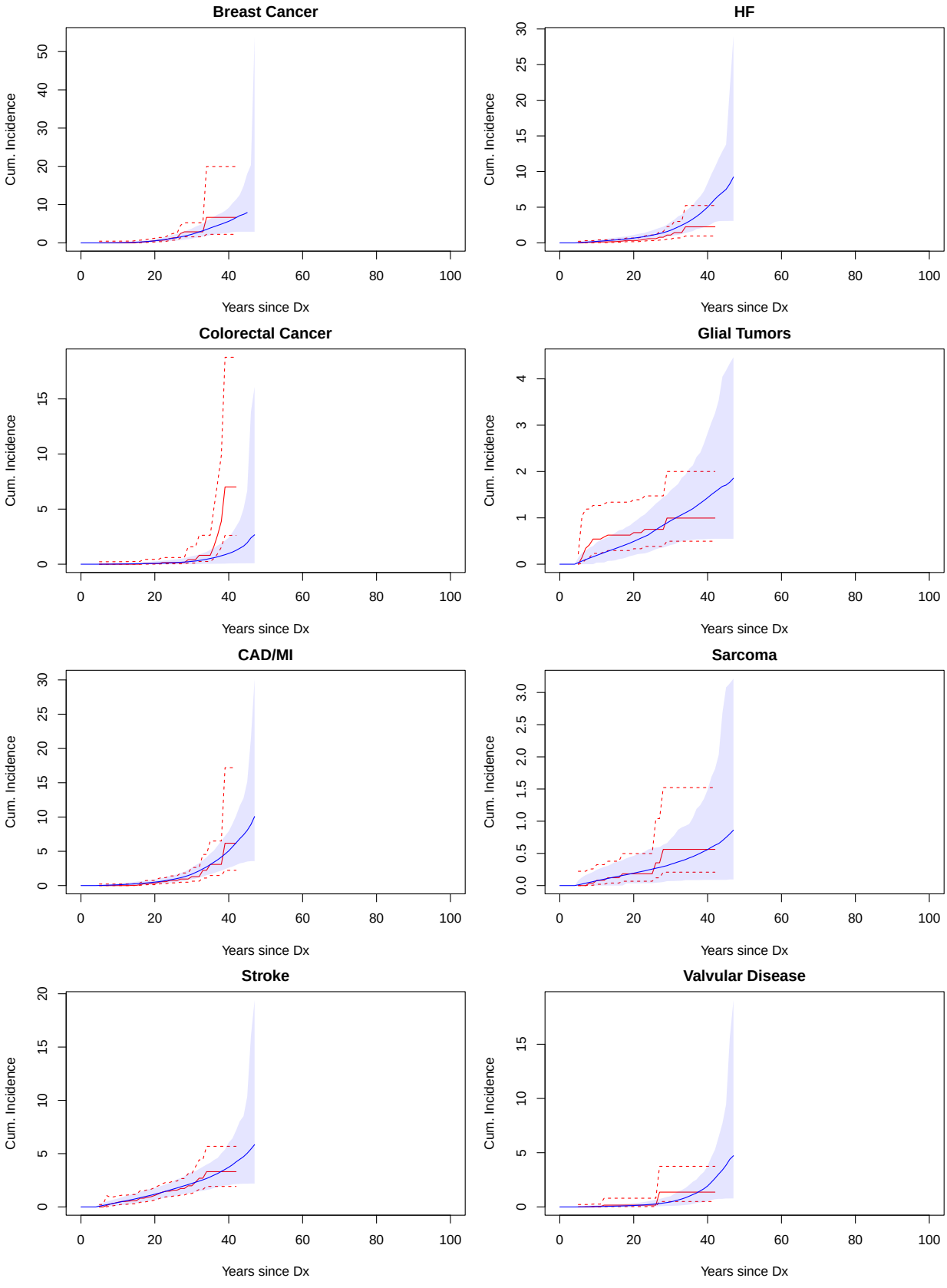




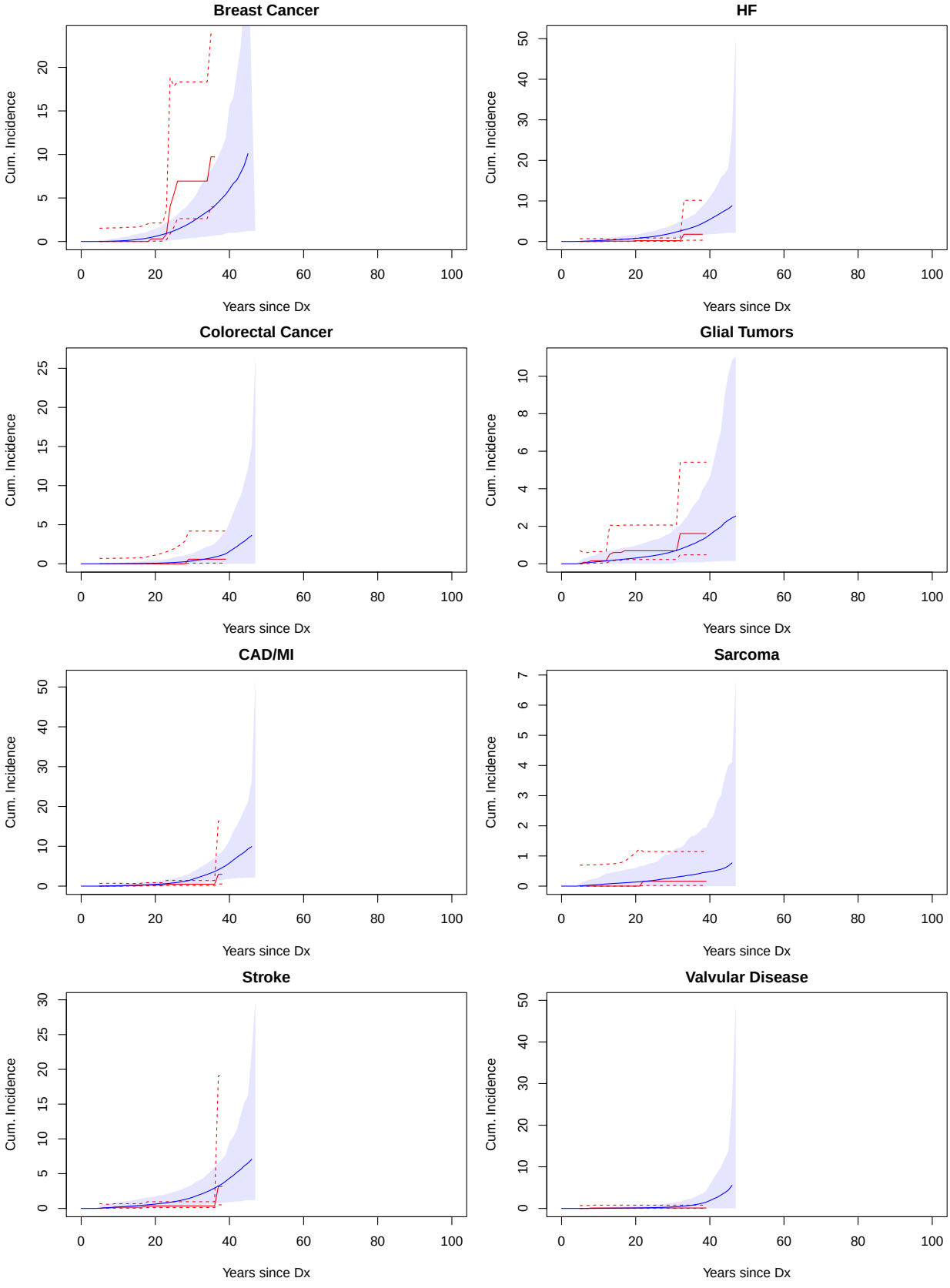




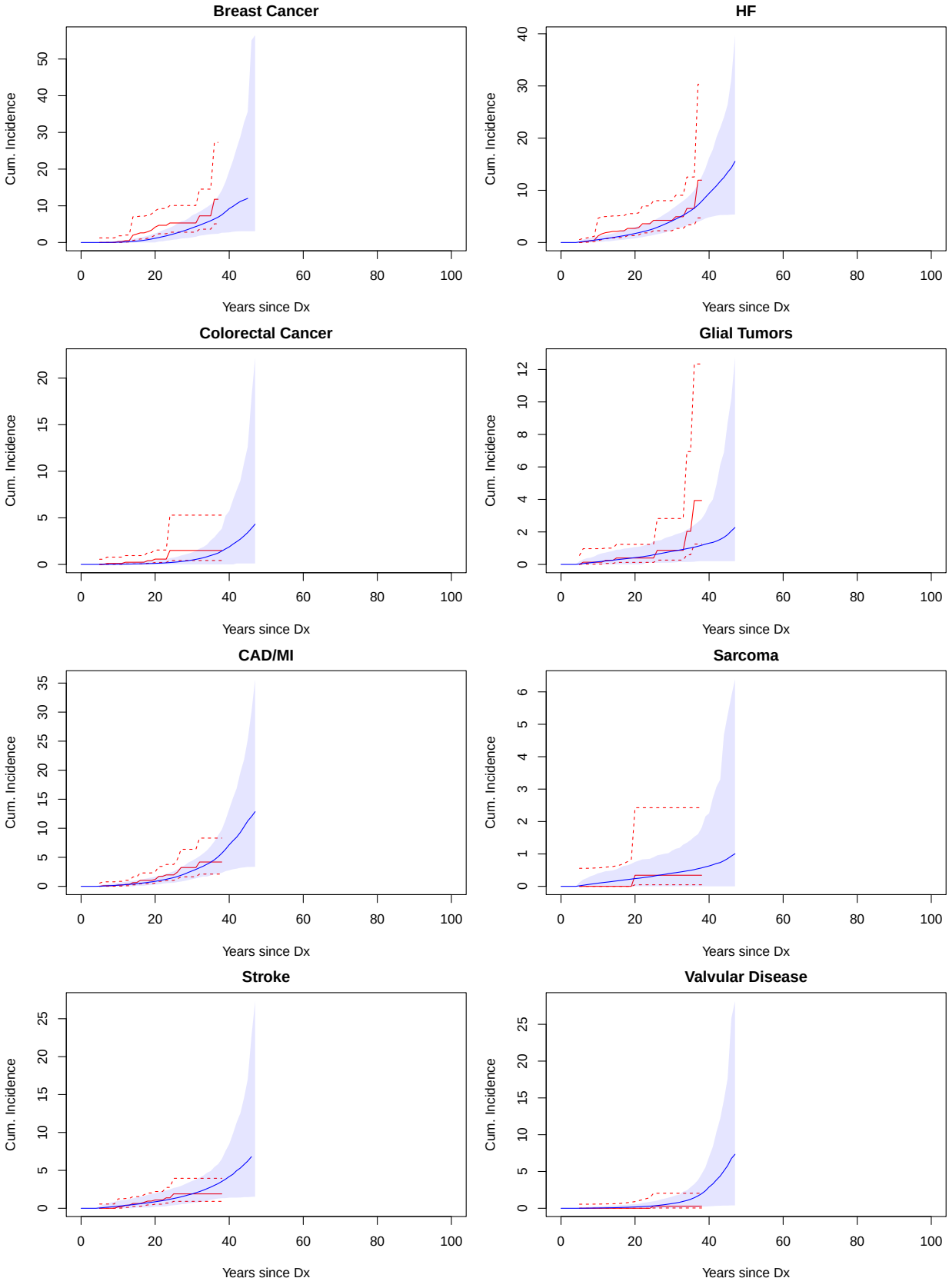
6.5.1.34 AlkNone



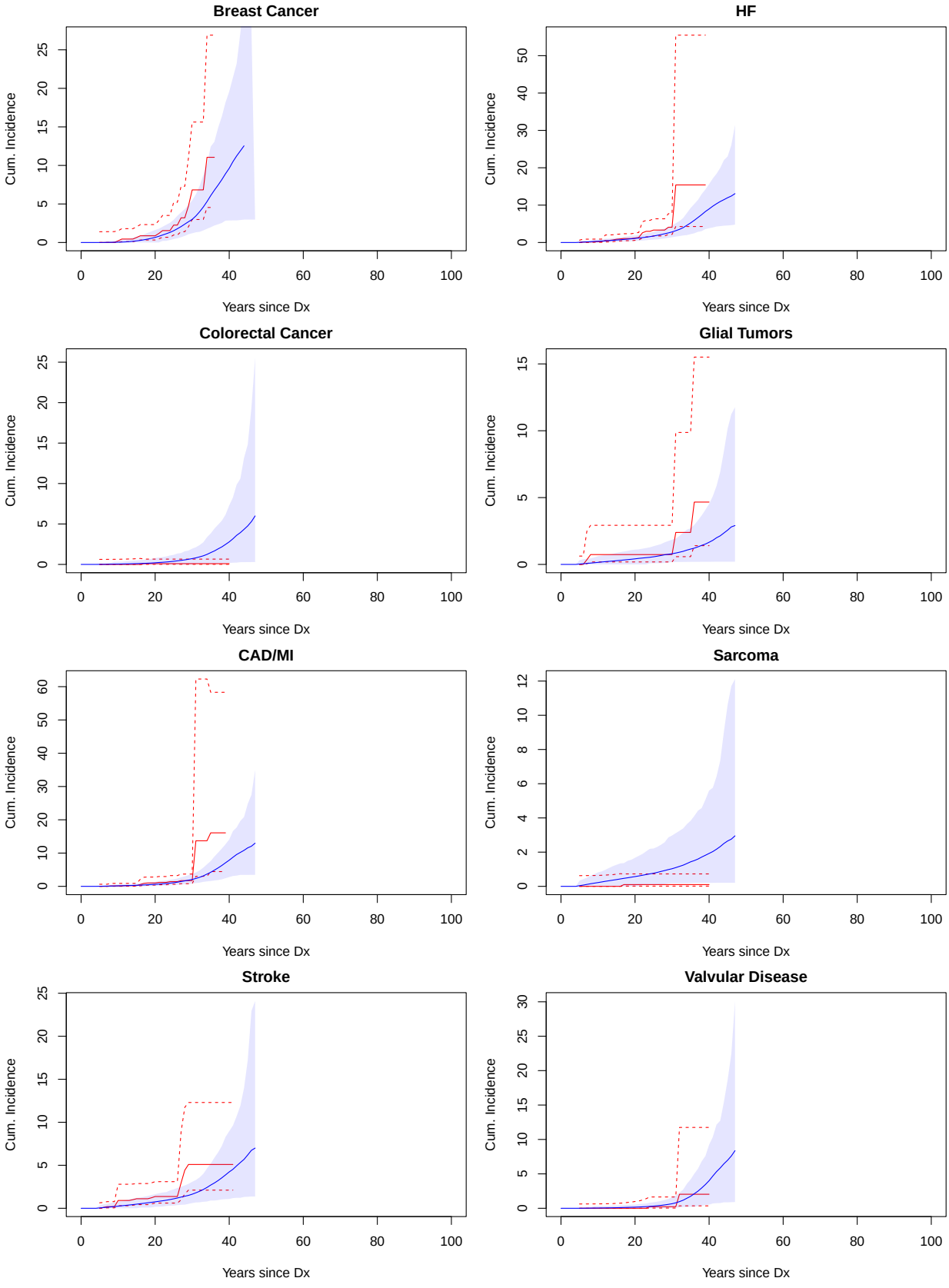
6.5.1.35 Alk<4000



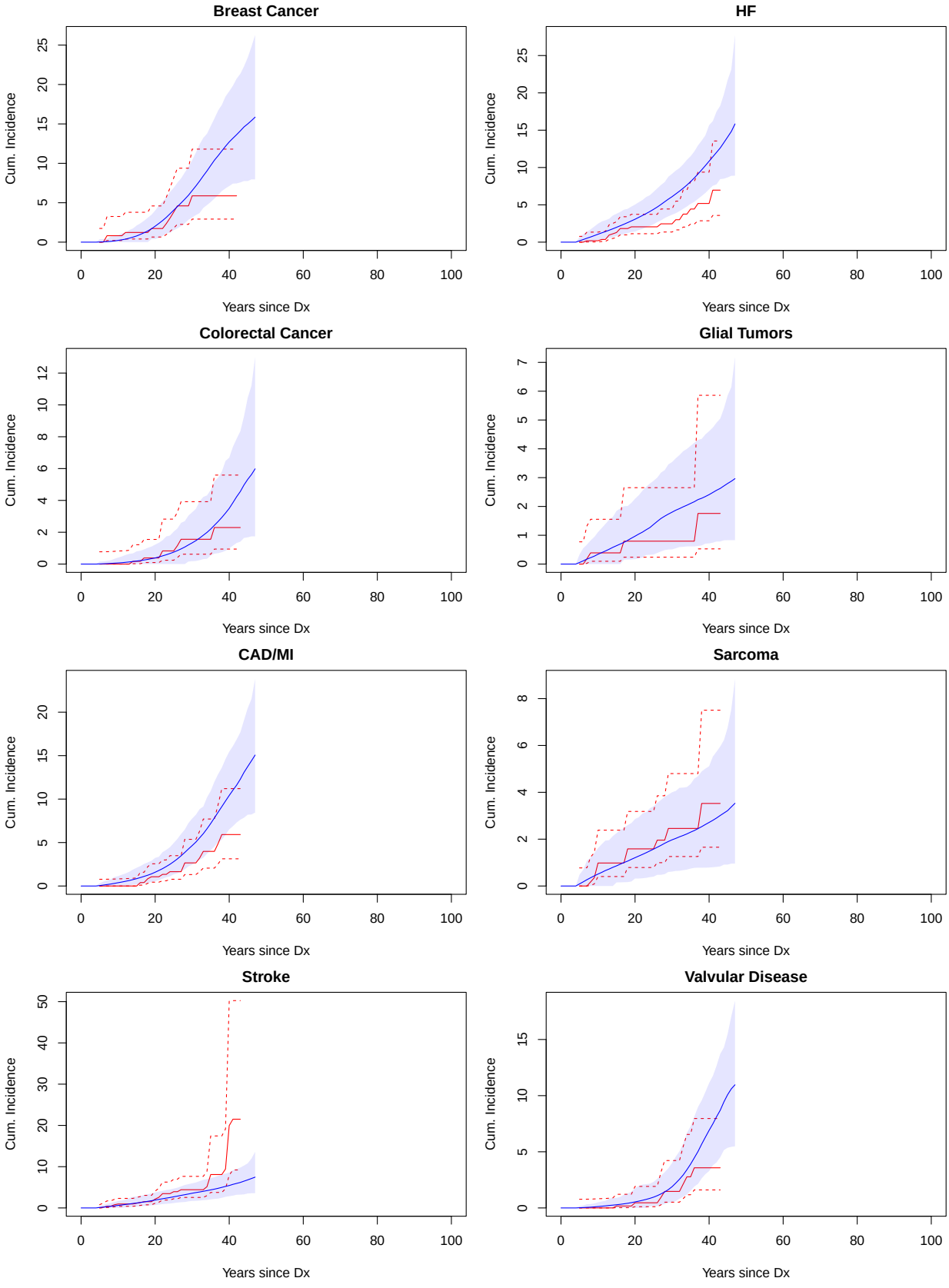
6.5.1.36 Alk4000_7999



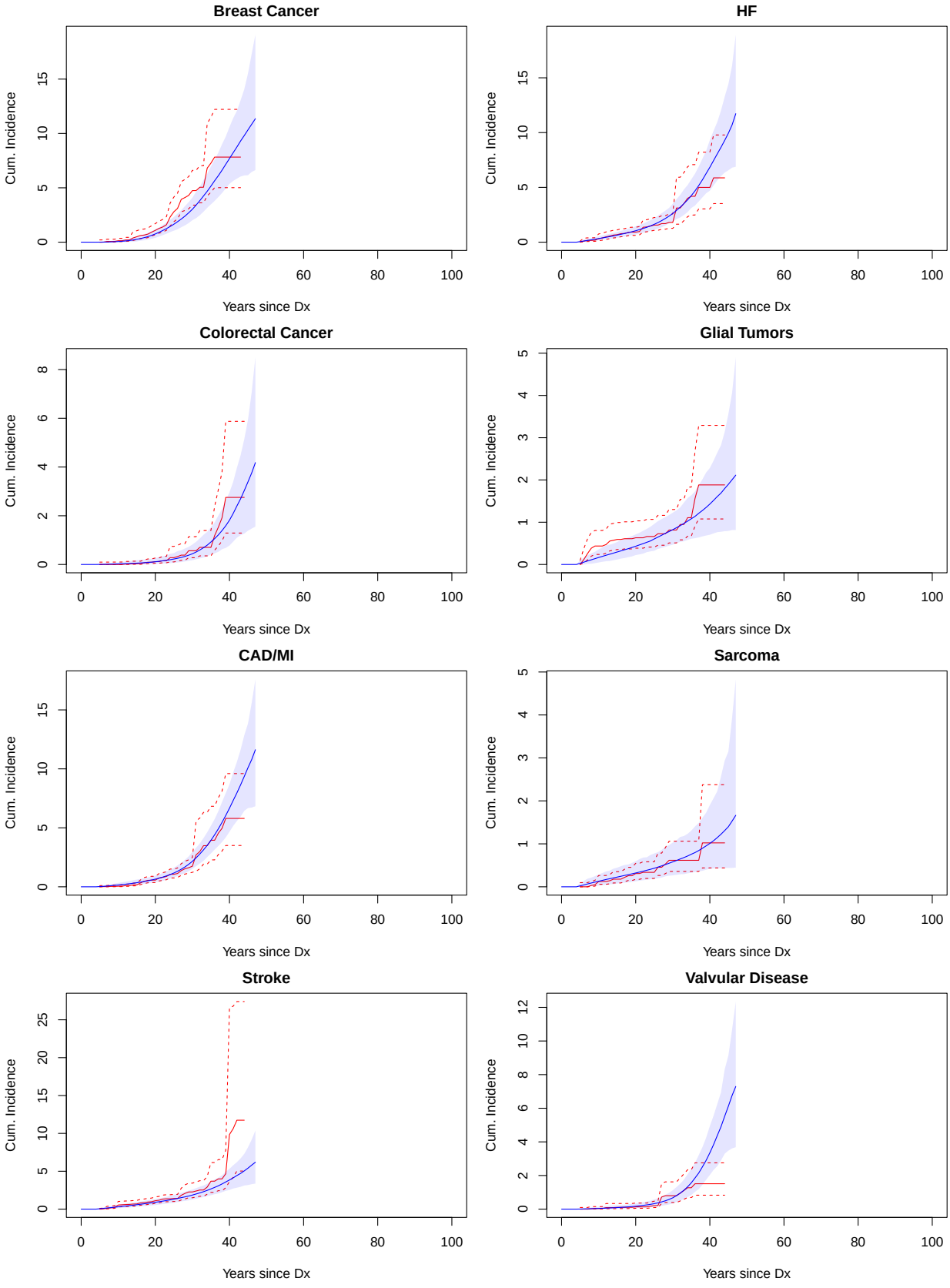
6.5.1.37 Alk8000_11999



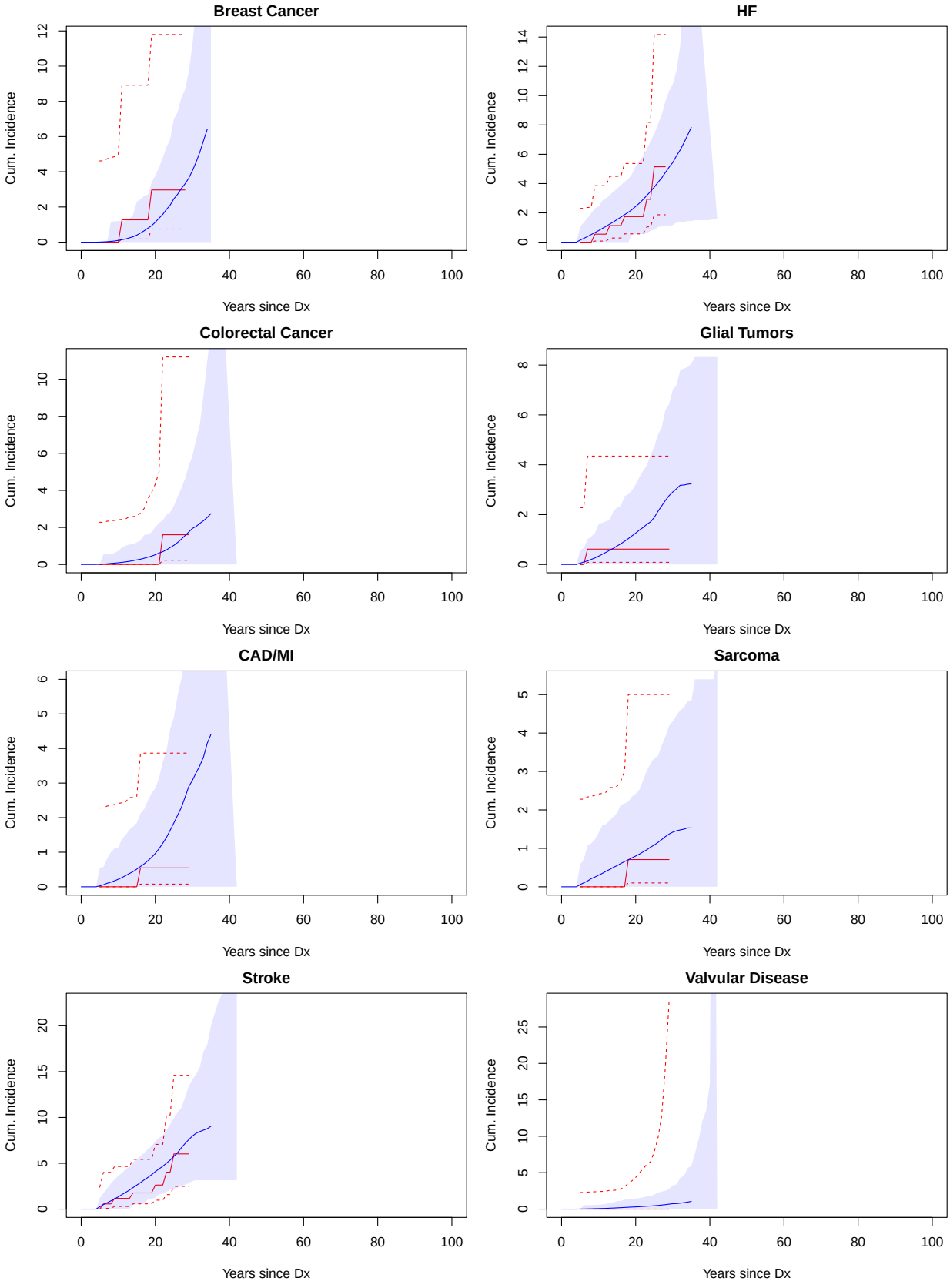
6.5.1.38 Alk12000+



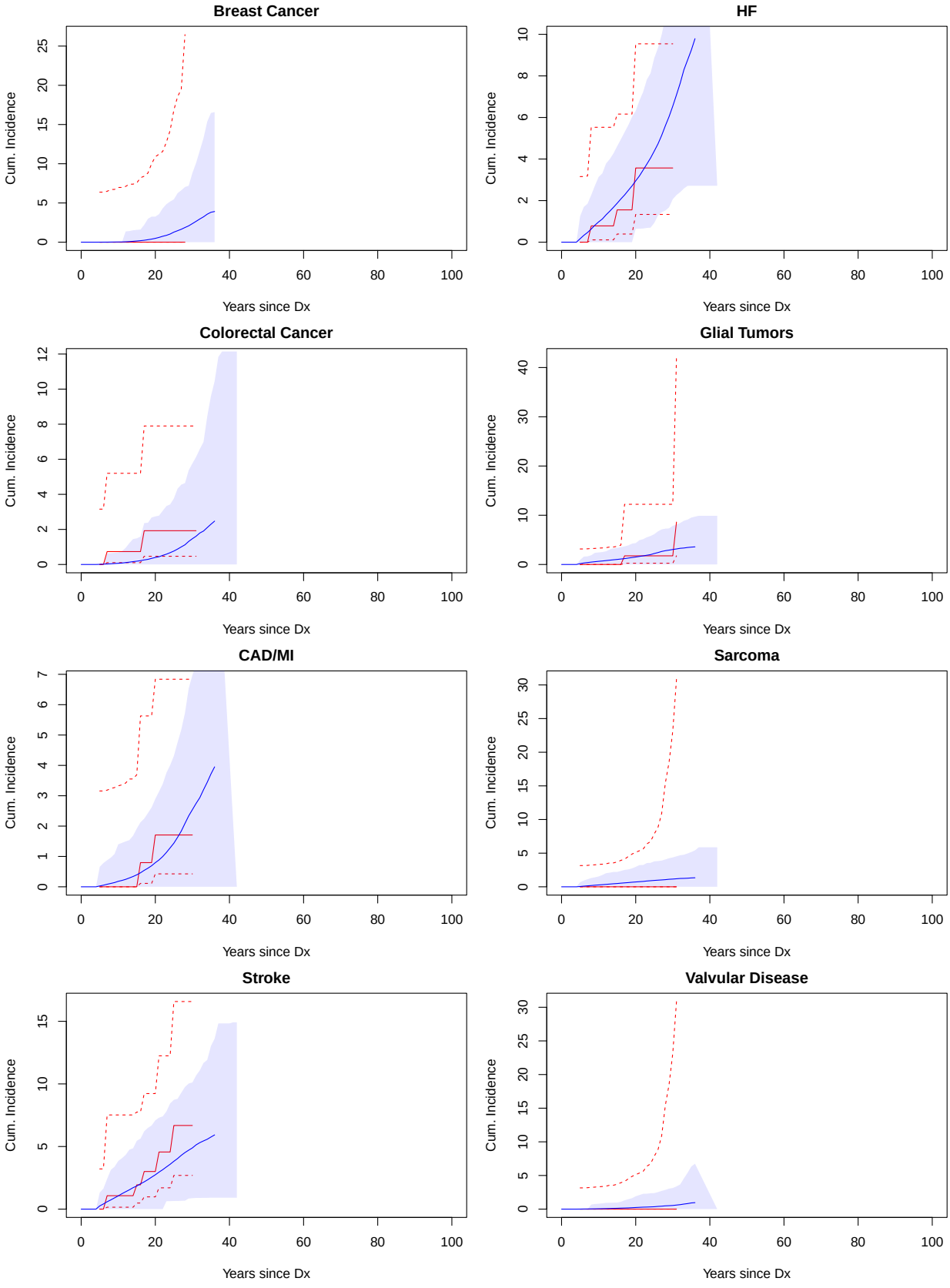
6.5.1.39 CispNone



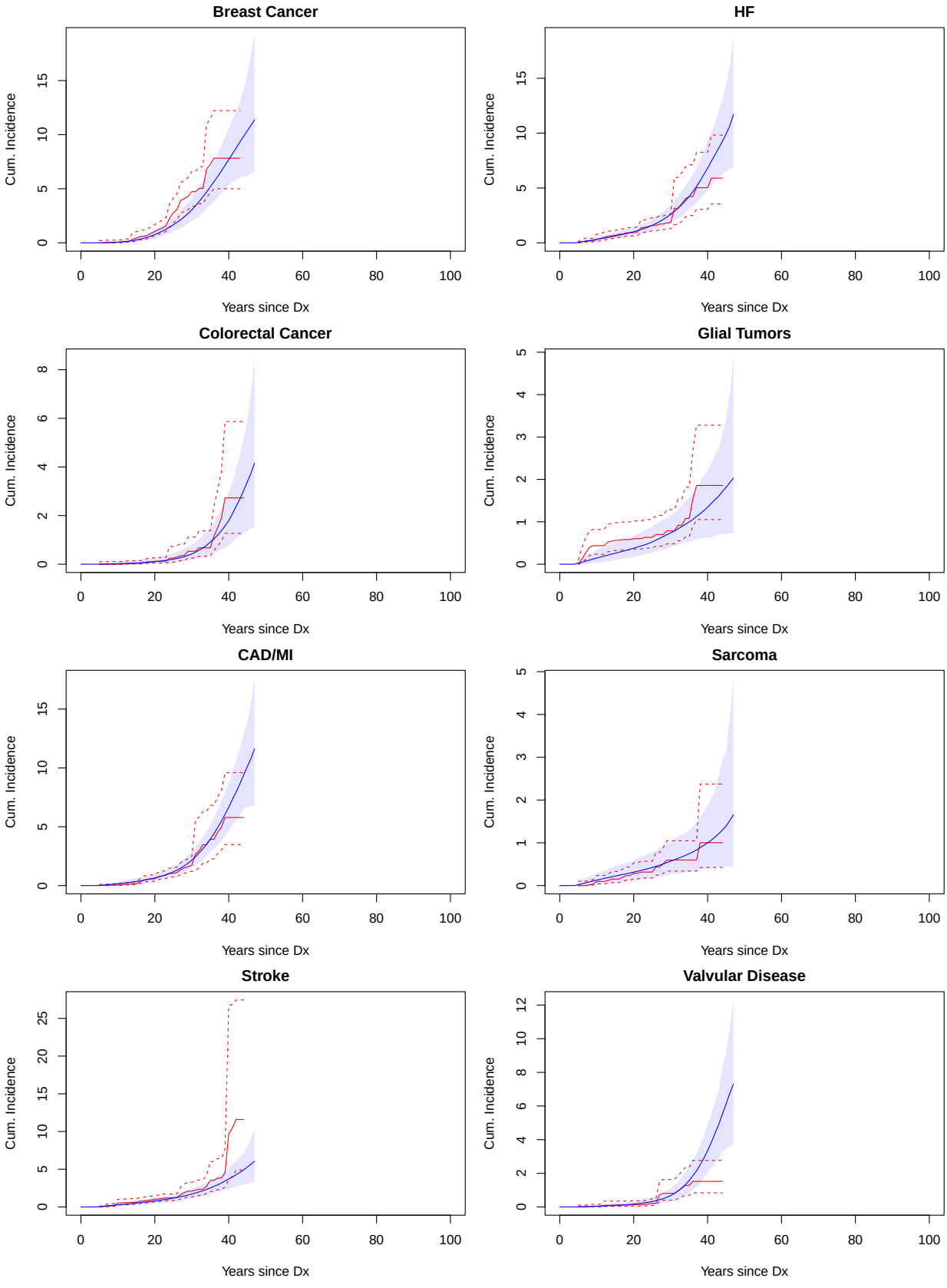
6.5.1.40 Cisp<400



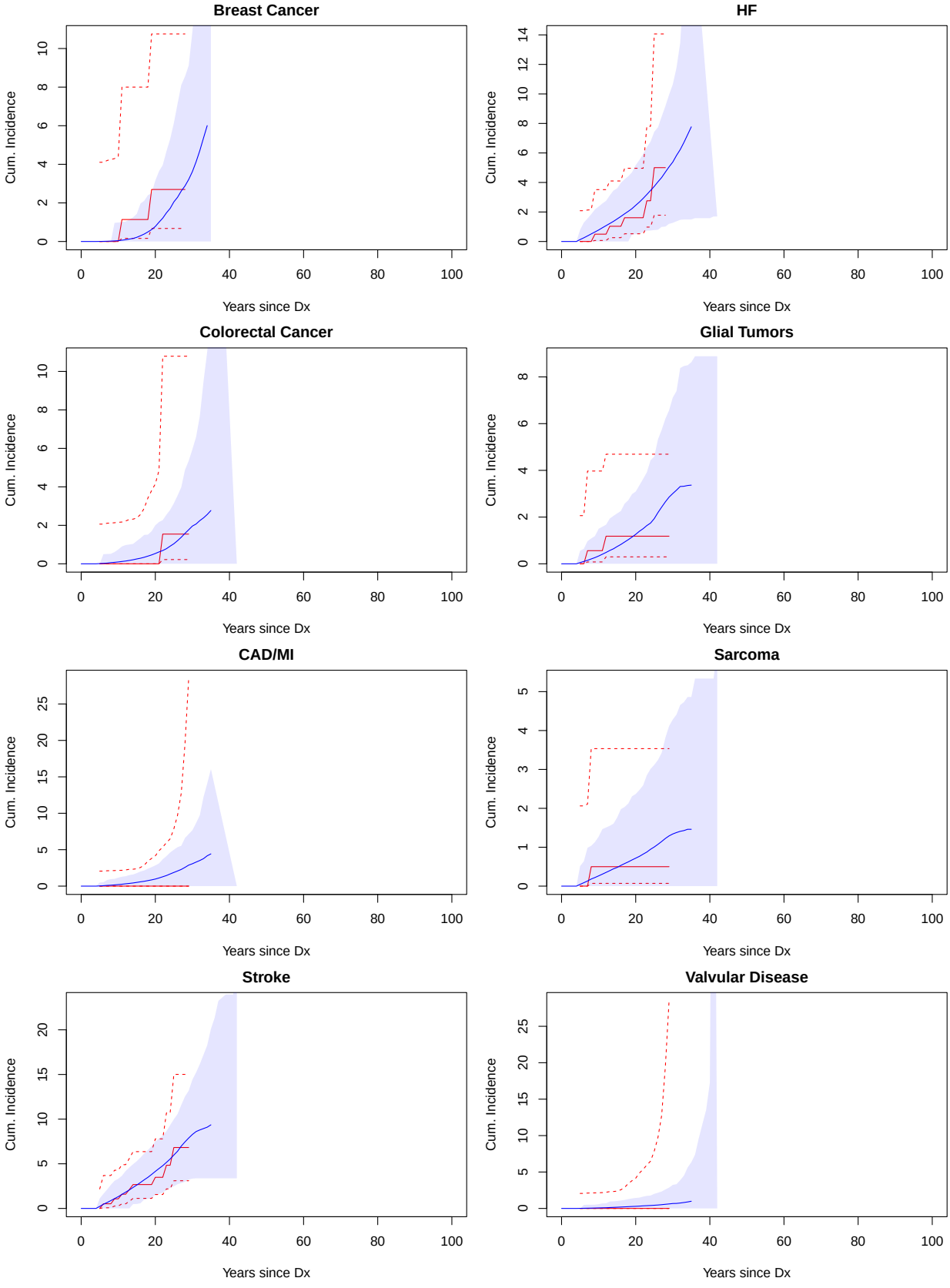
6.5.1.41 Cisp400+



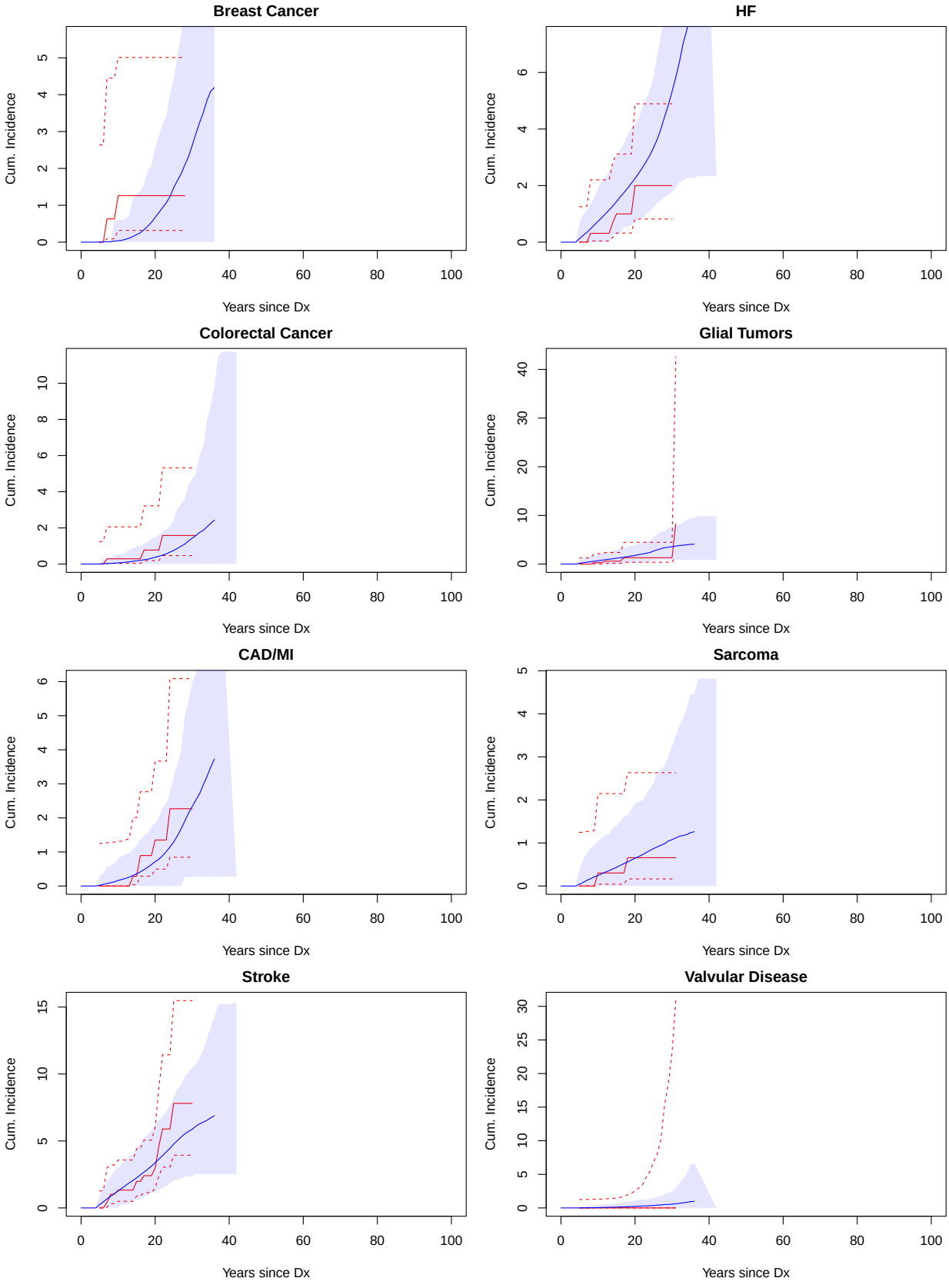
6.5.1.42 PlatNone



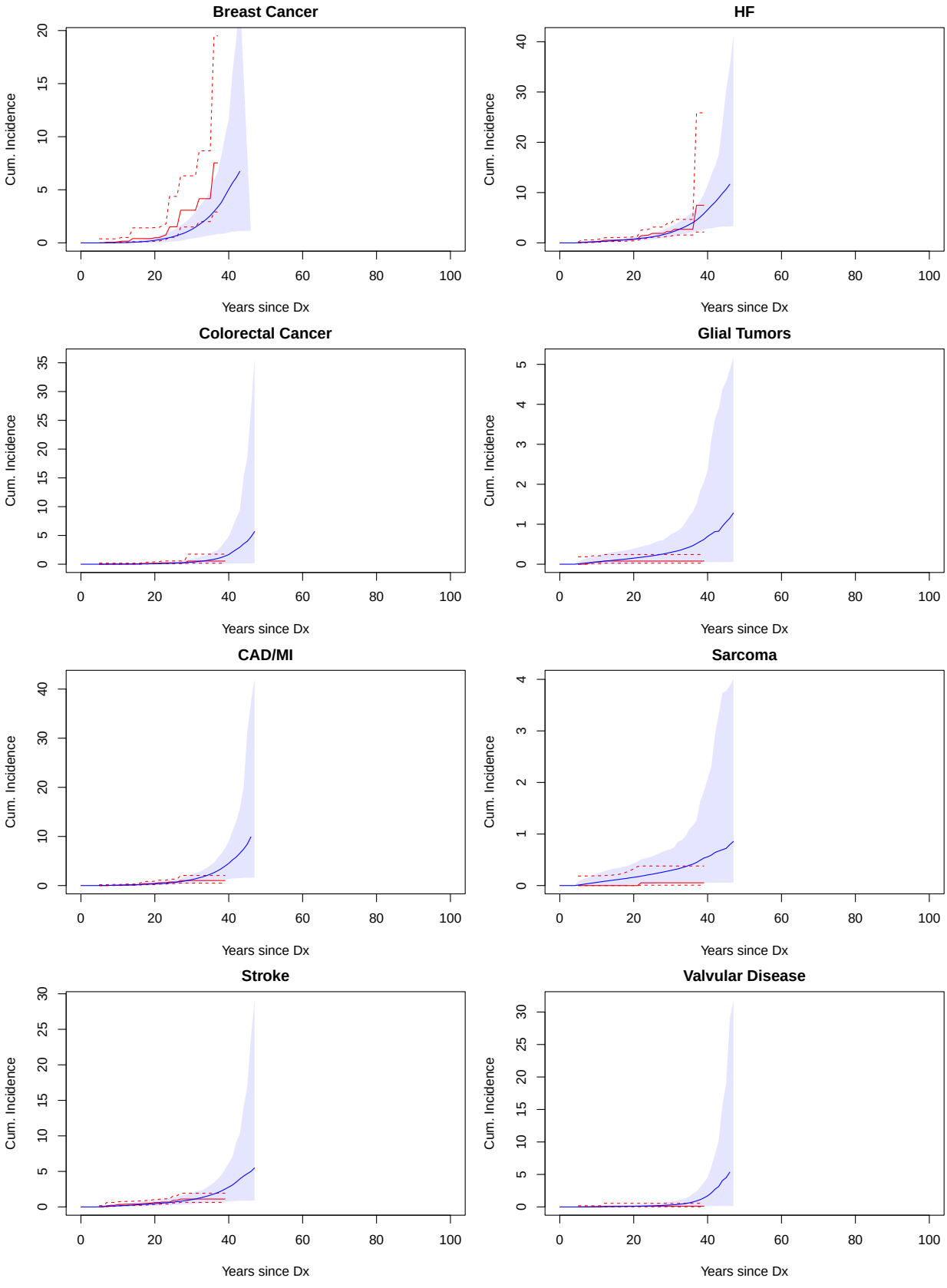
6.5.1.43 Plat<400



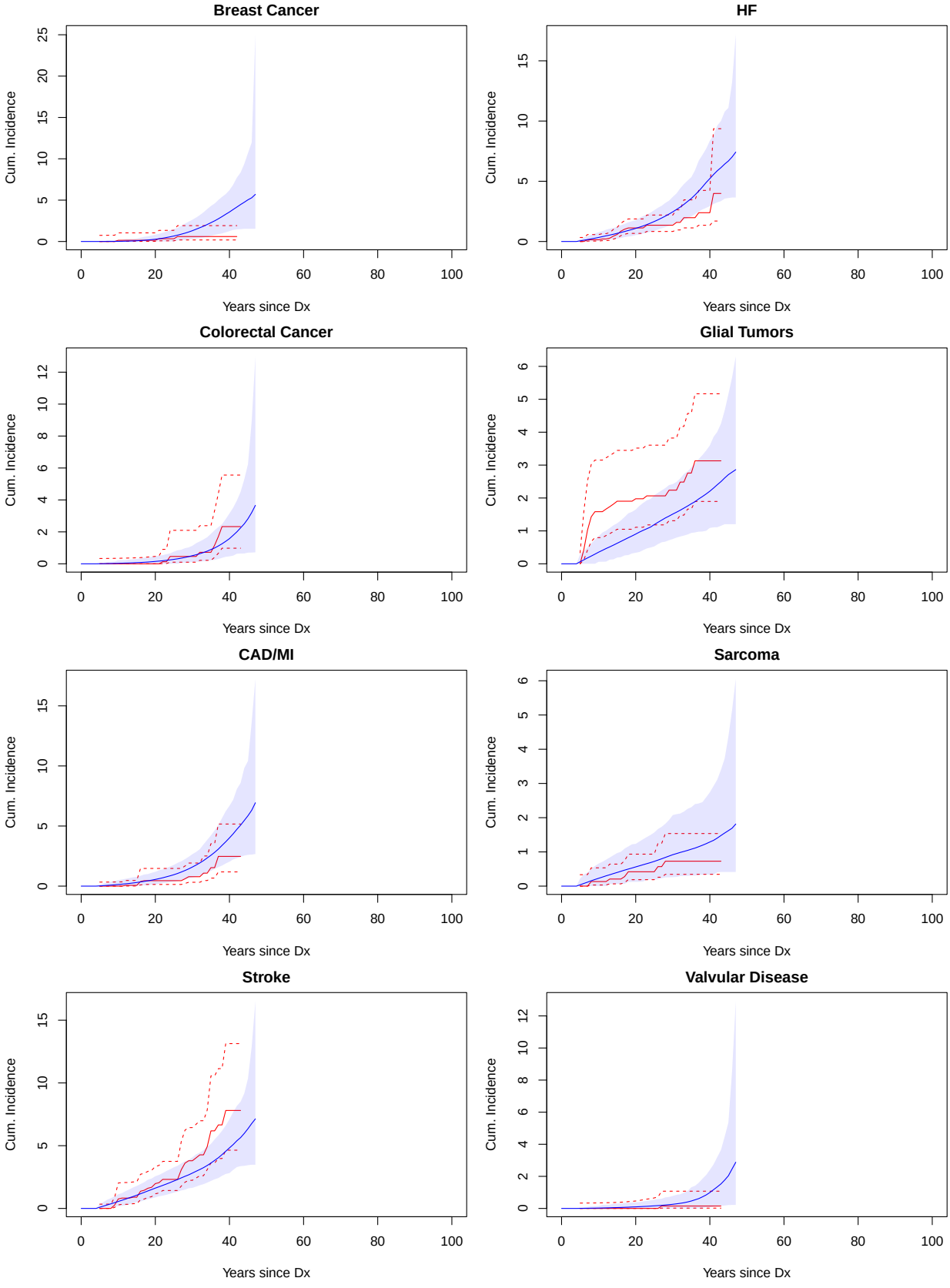
6.5.1.44 Plat400+



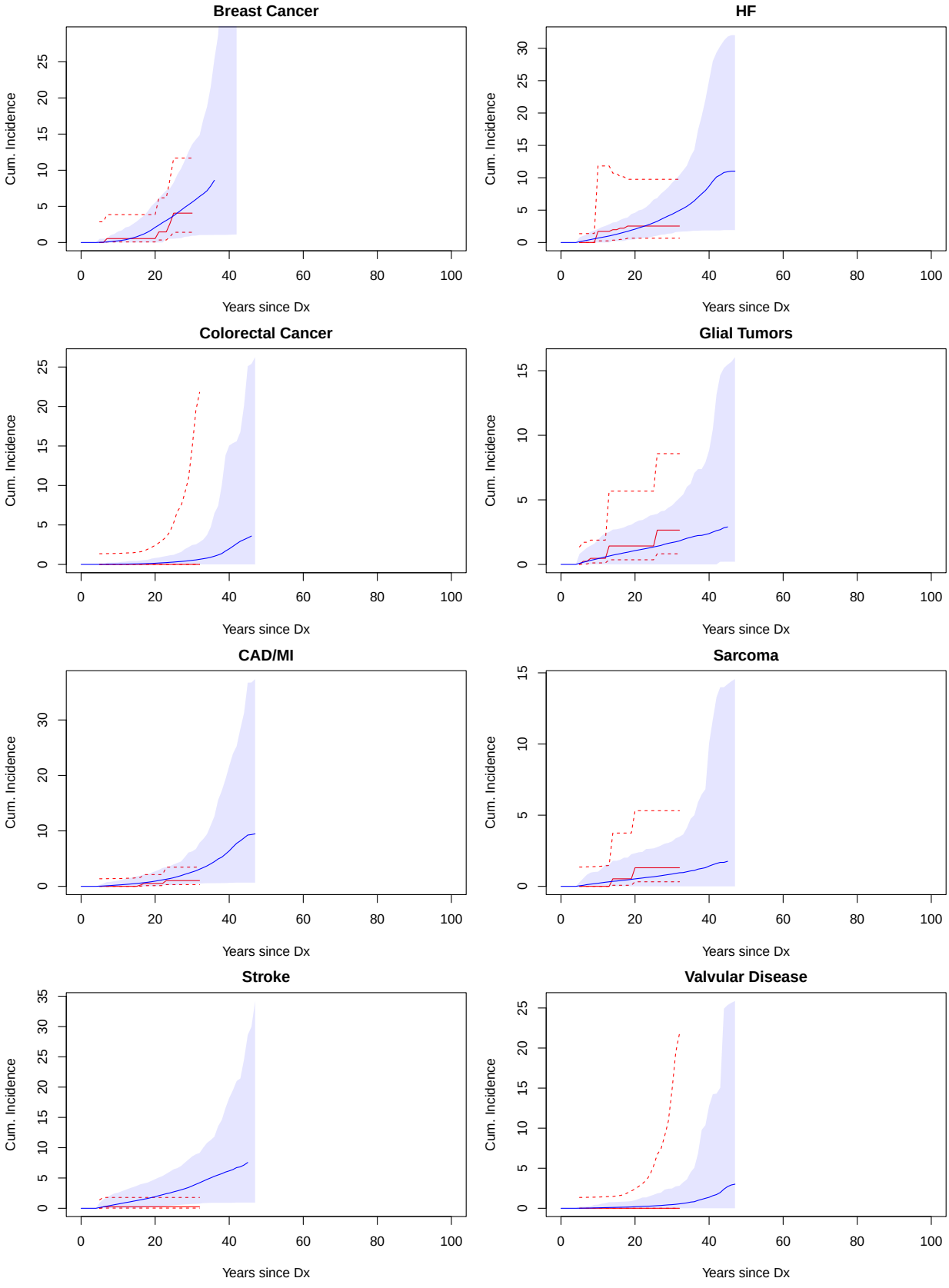
6.5.1.45 ChestNone



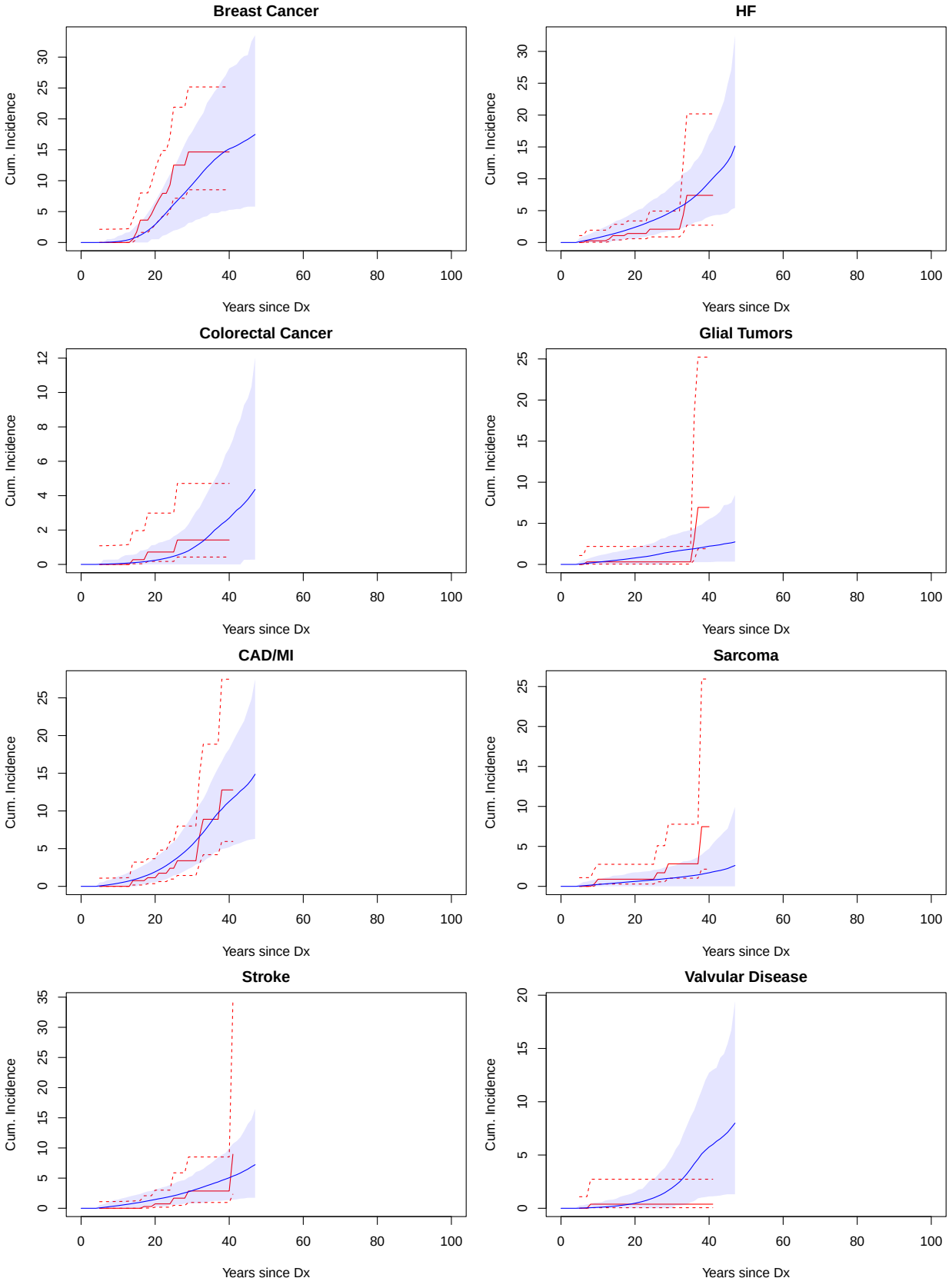
6.5.1.46 Chest<10



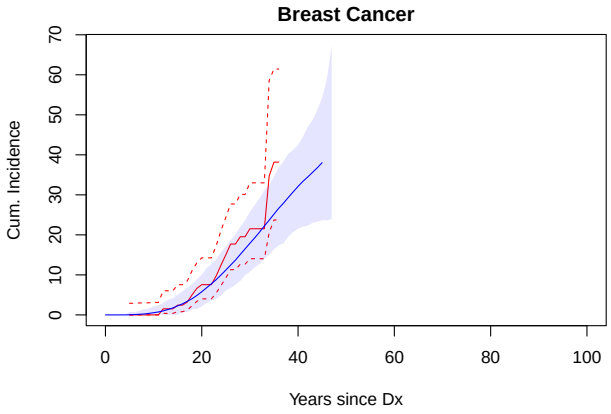
6.5.1.47 Chest10_19

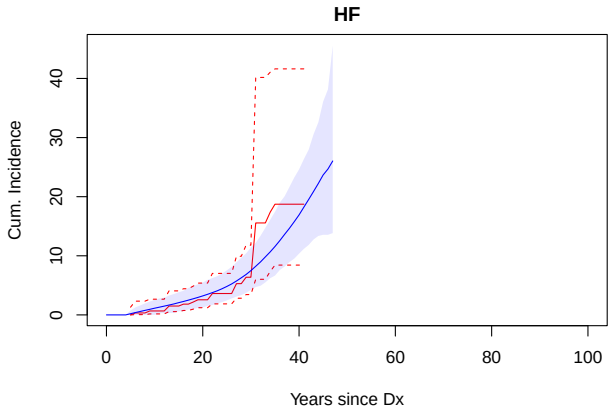


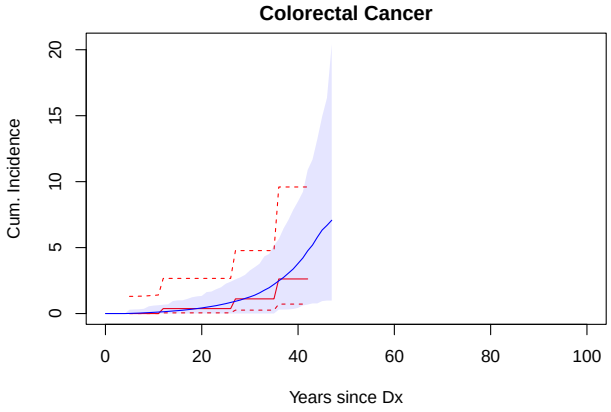
6.5.1.48 Chest20_29

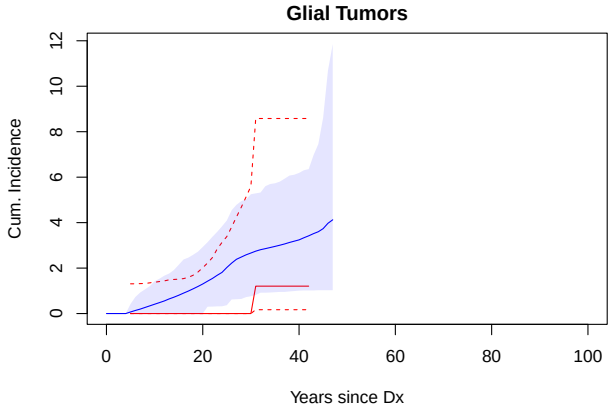


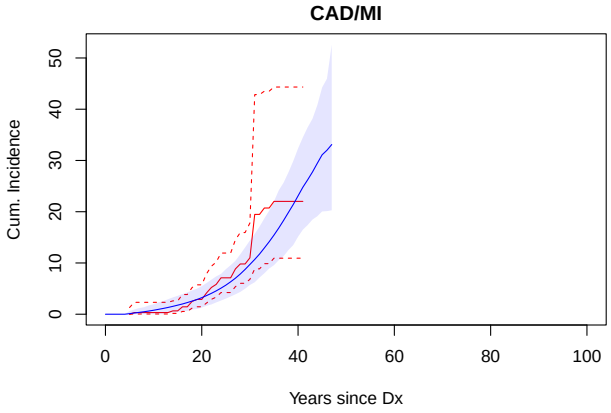
6.5.1.49 Chest30+

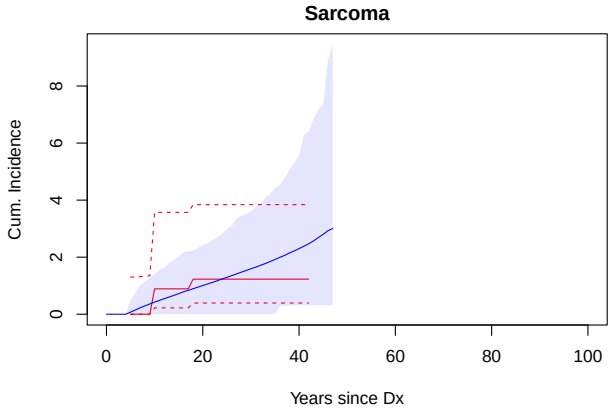


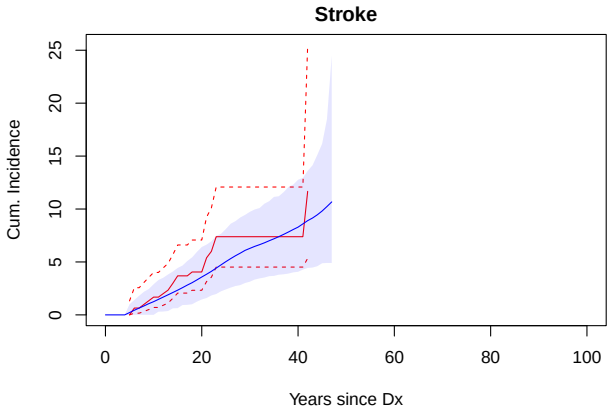


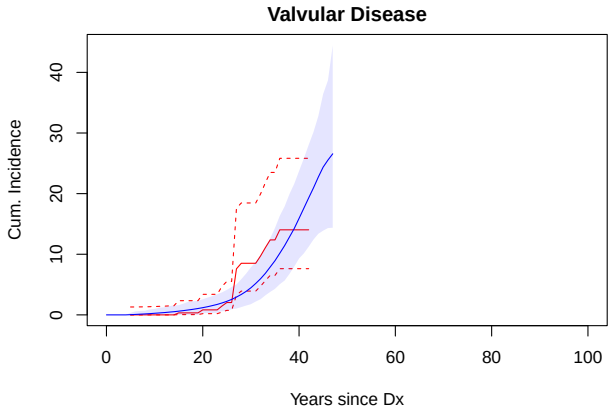




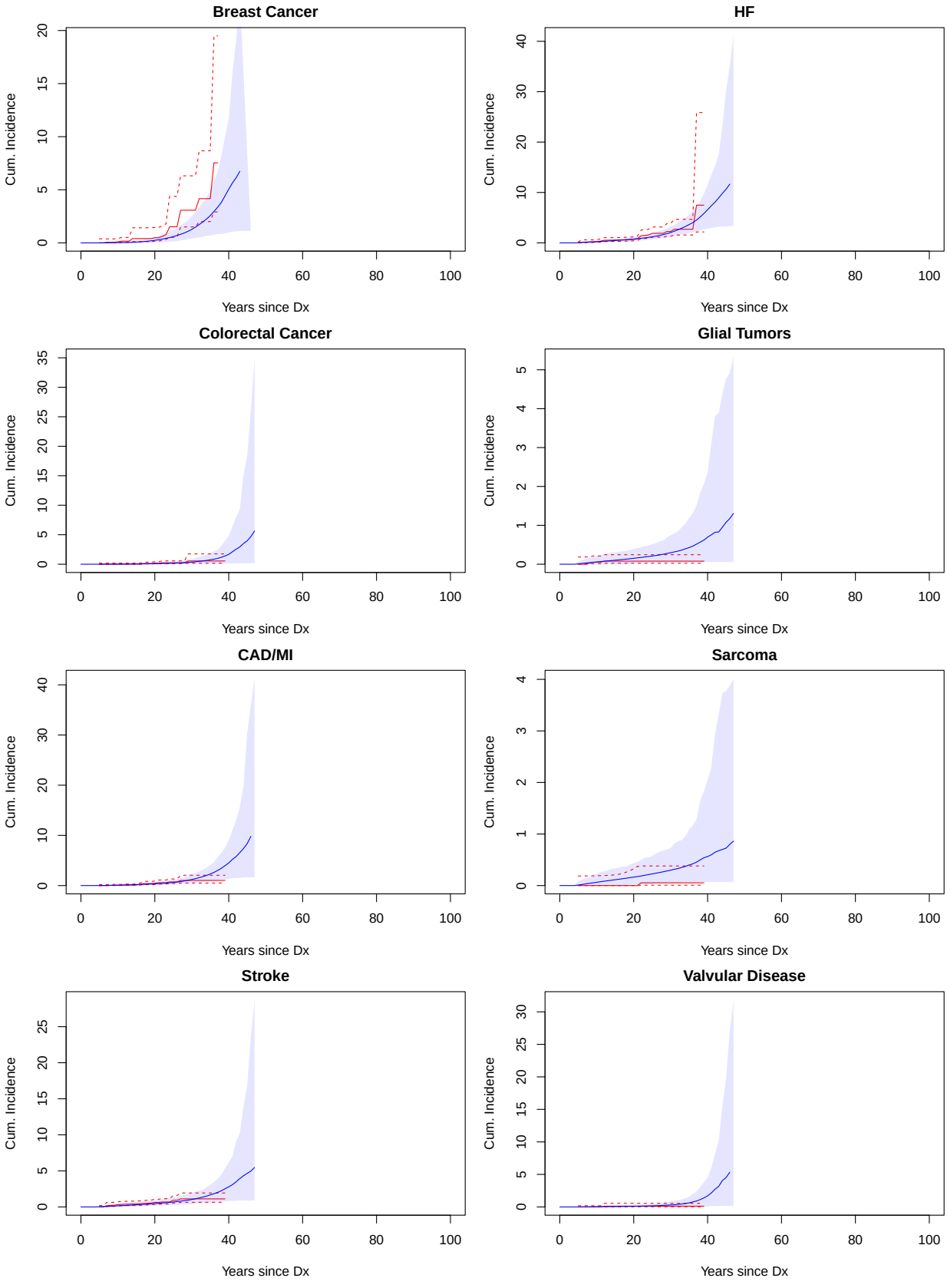




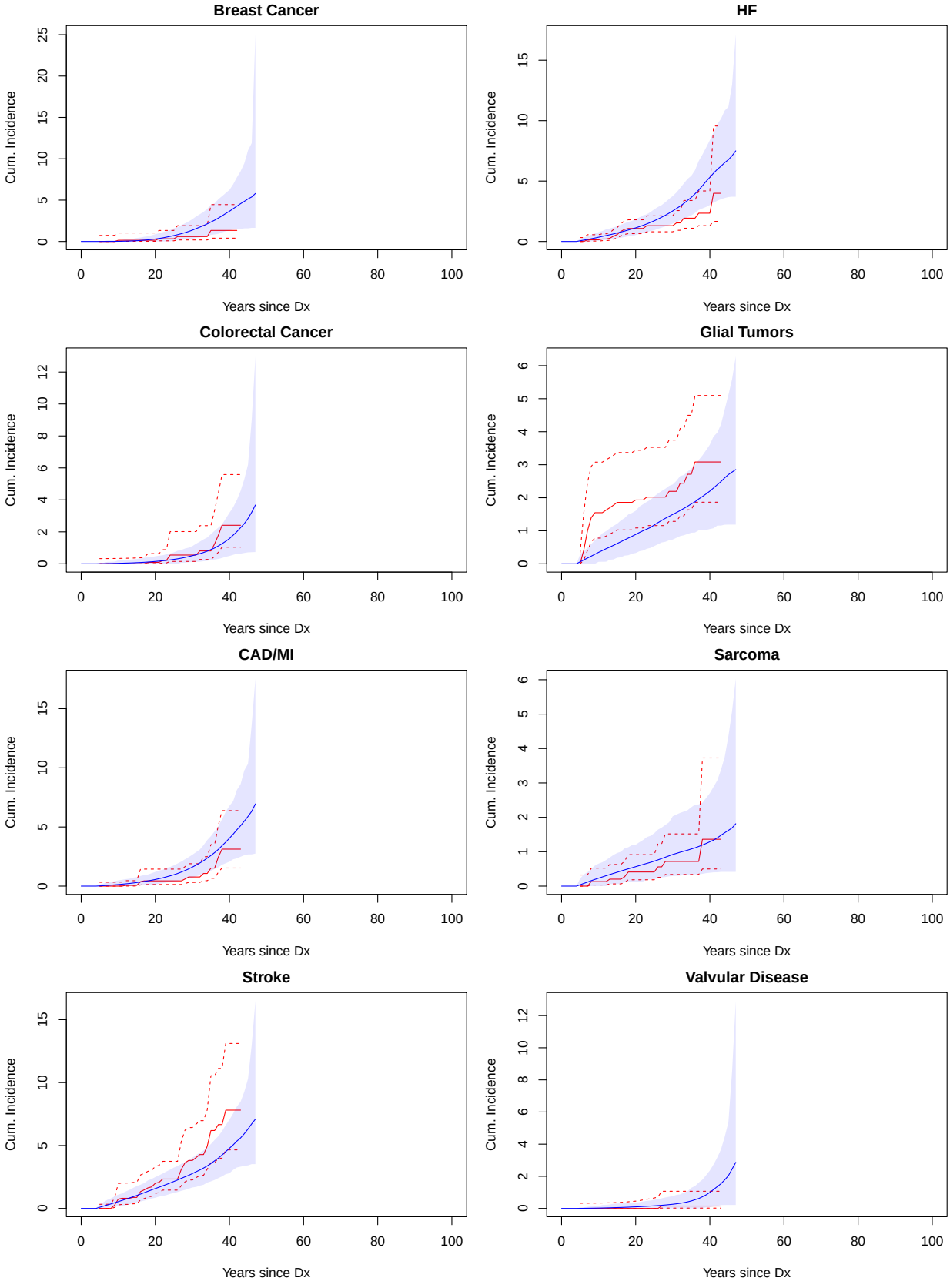




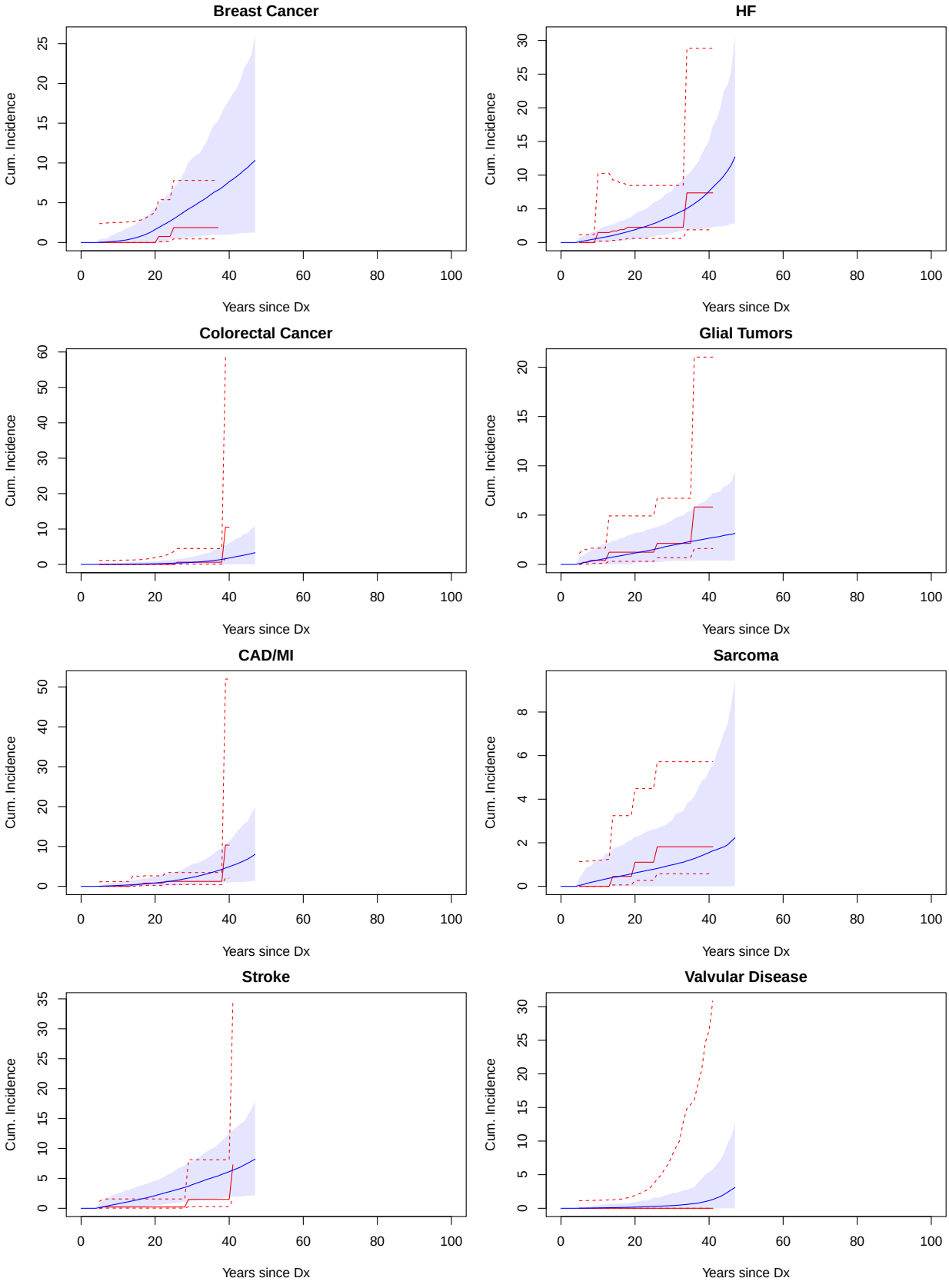
6.5.1.50 HeartNone



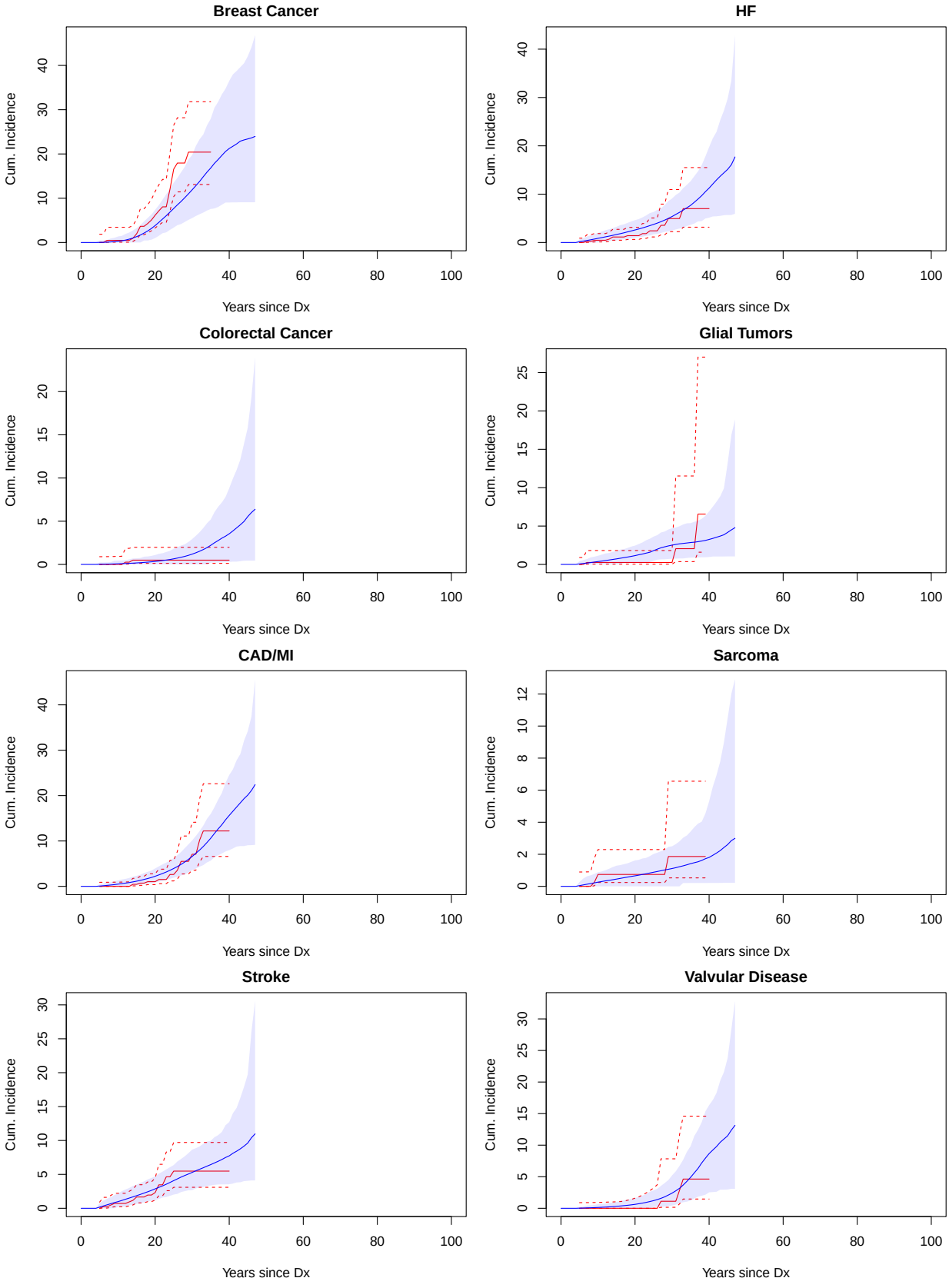
6.5.1.51 Heart<5



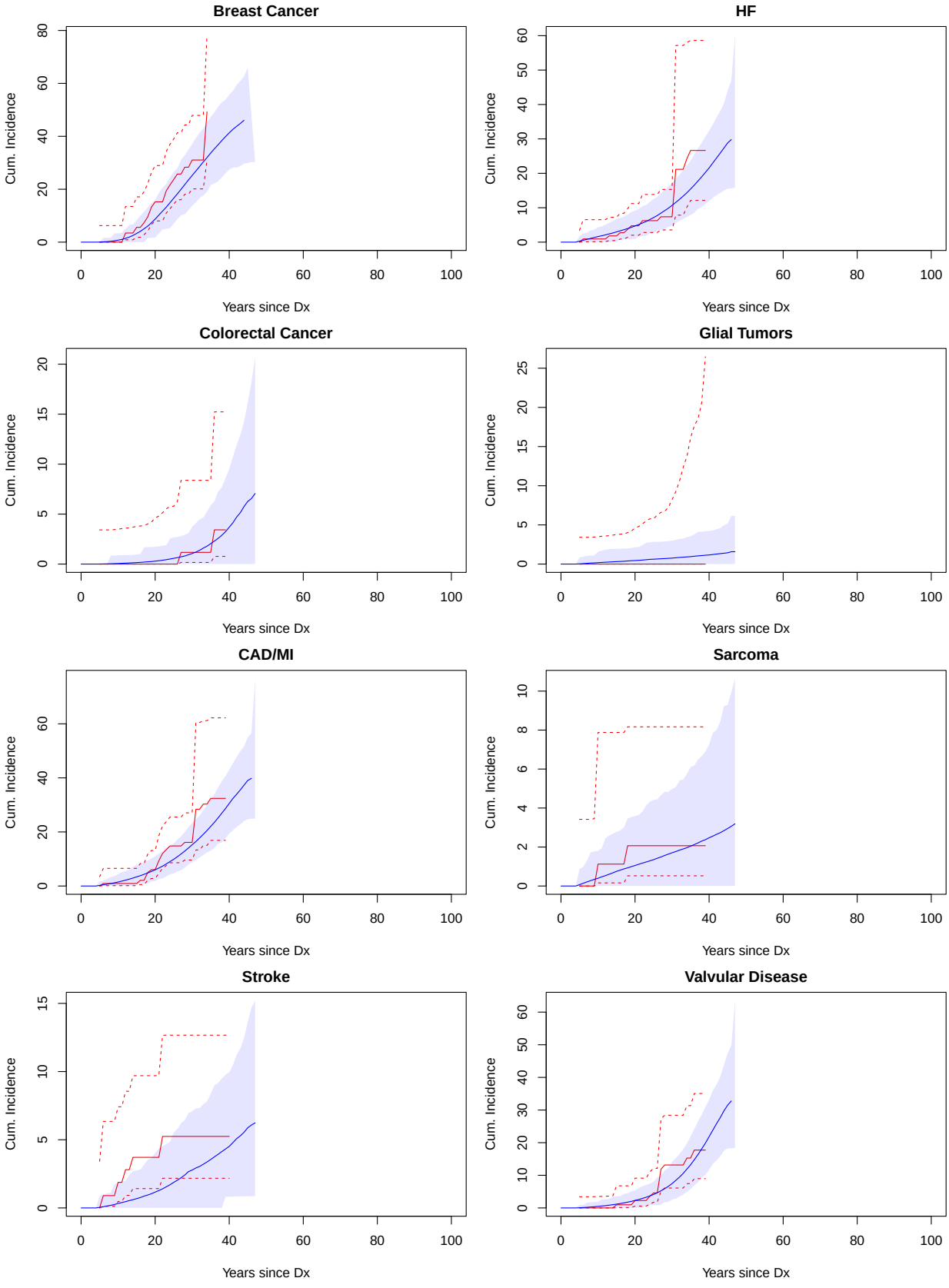
6.5.1.52 Heart5_14



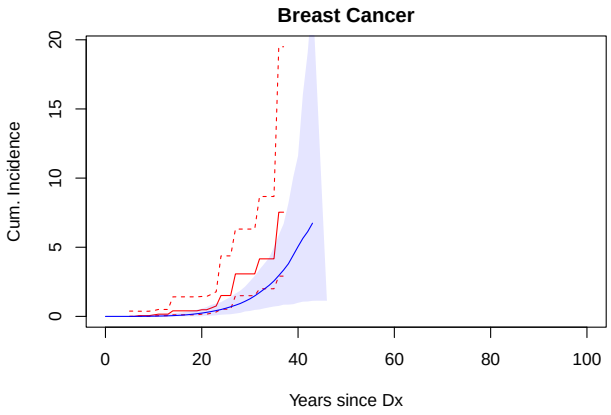
6.5.1.53 Heart15_34

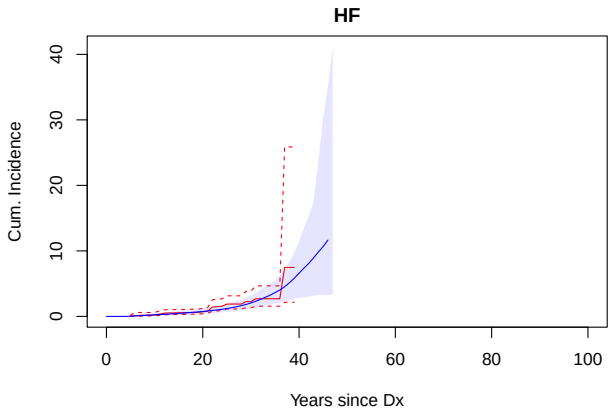


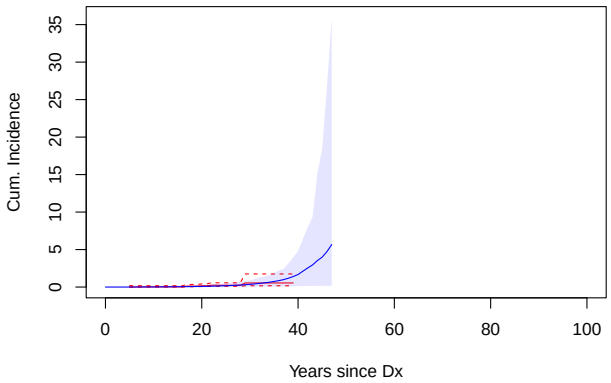
6.5.1.54 Heart35+

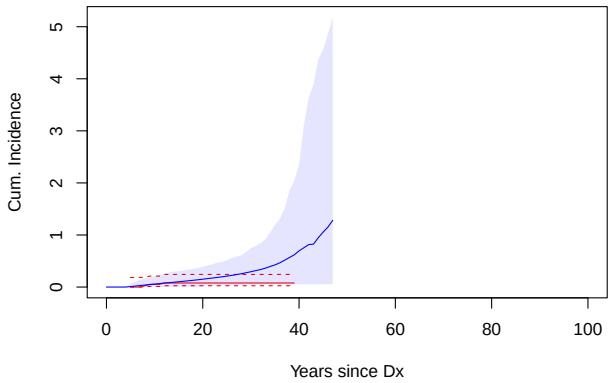


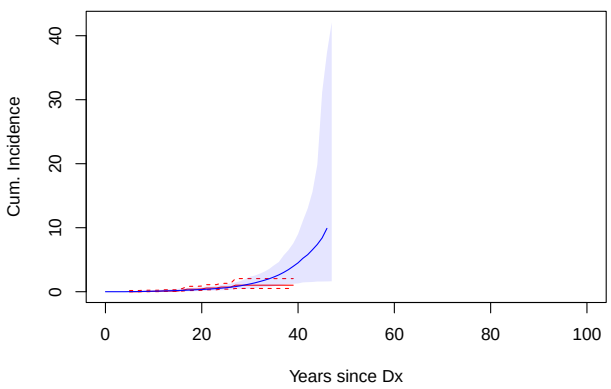
6.5.1.55 CRTNone

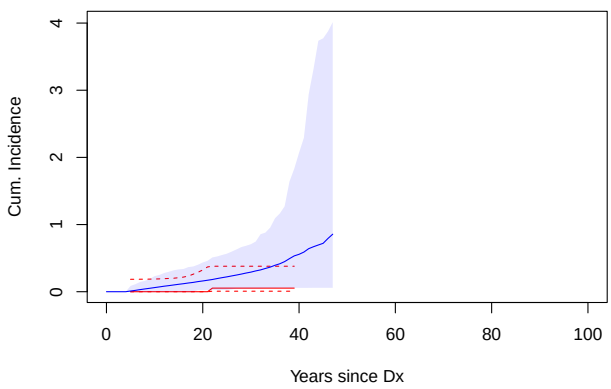


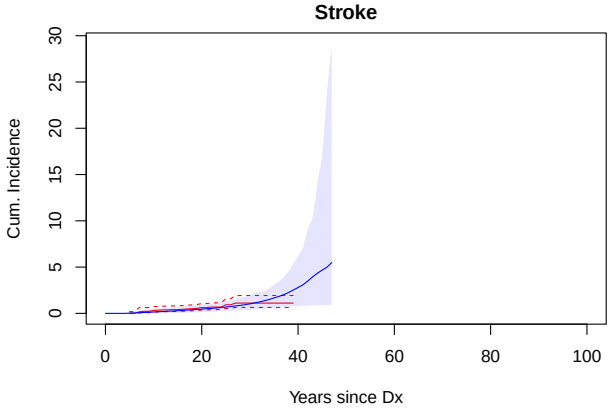


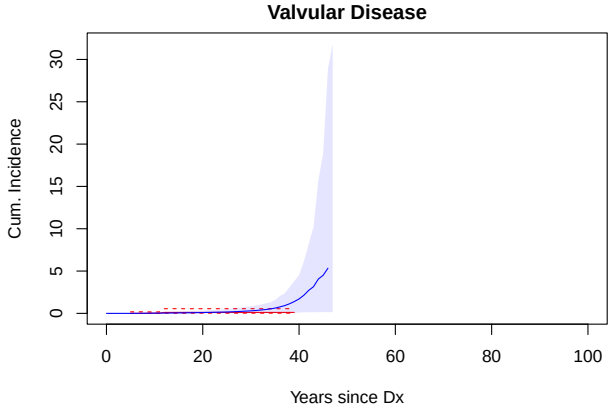




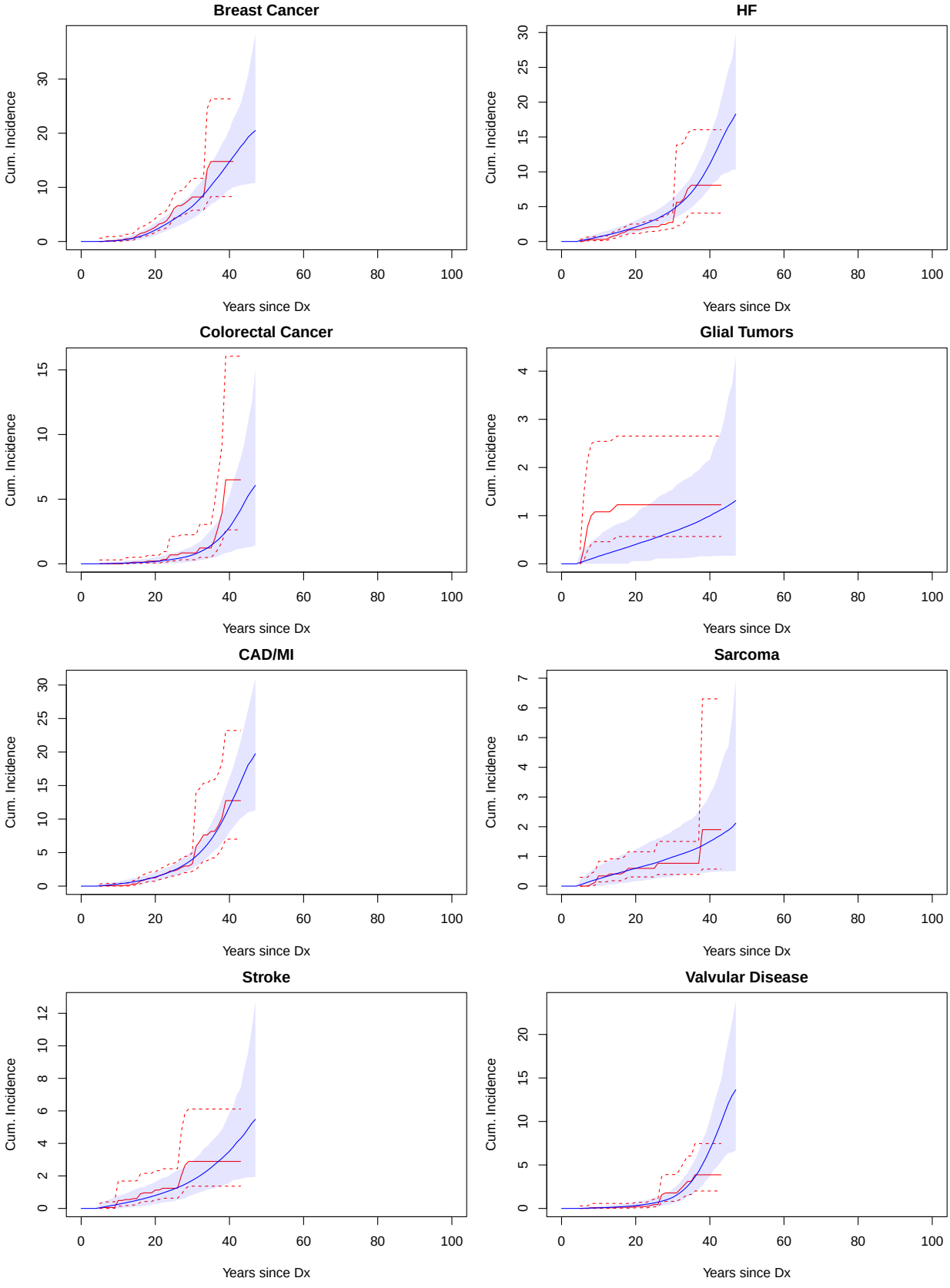




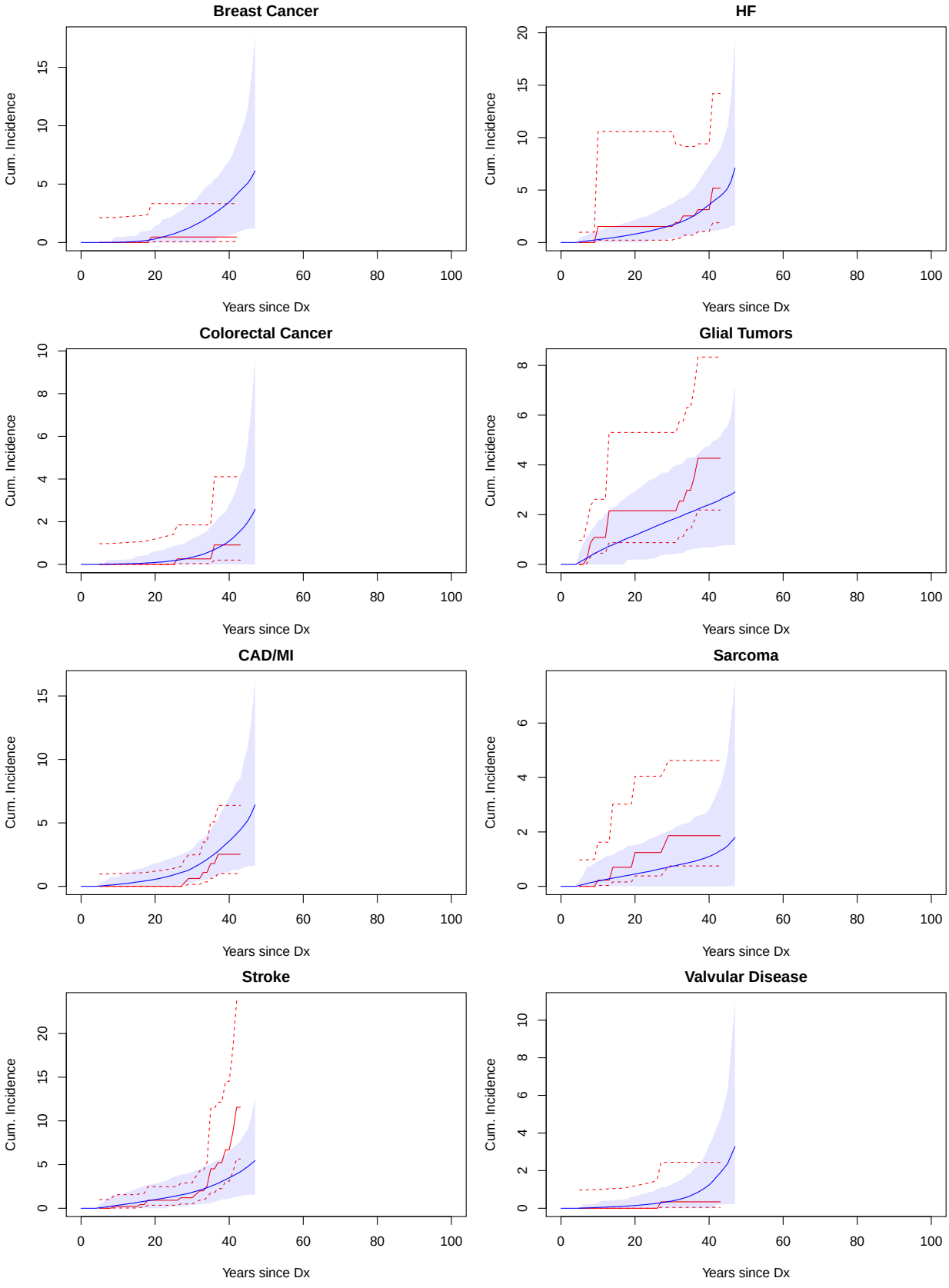




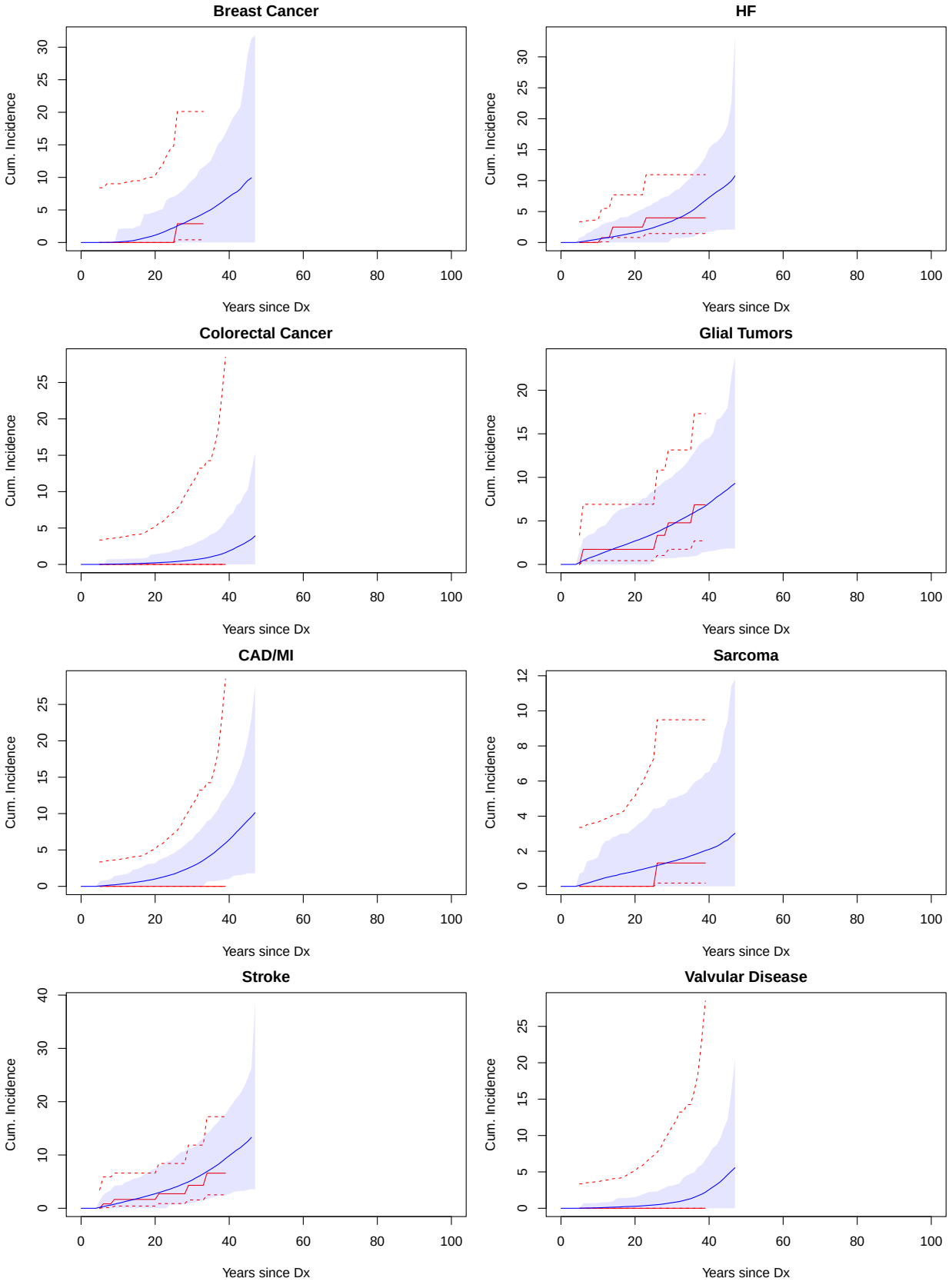
6.5.1.56 CRT<20


Breast Cancer
HF
Colorectal Cancer
Glial Tumors
CAD/MI
Sarcoma
Stroke
Valvular Disease
Cum. Incidence
Years since Dx

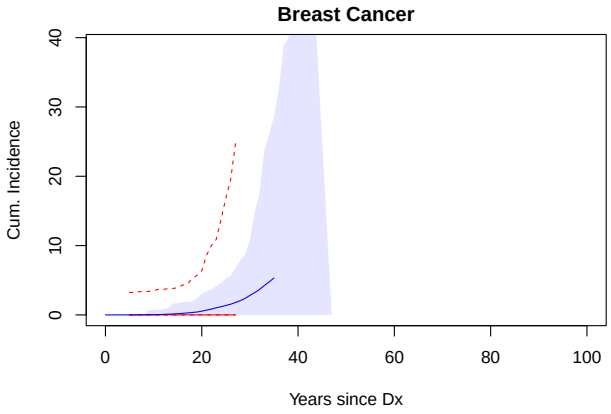
6.5.1.57 CRT20_29

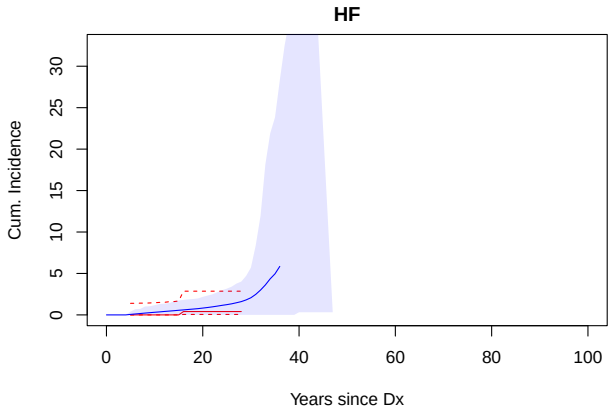


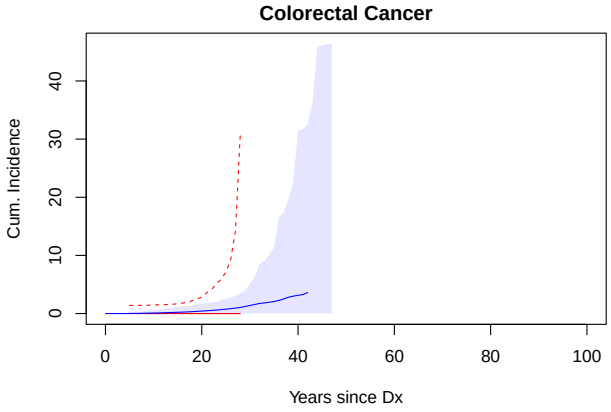
6.5.1.58 CRT30_49

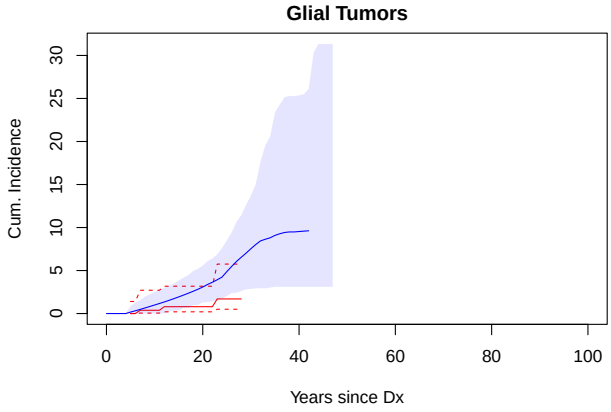


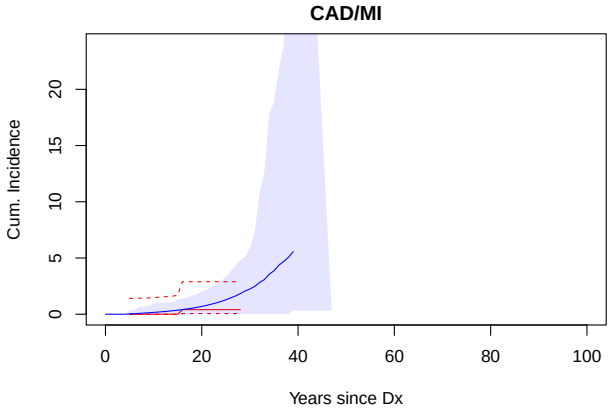
6.5.1.59 CRT50+

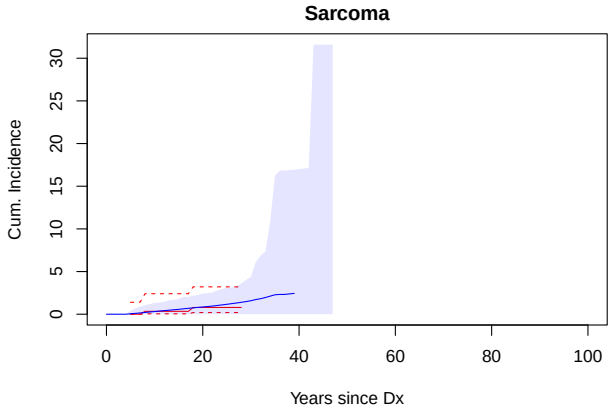

Breast Cancer
Cum. Incidence
0
10
20
30
40
0
20
40
60
80
100
Years since Dx


HF
Cum. Incidence
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx

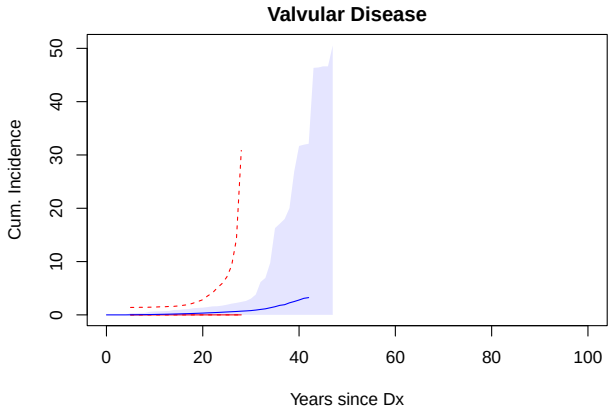

Colorectal Cancer
Cum. Incidence
0
10
20
30
40
0
20
40
60
80
100
Years since Dx


Glial Tumors
Cum. Incidence
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx

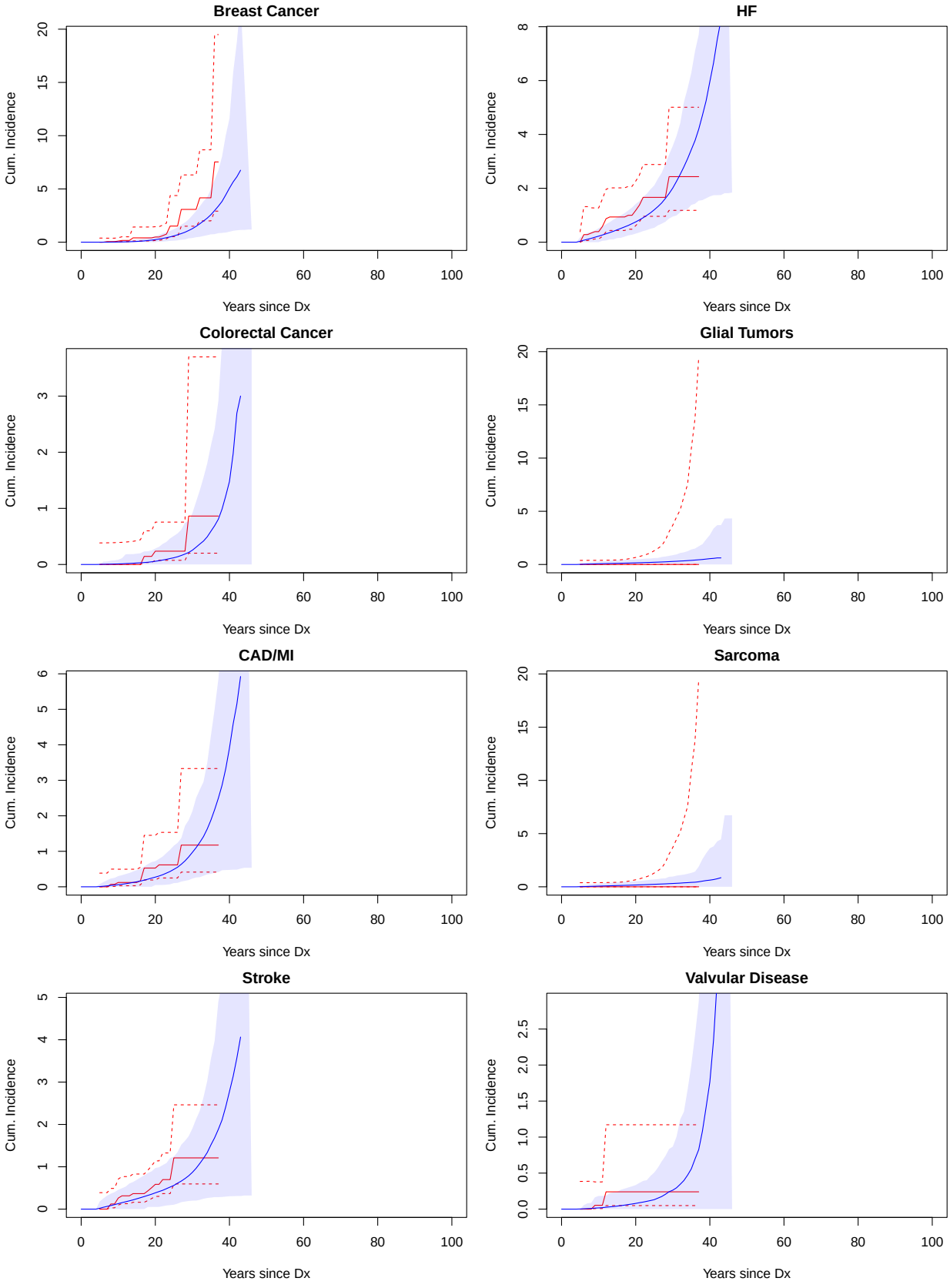

CAD/MI
Cum. Incidence
0
5
10
15
20
0
20
40
60
80
100
Years since Dx


Sarcoma
Cum. Incidence
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx

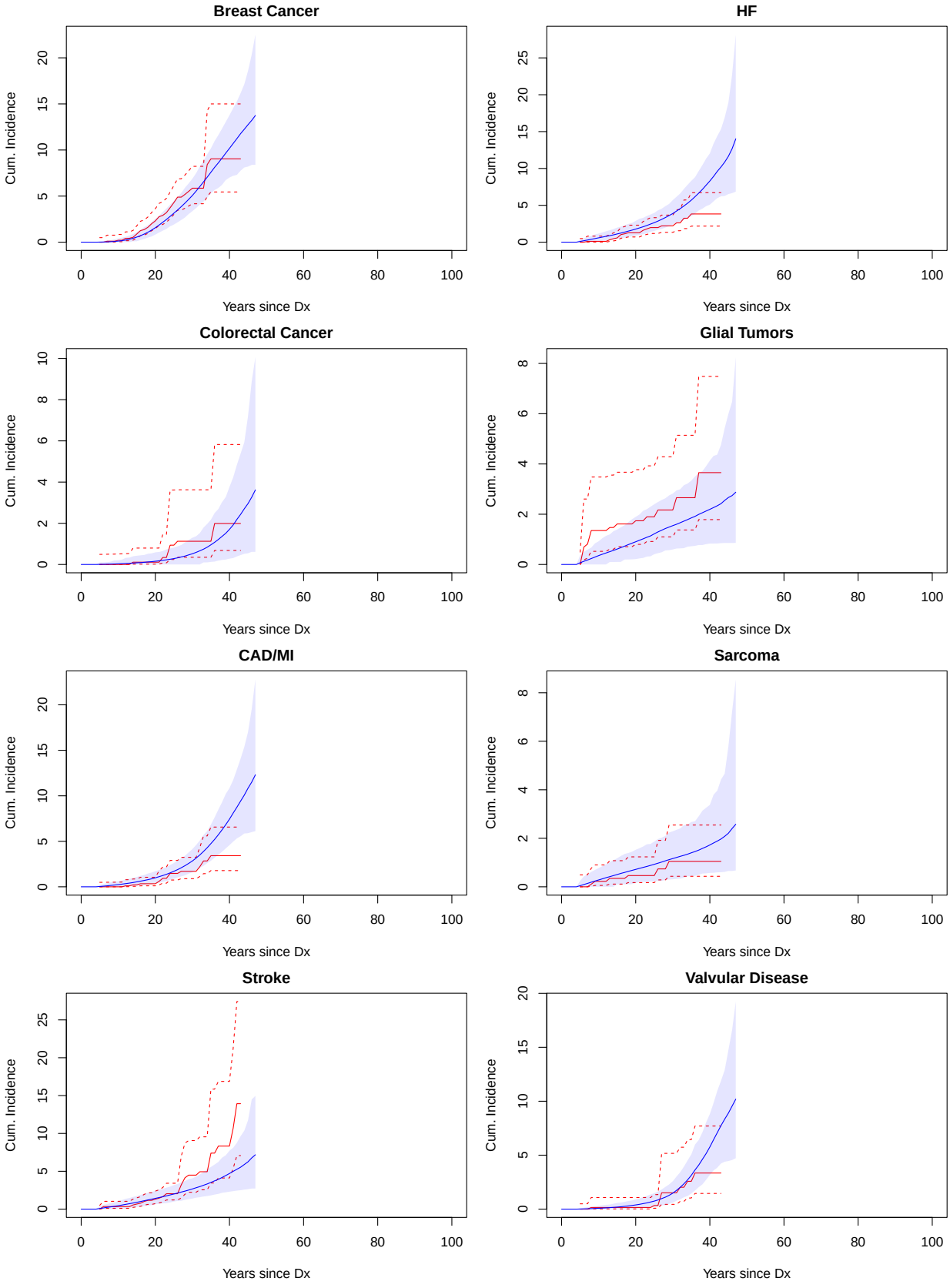
Stroke
Cum. Incidence
0
10
20
30
40
0
20
40
60
80
100
Years since Dx


Valvular Disease
Cum. Incidence
0
10
20
30
40
50
0
20
40
60
80
100
Years since Dx

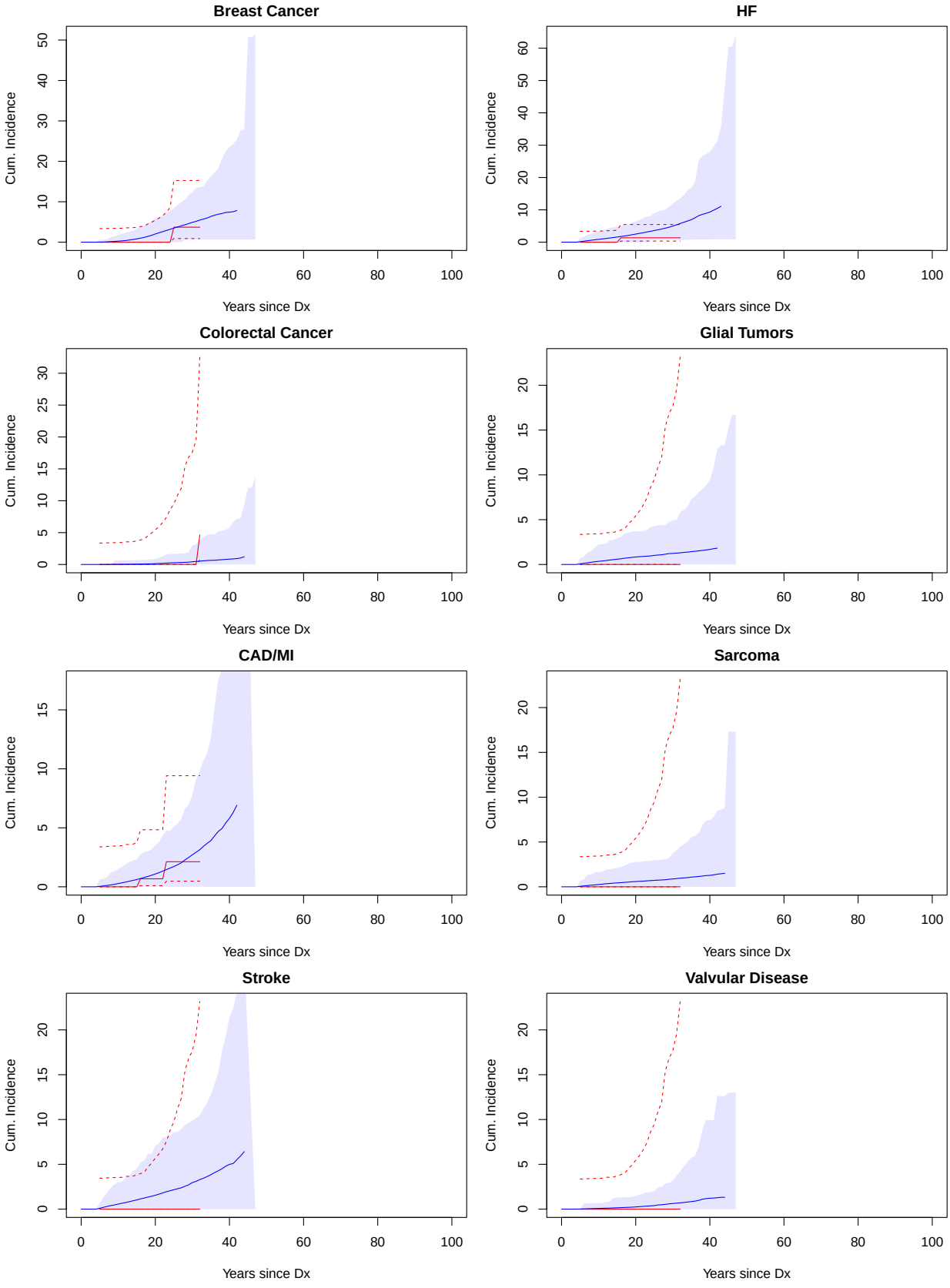
6.5.1.60 OvaryNone



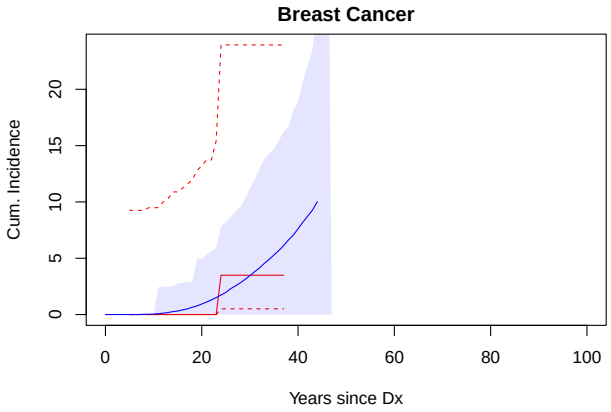
6.5.1.61 Ovary<10

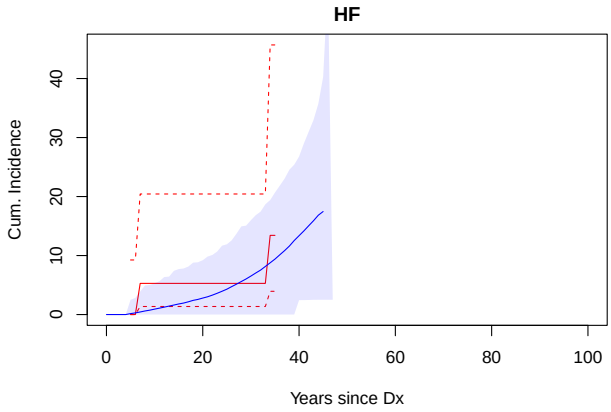


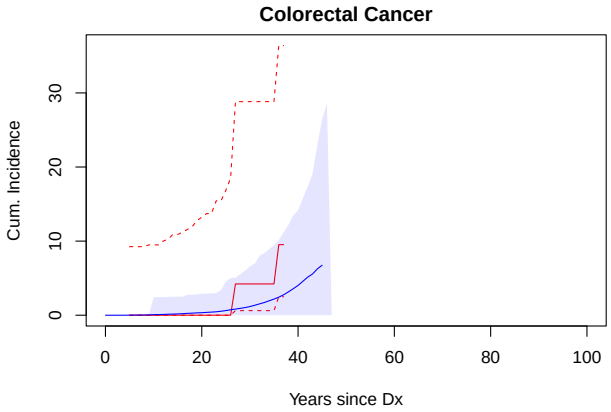
6.5.1.62 Ovary10-19

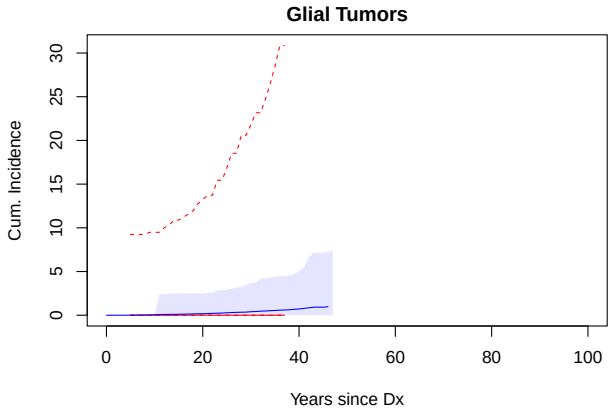


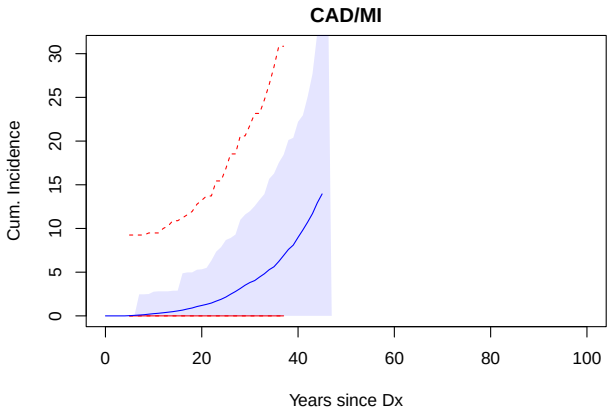
6.5.1.63 Ovary20+

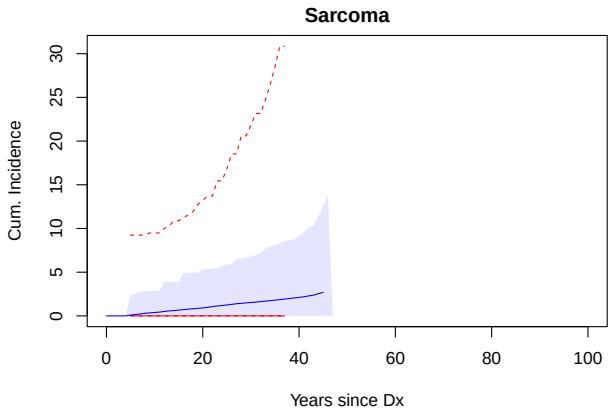


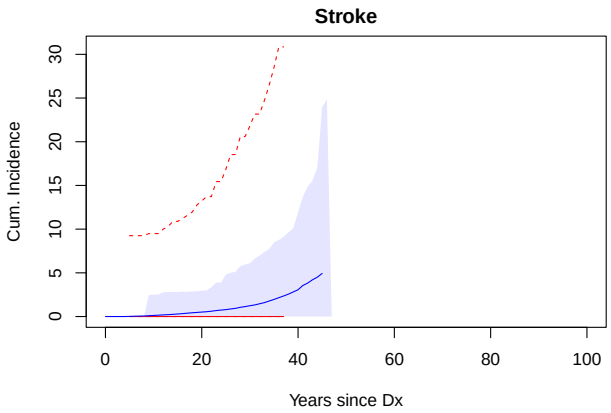


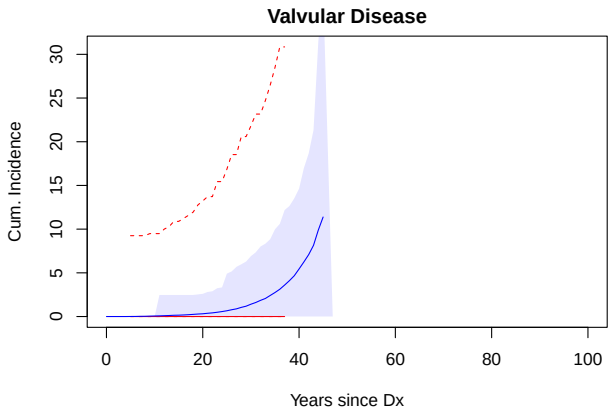




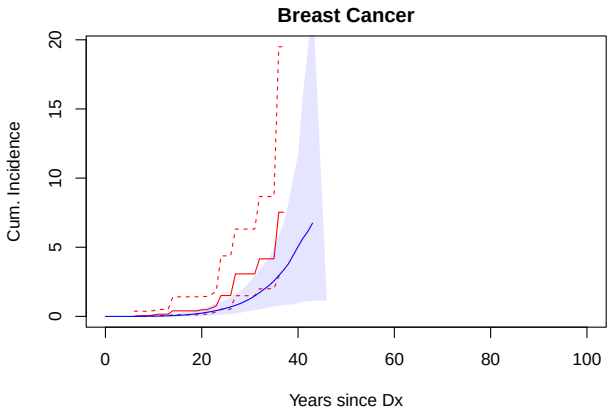


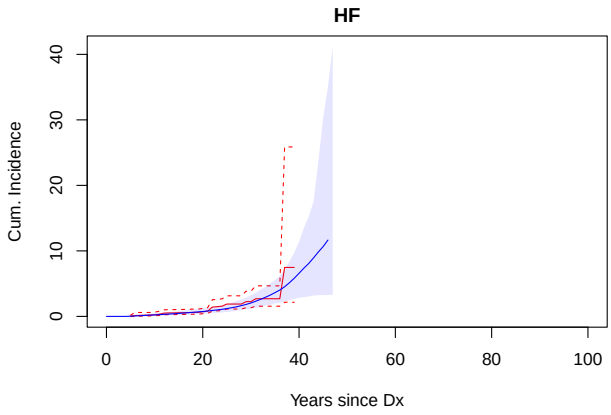


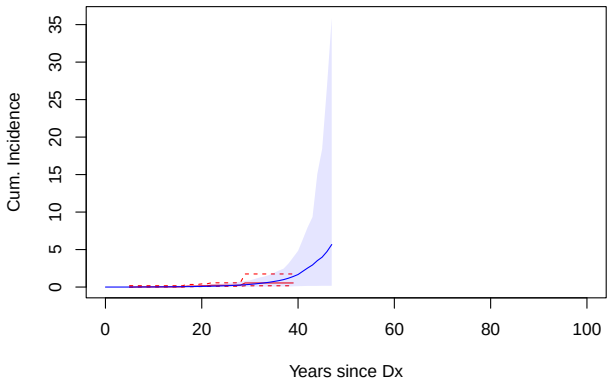


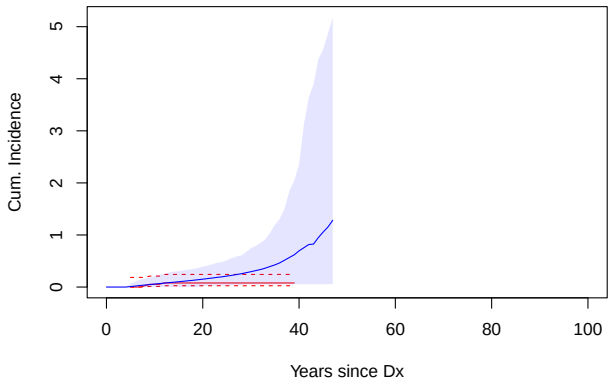


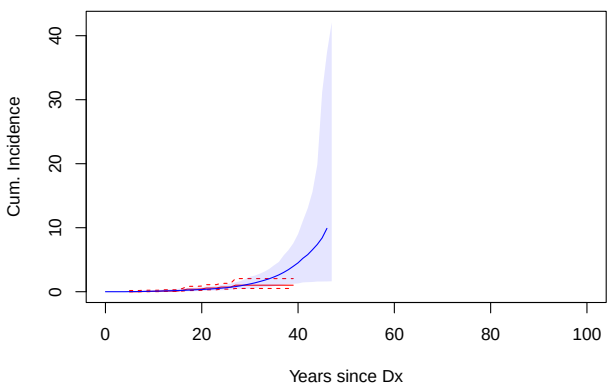
6.5.1.64 AbdPelNone

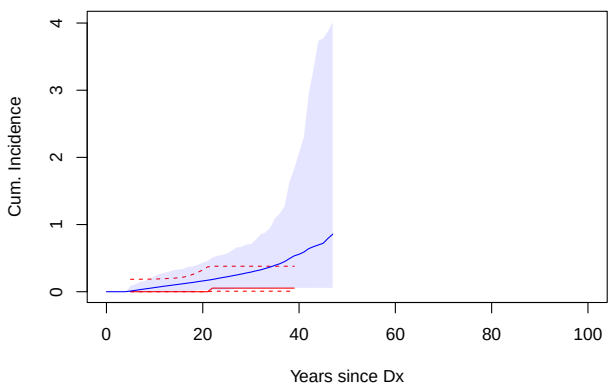


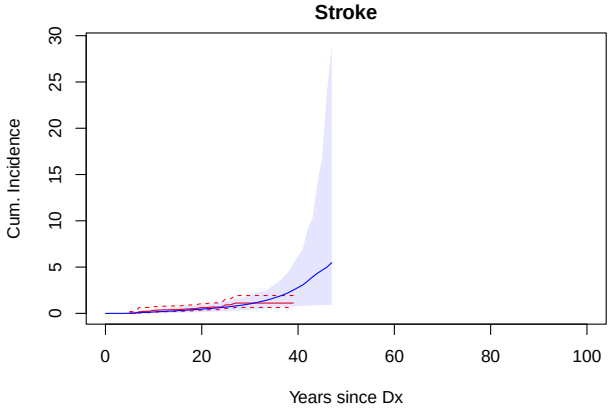


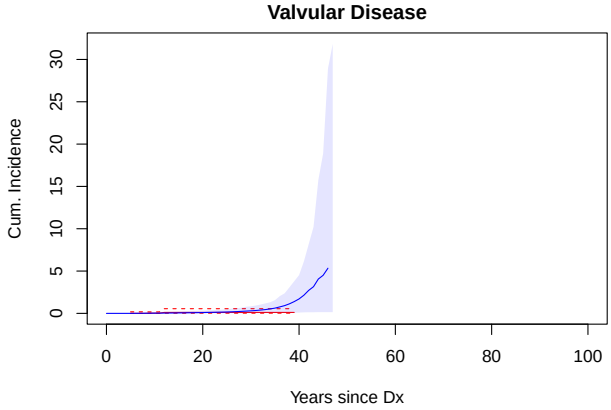




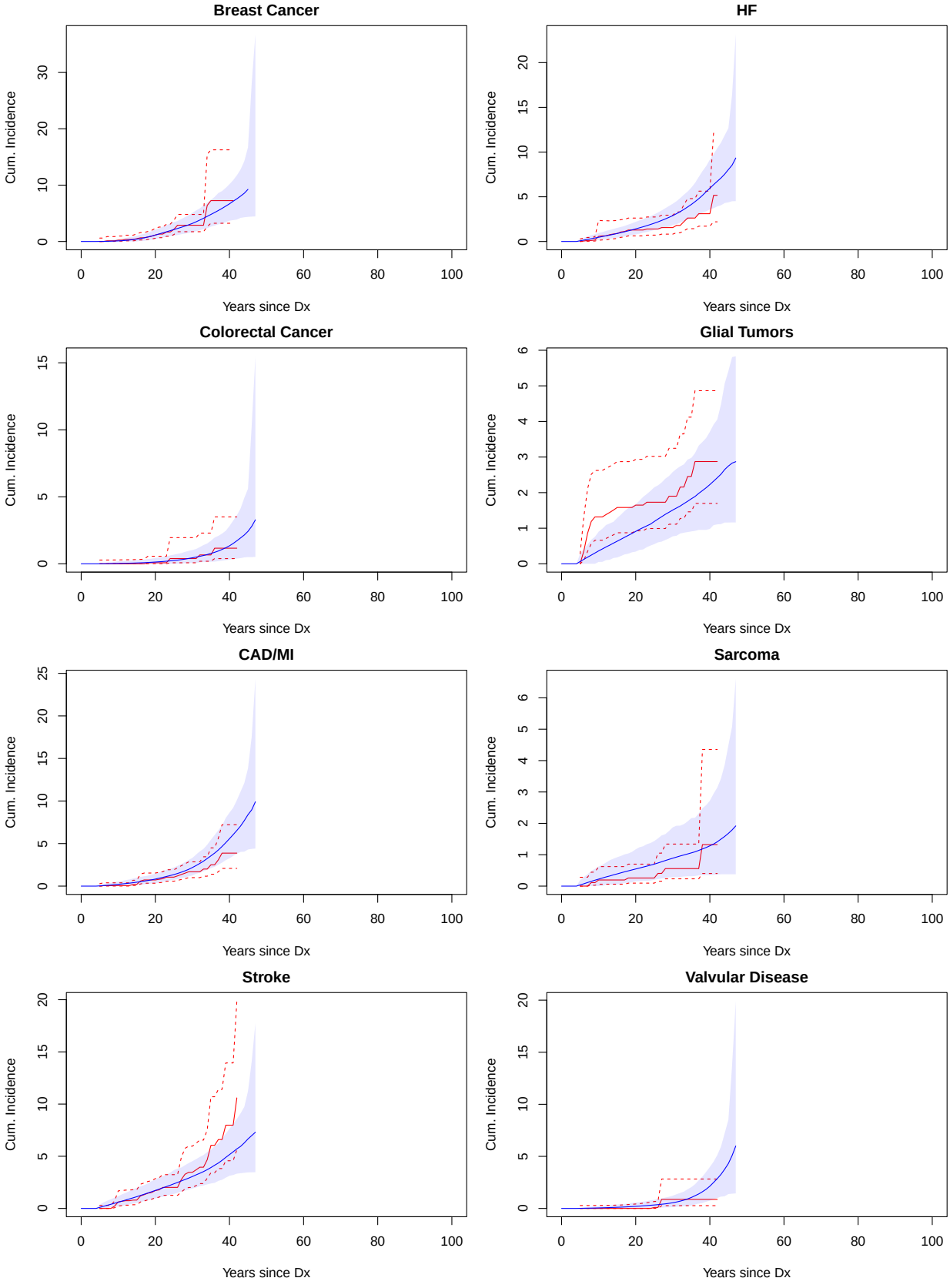




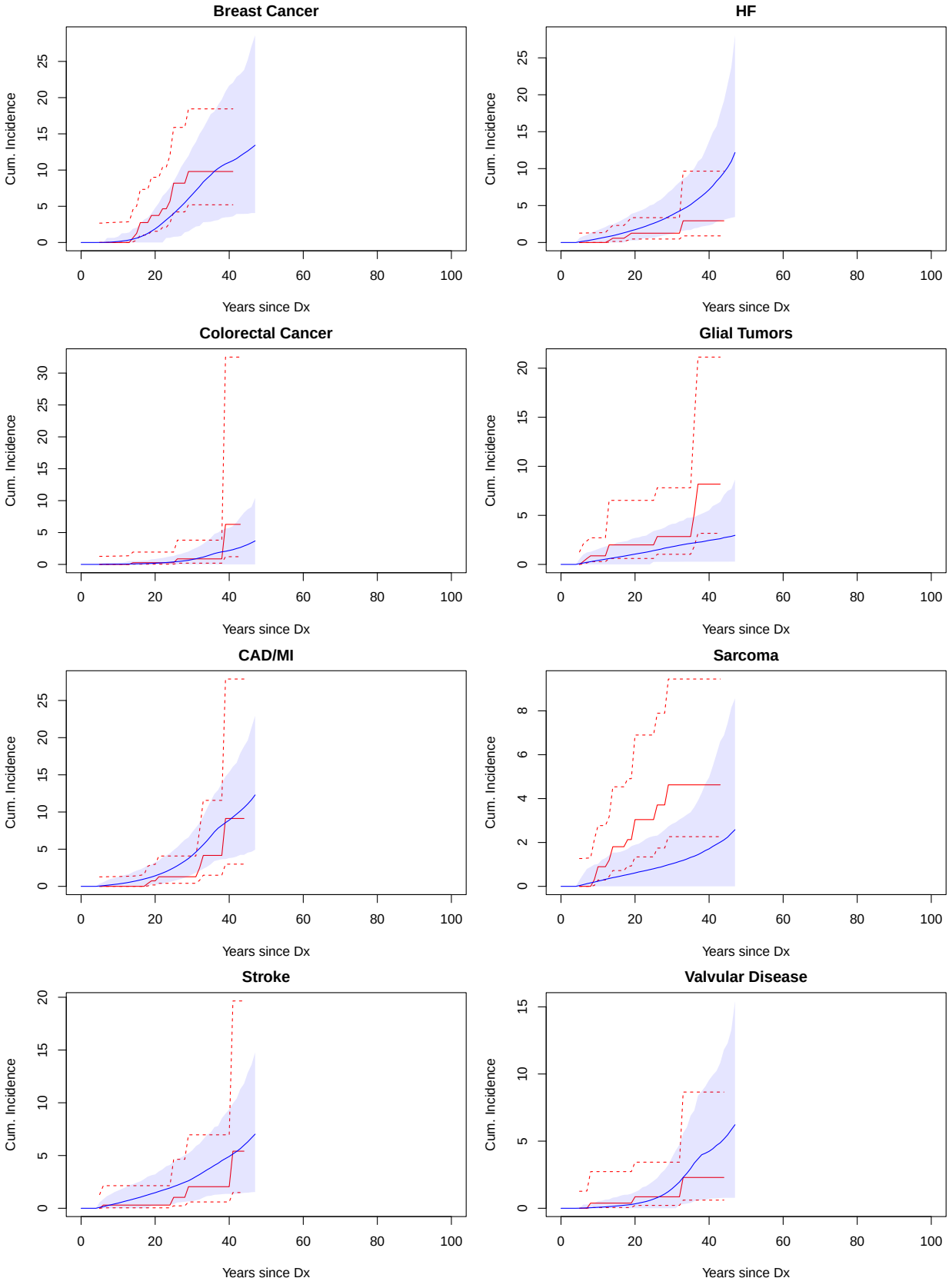




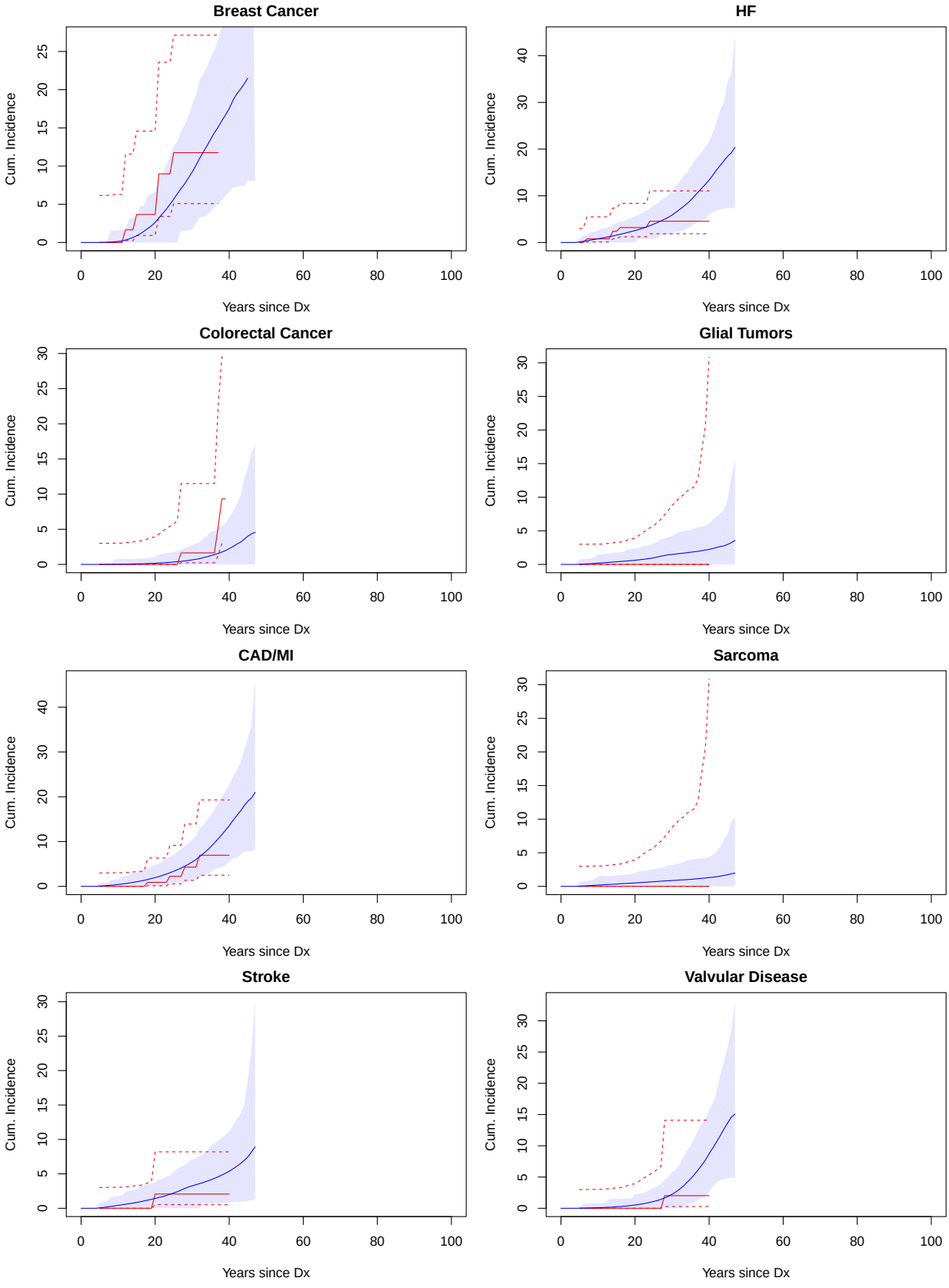
6.5.1.65 AbdPel<15



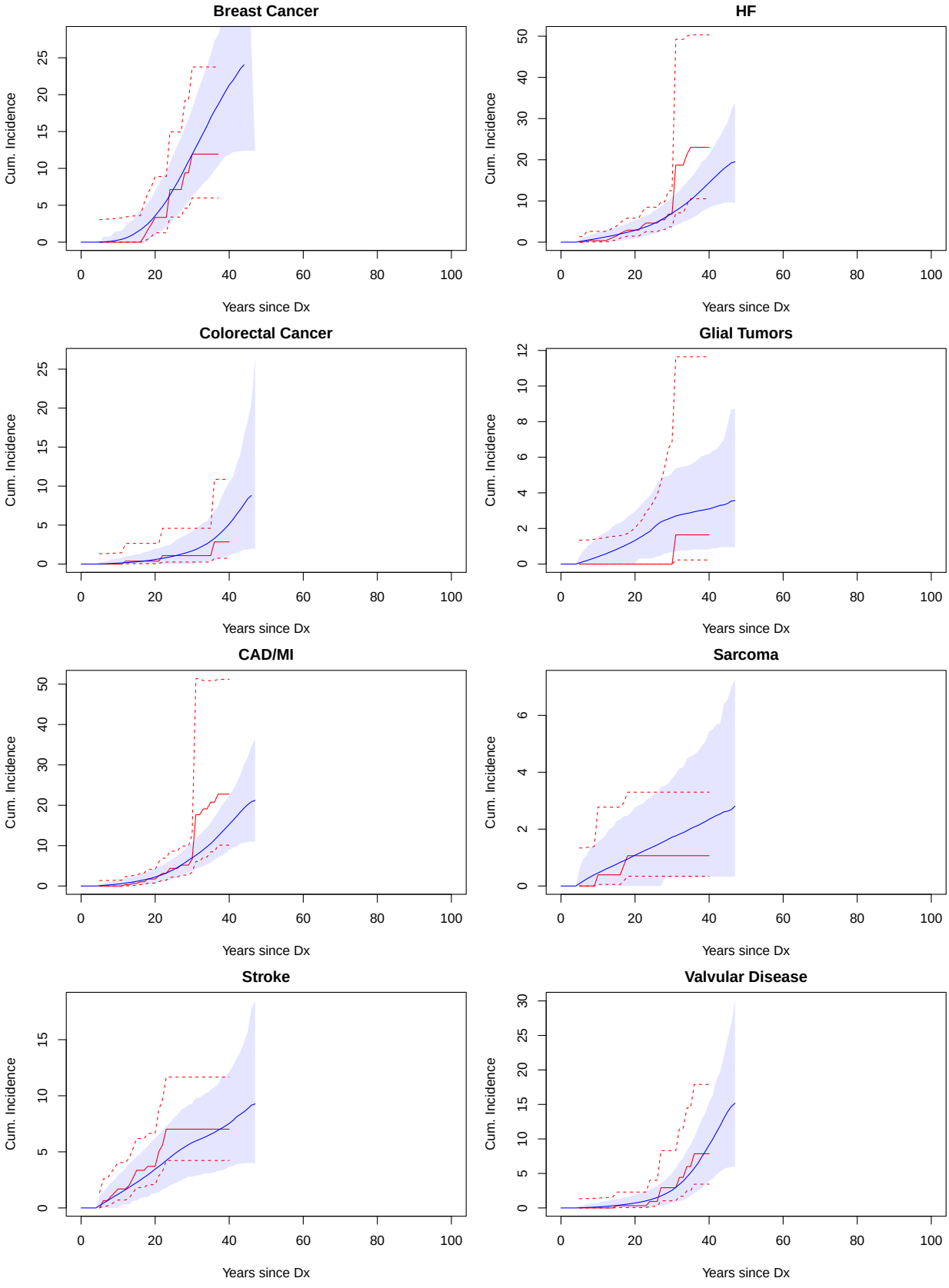
6.5.1.66 AbdPel15_24



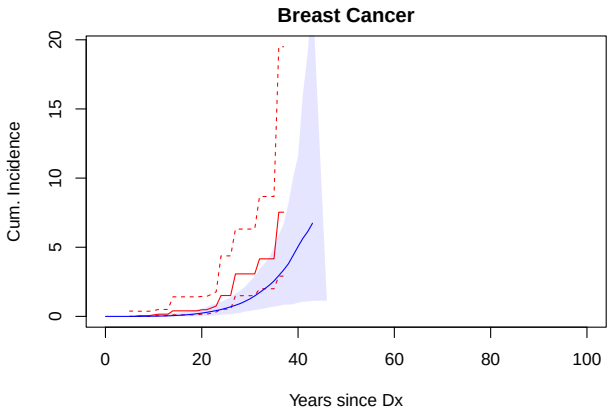
6.5.1.67 AbdPel25_34

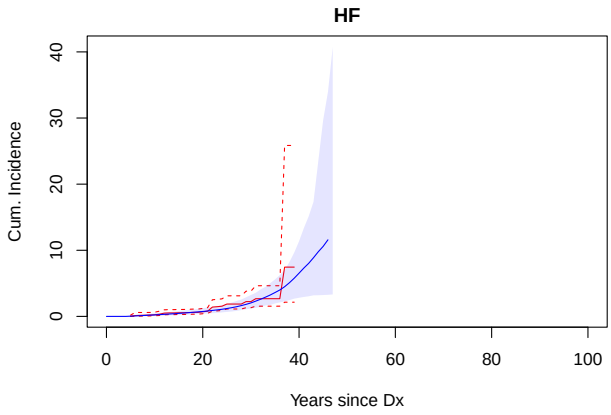


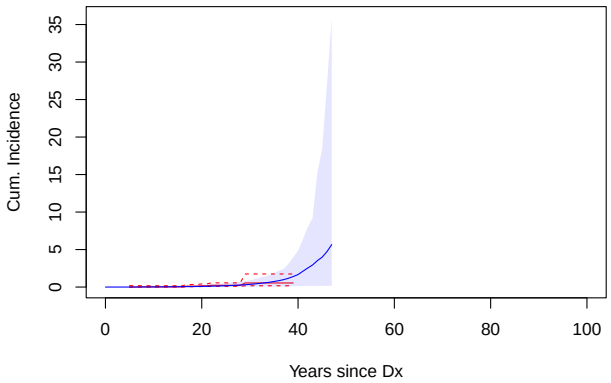
6.5.1.68 AbdPel35+

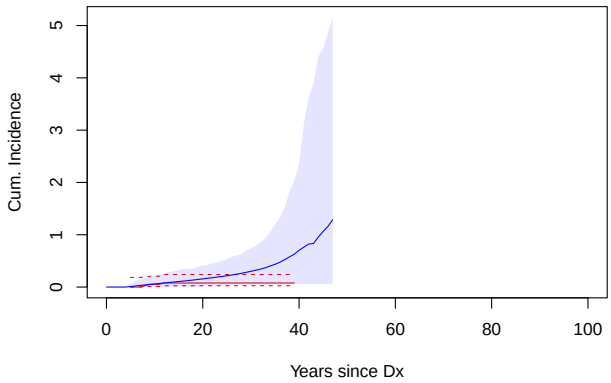


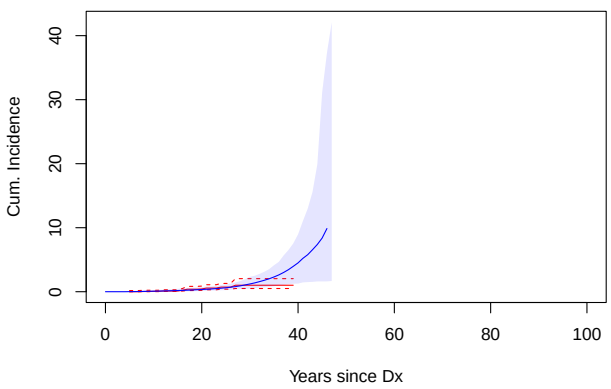
6.5.1.69 MaxRTNone

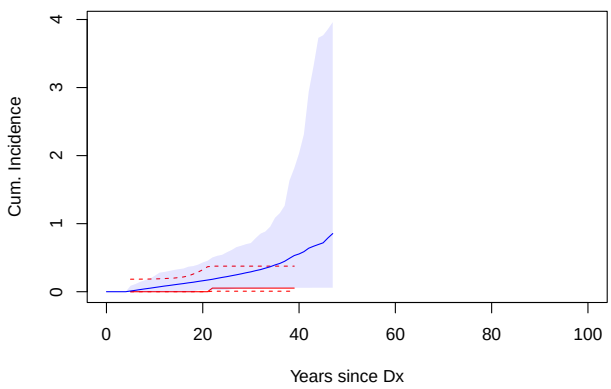


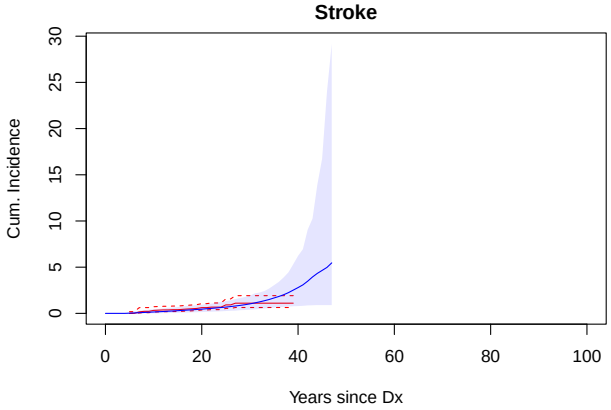


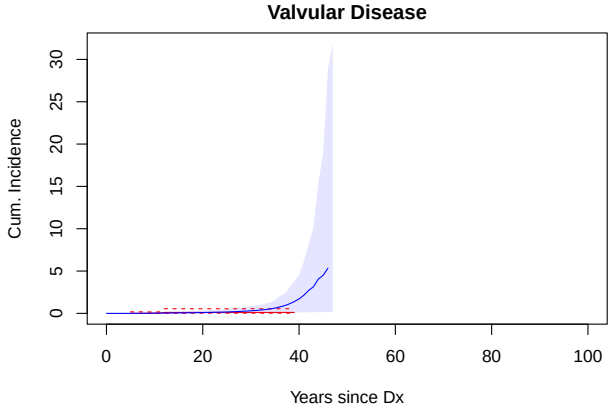




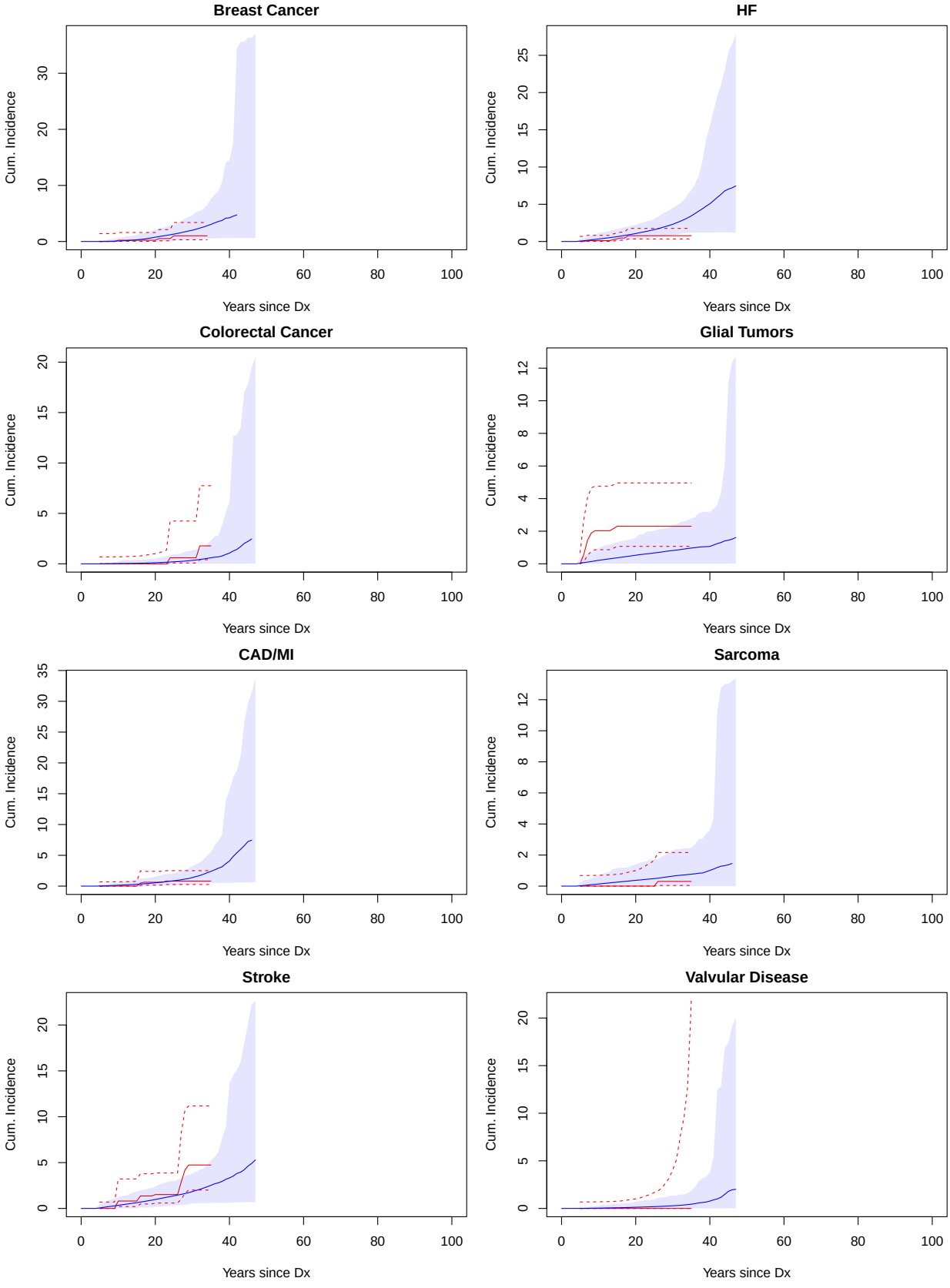




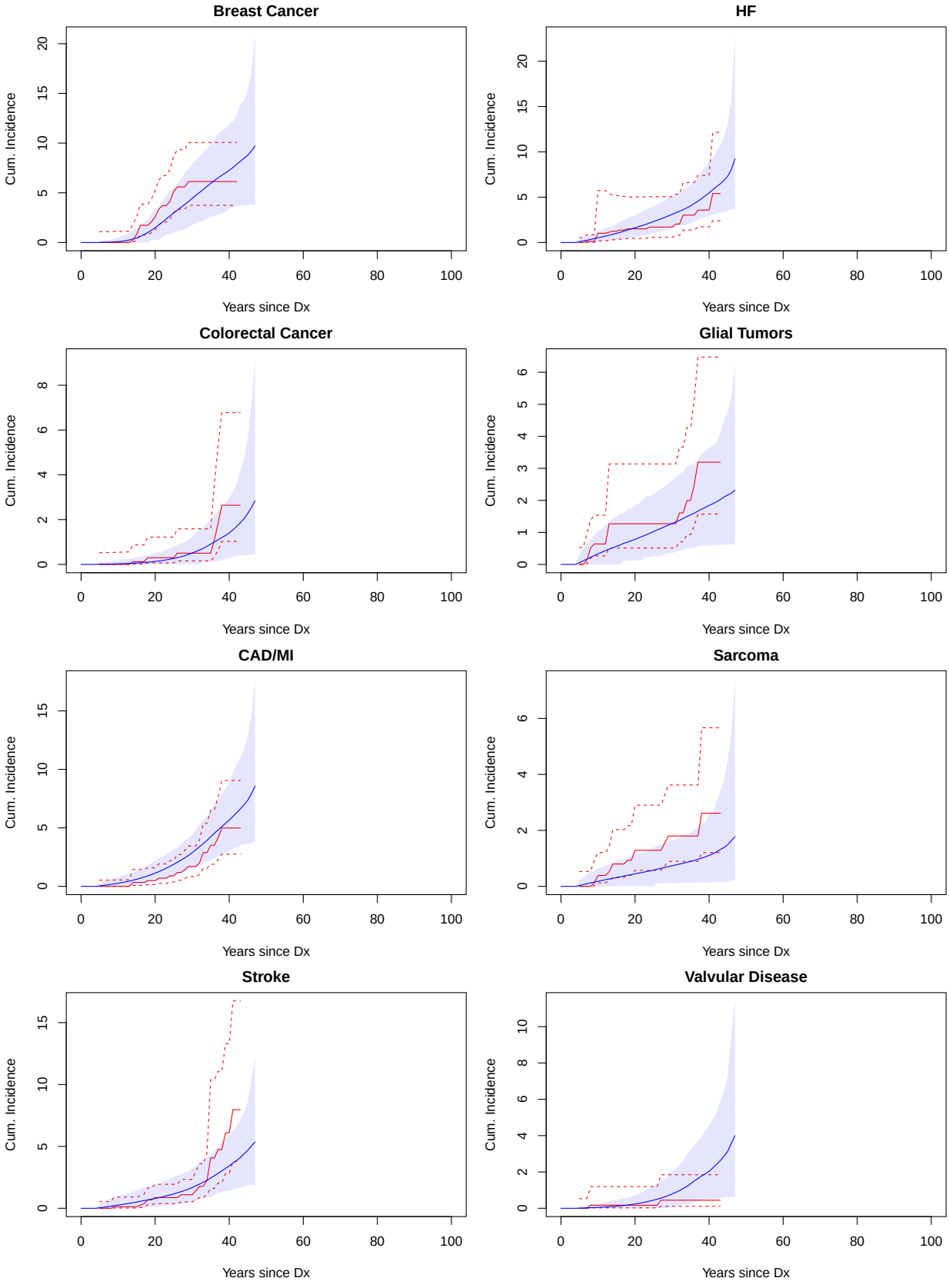




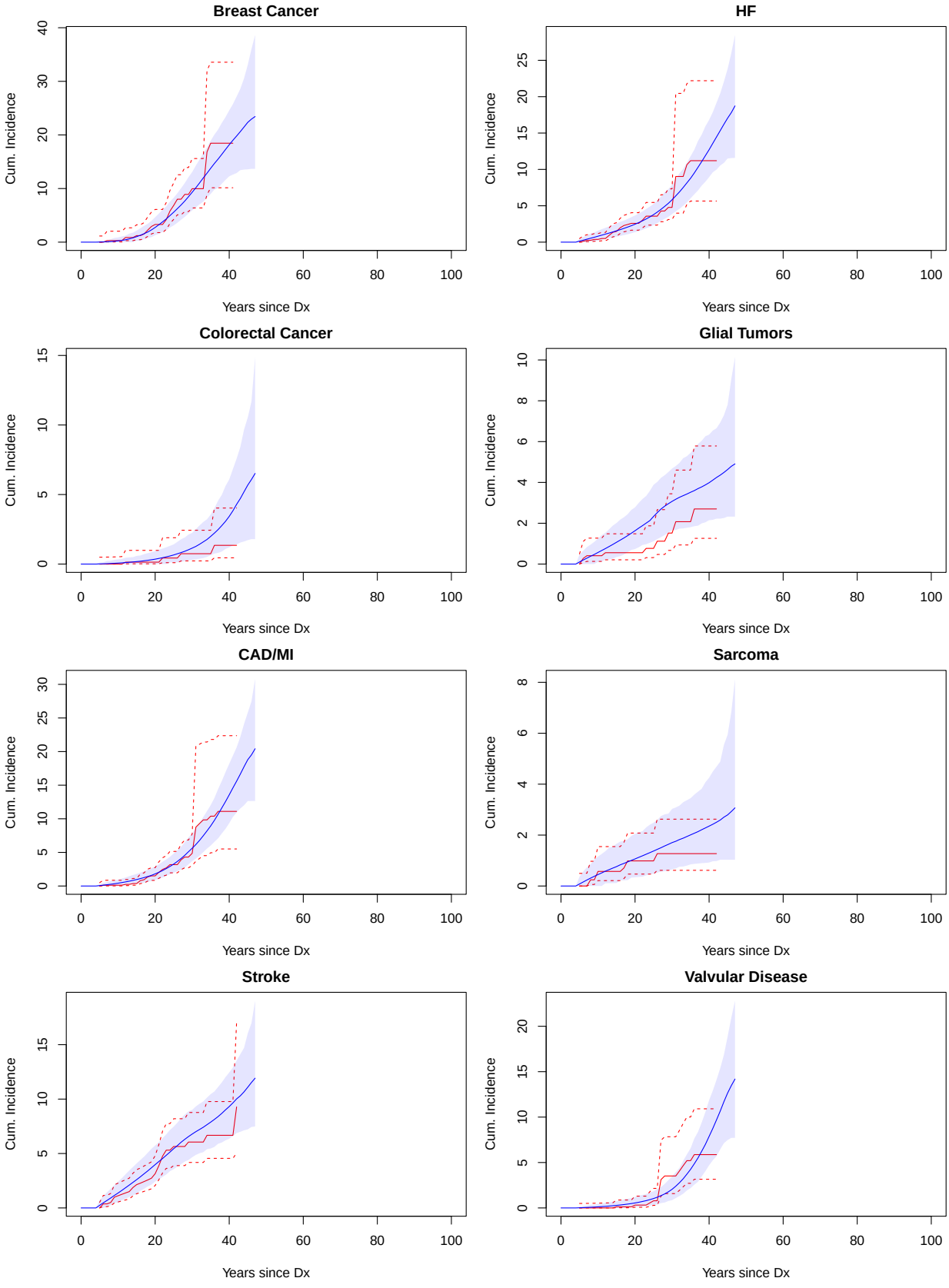
6.5.1.70 MaxRT<20



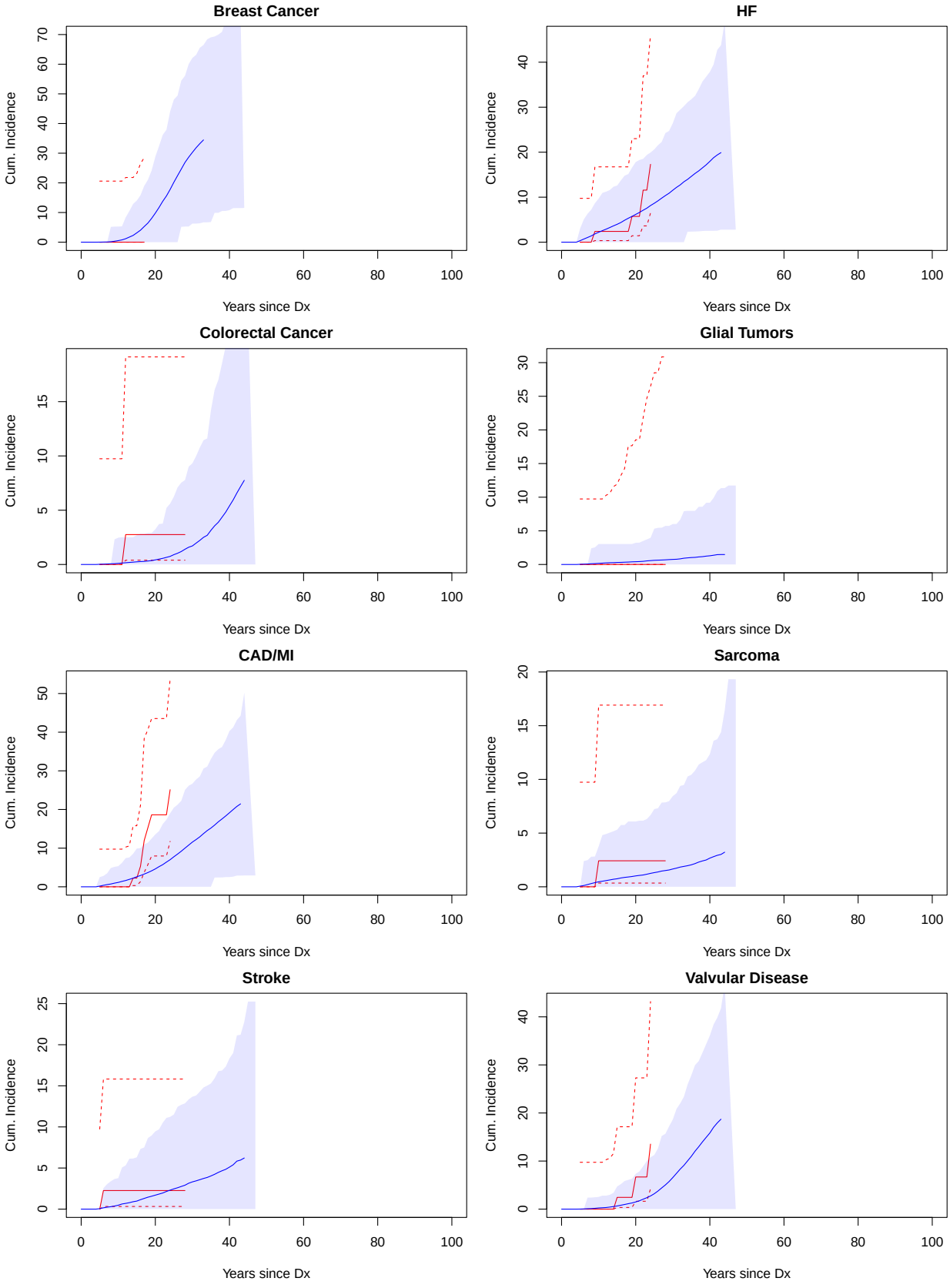
6.5.1.71 MaxRT20_29



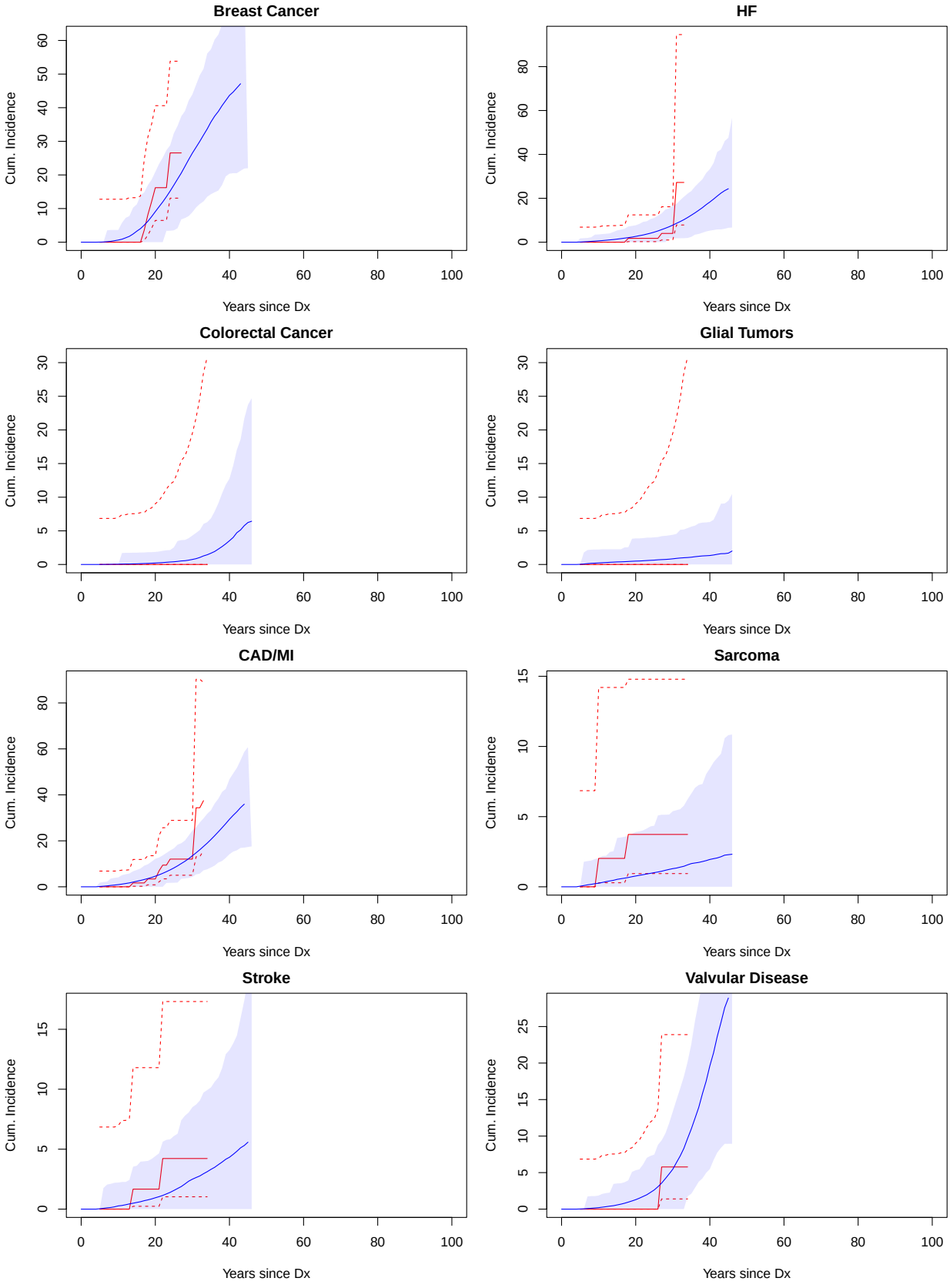
6.5.1.72 MaxRT30+



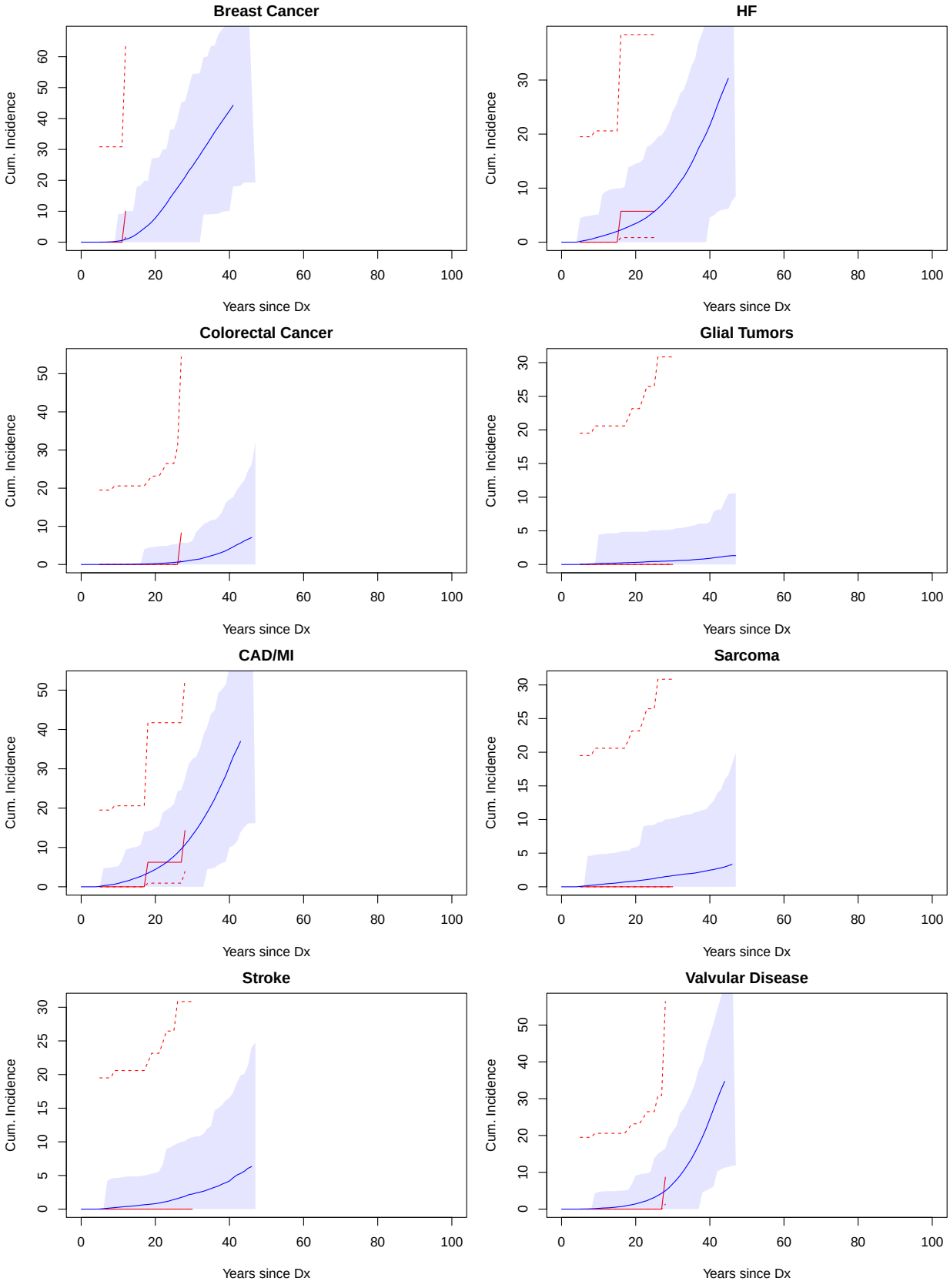
6.5.1.73 HL grp: Salvage



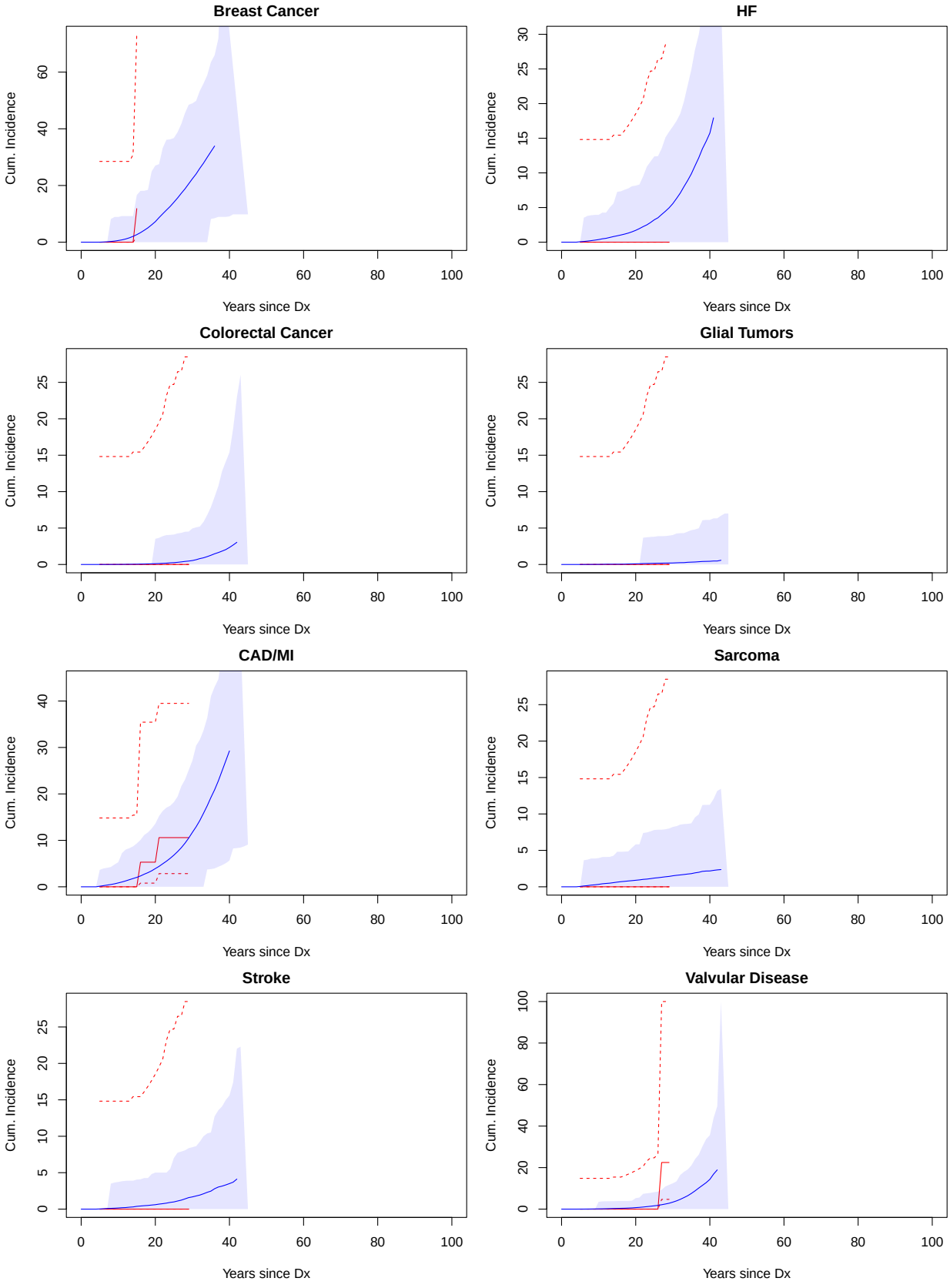
6.5.1.74 HL grp: Extended



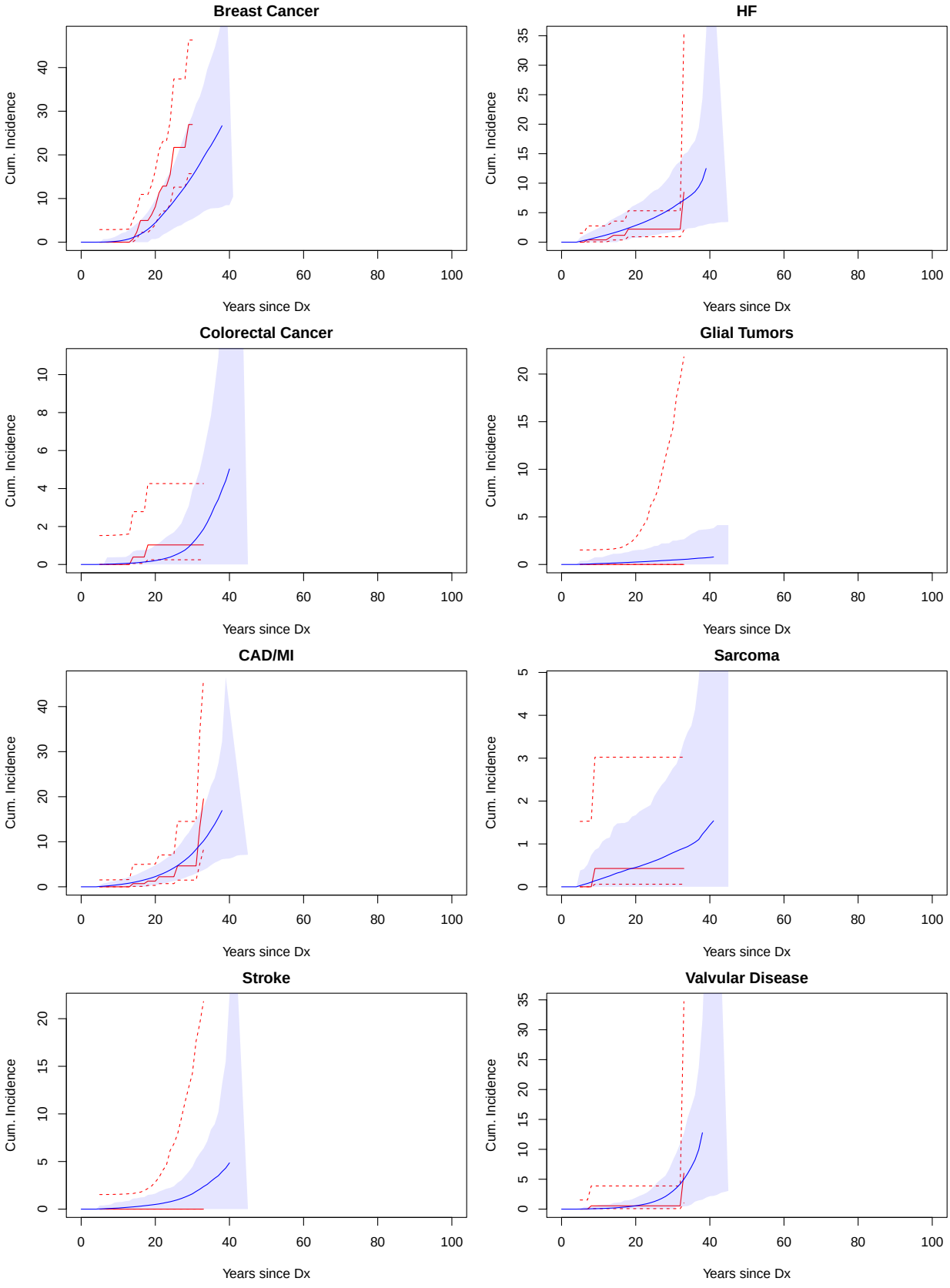
6.5.1.75 HL grp: Chest RT>=35 plus chemo



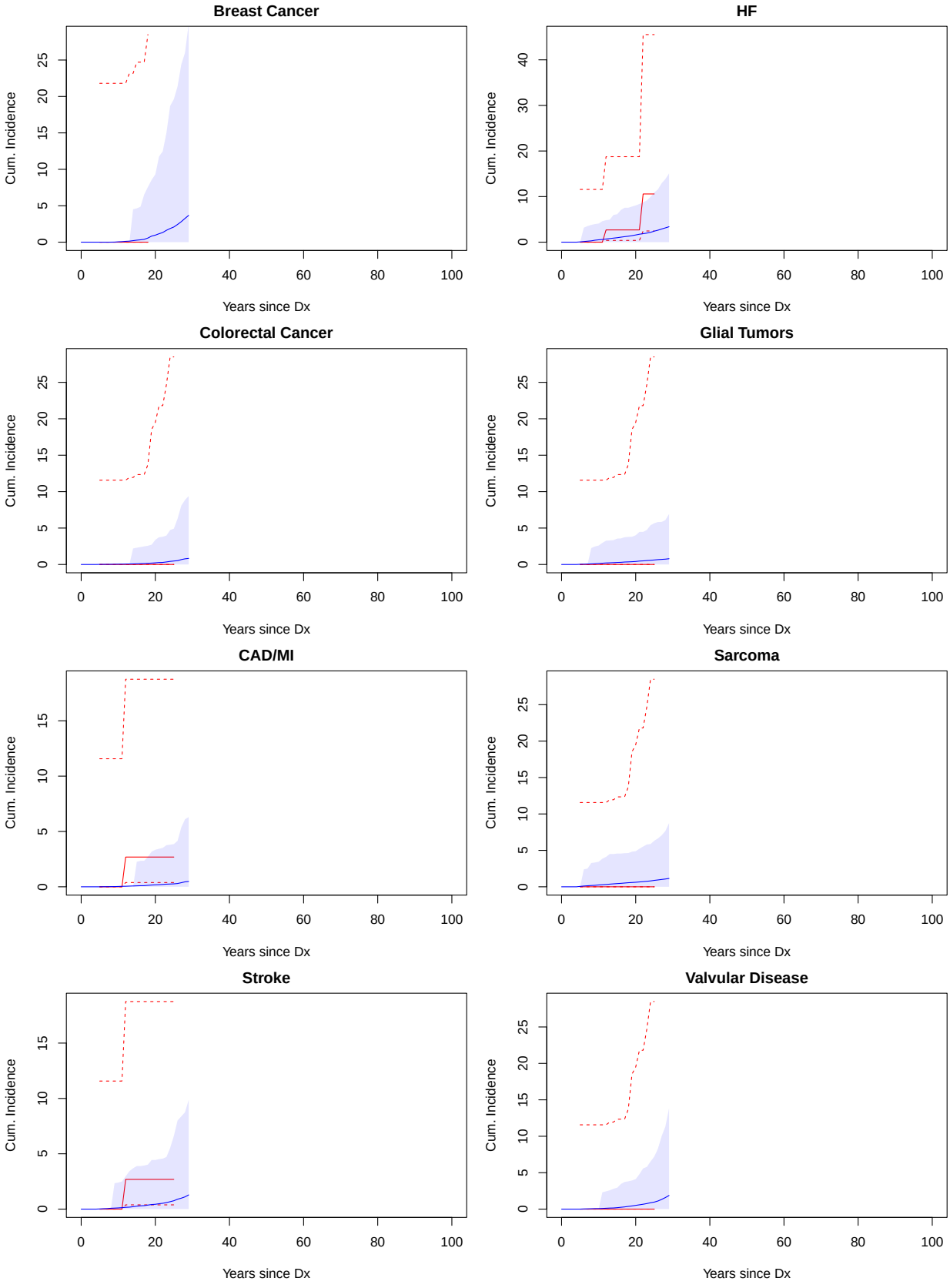
6.5.1.76 HL grp: Chest RT>=35 no chemo



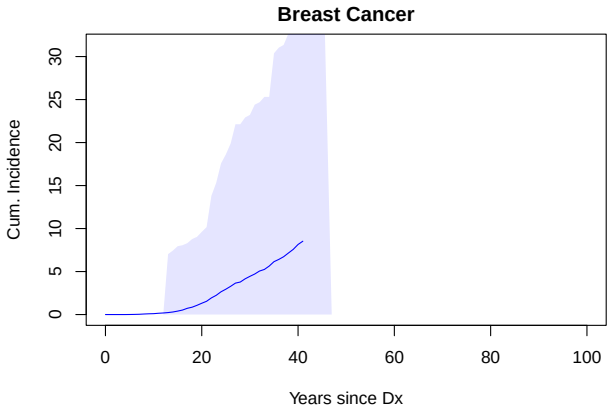
6.5.1.77 HL grp: Chest RT<35 plus chemo

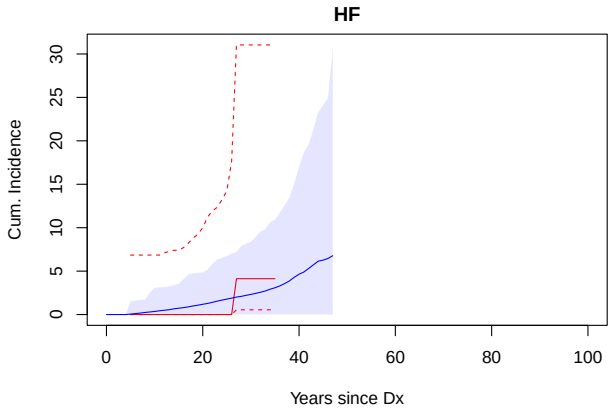


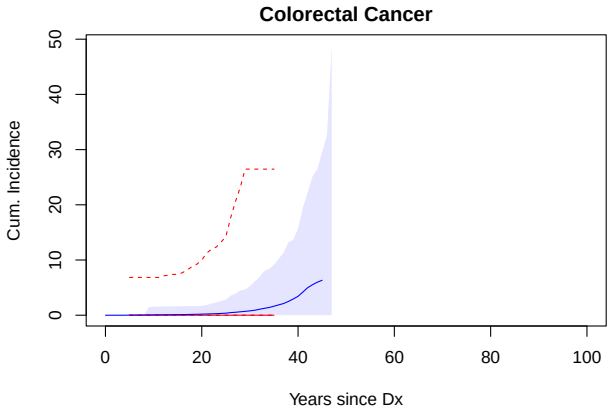
6.5.1.78 HL grp: Chemo without chest RT

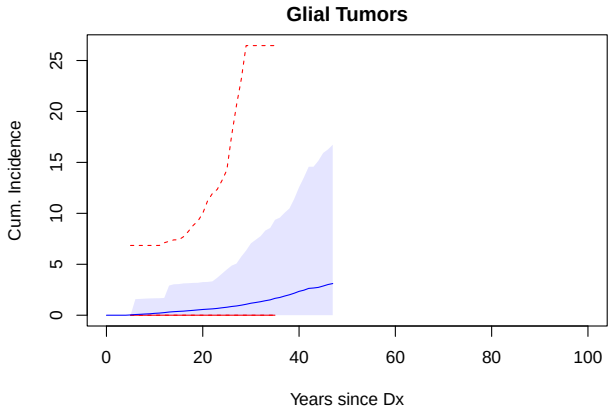


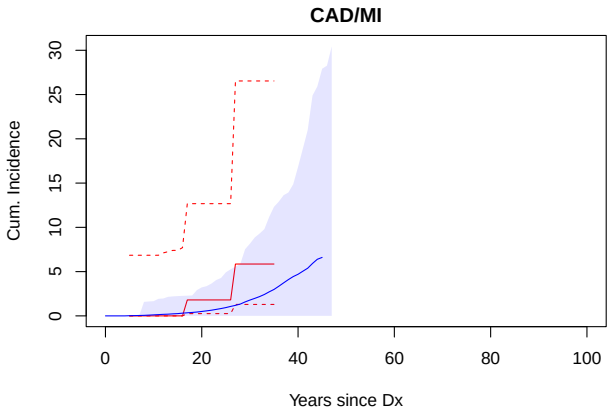
6.5.1.79 HL grp: Other

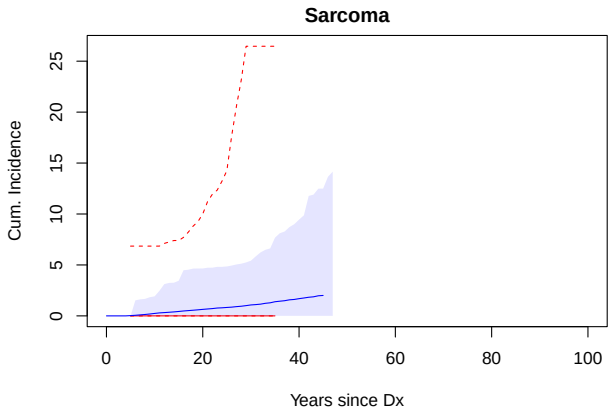


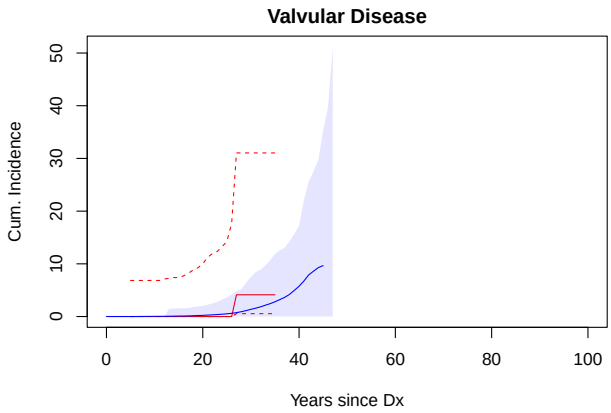




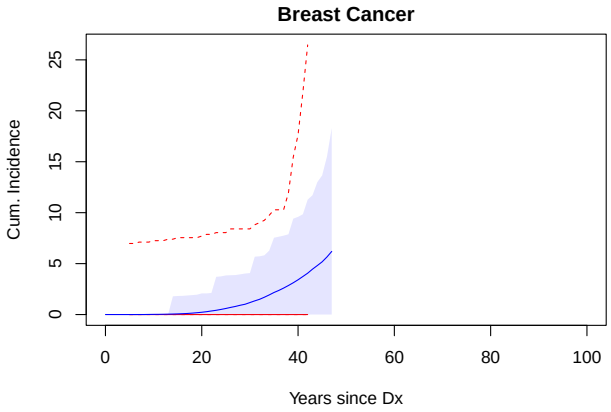


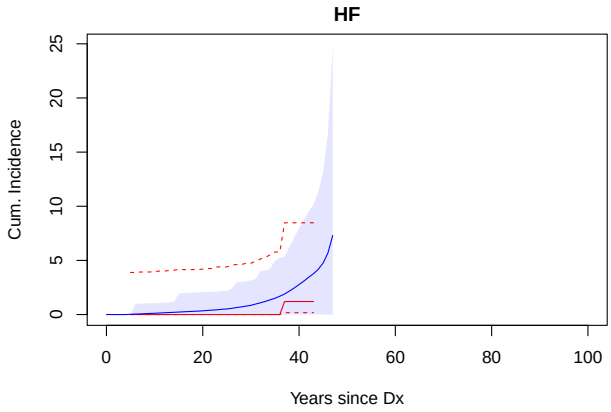


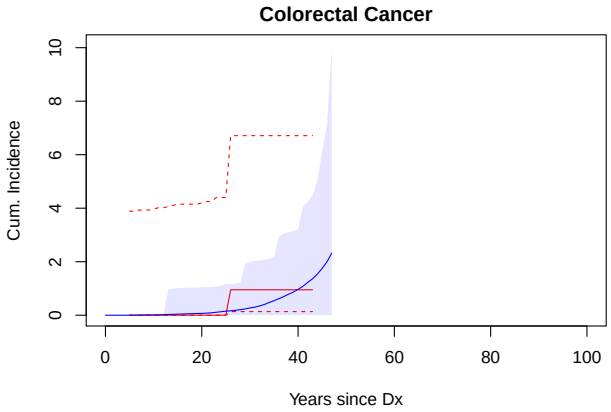


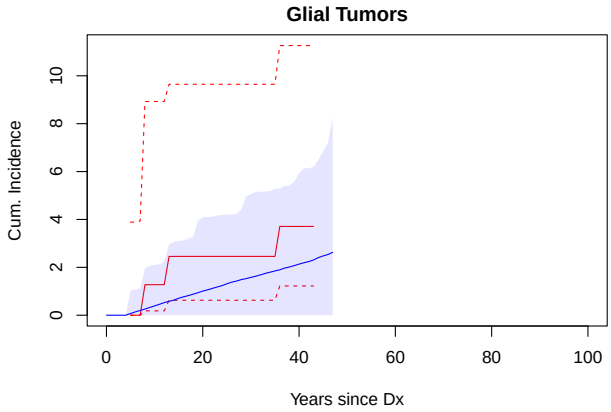


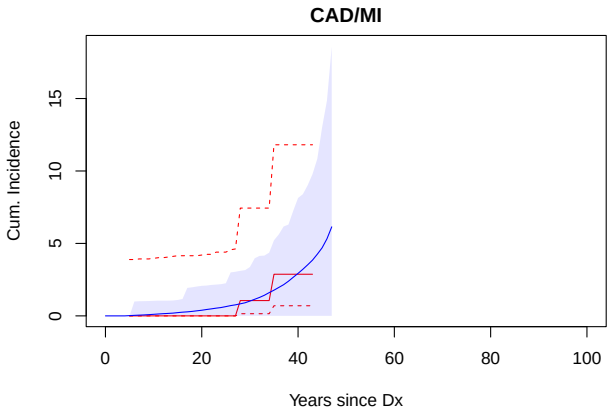
6.5.1.80 ALL grp: 1970s-like

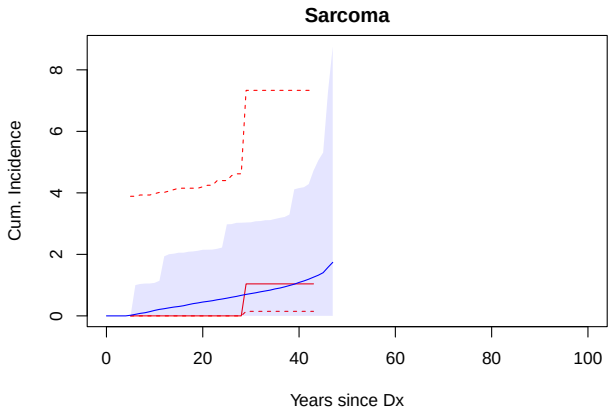


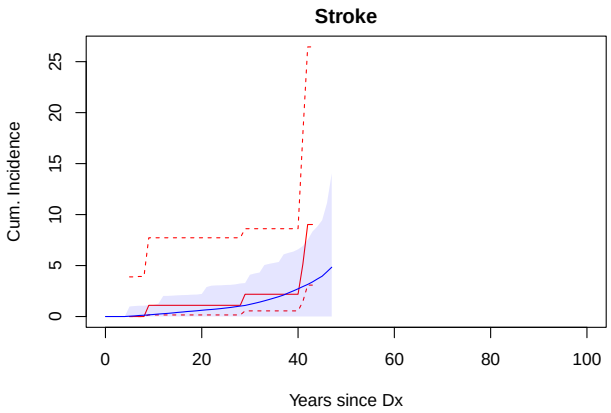


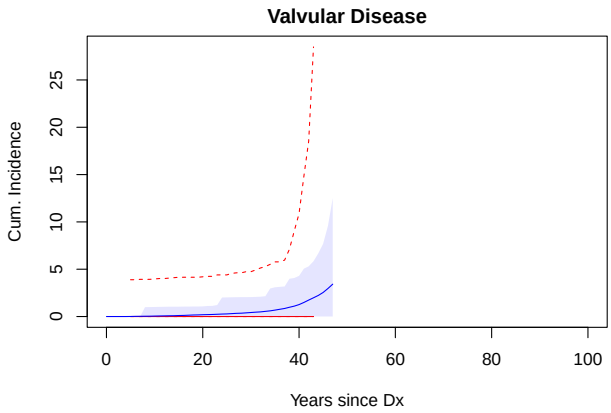




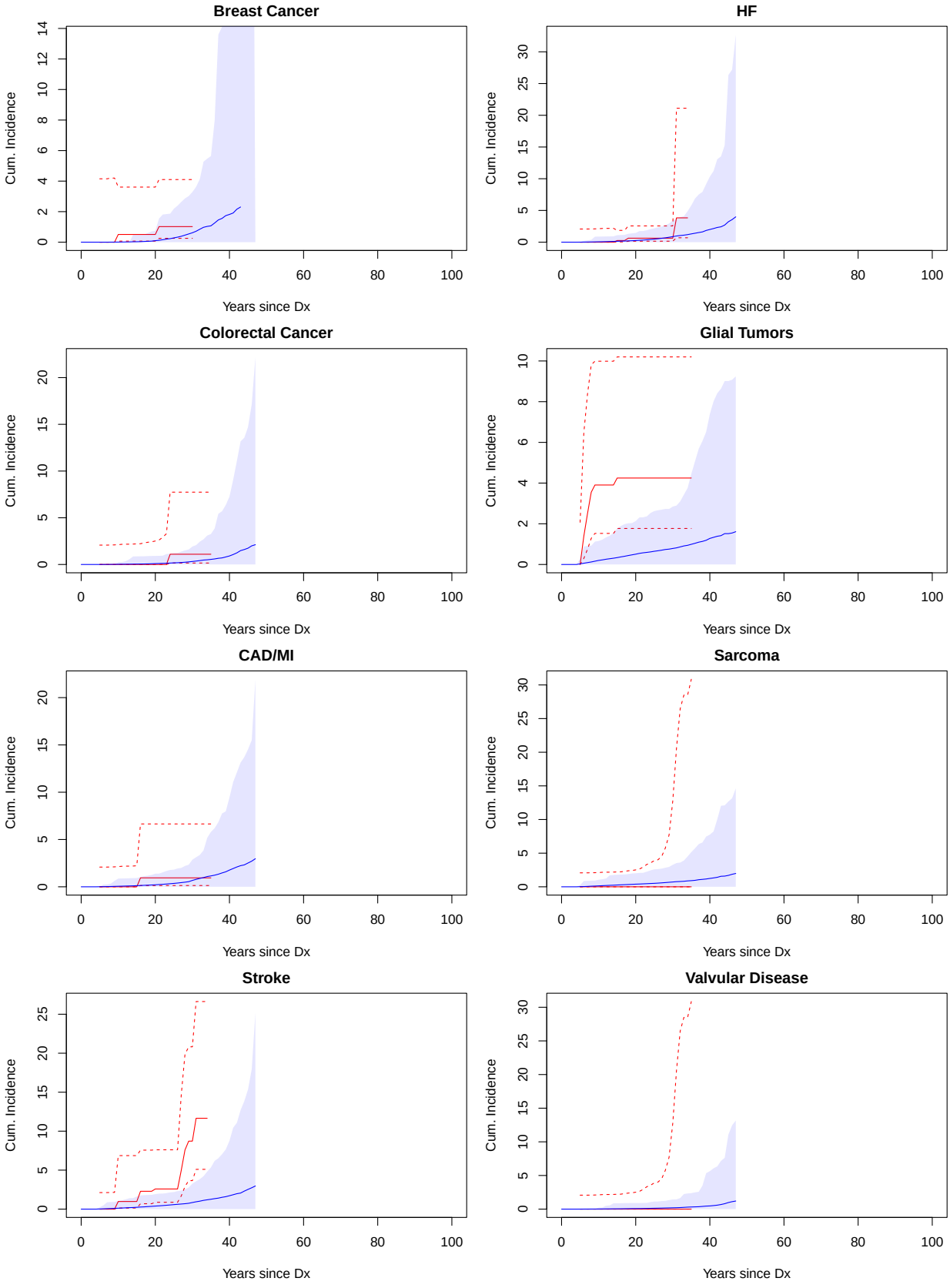




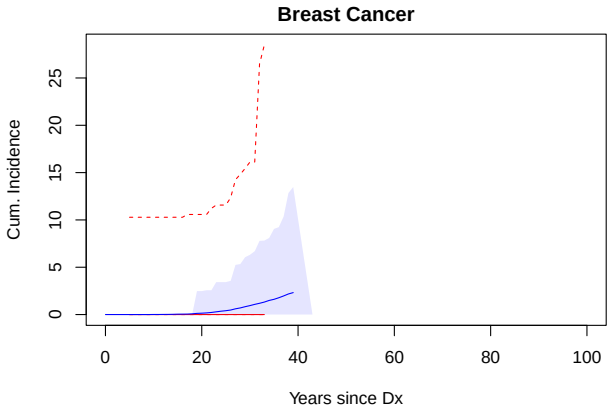


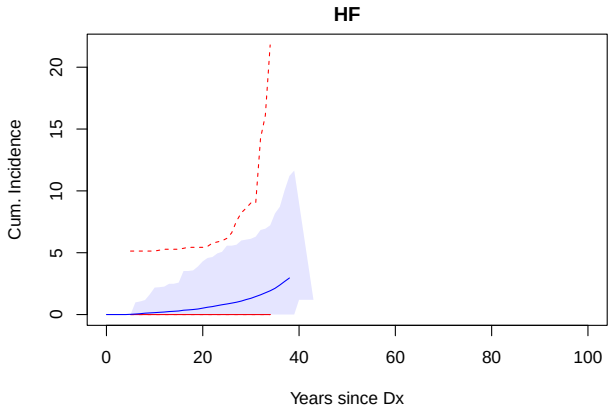


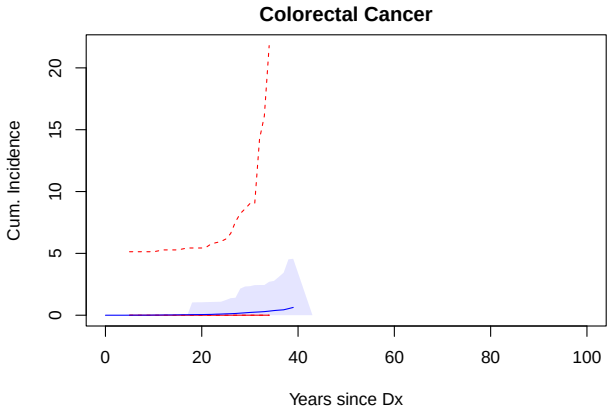
6.5.1.81 ALL grp: 1980s SR-like

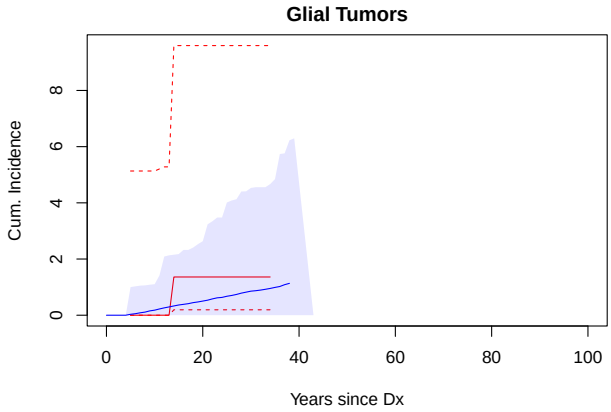


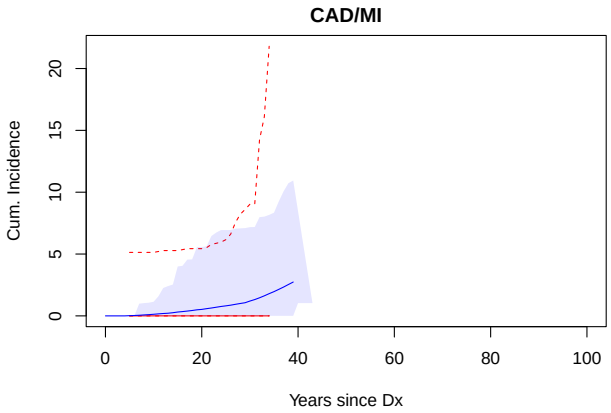
6.5.1.82 ALL grp: 1980s HR-like

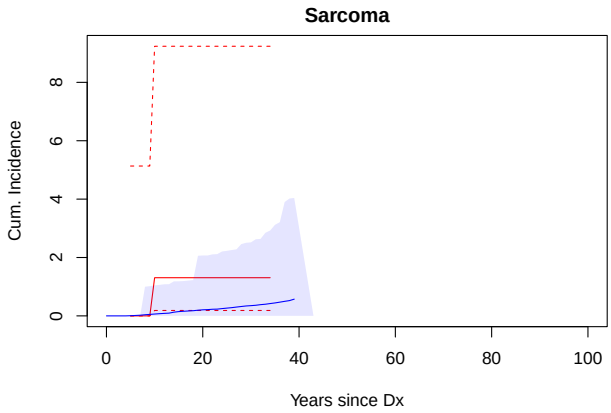


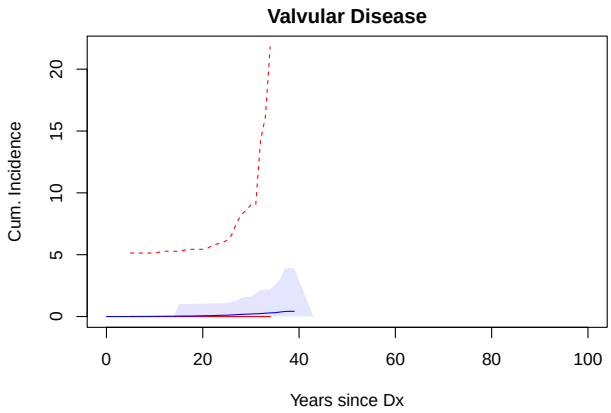




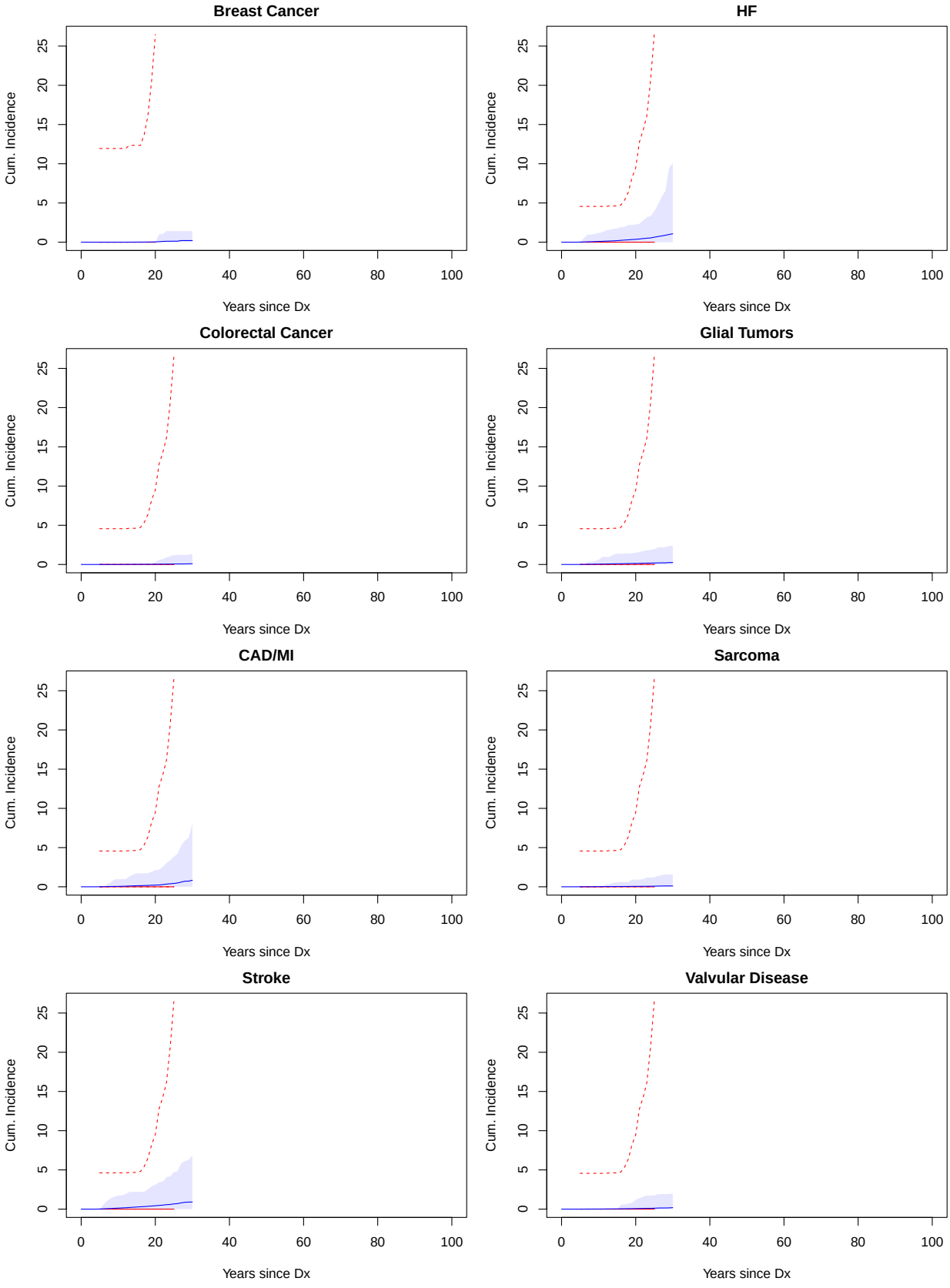




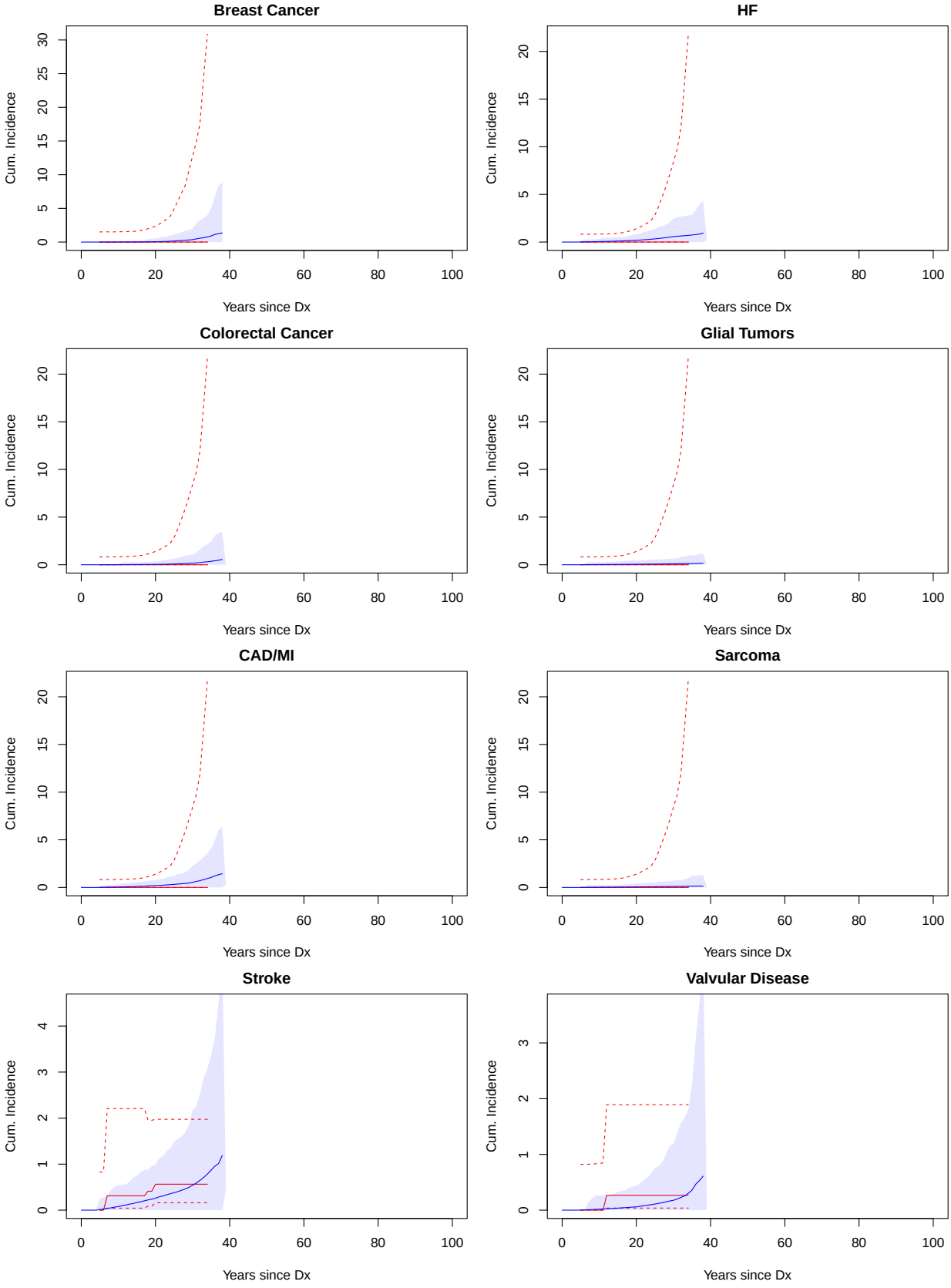




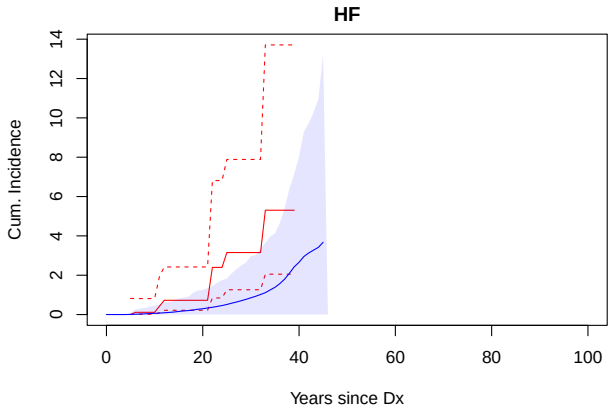
6.5.1.83 ALL grp: 1990s HR-like

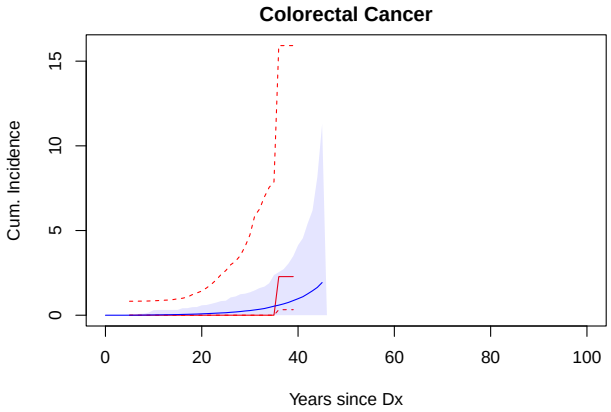


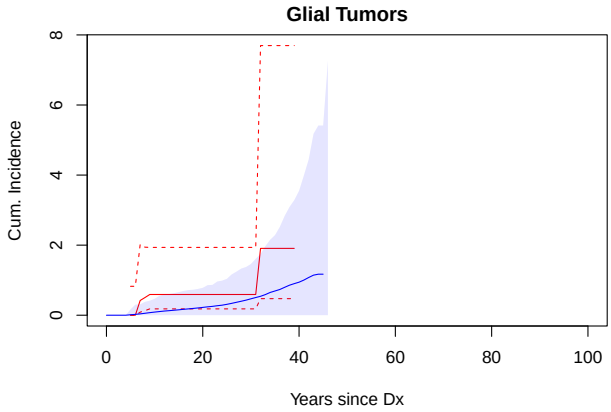
6.5.1.84 ALL grp: 1990s SR/Essig

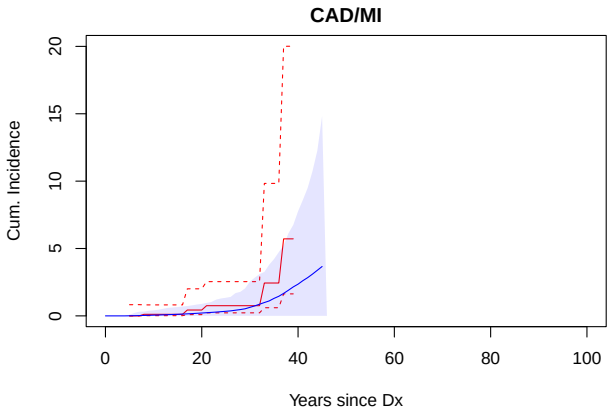


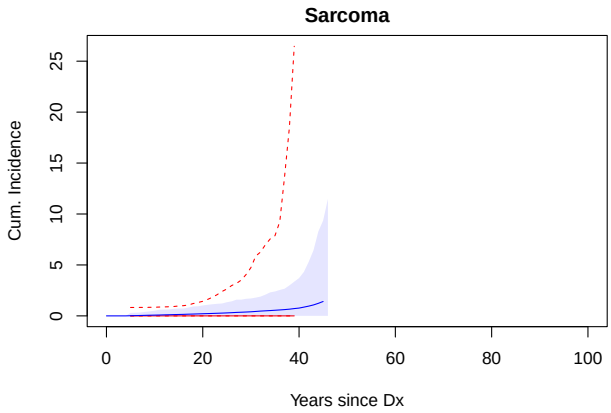
6.5.1.85 ALL grp: Other

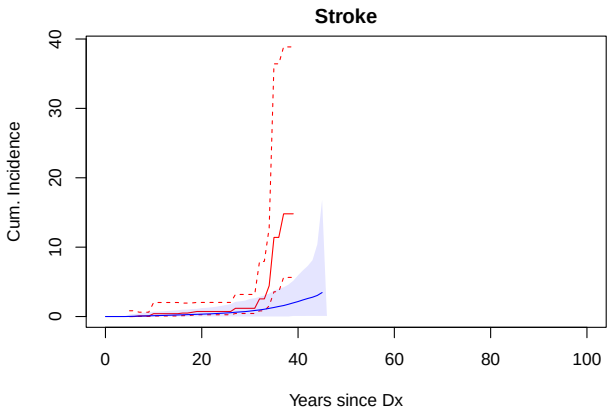


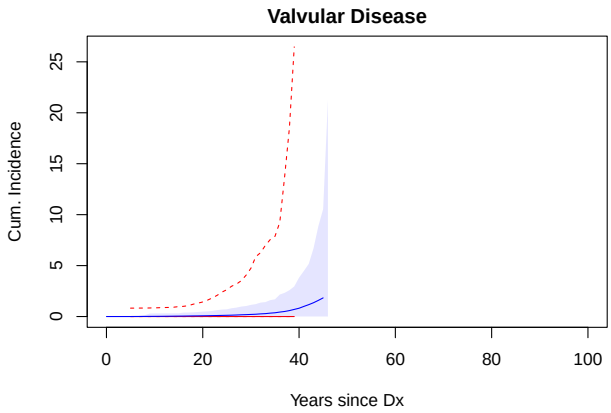




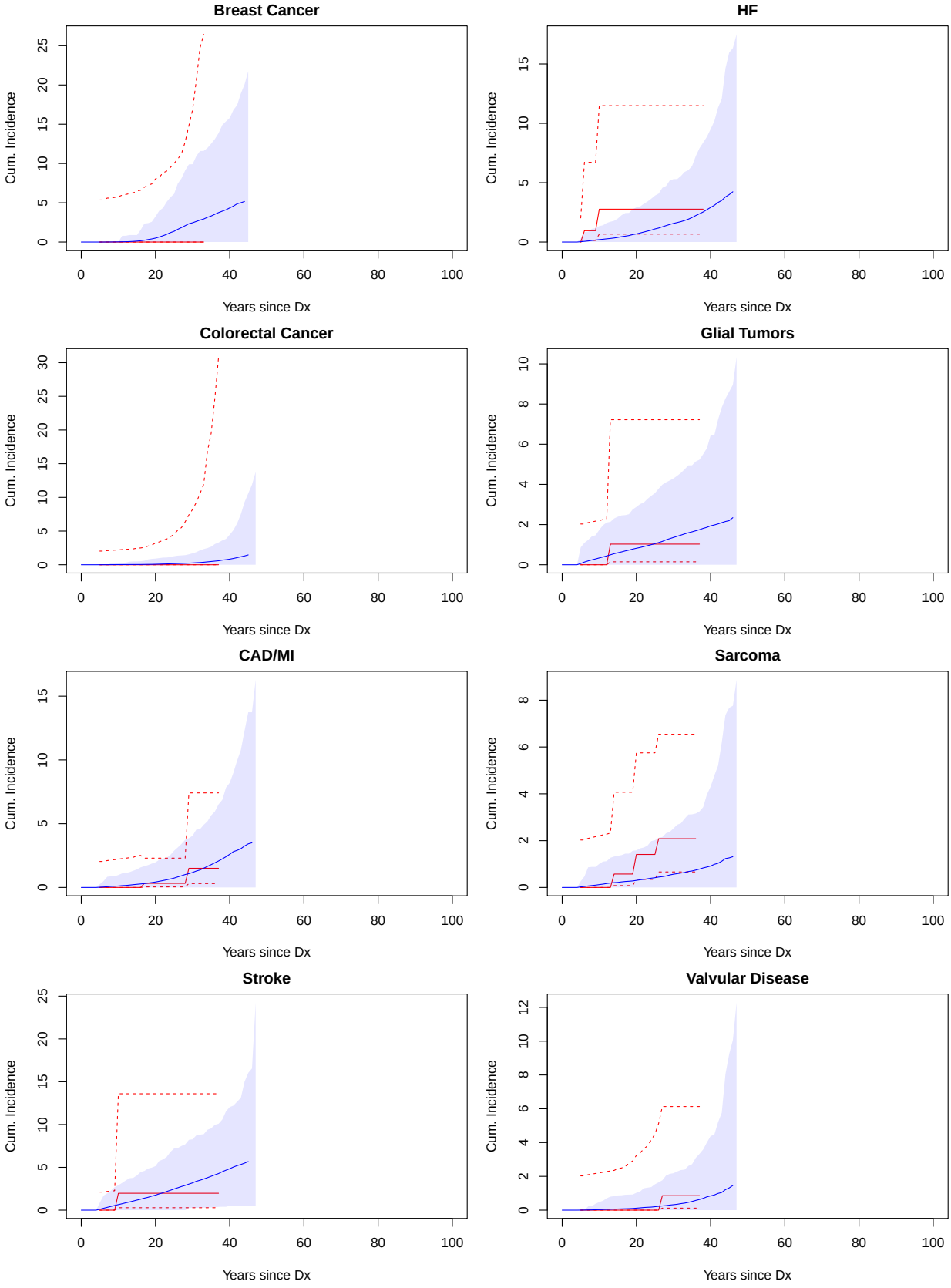




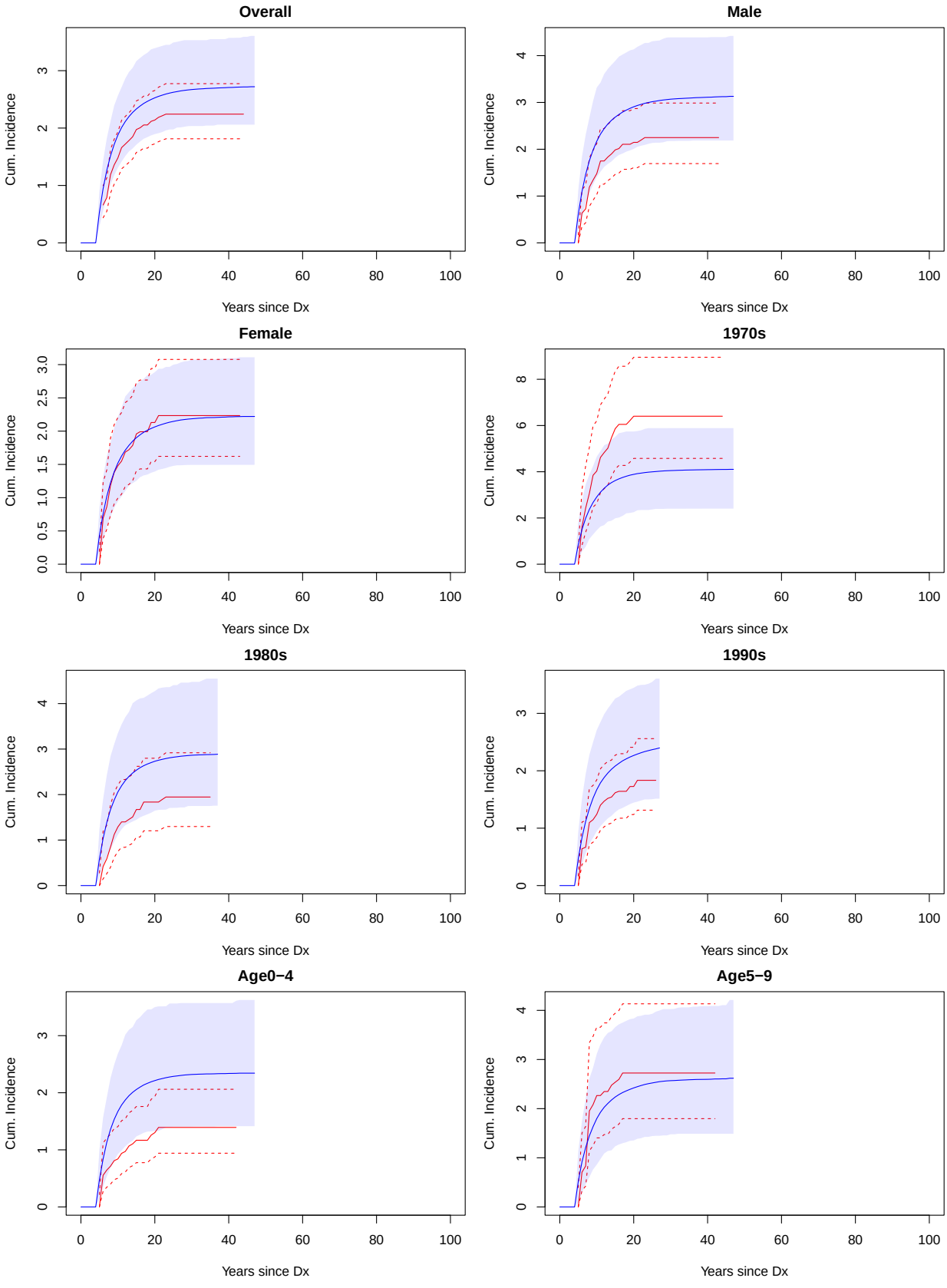


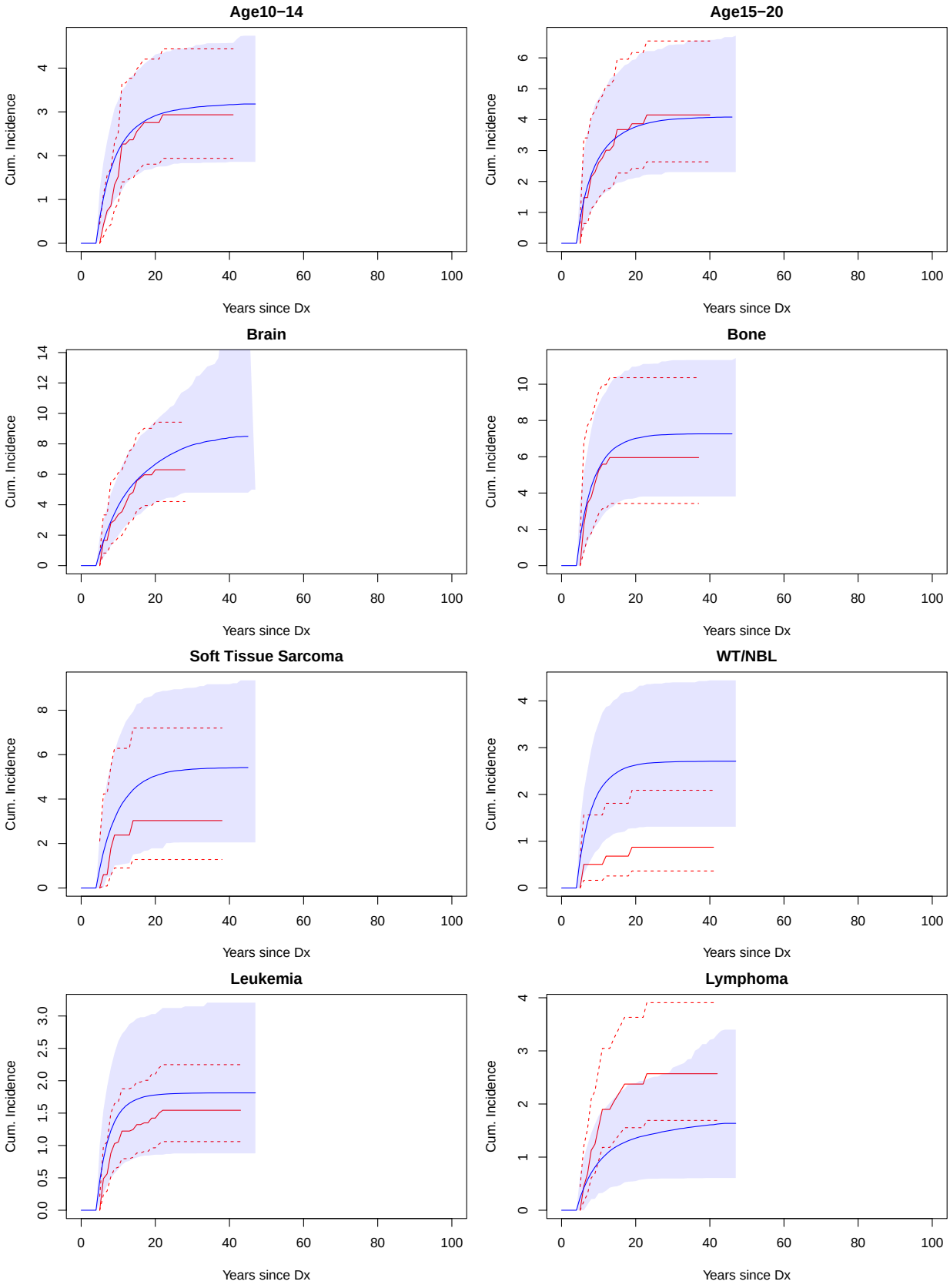


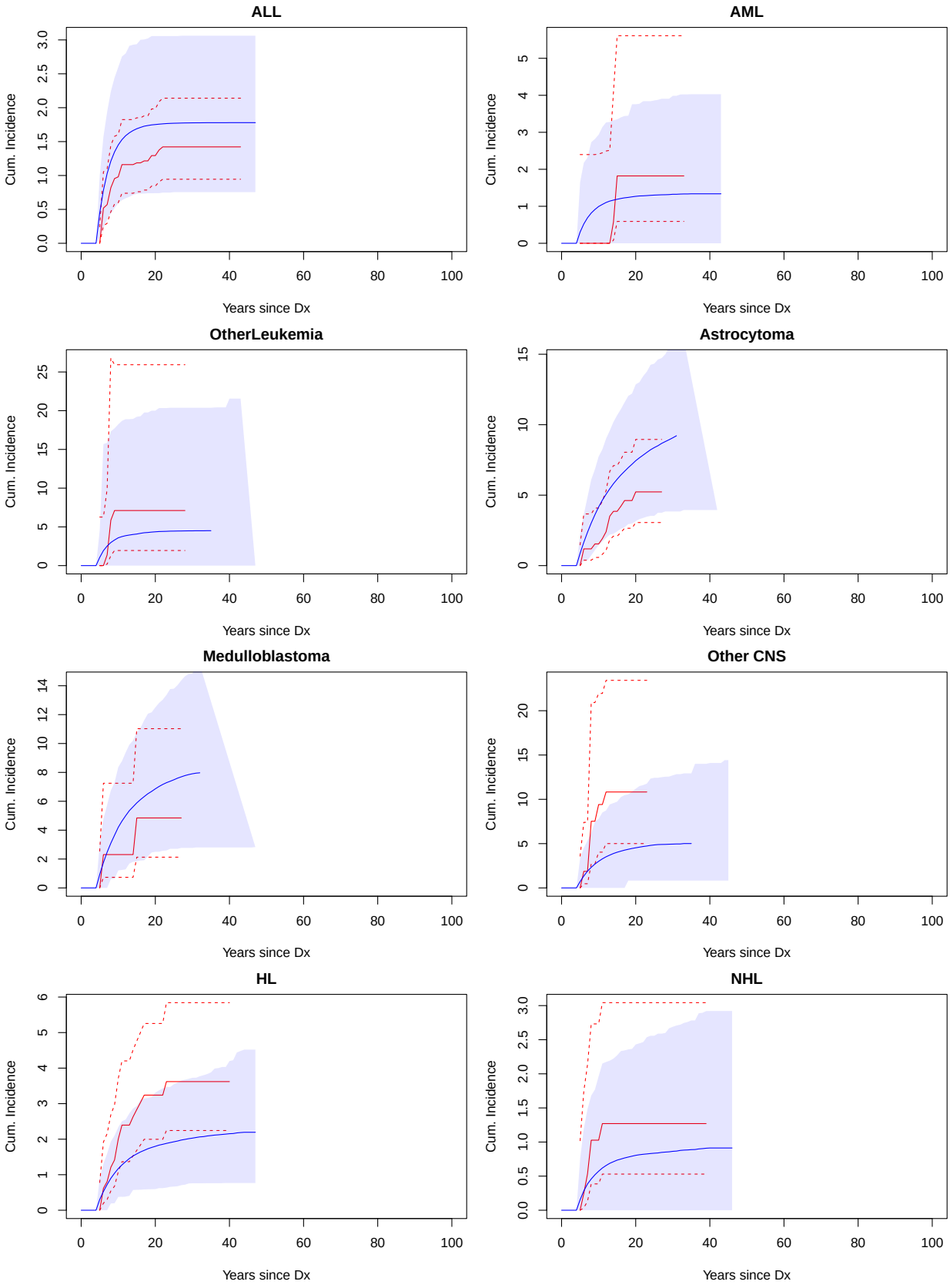
6.5.1.86 ALL grp: Relapse/Transplant

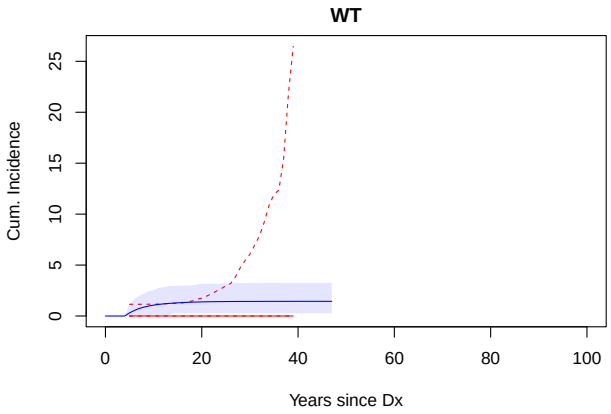


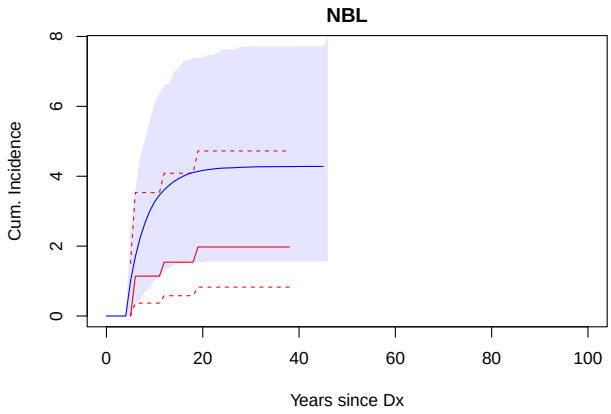
6.5.2 Late Recurrence

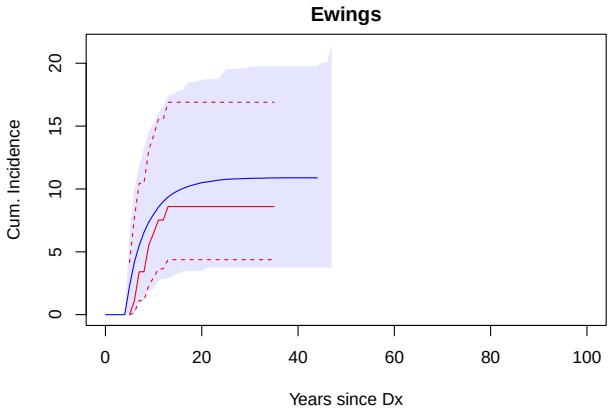


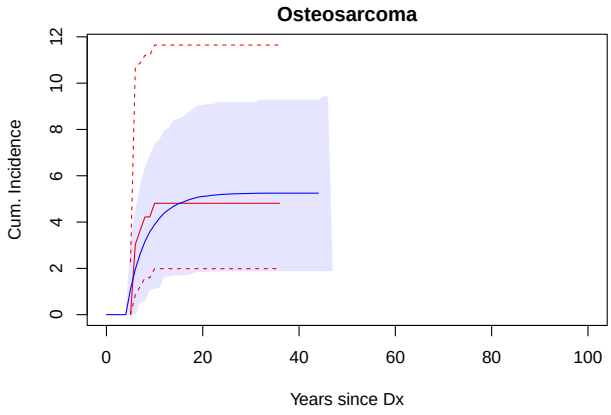

Age10−14
Cum. Incidence
0
1
2
3
4
0
20
40
60
80
100
Years since Dx
Age15−20
Cum. Incidence
0
1
2
3
4
5
6
0
20
40
60
80
100
Years since Dx
Brain
Cum. Incidence
0
2
4
6
8
10
12
14
0
20
40
60
80
100
Years since Dx
Bone
Cum. Incidence
0
2
4
6
8
10
0
20
40
60
80
100
Years since Dx
Soft Tissue Sarcoma
Cum. Incidence
0
2
4
6
8
0
20
40
60
80
100
Years since Dx
WT/NBL
Cum. Incidence
0
1
2
3
4
0
20
40
60
80
100
Years since Dx
Leukemia
Cum. Incidence
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0
20
40
60
80
100
Years since Dx
Lymphoma
Cum. Incidence
0
1
2
3
4
0
20
40
60
80
100
Years since Dx

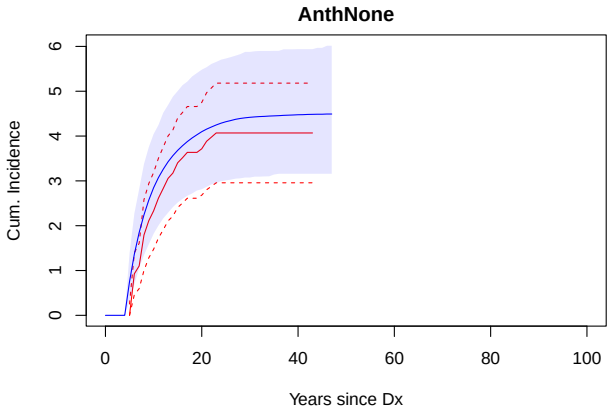

ALL
AML
OtherLeukemia
Astrocytoma
Medulloblastoma
Other CNS
HL
NHL
Cum. Incidence
Years since Dx

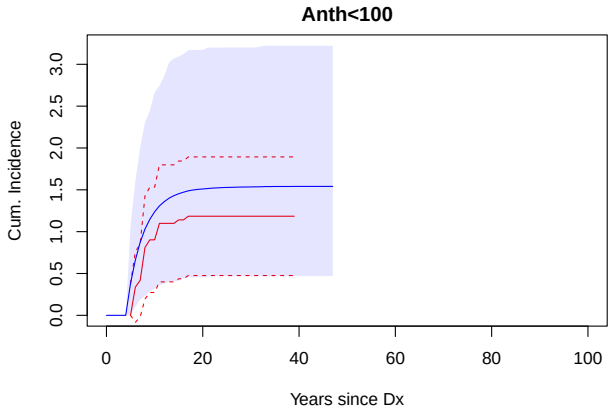

WT
Cum. Incidence
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx

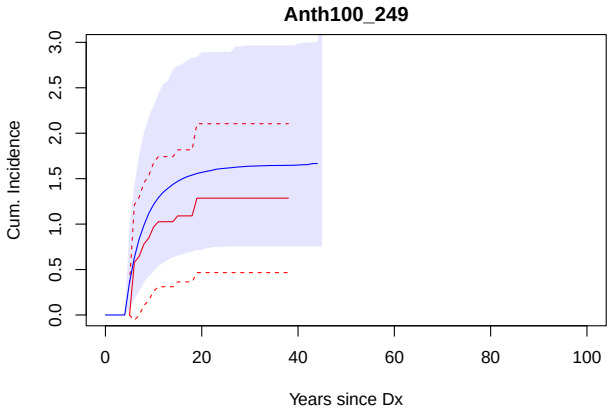

NBL
Cum. Incidence
0
2
4
6
8
0
20
40
60
80
100
Years since Dx

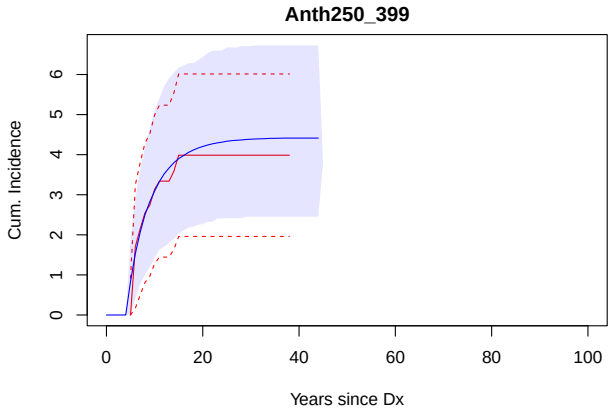

Ewings
Cum. Incidence
0
5
10
15
20
0
20
40
60
80
100
Years since Dx

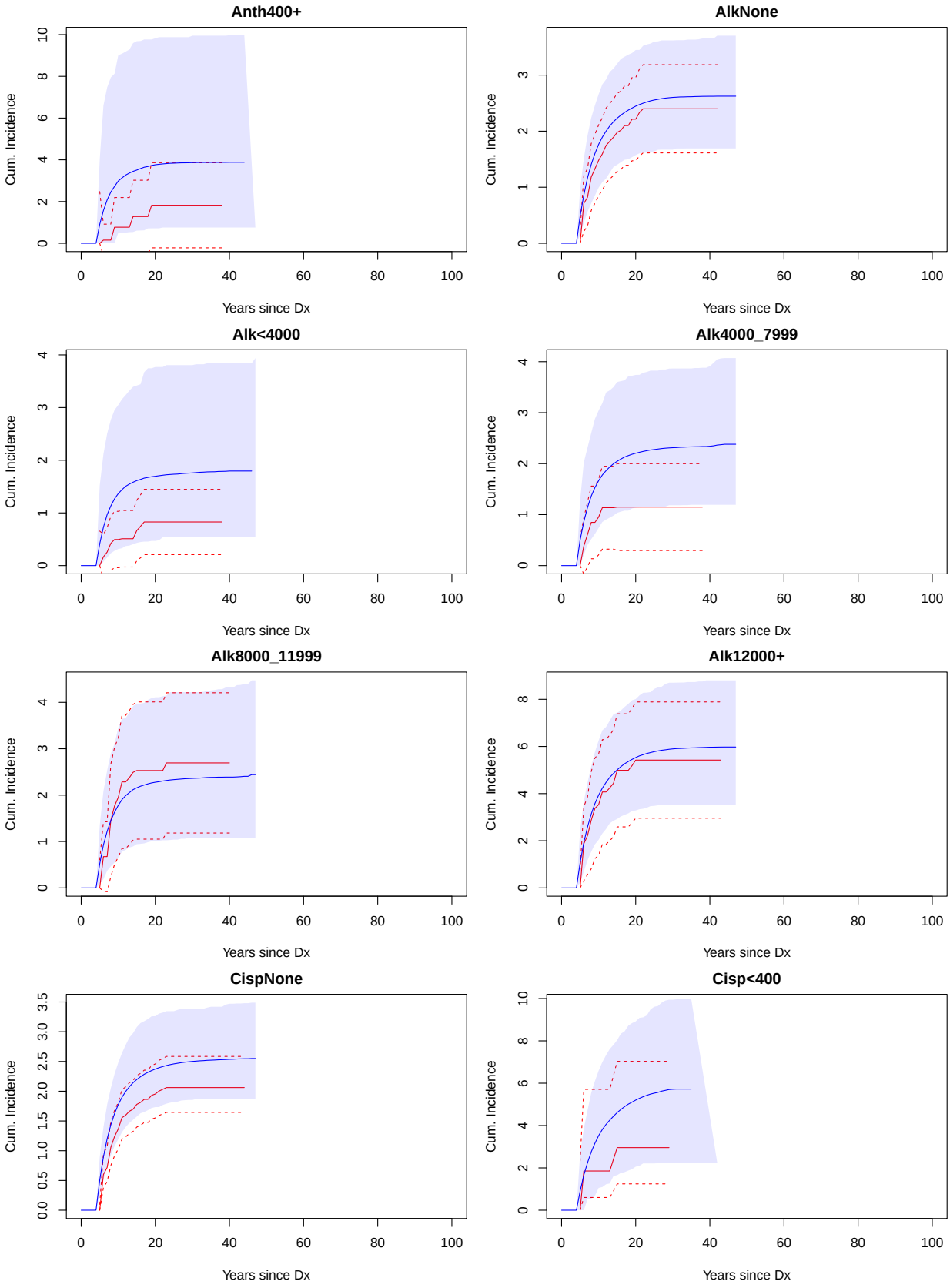

Osteosarcoma
Cum. Incidence
0
2
4
6
8
10
12
0
20
40
60
80
100
Years since Dx

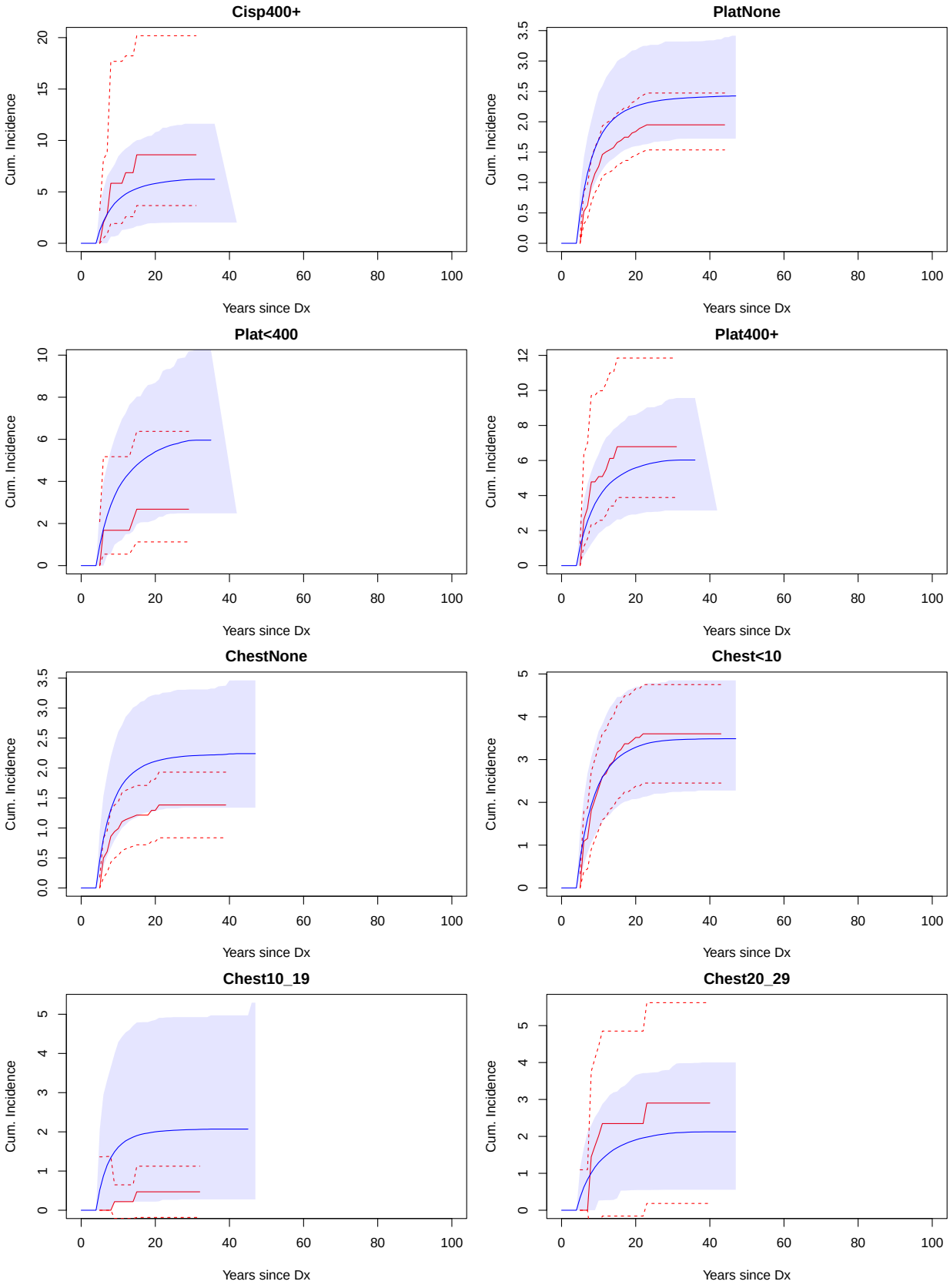

AnthNone
Cum. Incidence
0
1
2
3
4
5
6
0
20
40
60
80
100
Years since Dx

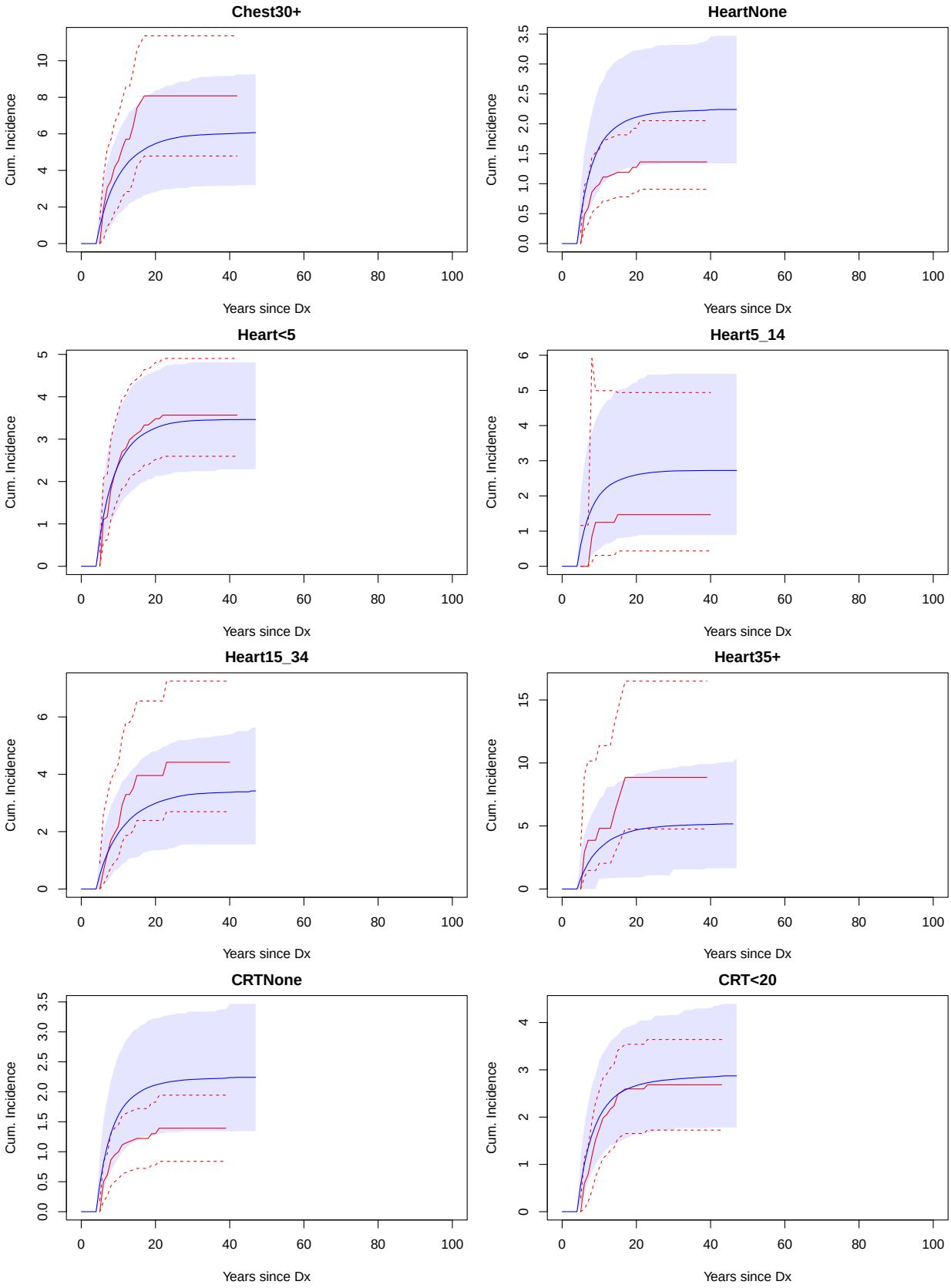

Anth<100
Cum. Incidence
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0
20
40
60
80
100
Years since Dx

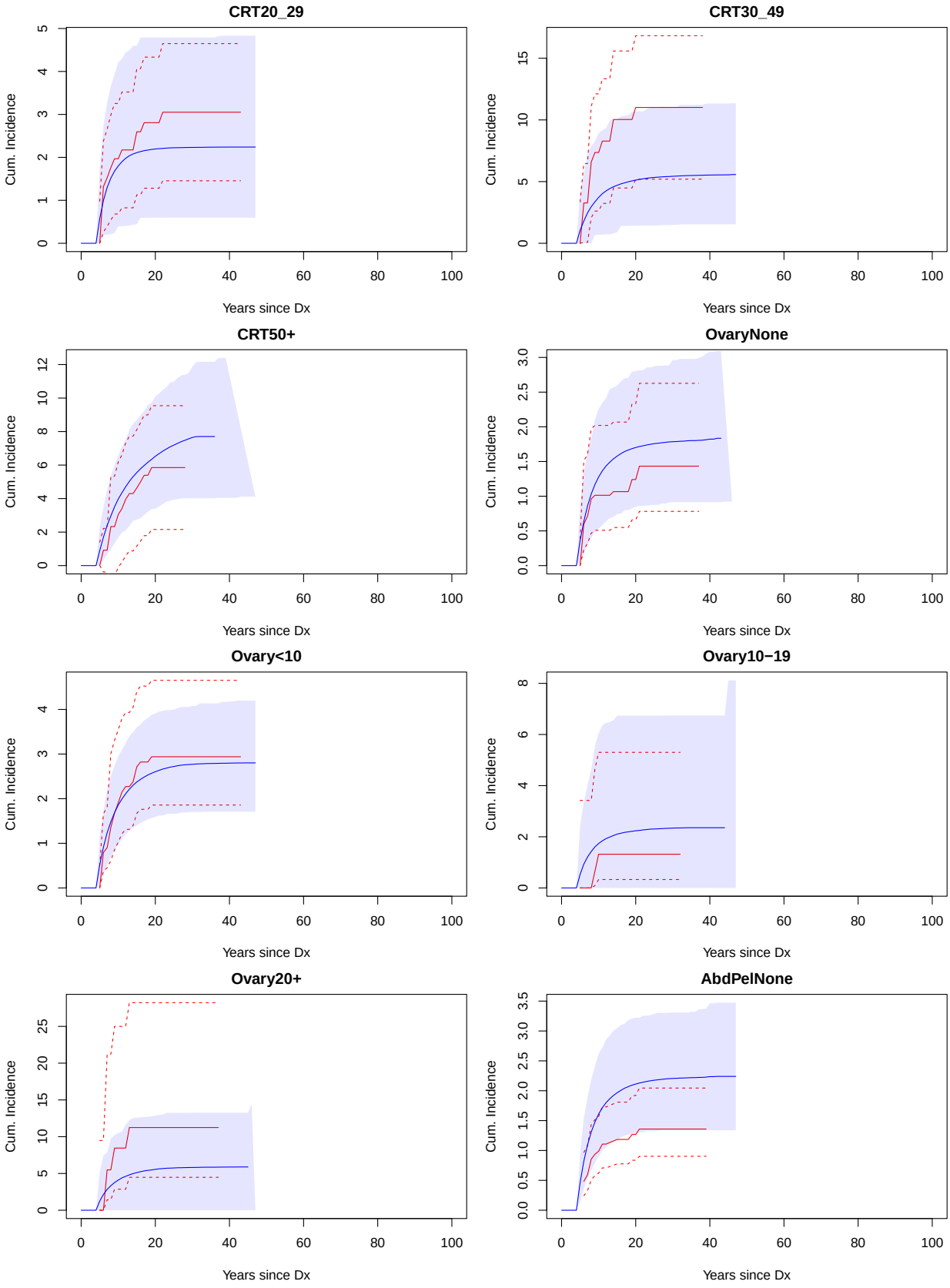

Anth100_249
Cum. Incidence
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0
20
40
60
80
100
Years since Dx

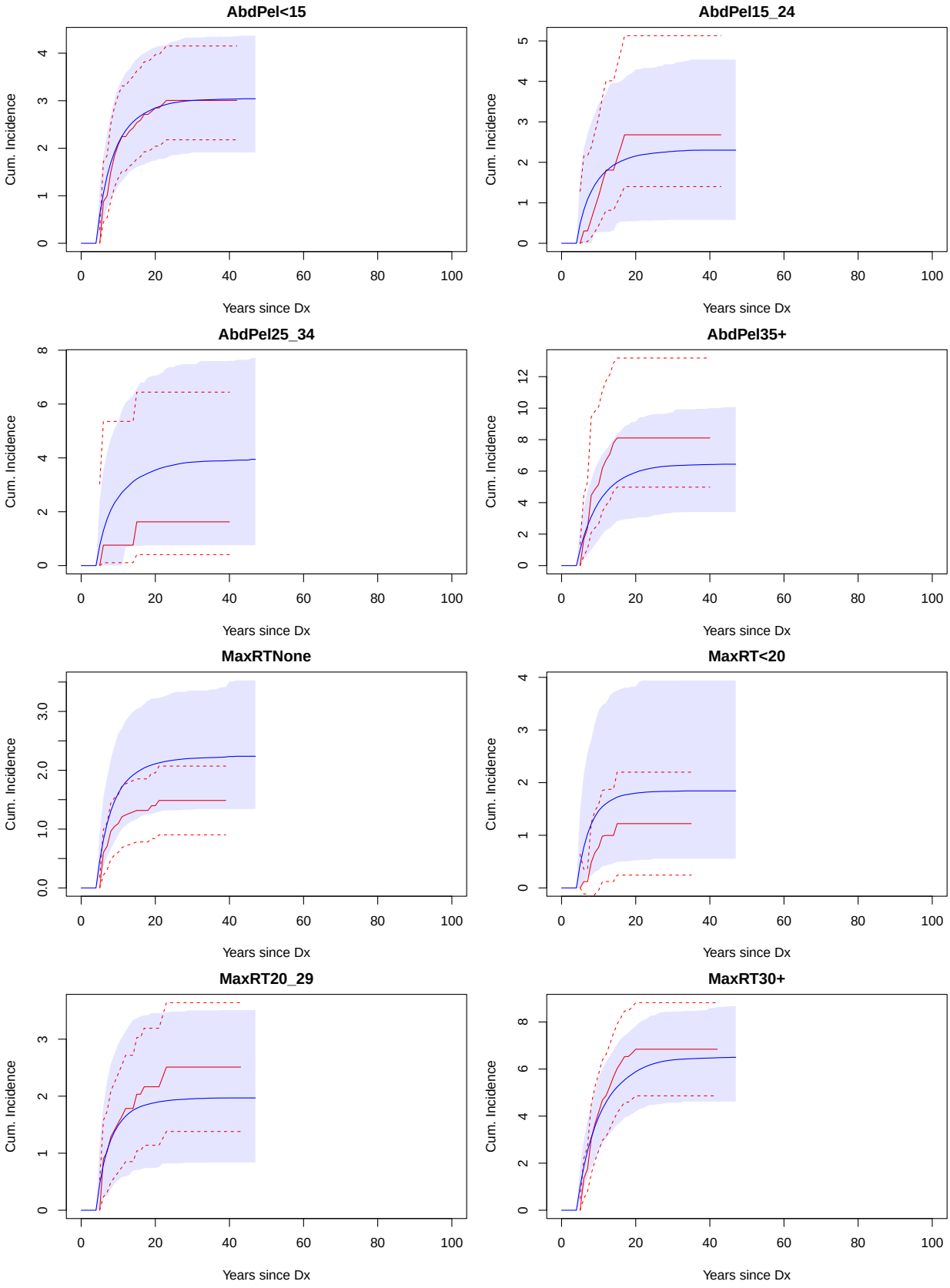

Anth250_399
Cum. Incidence
0
1
2
3
4
5
6
0
20
40
60
80
100
Years since Dx

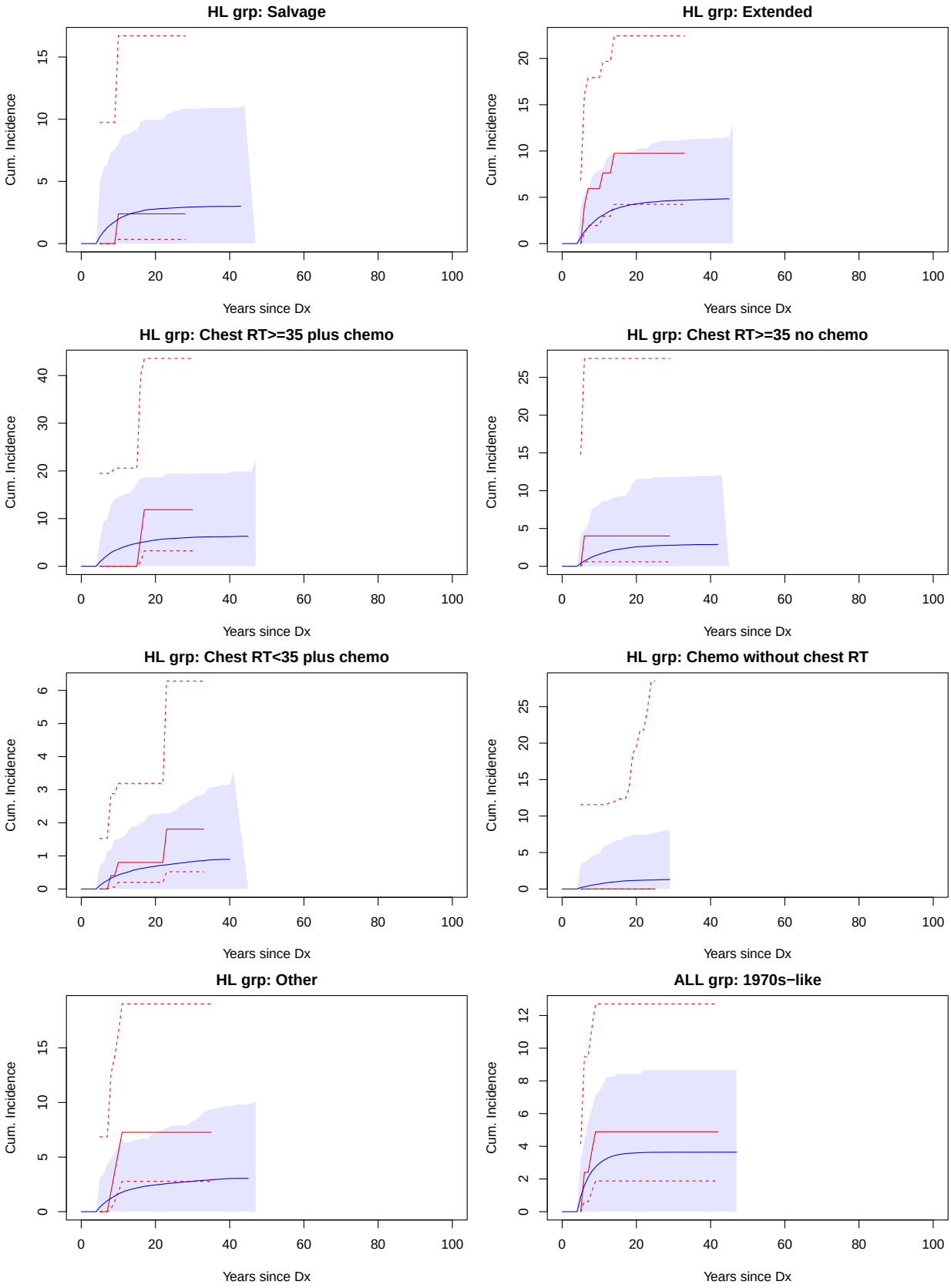

Anth400+
AlkNone
Alk<4000
Alk4000_7999
Alk8000_11999
Alk12000+
CispNone
Cisp<400
Cum. Incidence
Years since Dx

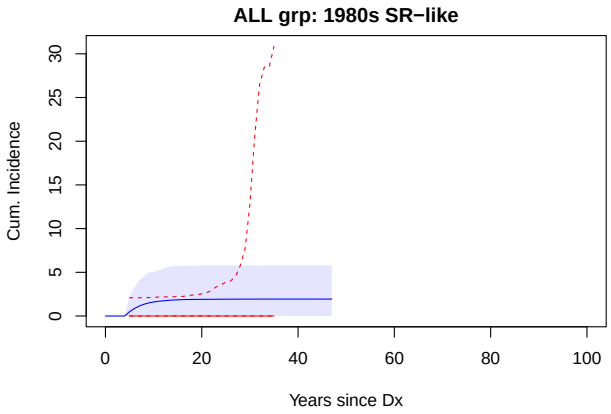

Cisp400+
Cum. Incidence
0
5
10
15
20
0
20
40
60
80
100
Years since Dx
PlatNone
Cum. Incidence
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
0
20
40
60
80
100
Years since Dx
Plat<400
Cum. Incidence
0
2
4
6
8
10
0
20
40
60
80
100
Years since Dx
Plat400+
Cum. Incidence
0
2
4
6
8
10
12
0
20
40
60
80
100
Years since Dx
ChestNone
Cum. Incidence
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
0
20
40
60
80
100
Years since Dx
Chest<10
Cum. Incidence
0
1
2
3
4
5
0
20
40
60
80
100
Years since Dx
Chest10_19
Cum. Incidence
0
1
2
3
4
5
0
20
40
60
80
100
Years since Dx
Chest20_29
Cum. Incidence
0
1
2
3
4
5
0
20
40
60
80
100
Years since Dx

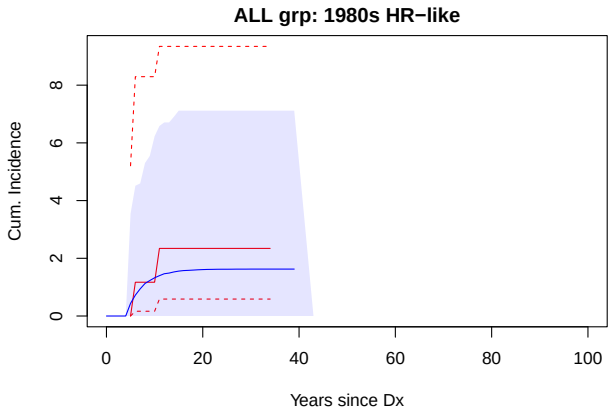

Chest30+
Cum. Incidence
0 2 4 6 8 10
0 20 40 60 80 100
Years since Dx
HeartNone
Cum. Incidence
0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5
0 20 40 60 80 100
Years since Dx
Heart<5
Cum. Incidence
0 1 2 3 4 5
0 20 40 60 80 100
Years since Dx
Heart5_14
Cum. Incidence
0 1 2 3 4 5 6
0 20 40 60 80 100
Years since Dx
Heart15_34
Cum. Incidence
0 2 4 6
0 20 40 60 80 100
Years since Dx
Heart35+
Cum. Incidence
0 5 10 15
0 20 40 60 80 100
Years since Dx
CRTNone
Cum. Incidence
0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5
0 20 40 60 80 100
Years since Dx
CRT<20
Cum. Incidence
0 1 2 3 4
0 20 40 60 80 100
Years since Dx

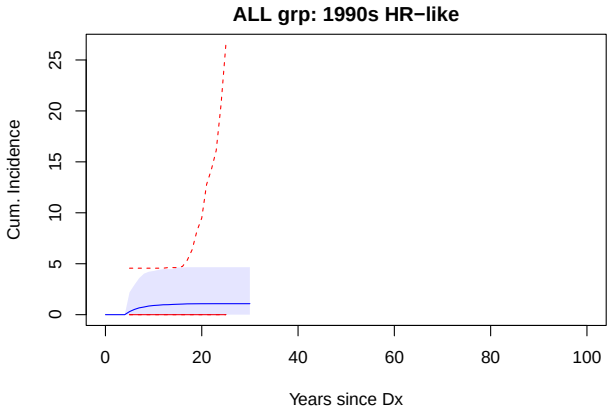

CRT20_29
Cum. Incidence
Years since Dx
CRT30_49
Cum. Incidence
Years since Dx
CRT50+
Cum. Incidence
Years since Dx
OvaryNone
Cum. Incidence
Years since Dx
Ovary<10
Cum. Incidence
Years since Dx
Ovary10−19
Cum. Incidence
Years since Dx
Ovary20+
Cum. Incidence
Years since Dx
AbdPelNone
Cum. Incidence
Years since Dx

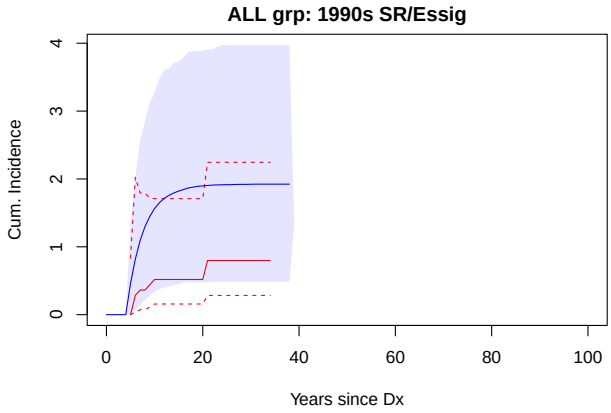

AbdPel<15
AbdPel15_24
AbdPel25_34
AbdPel35+
MaxRTNone
MaxRT<20
MaxRT20_29
MaxRT30+
Cum. Incidence
Years since Dx

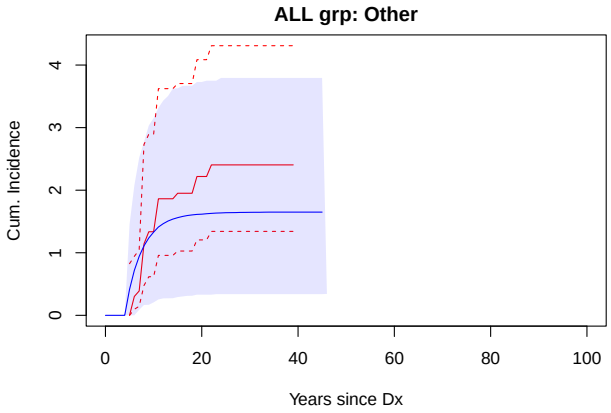

HL grp: Salvage
HL grp: Extended
HL grp: Chest RT>=35 plus chemo
HL grp: Chest RT>=35 no chemo
HL grp: Chest RT<35 plus chemo
HL grp: Chemo without chest RT
HL grp: Other
ALL grp: 1970s−like
Cum. Incidence
Years since Dx

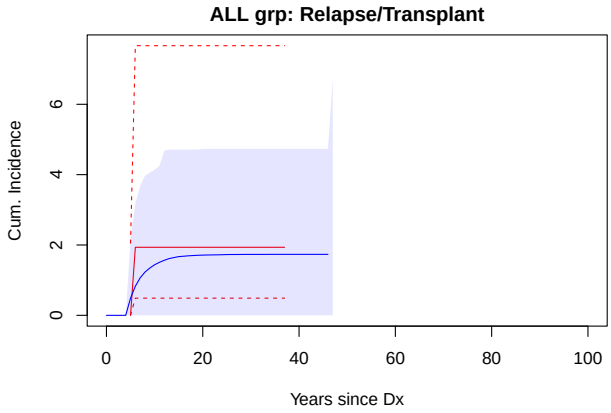

ALL grp: 1980s SR−like
Cum. Incidence
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx


ALL grp: 1980s HR−like
Cum. Incidence
0
2
4
6
8
0
20
40
60
80
100
Years since Dx

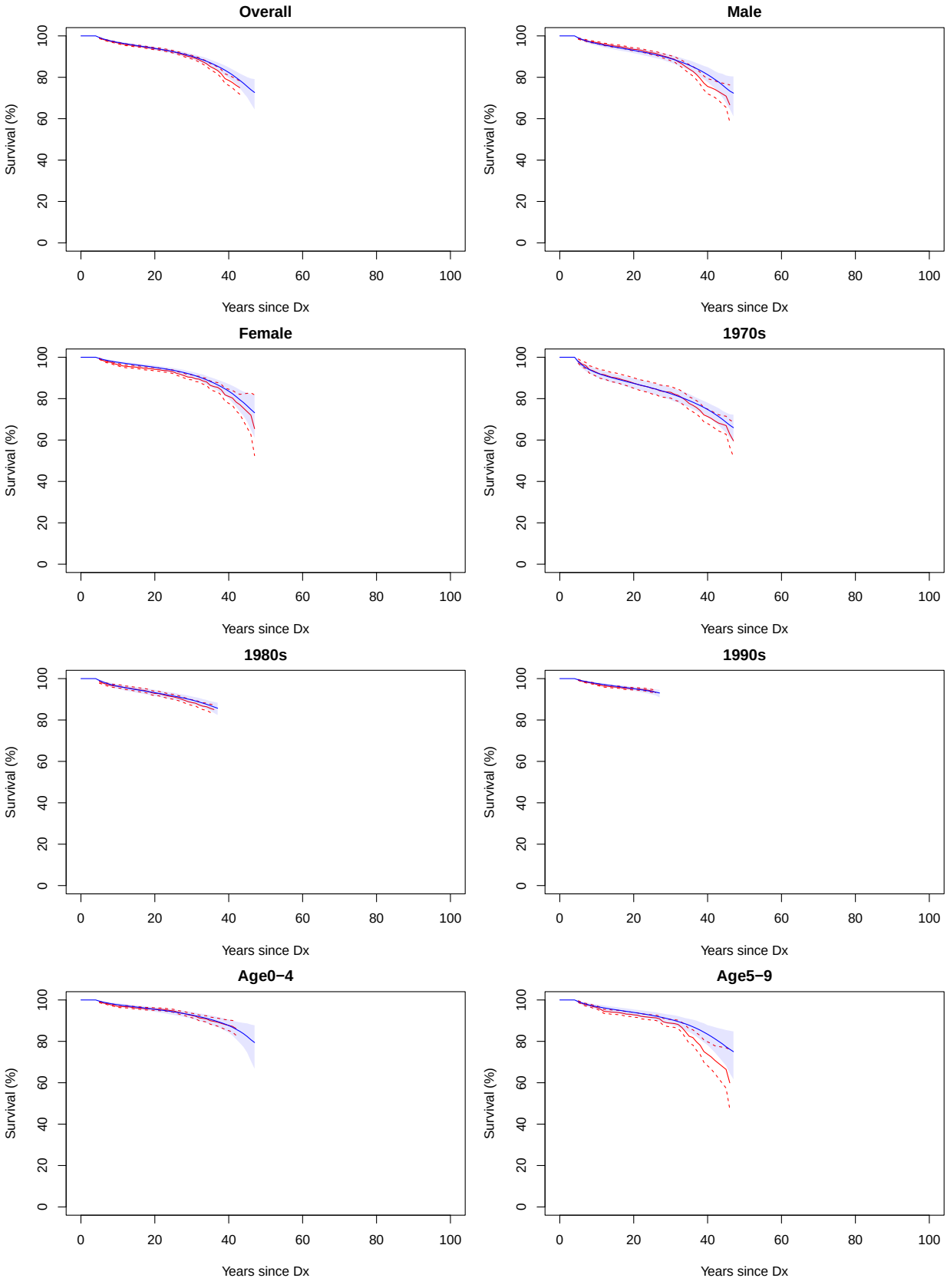

ALL grp: 1990s HR−like
Cum. Incidence
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx

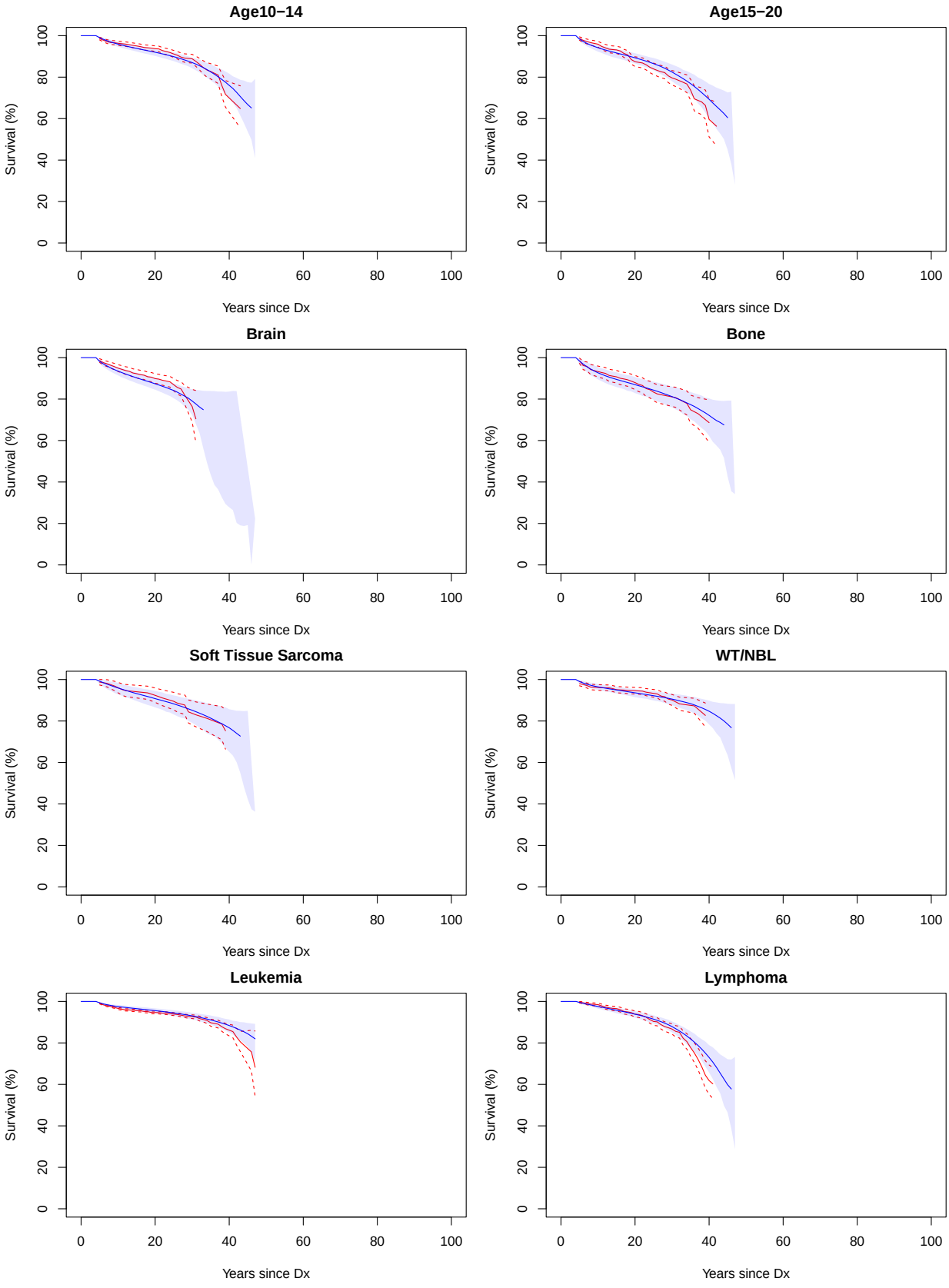

ALL grp: 1990s SR/Essig
Cum. Incidence
0
1
2
3
4
0
20
40
60
80
100
Years since Dx

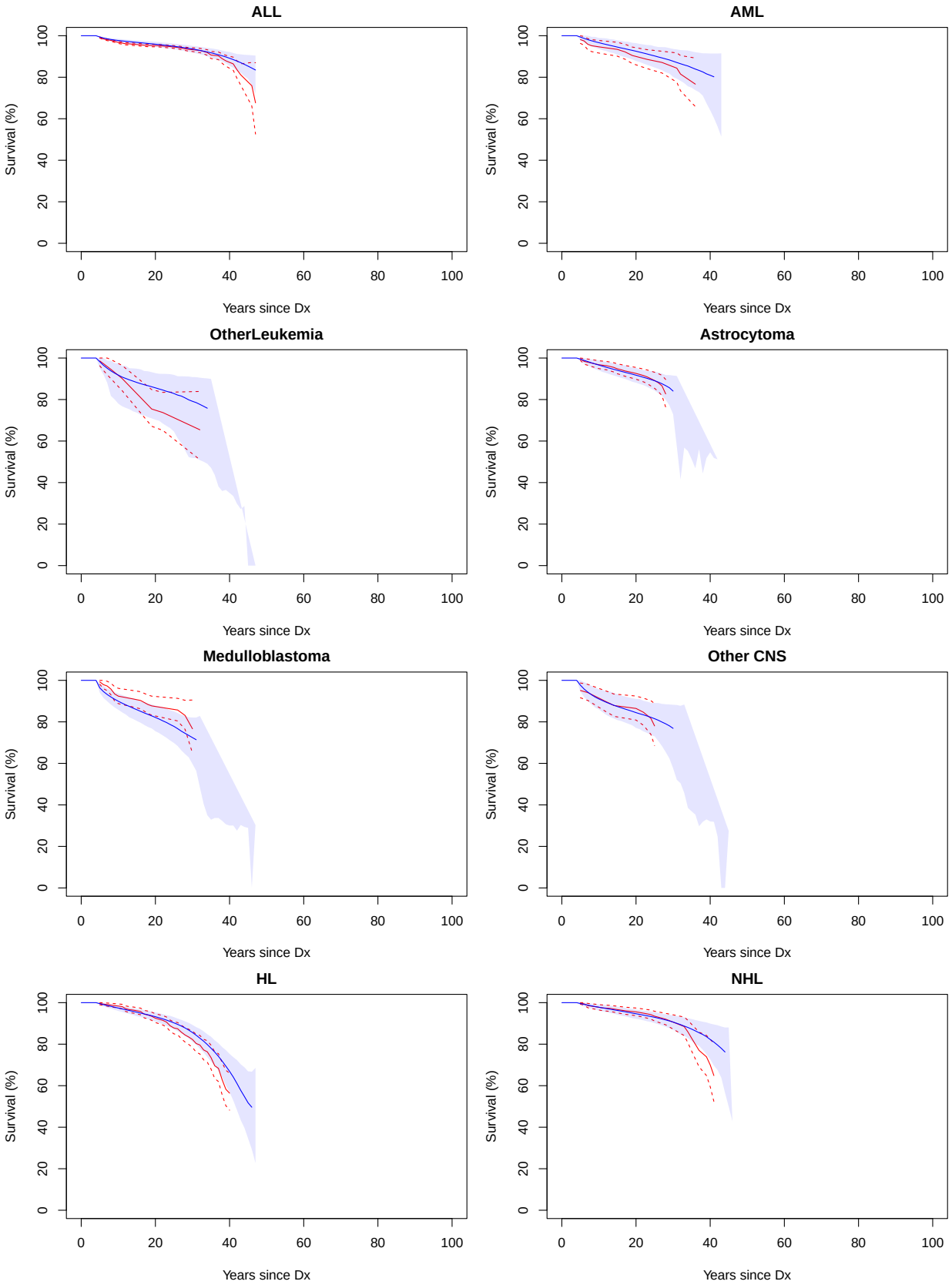

ALL grp: Other
Cum. Incidence
0
1
2
3
4
0
20
40
60
80
100
Years since Dx

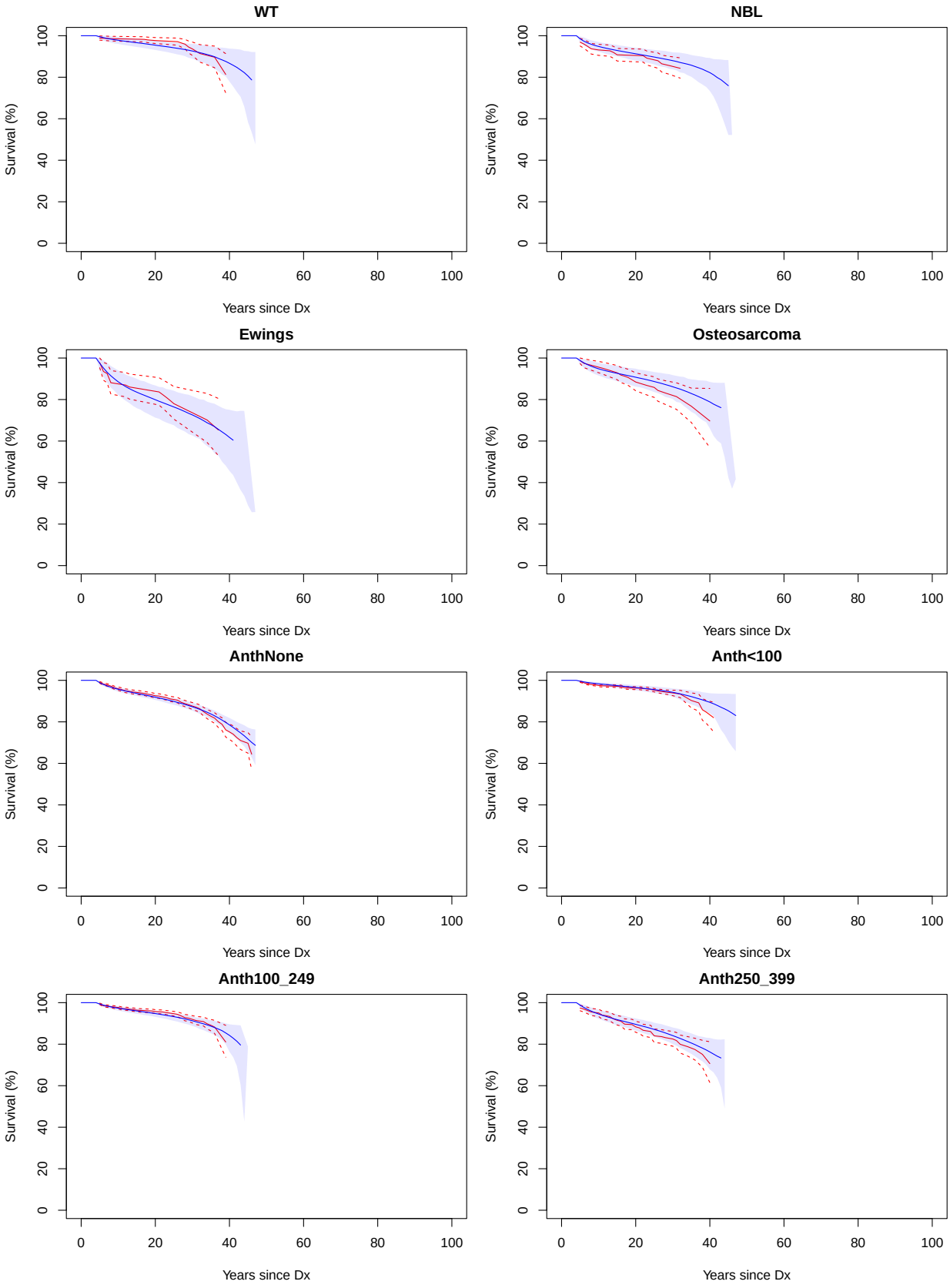

ALL grp: Relapse/Transplant
Cum. Incidence
0
2
4
6
0
20
40
60
80
100
Years since Dx

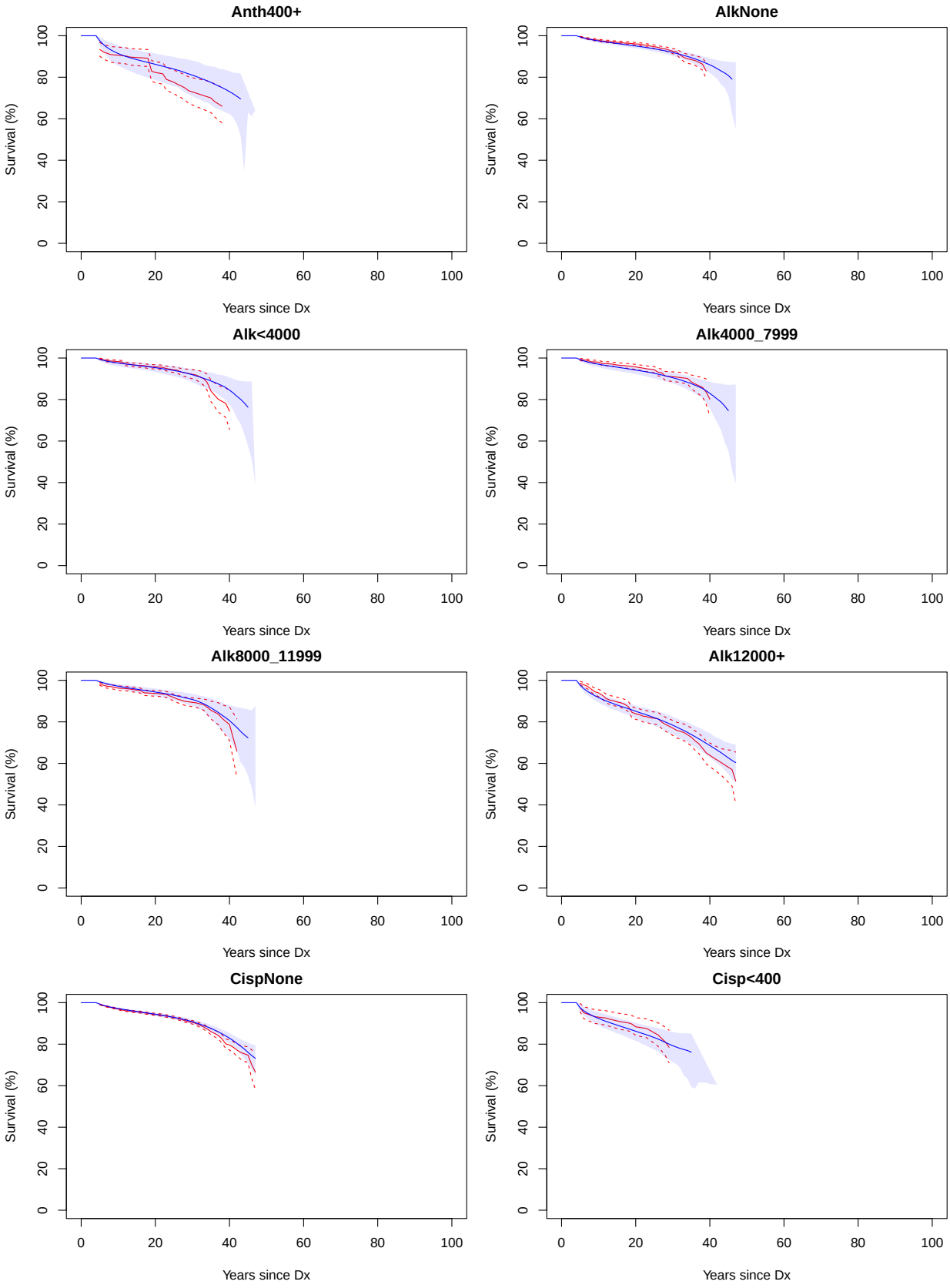
6.5.3 Survival

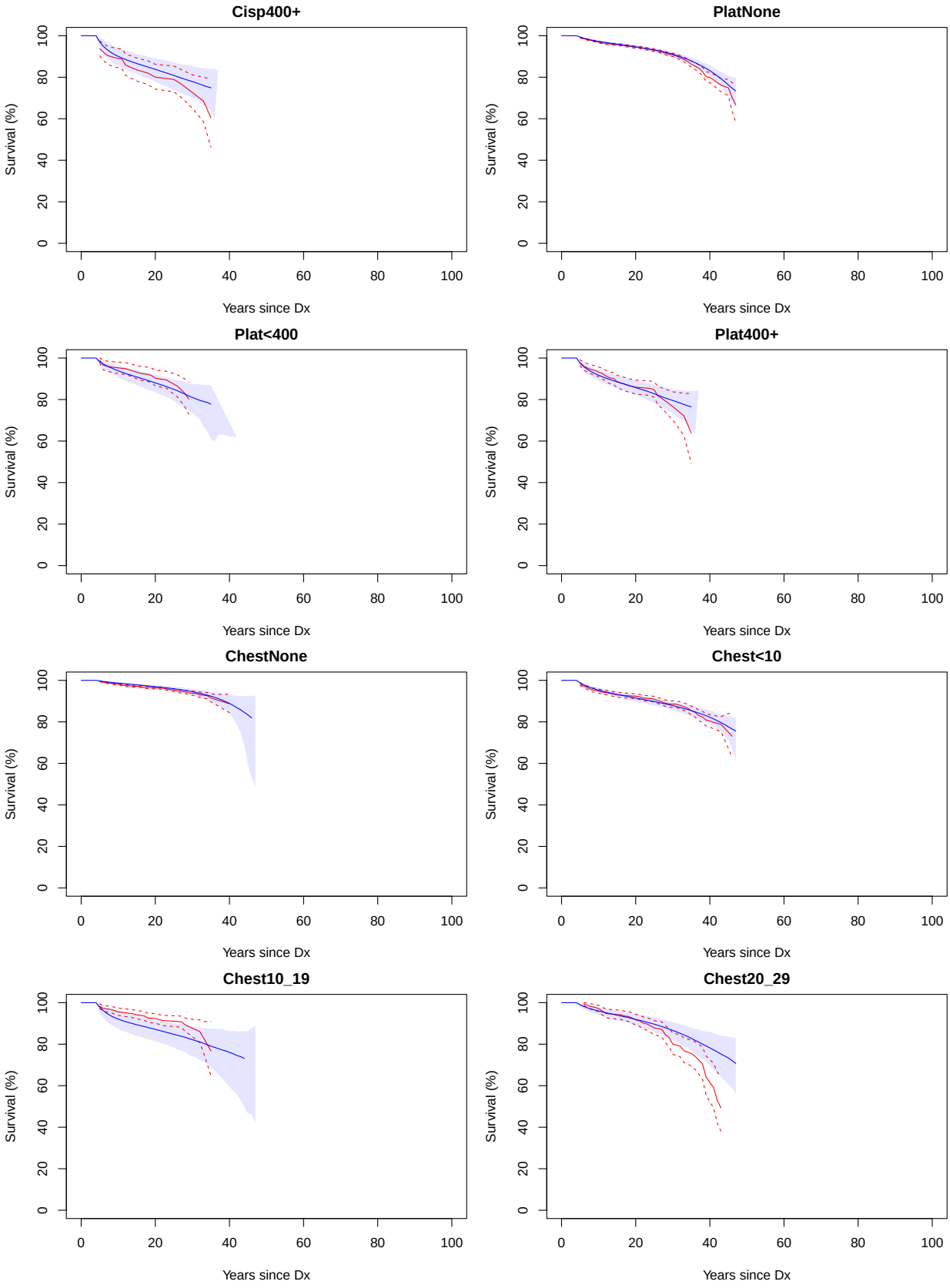


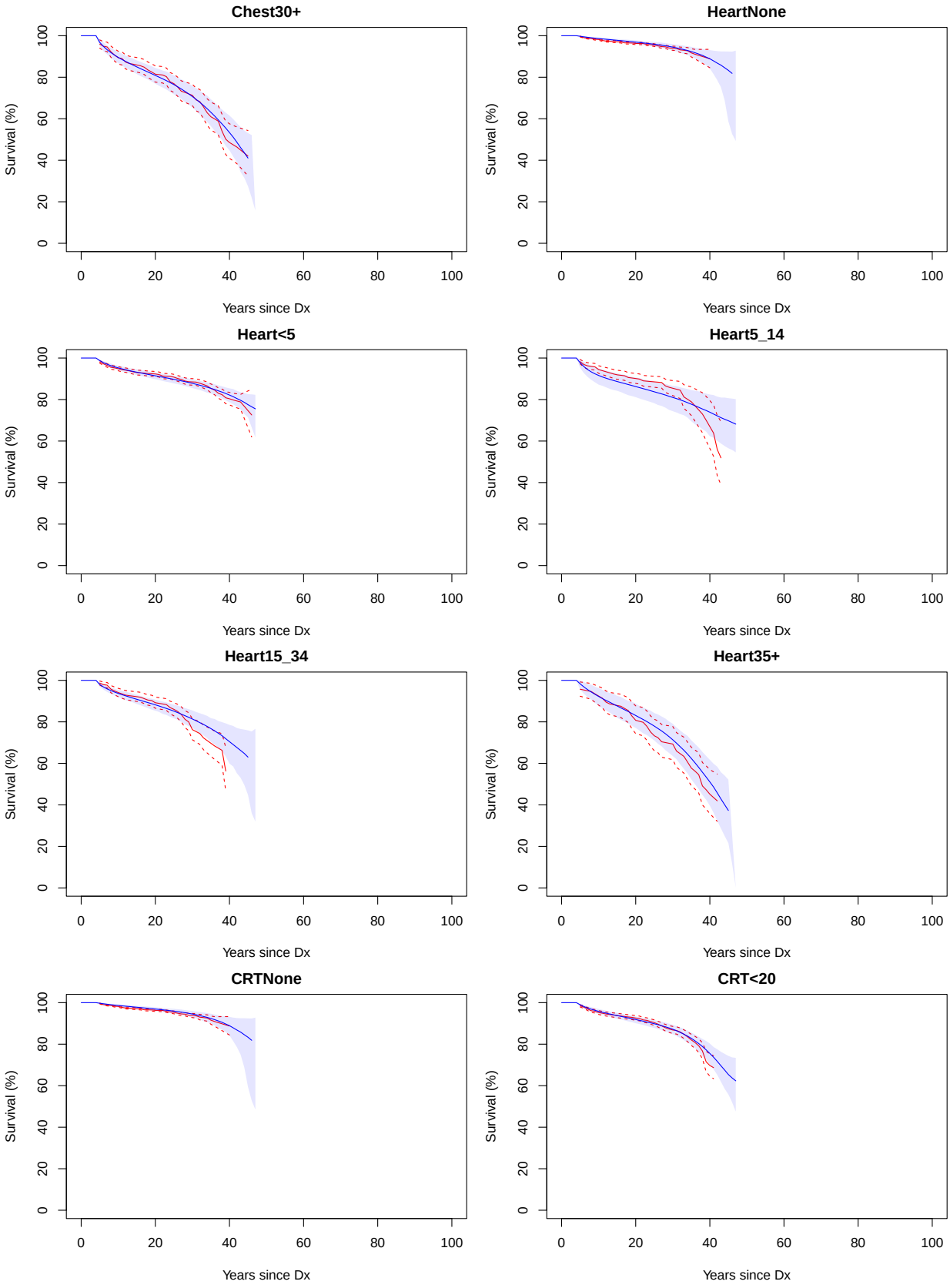

Age10−14
Age15−20
Brain
Bone
Soft Tissue Sarcoma
WT/NBL
Leukemia
Lymphoma
Survival (%)
Years since Dx
0
20
40
60
80
100

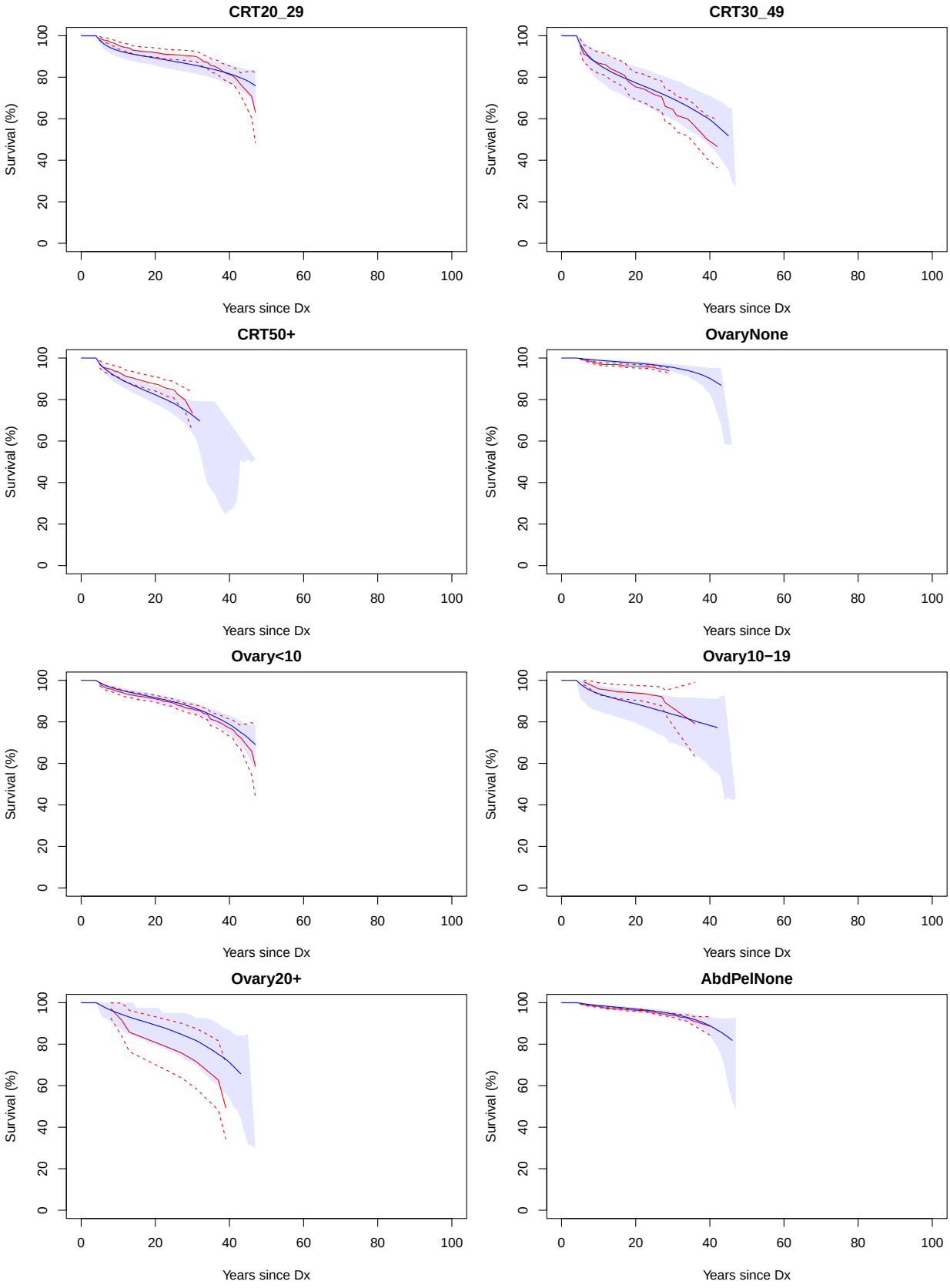

ALL
AML
OtherLeukemia
Astrocytoma
Medulloblastoma
Other CNS
HL
NHL
Survival (%)
Years since Dx
0
20
40
60
80
100

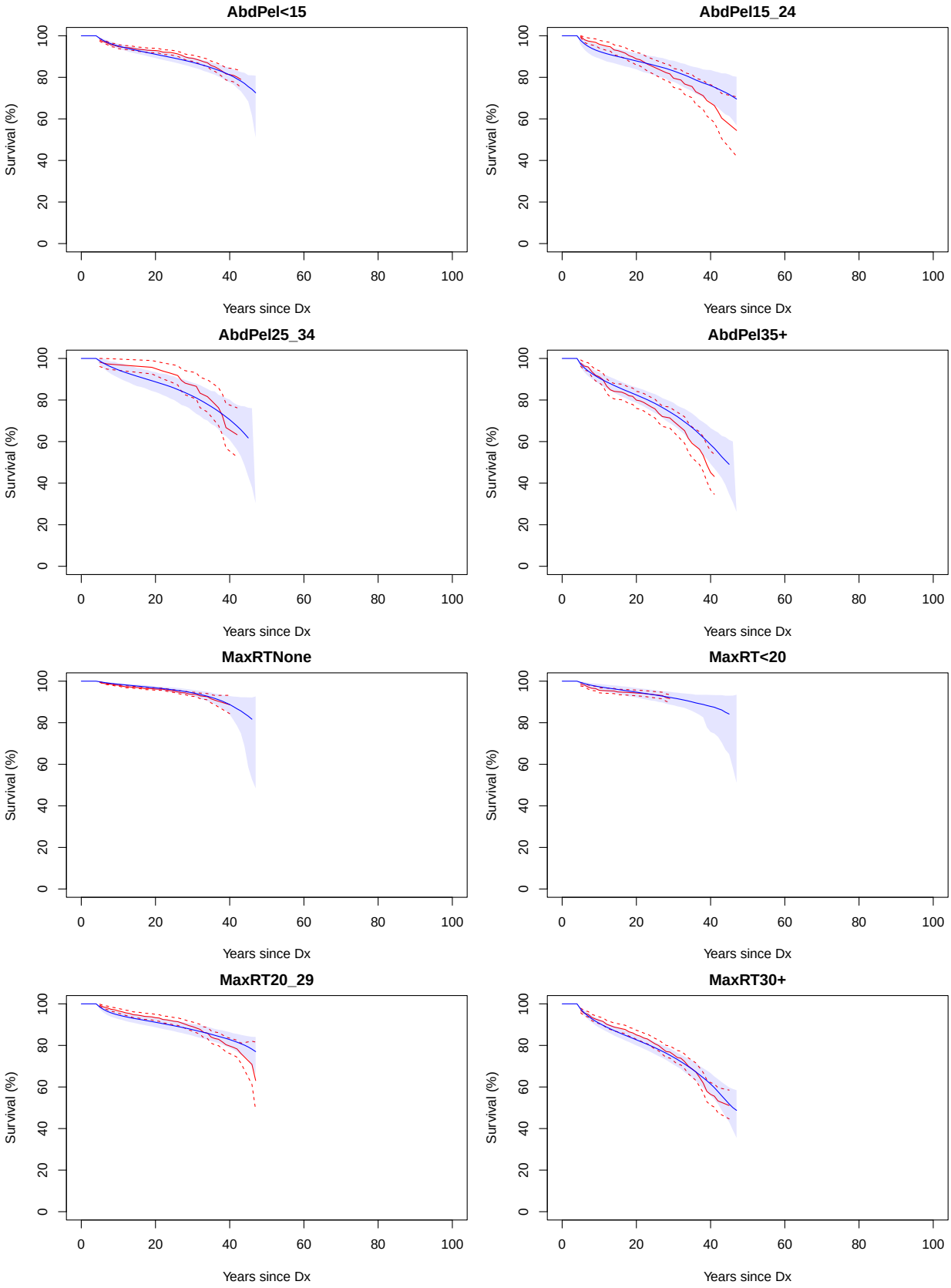

WT
NBL
Ewings
Osteosarcoma
AnthNone
Anth<100
Anth100_249
Anth250_399
Survival (%)
Years since Dx
0
20
40
60
80
100

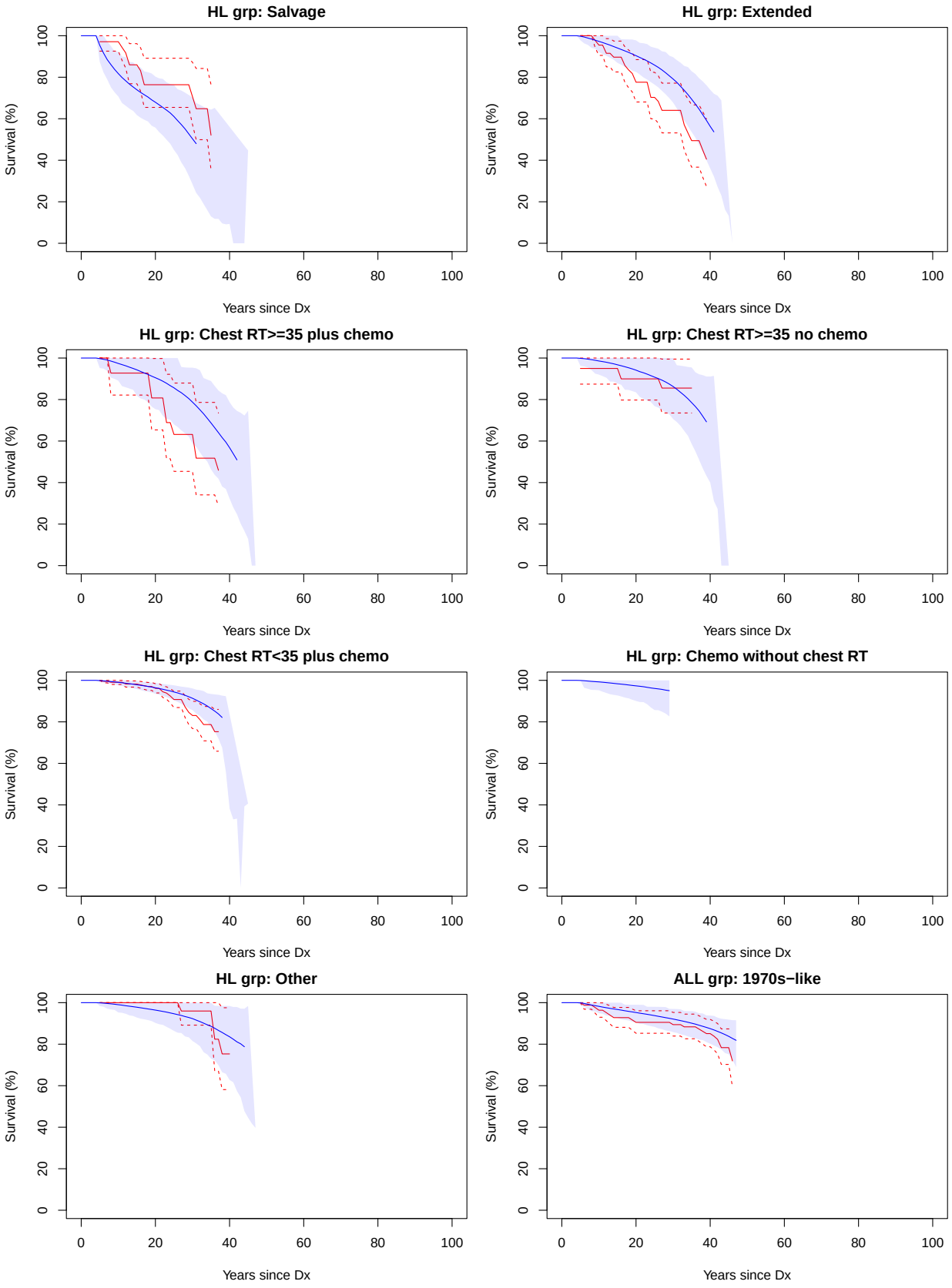

Anth400+
AlkNone
Alk<4000
Alk4000_7999
Alk8000_11999
Alk12000+
CispNone
Cisp<400
Survival (%)
Years since Dx
0
20
40
60
80
100

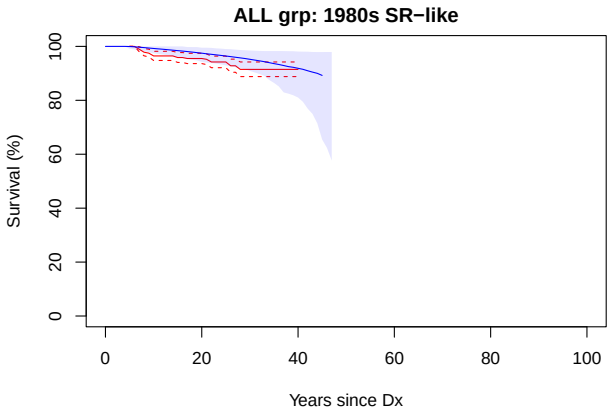

Cisp400+
PlatNone
Plat<400
Plat400+
ChestNone
Chest<10
Chest10_19
Chest20_29
Survival (%)
Years since Dx
0
20
40
60
80
100

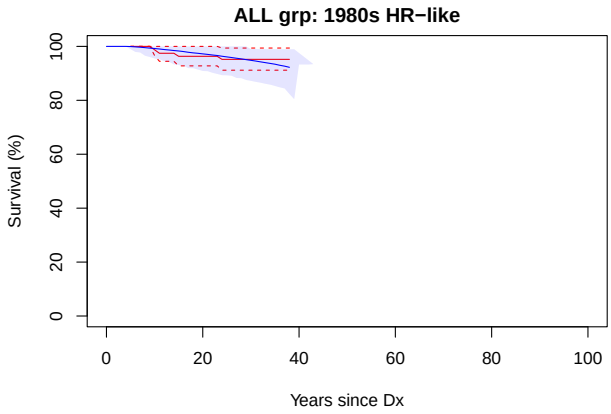

Chest30+
HeartNone
Heart<5
Heart5_14
Heart15_34
Heart35+
CRTNone
CRT<20
Survival (%)
Years since Dx
0
20
40
60
80
100

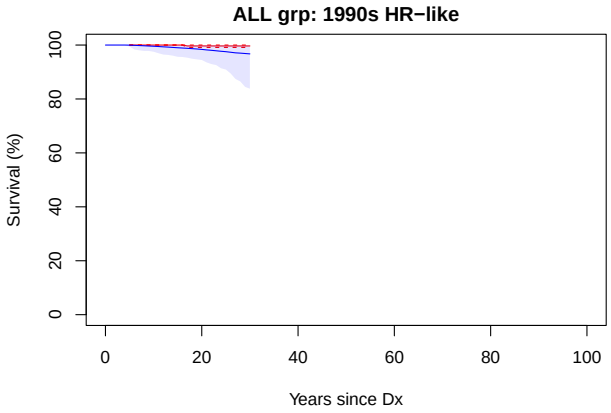

CRT20_29
CRT30_49
CRT50+
OvaryNone
Ovary<10
Ovary10−19
Ovary20+
AbdPelNone
Survival (%)
Years since Dx
0
20
40
60
80
100

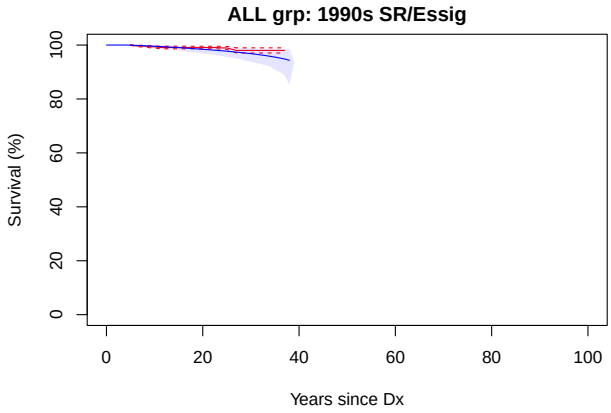

AbdPel<15
AbdPel15_24
AbdPel25_34
AbdPel35+
MaxRTNone
MaxRT<20
MaxRT20_29
MaxRT30+
Survival (%)
Years since Dx
0
20
40
60
80
100

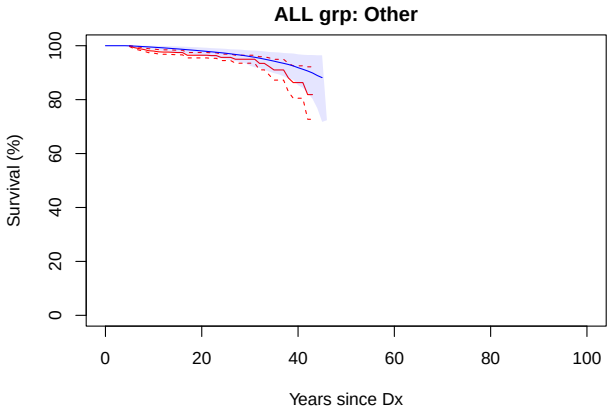

HL grp: Salvage
HL grp: Extended
HL grp: Chest RT>=35 plus chemo
HL grp: Chest RT>=35 no chemo
HL grp: Chest RT<35 plus chemo
HL grp: Chemo without chest RT
HL grp: Other
ALL grp: 1970s−like
Survival (%)
Years since Dx
0
20
40
60
80
100


ALL grp: 1980s SR−like
Survival (%)
0
20
40
60
80
100
0
20
40
60
80
100
Years since Dx


ALL grp: 1980s HR−like
Survival (%)
0
20
40
60
80
100
0
20
40
60
80
100
Years since Dx


ALL grp: 1990s HR−like
Survival (%)
0
20
40
60
80
100
0
20
40
60
80
100
Years since Dx


ALL grp: 1990s SR/Essig
Survival (%)
0
20
40
60
80
100
0
20
40
60
80
100
Years since Dx

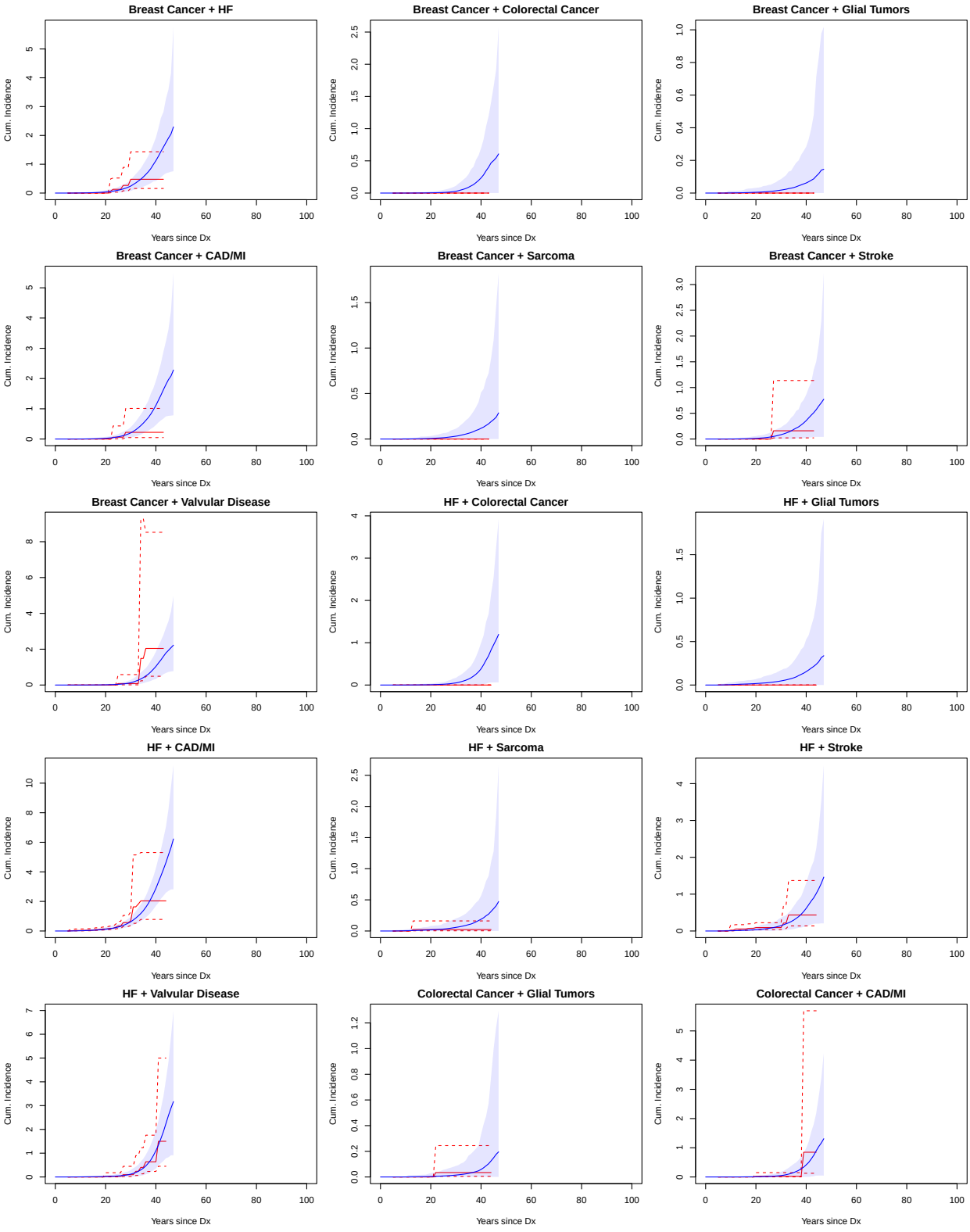

ALL grp: Other
Survival (%)
0
20
40
60
80
100
0
20
40
60
80
100
Years since Dx

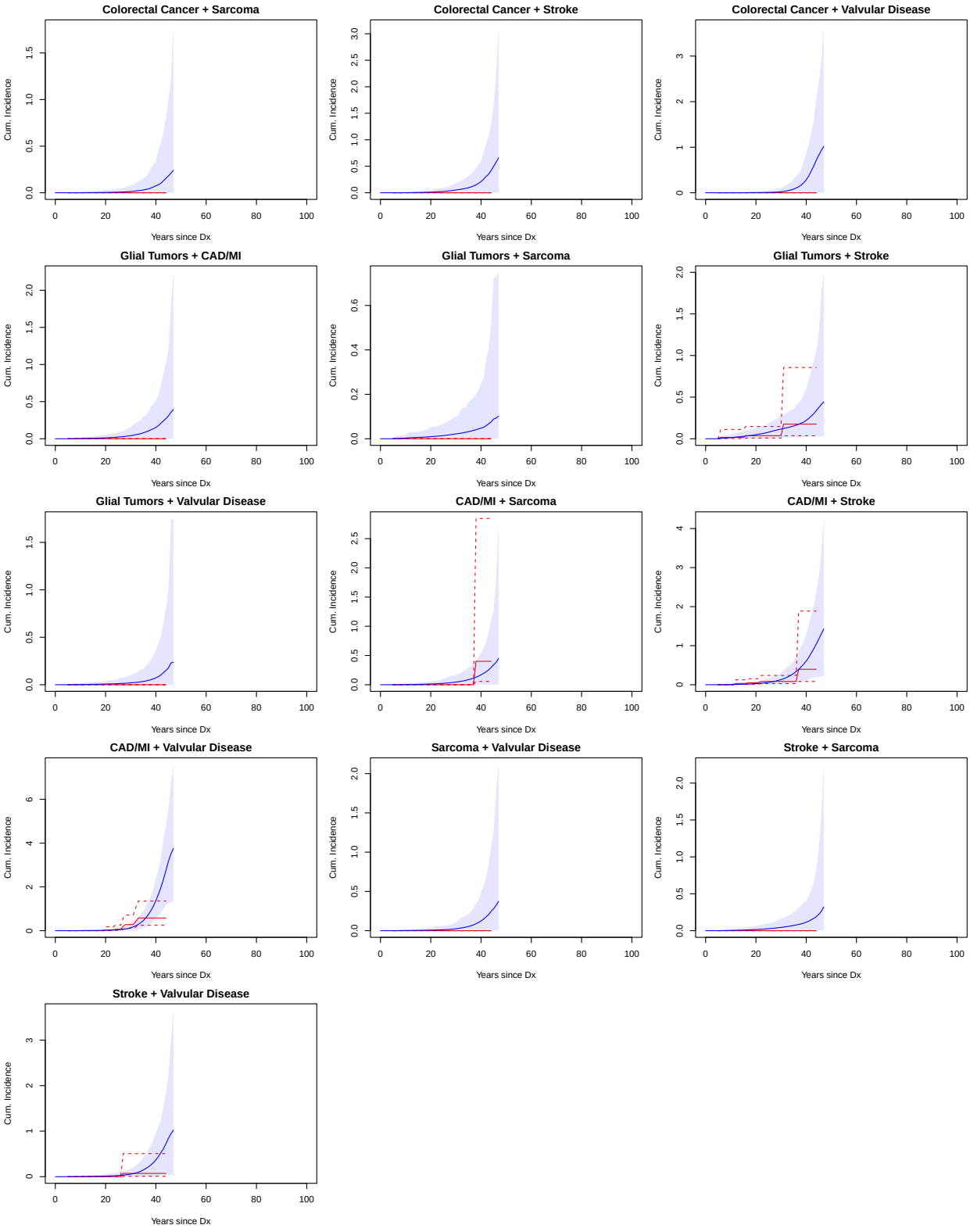
ALL grp: Relapse/Transplant
Survival (%)
0
20
40
60
80
100
0
20
40
60
80
100
Years since Dx

6.5.4 Joint Cumulative Incidence

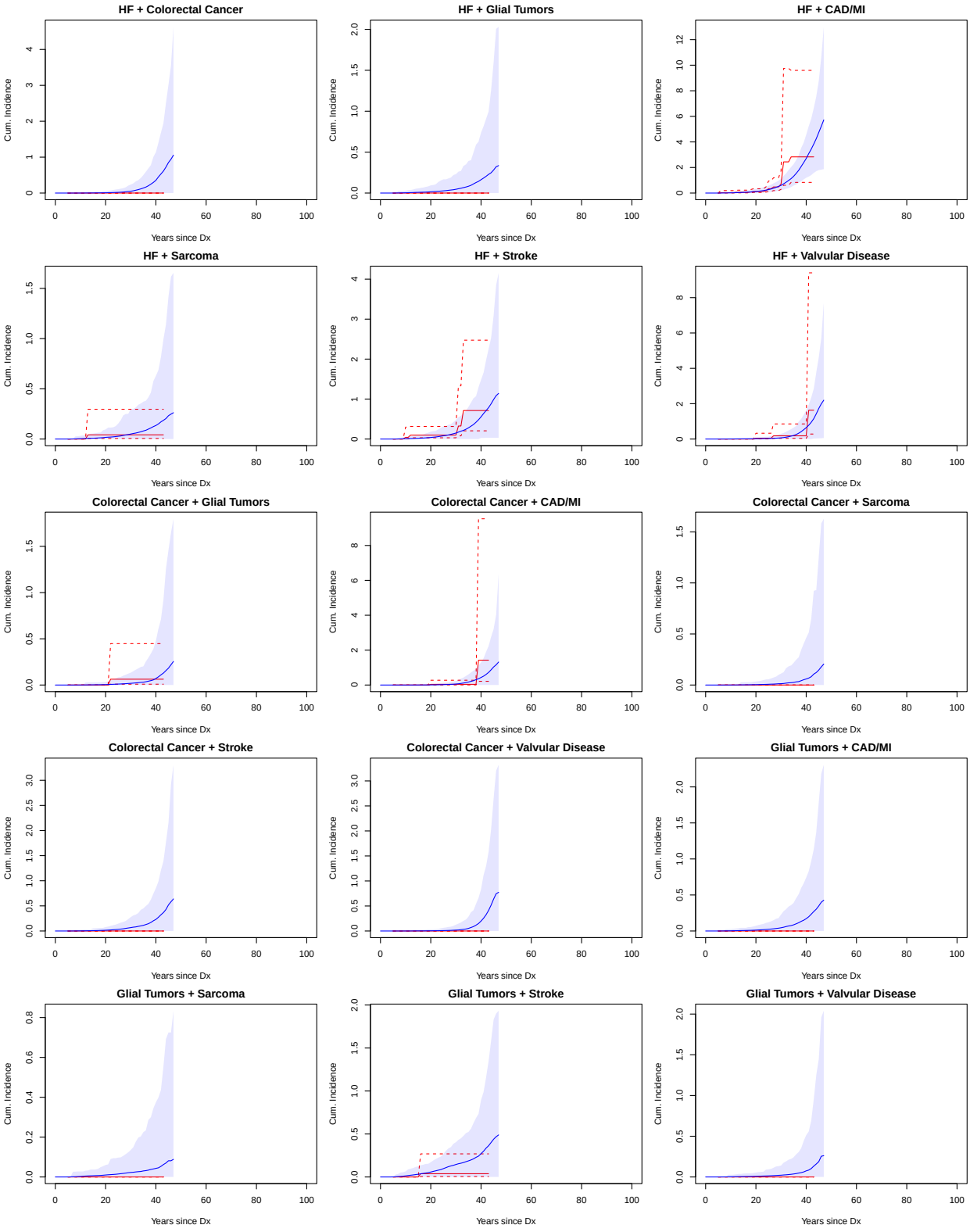
Here we plot the joint cumulative incidence for combinations of 2 diseases by subgroup.

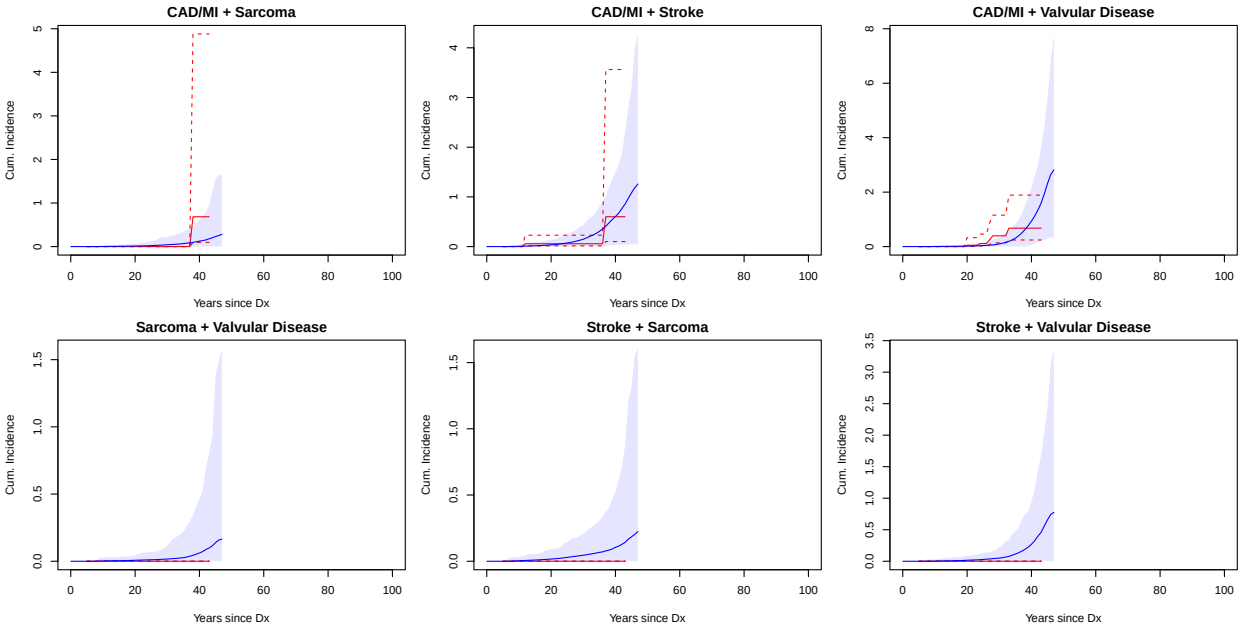
6.5.4.1 Overall



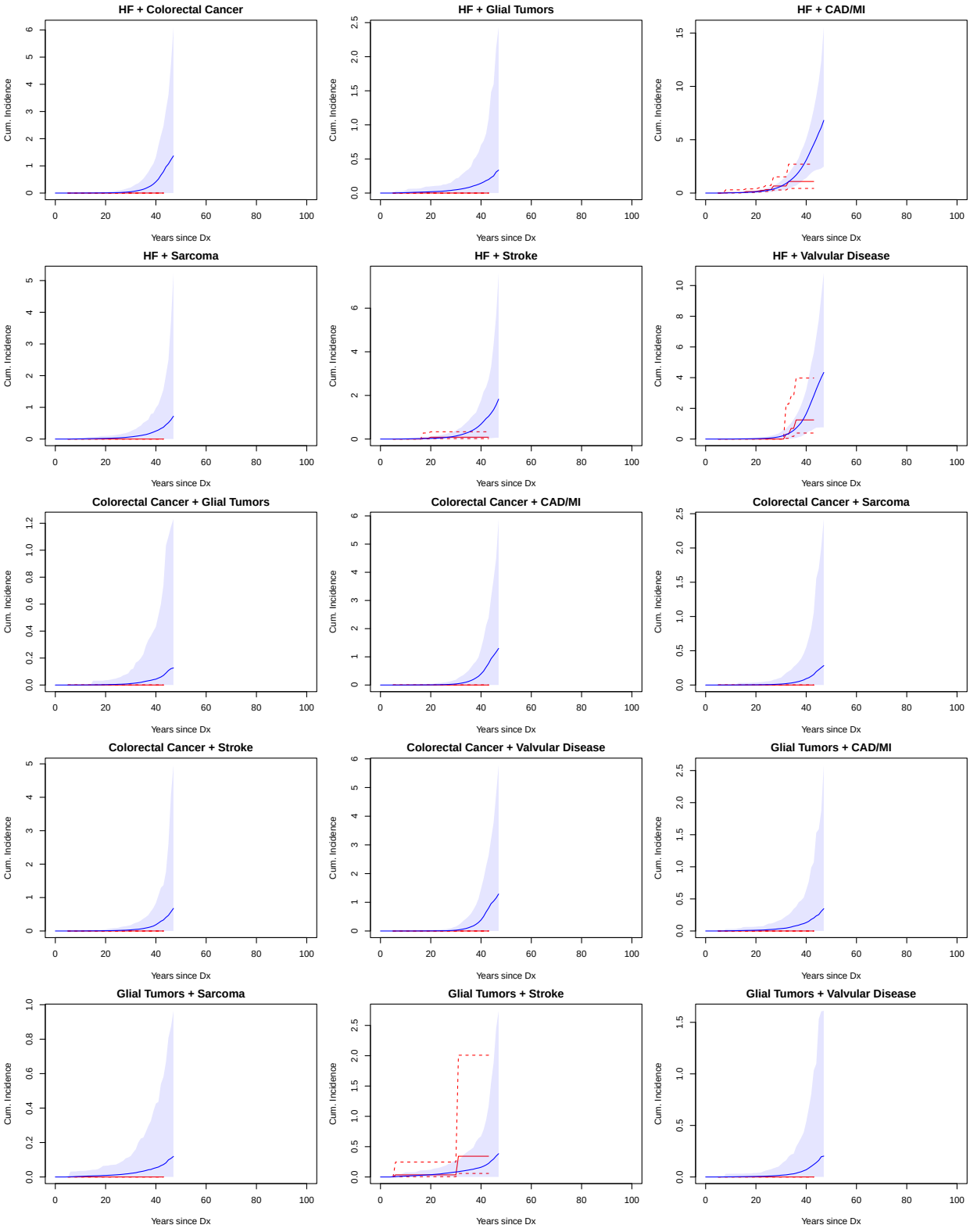

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

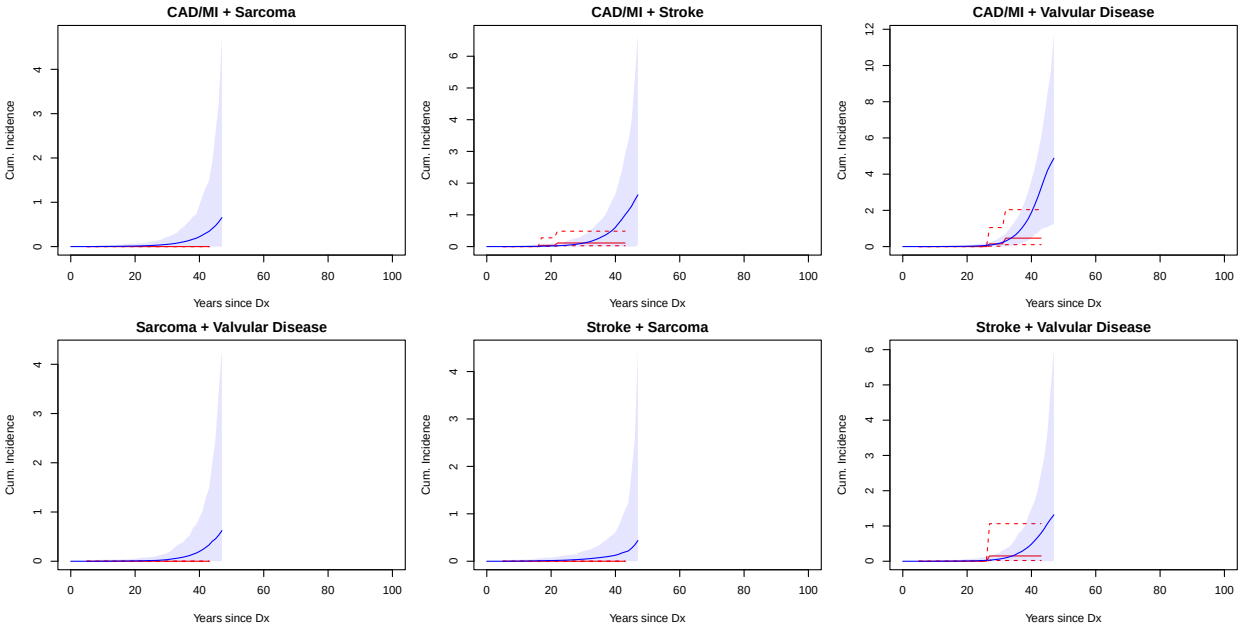
6.5.4.2 Male


HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
Cum. Incidence
Years since Dx

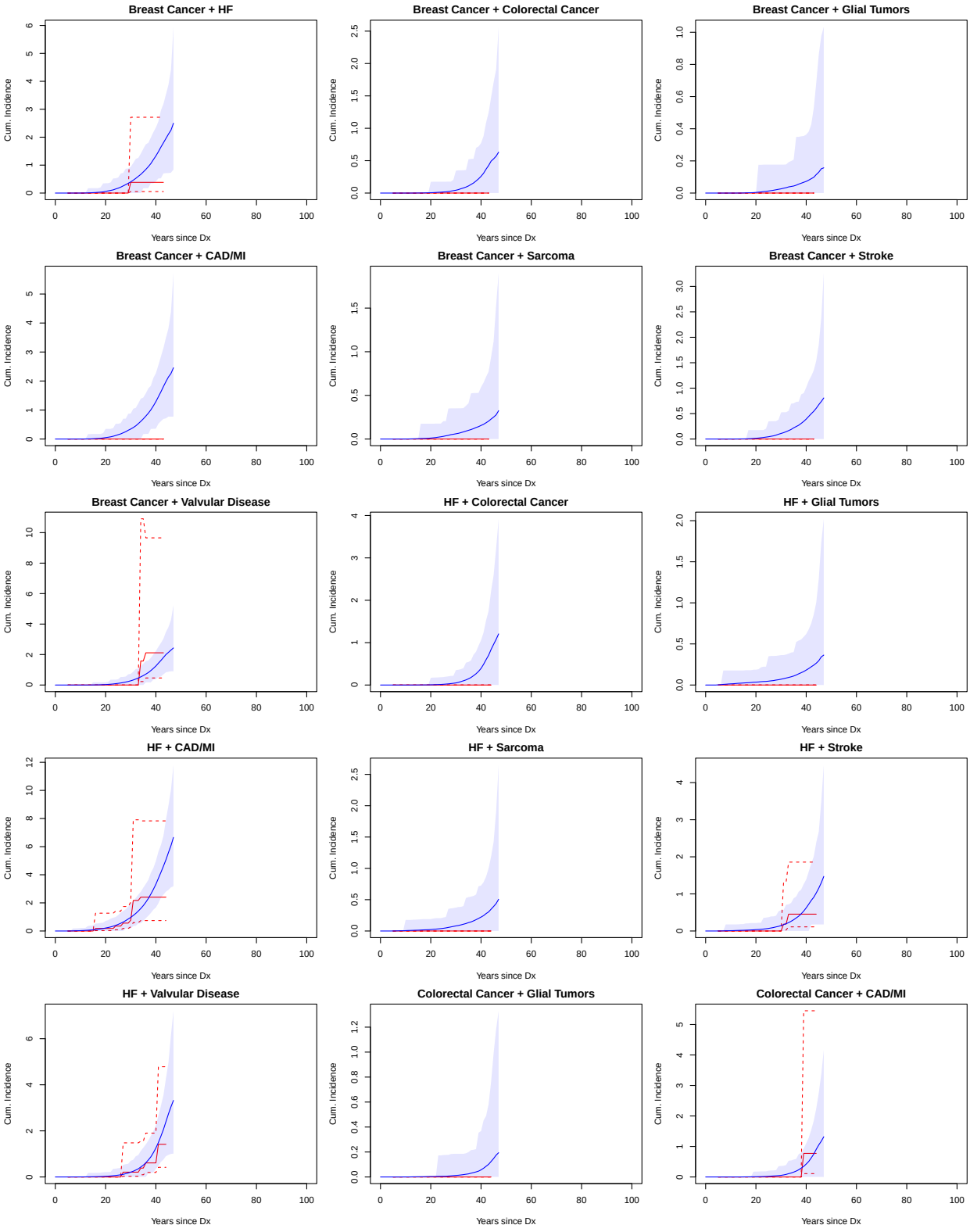

CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

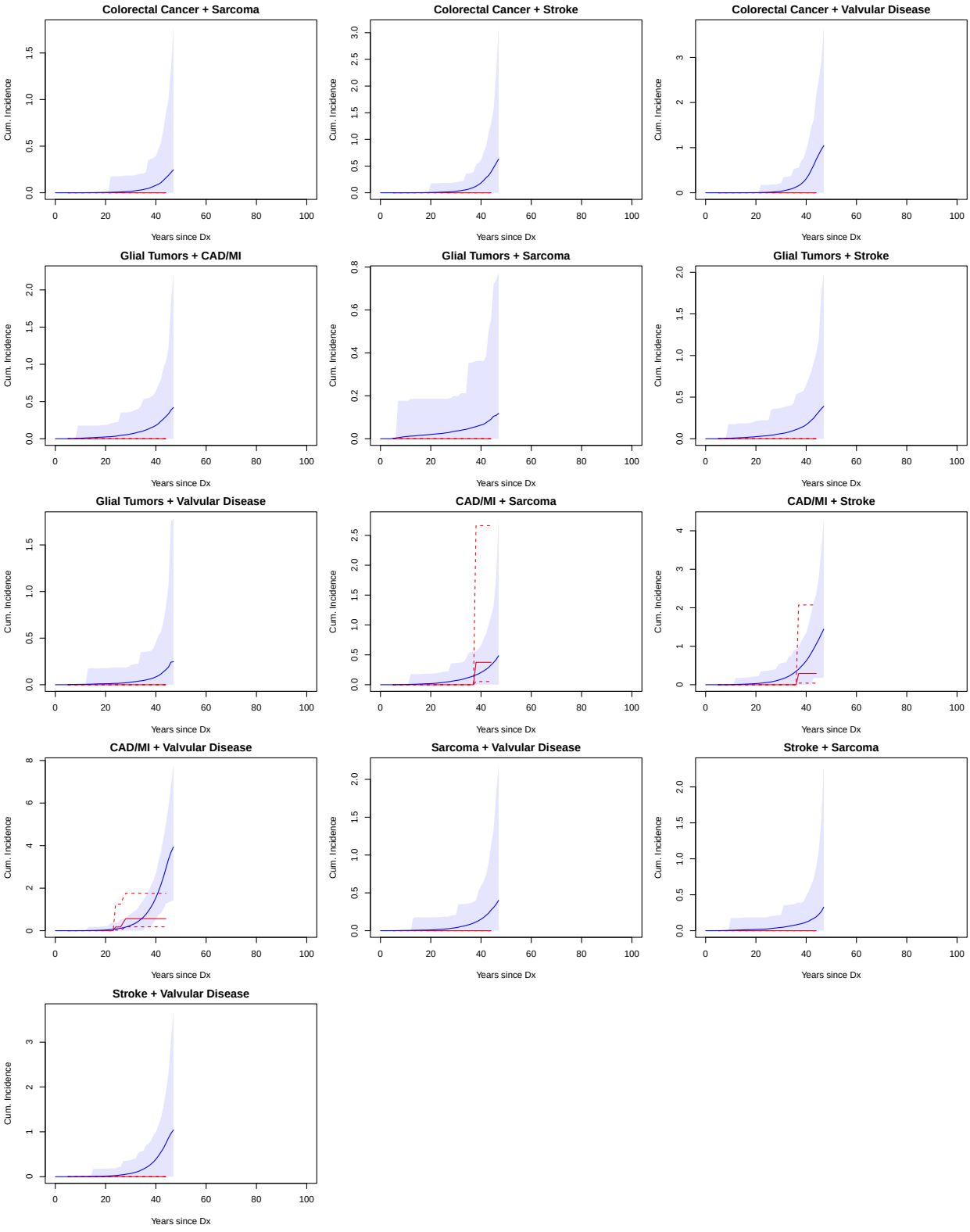
6.5.4.3 Female


HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
Cum. Incidence
Years since Dx

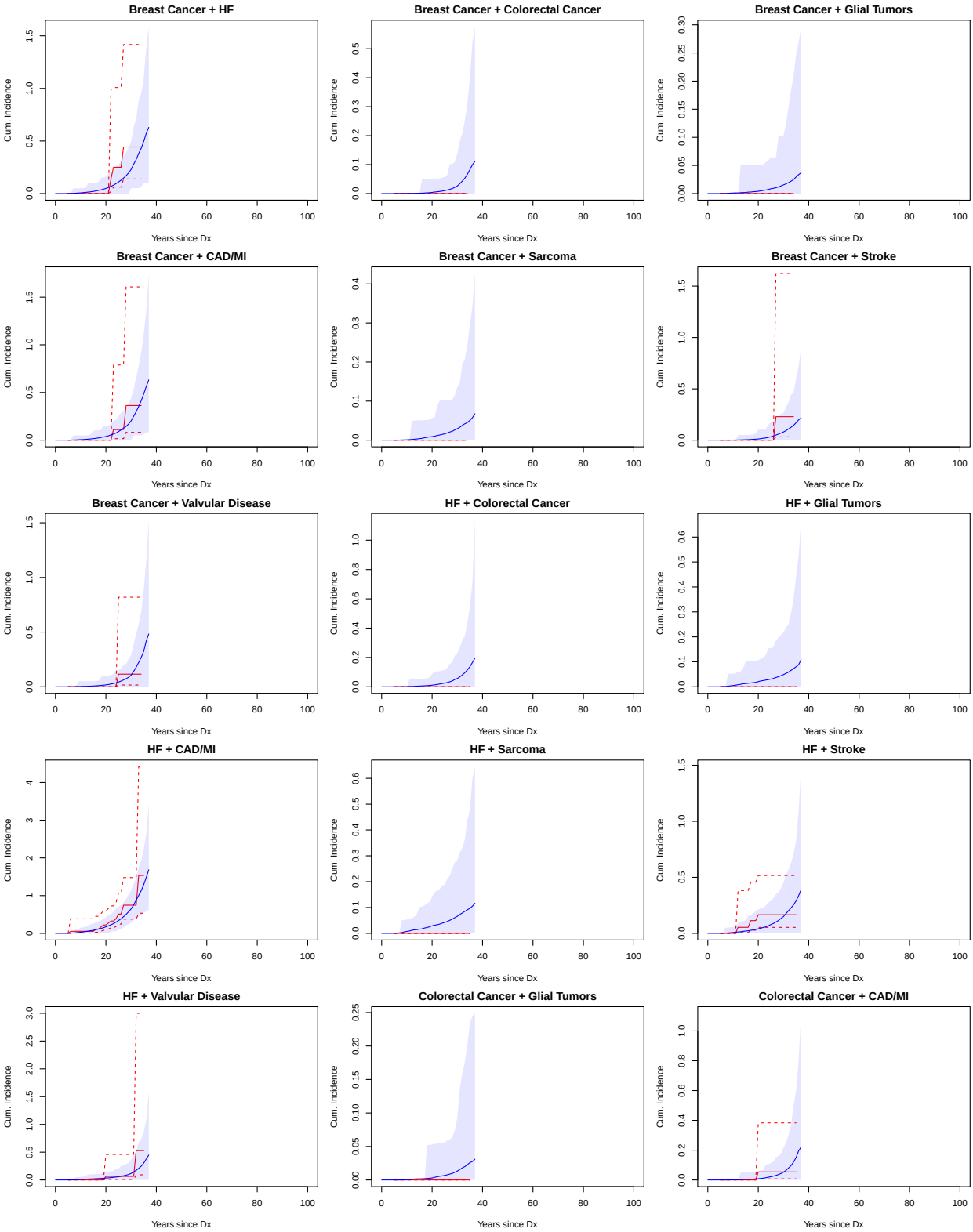

CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

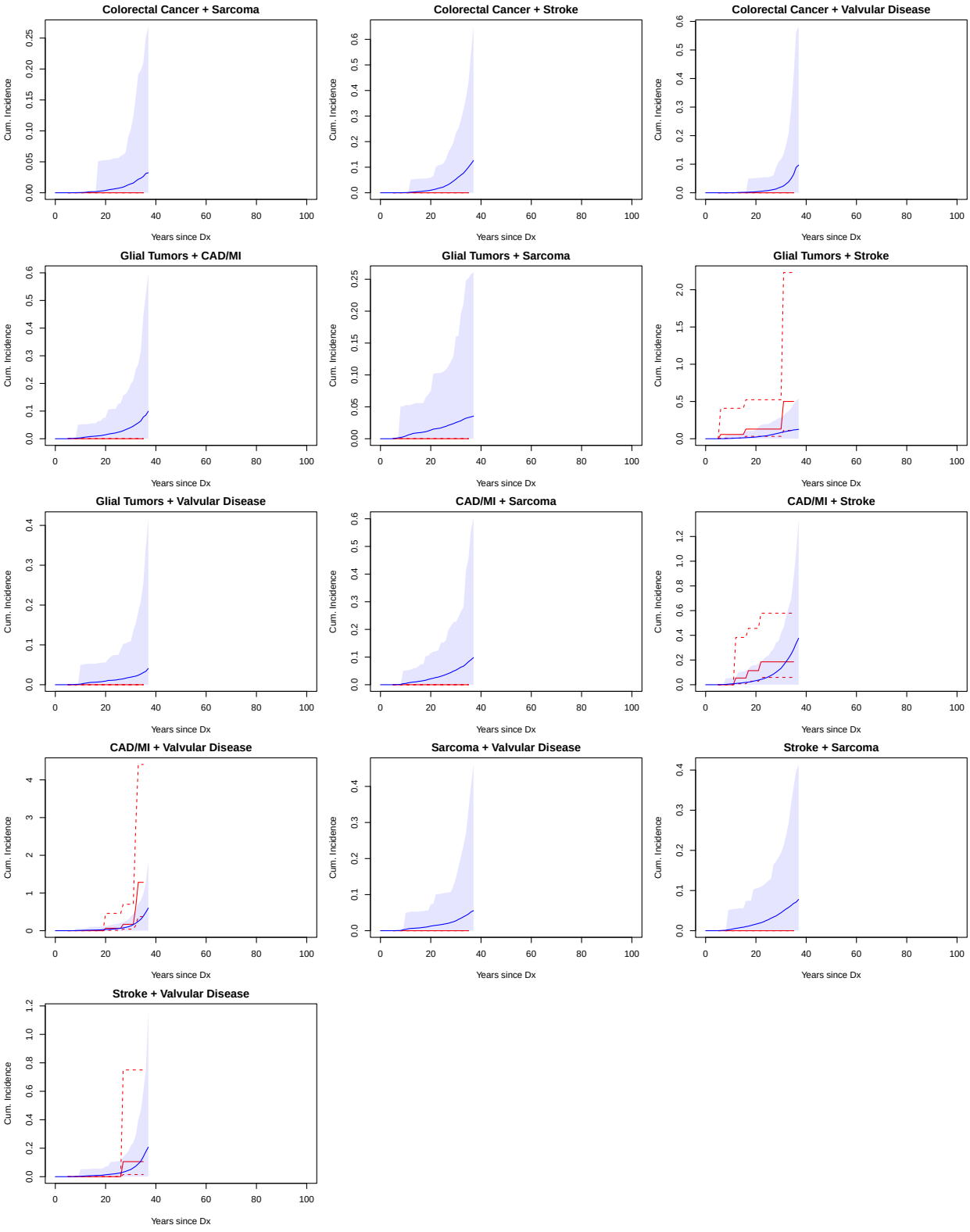
6.5.4.4 1970s


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

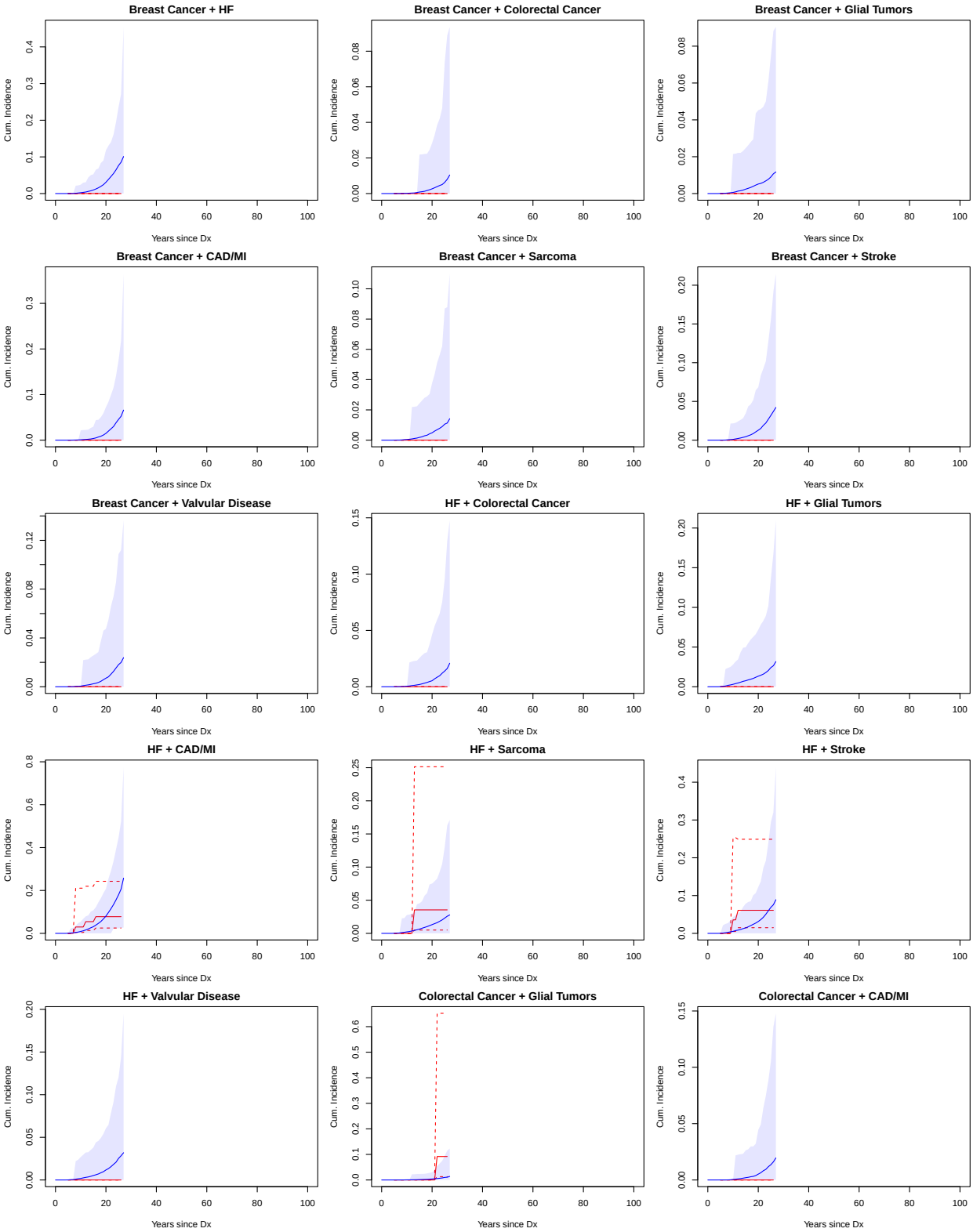

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

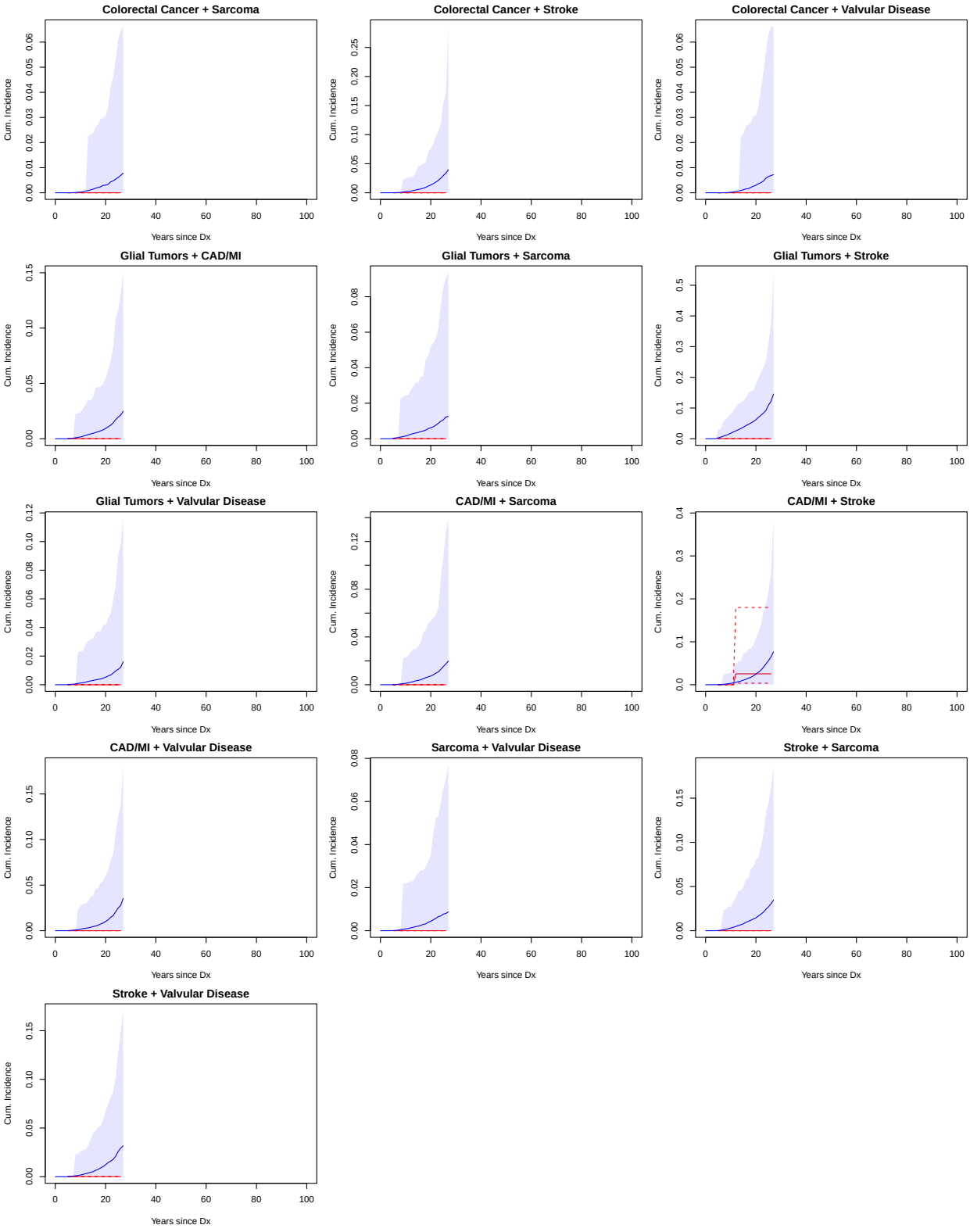
6.5.4.5 1980s


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

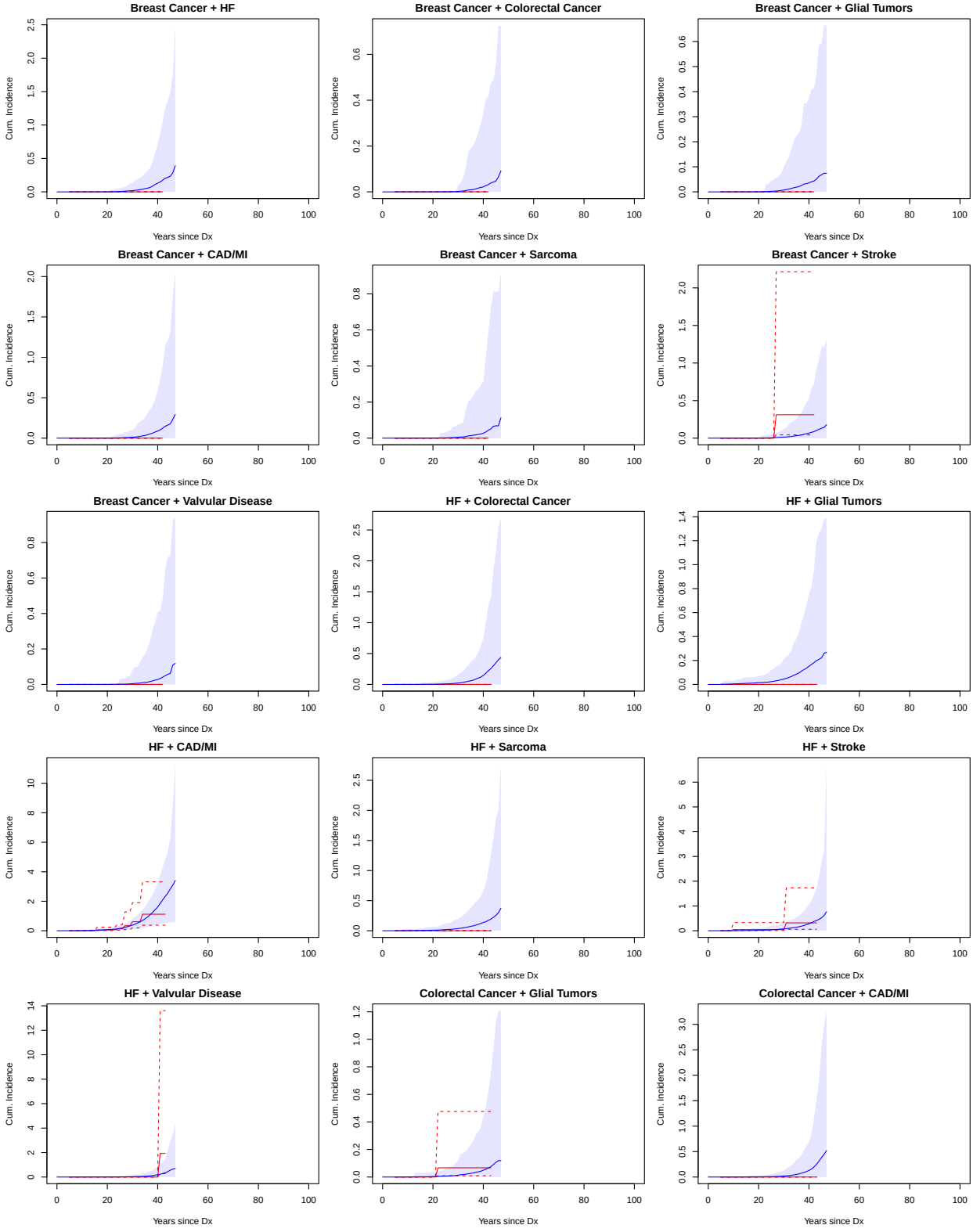

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

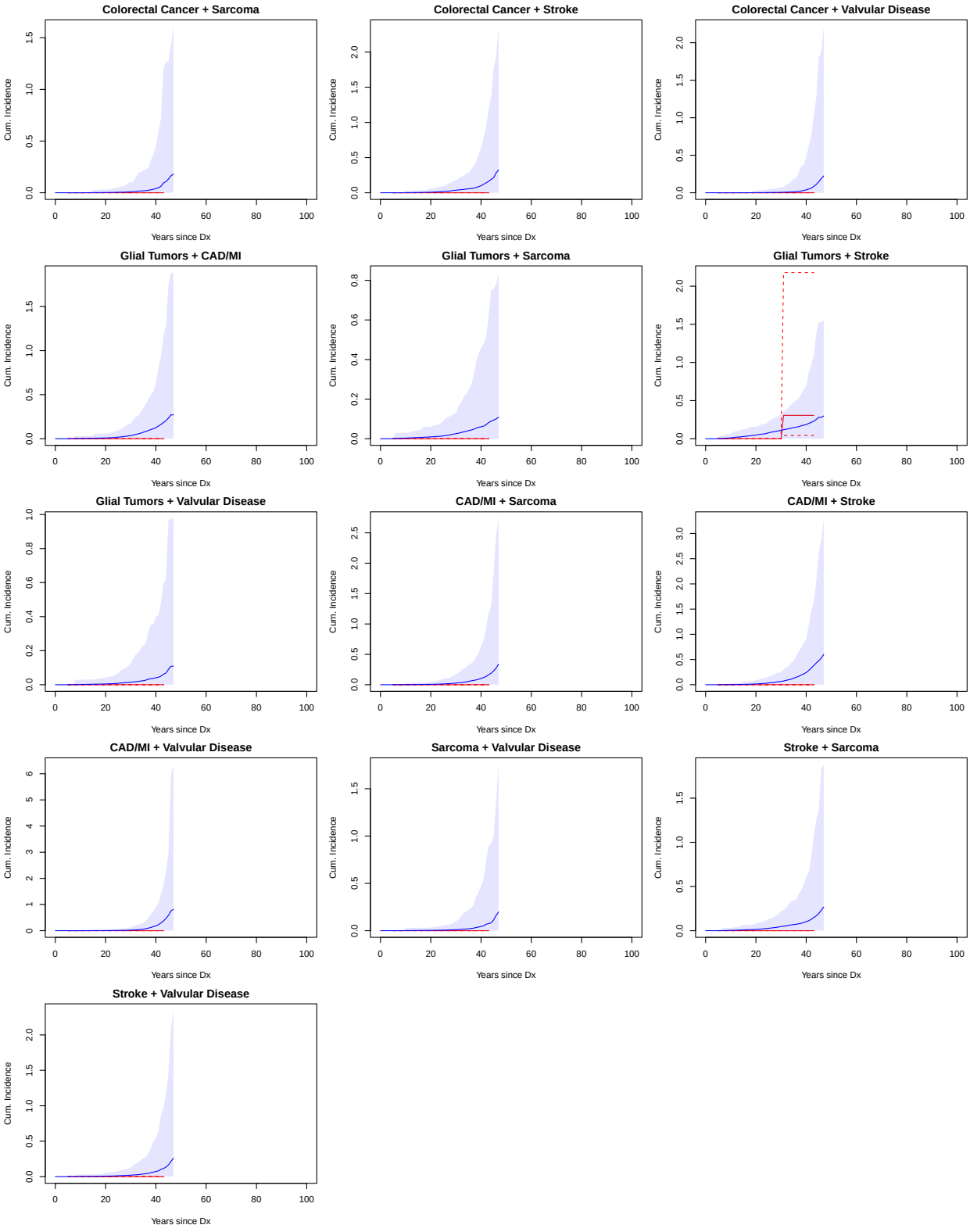
6.5.4.6 1990s


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

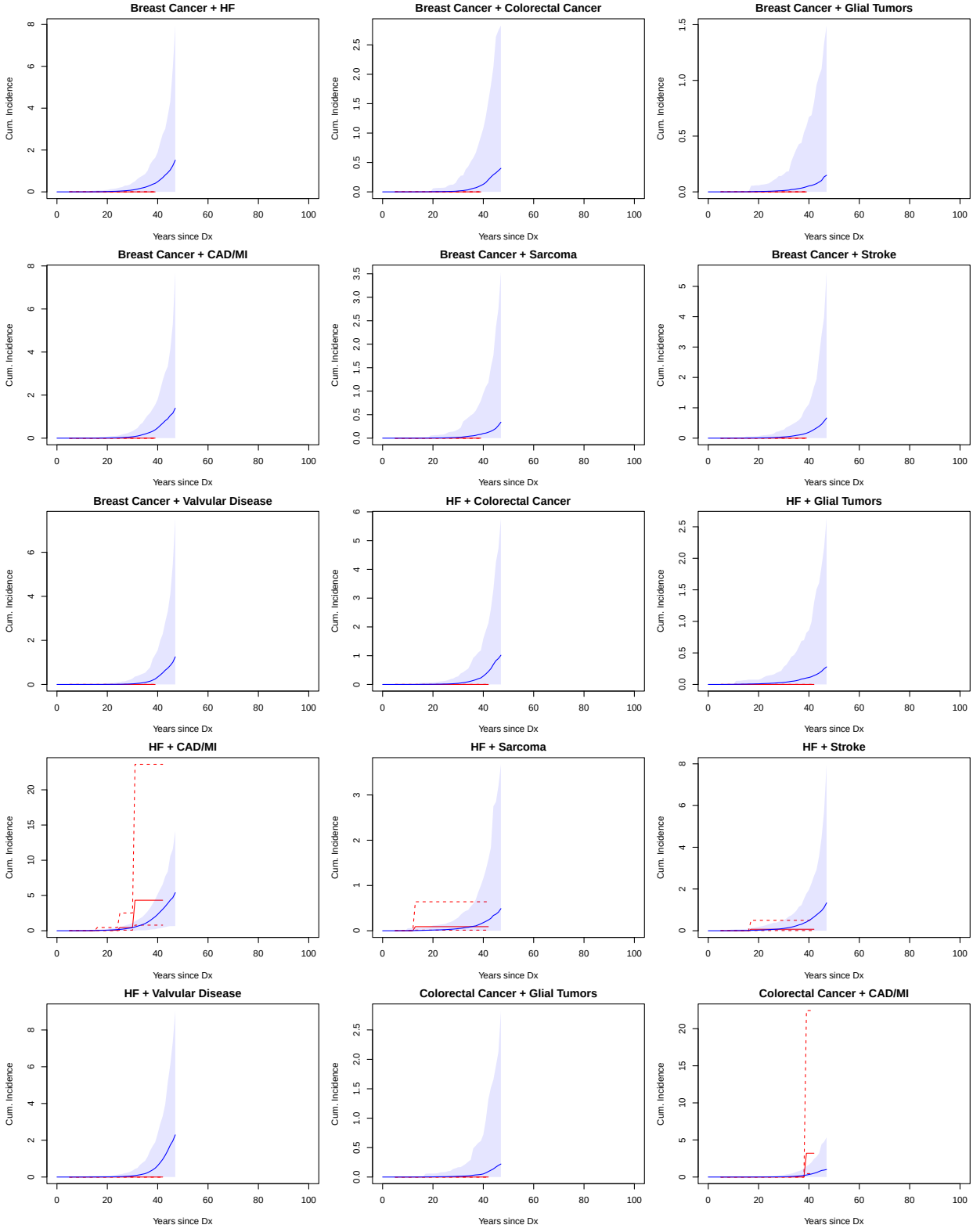

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

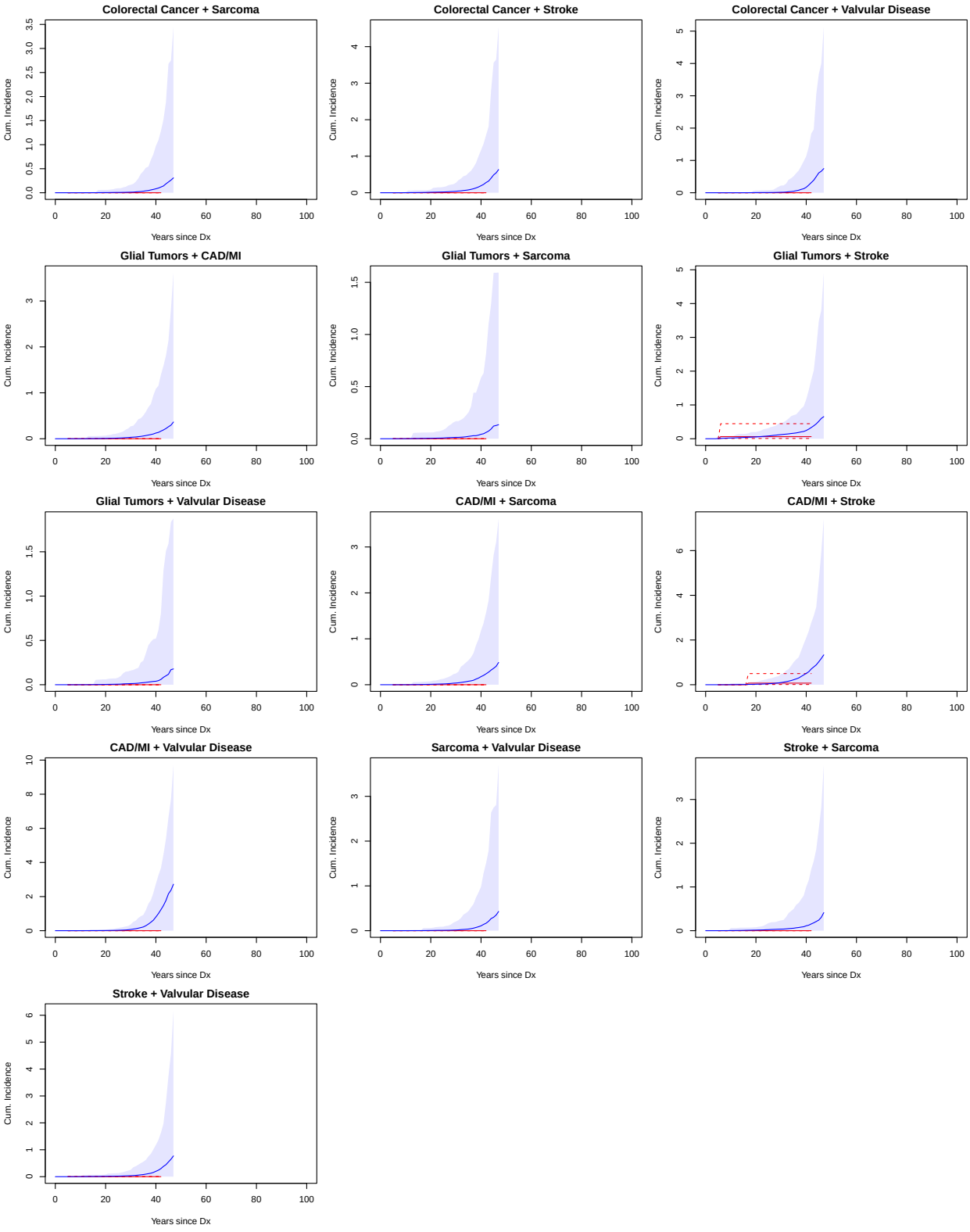
6.5.4.7 Age0-4


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

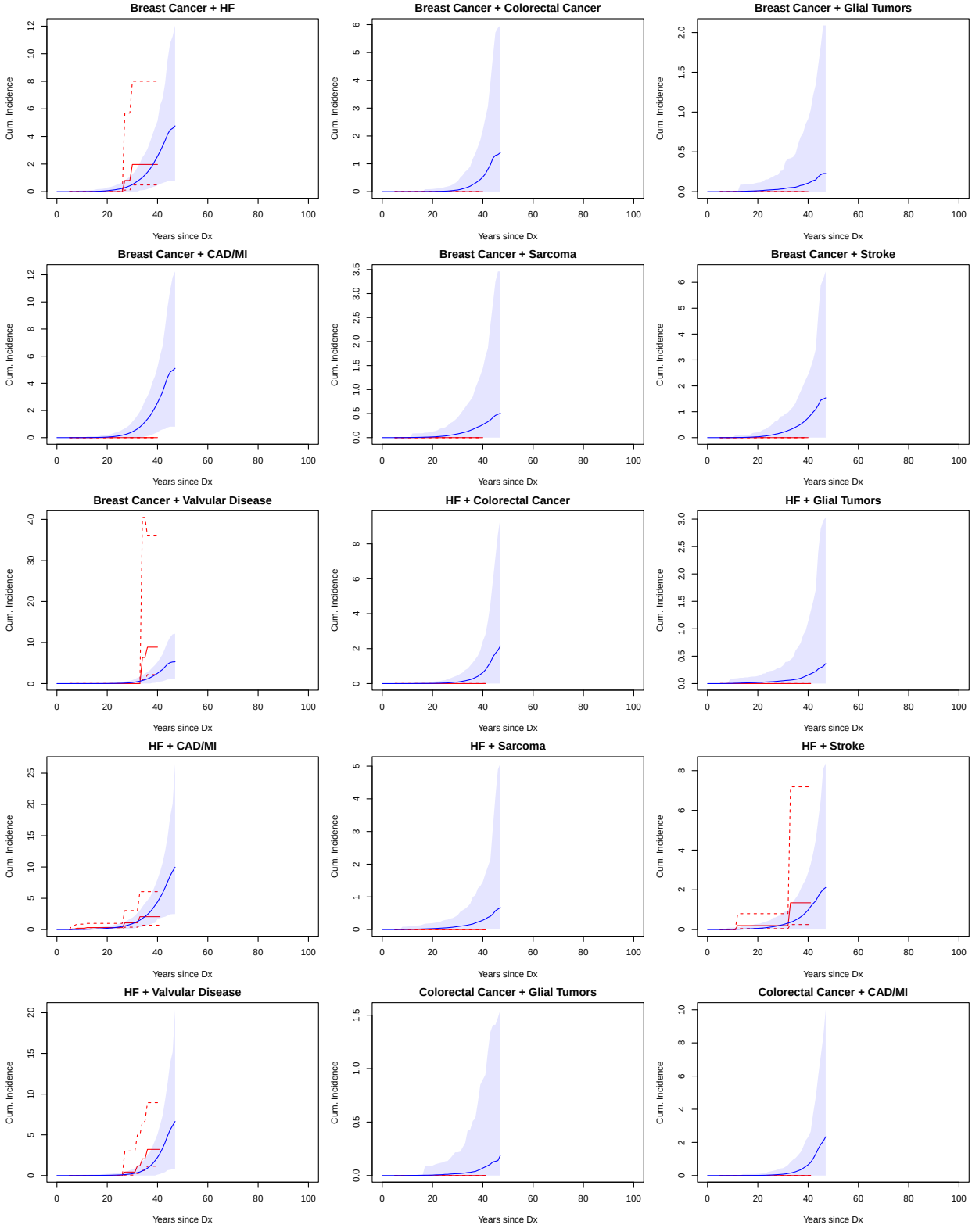

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

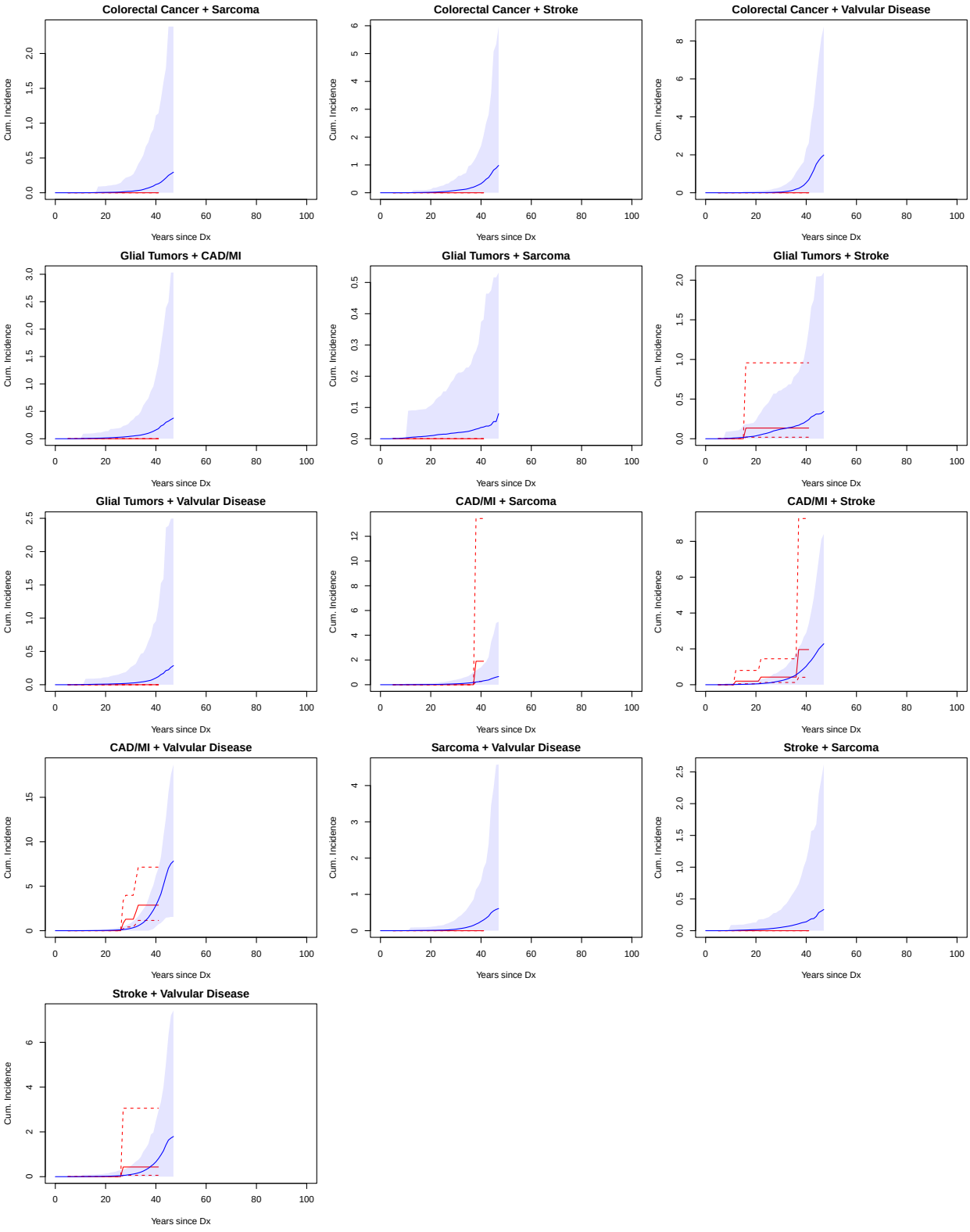
6.5.4.8 Age5-9


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

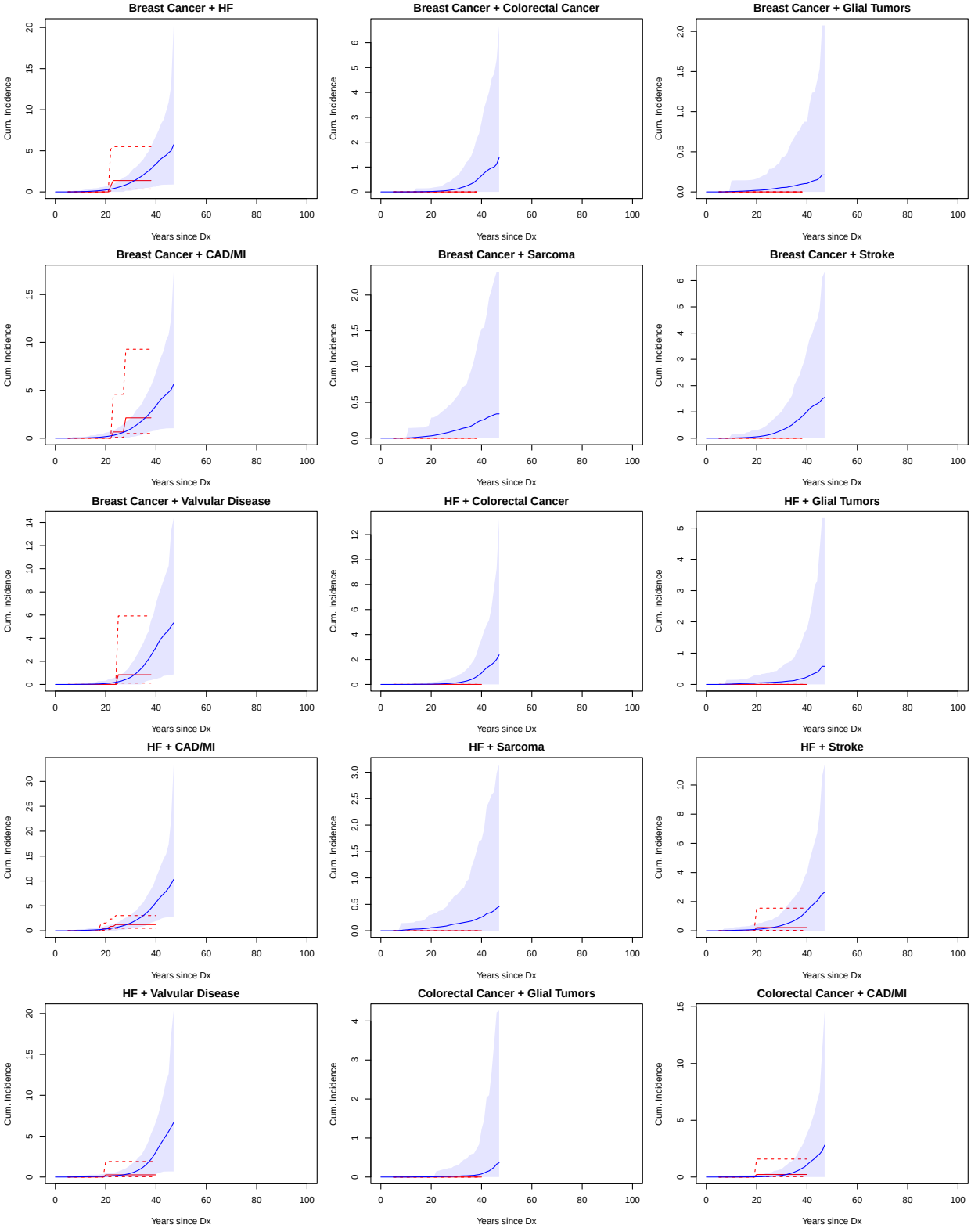

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

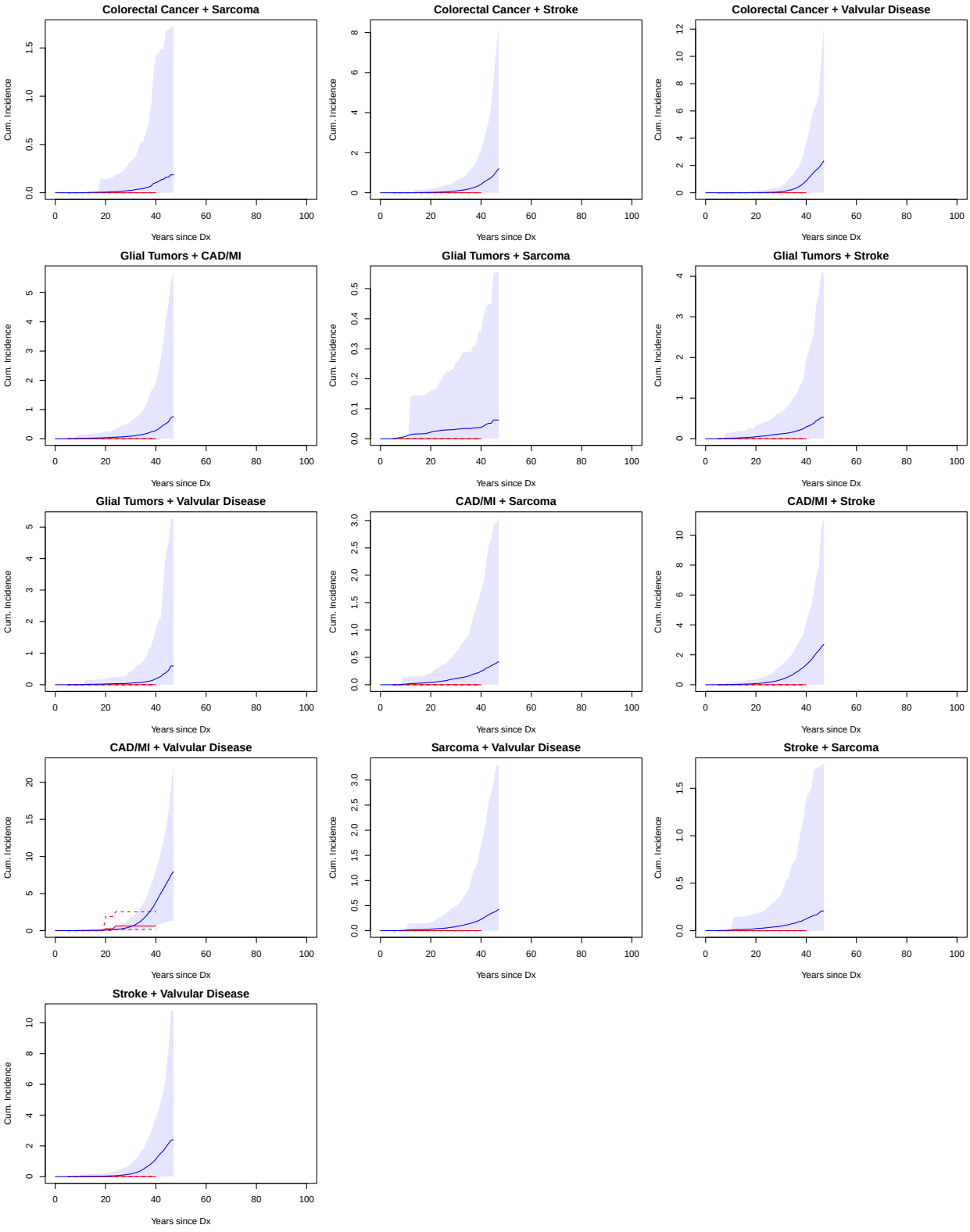
6.5.4.9 Age10-14



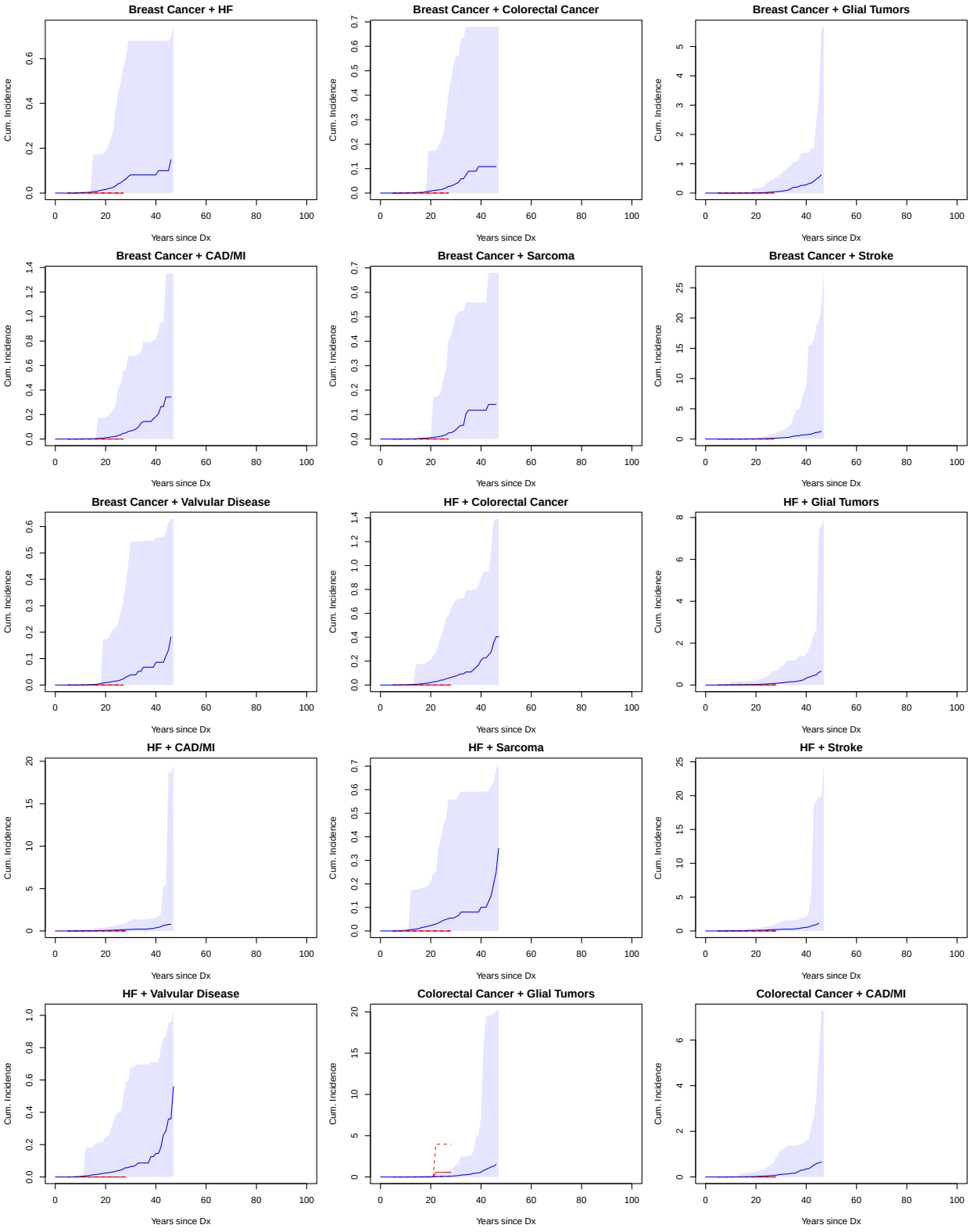

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

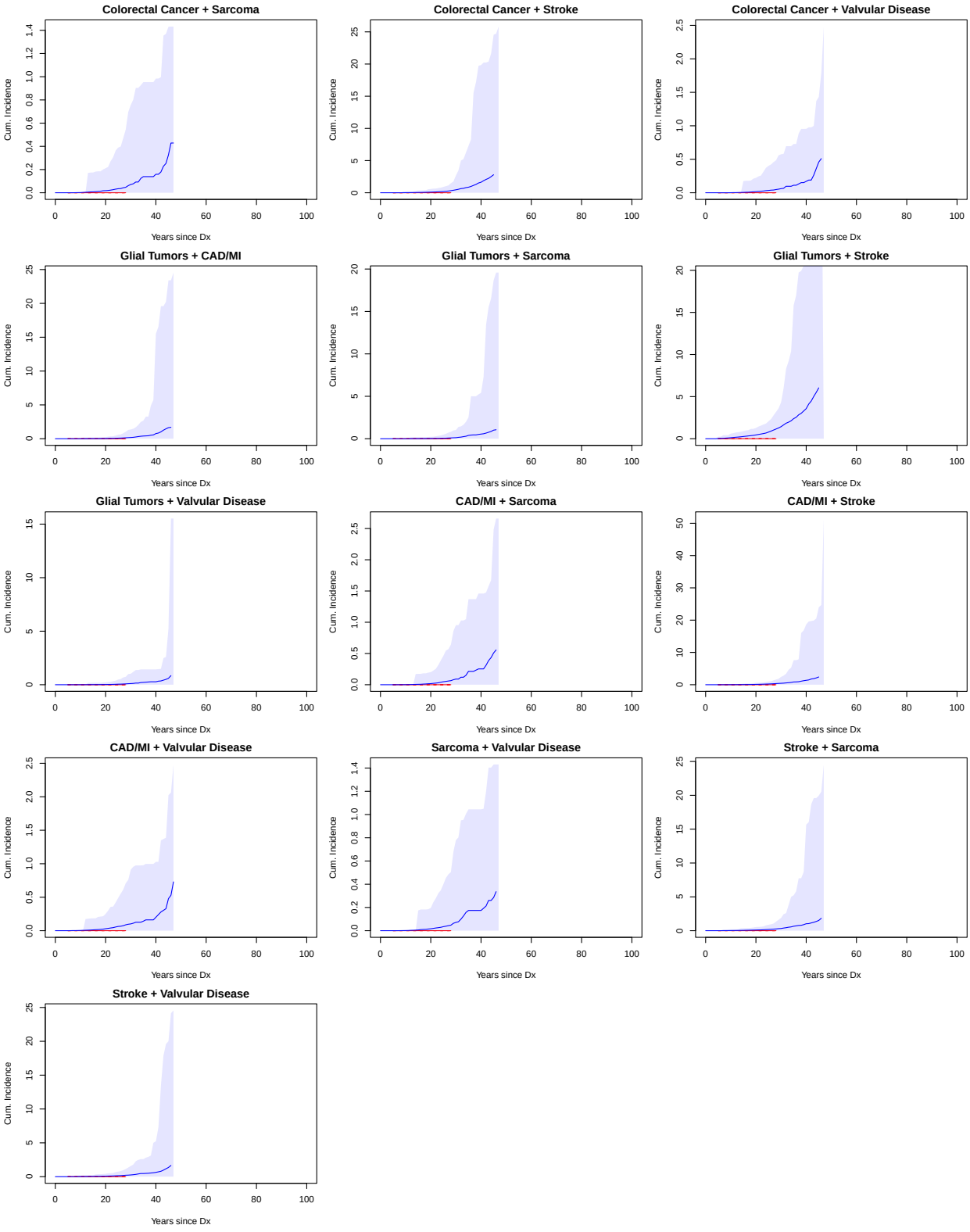
6.5.4.10 Age15-20



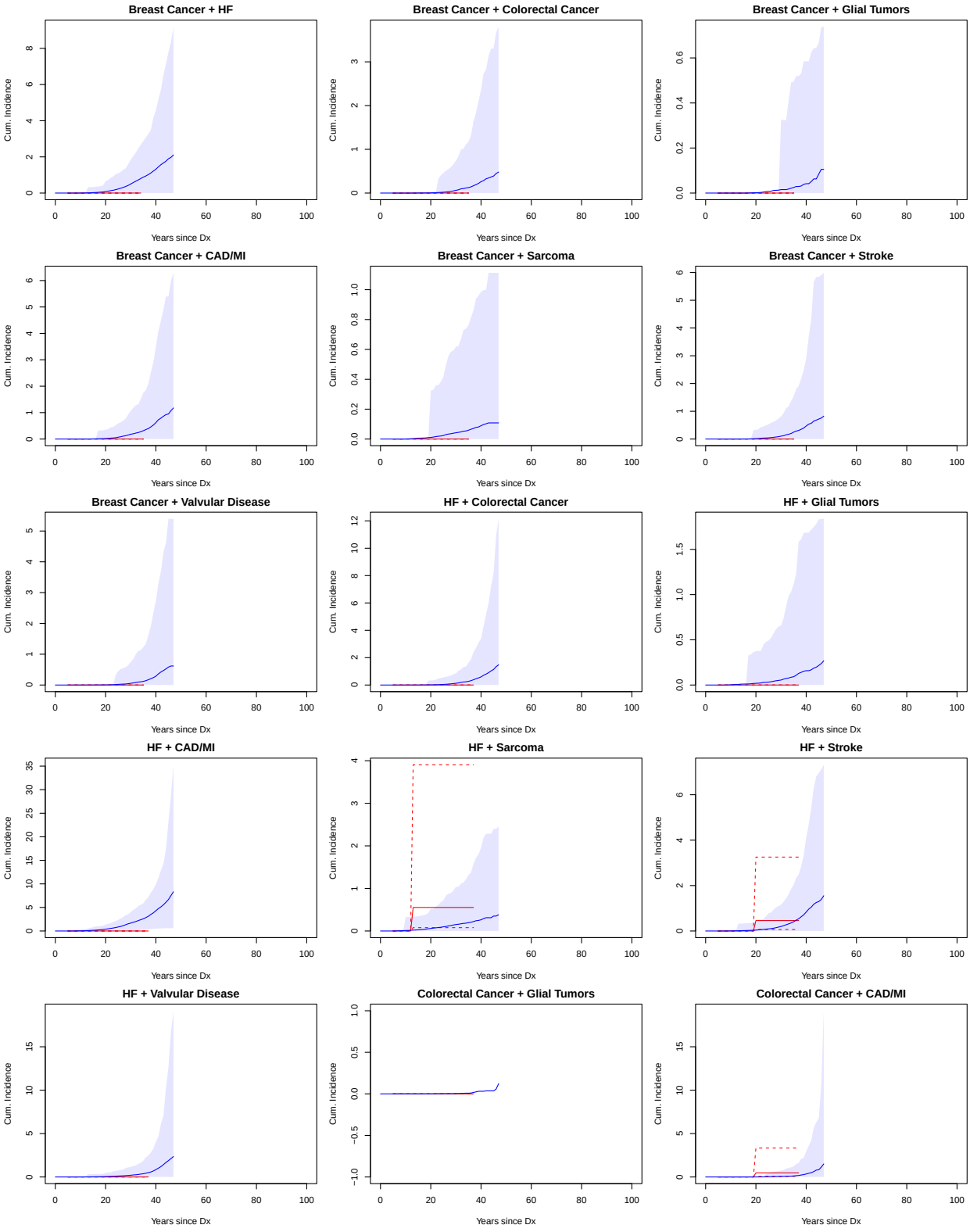

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

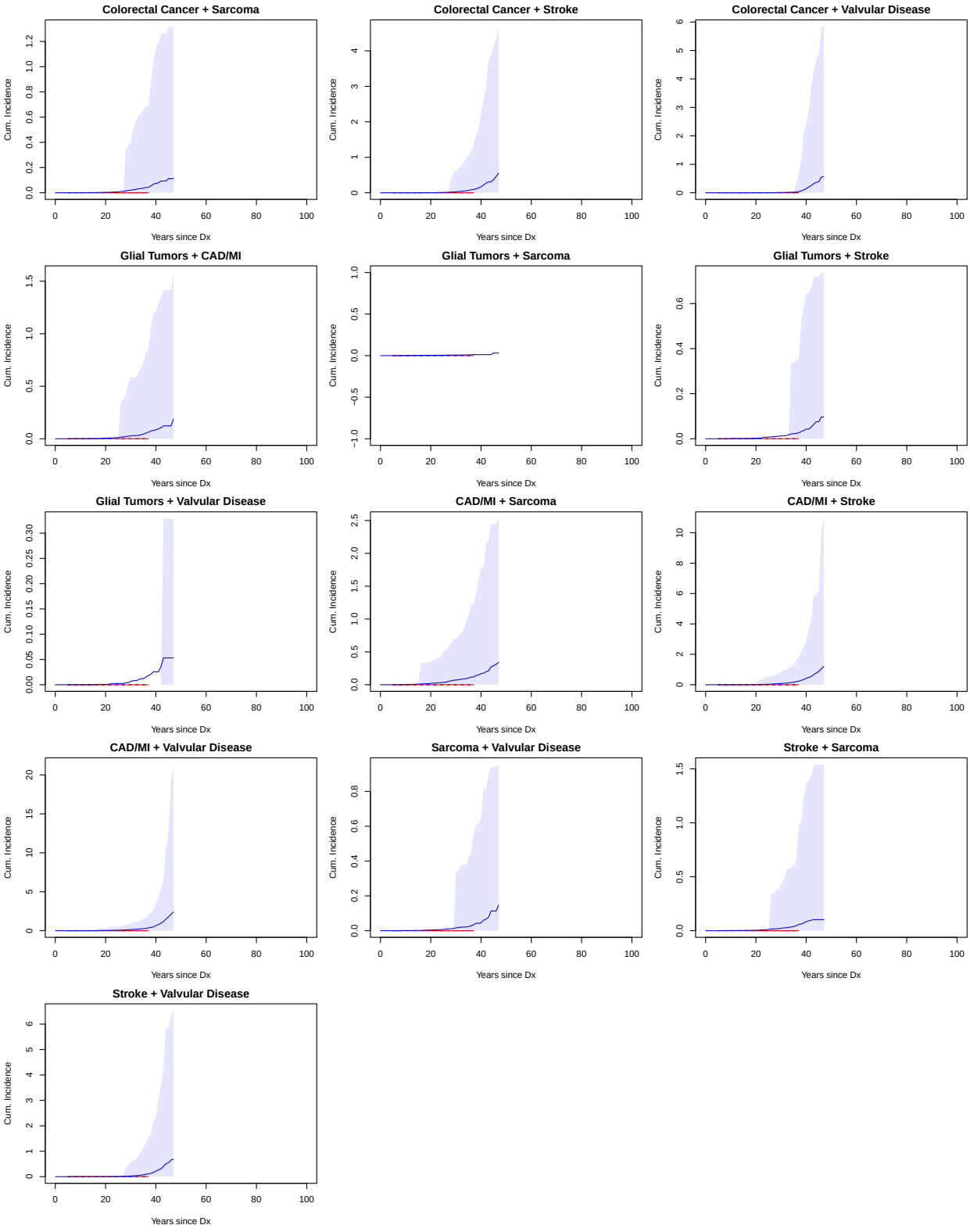
6.5.4.11 Brain


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

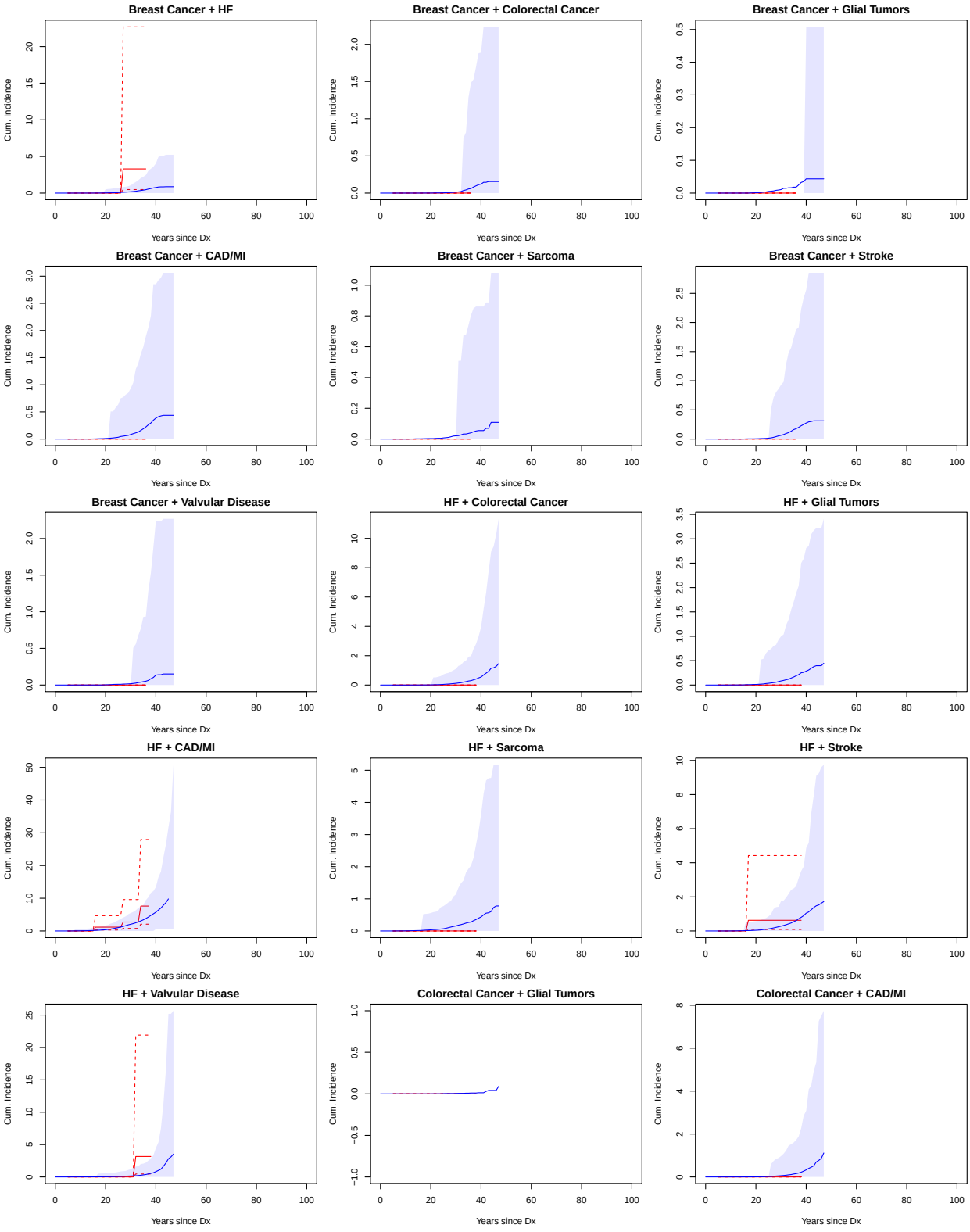

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

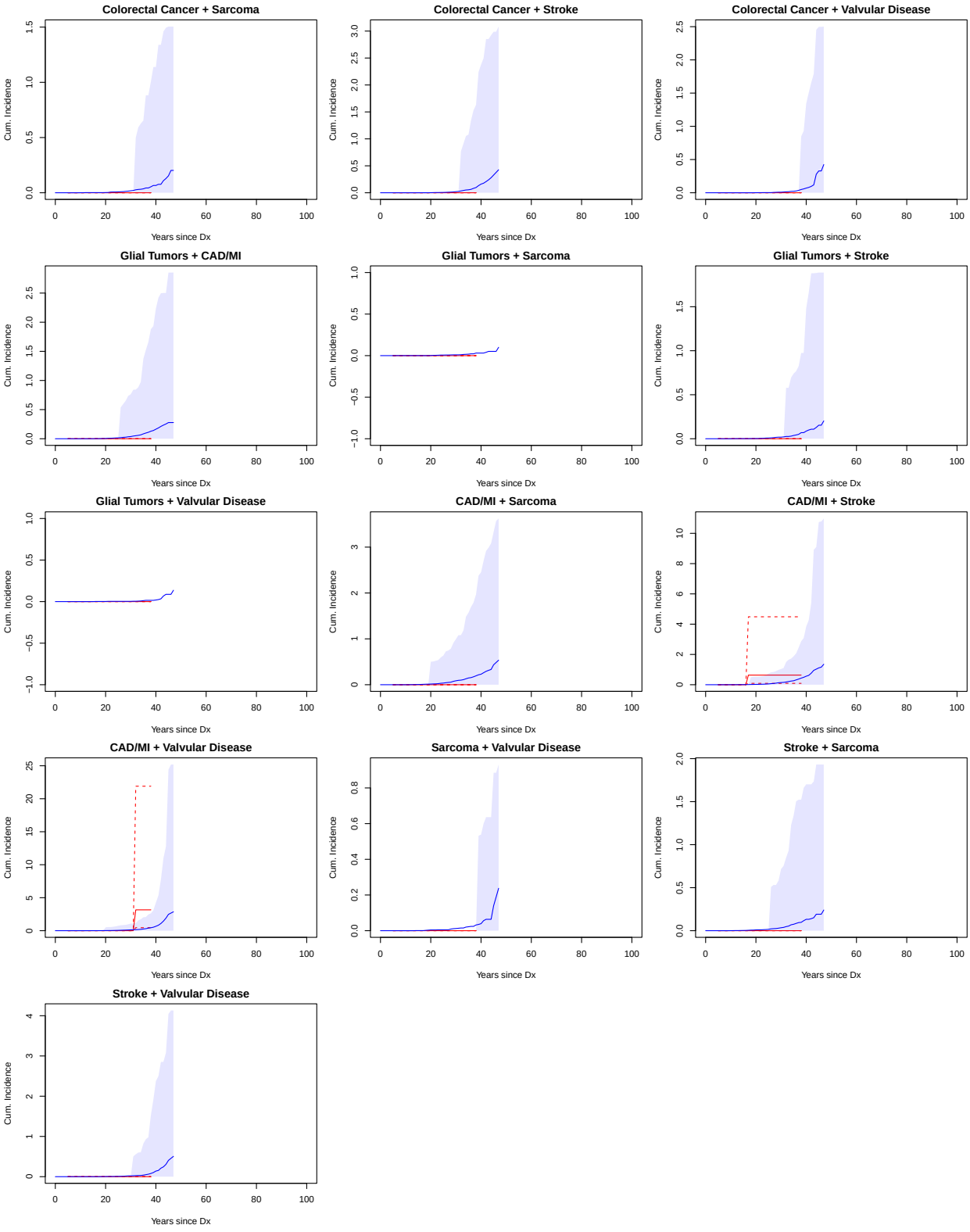
6.5.4.12 Bone


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

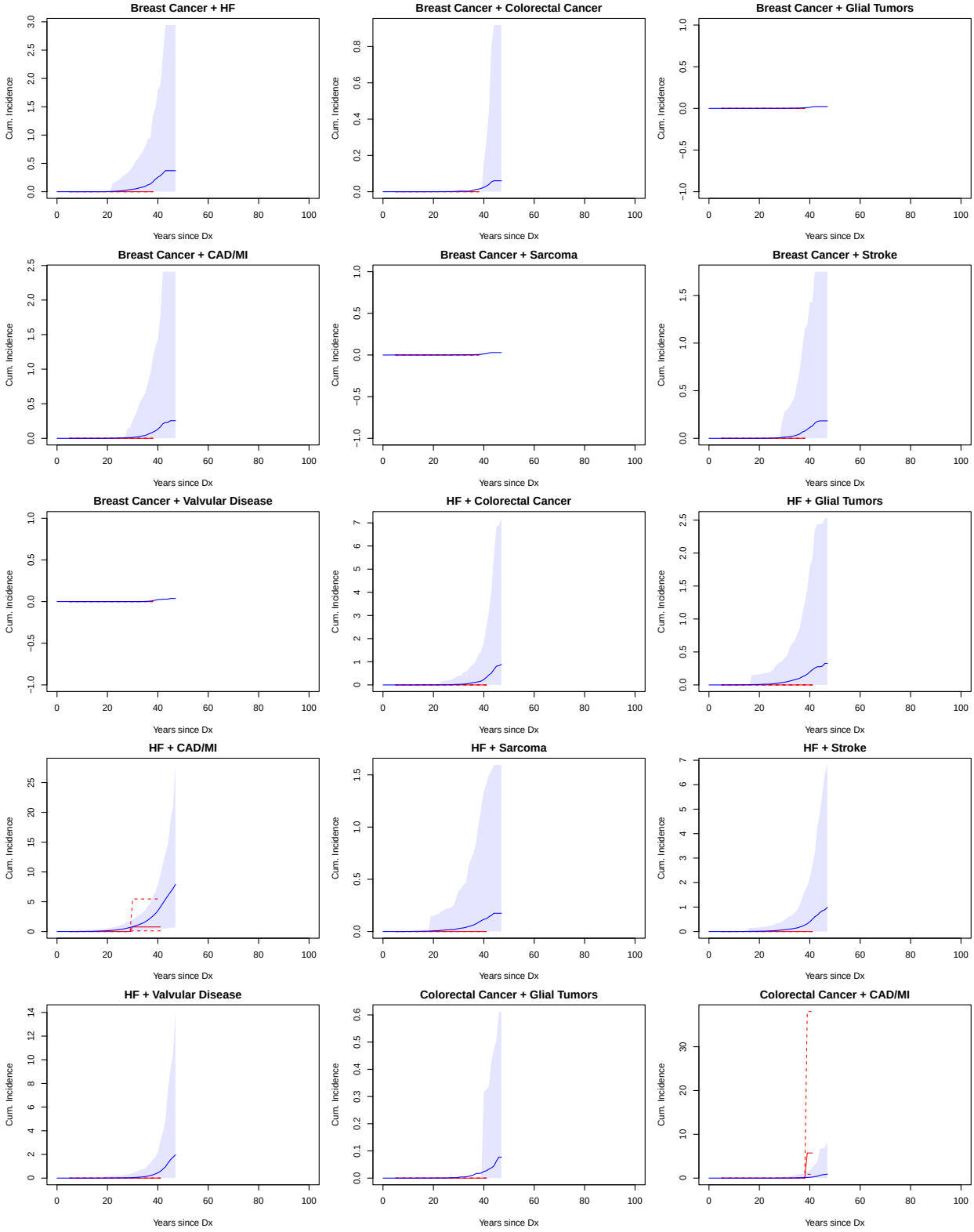

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

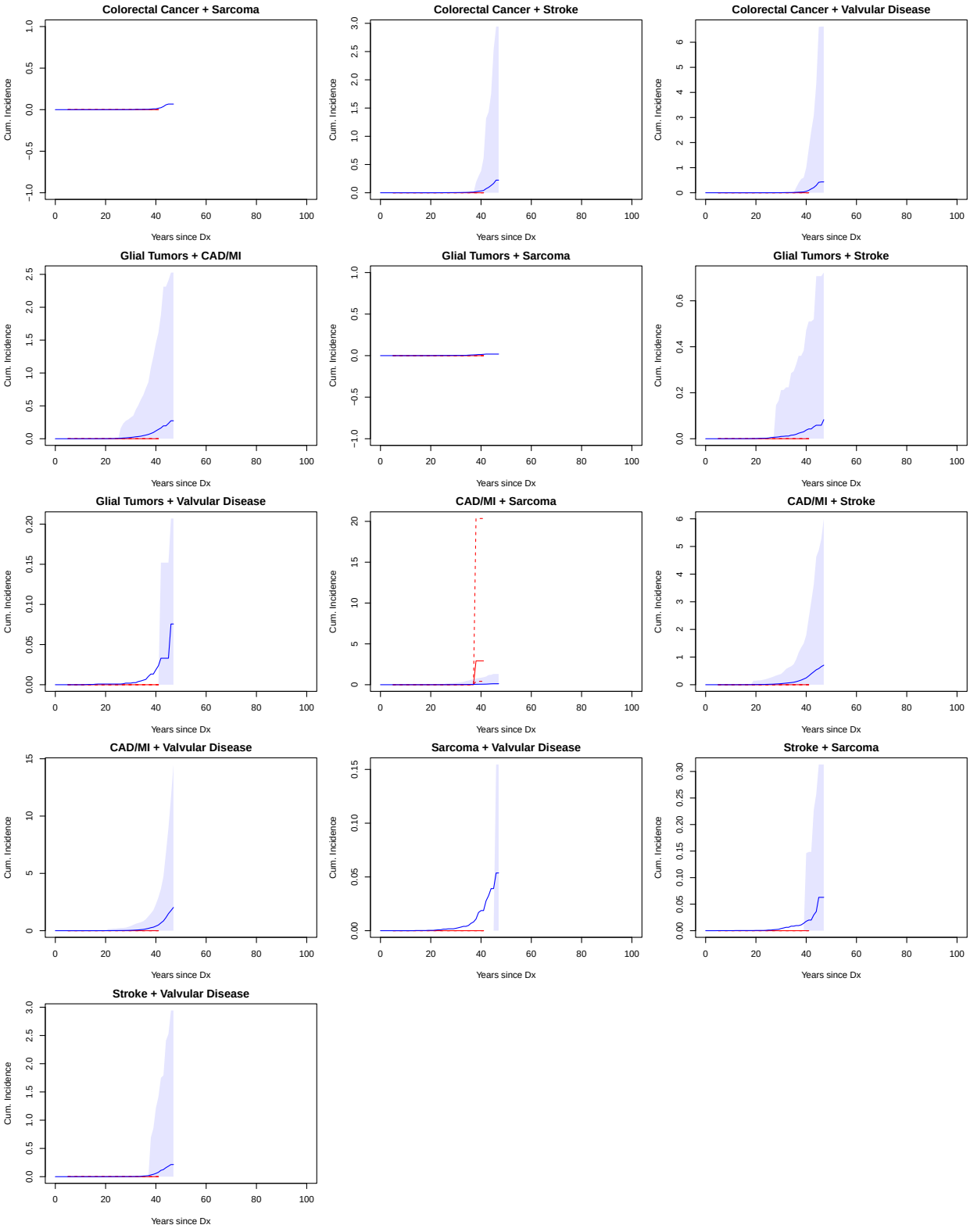
6.5.4.13 Soft Tissue Sarcoma



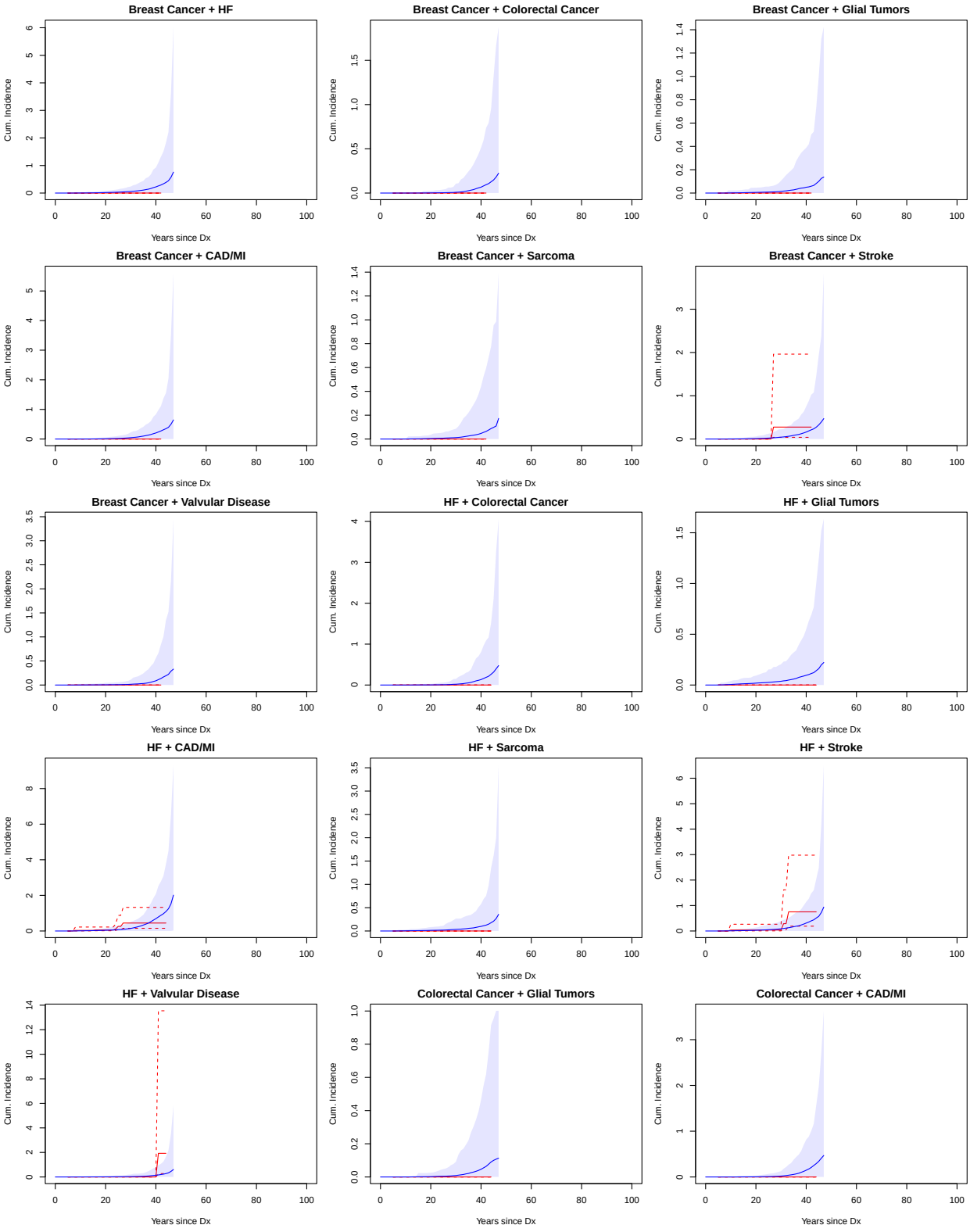

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

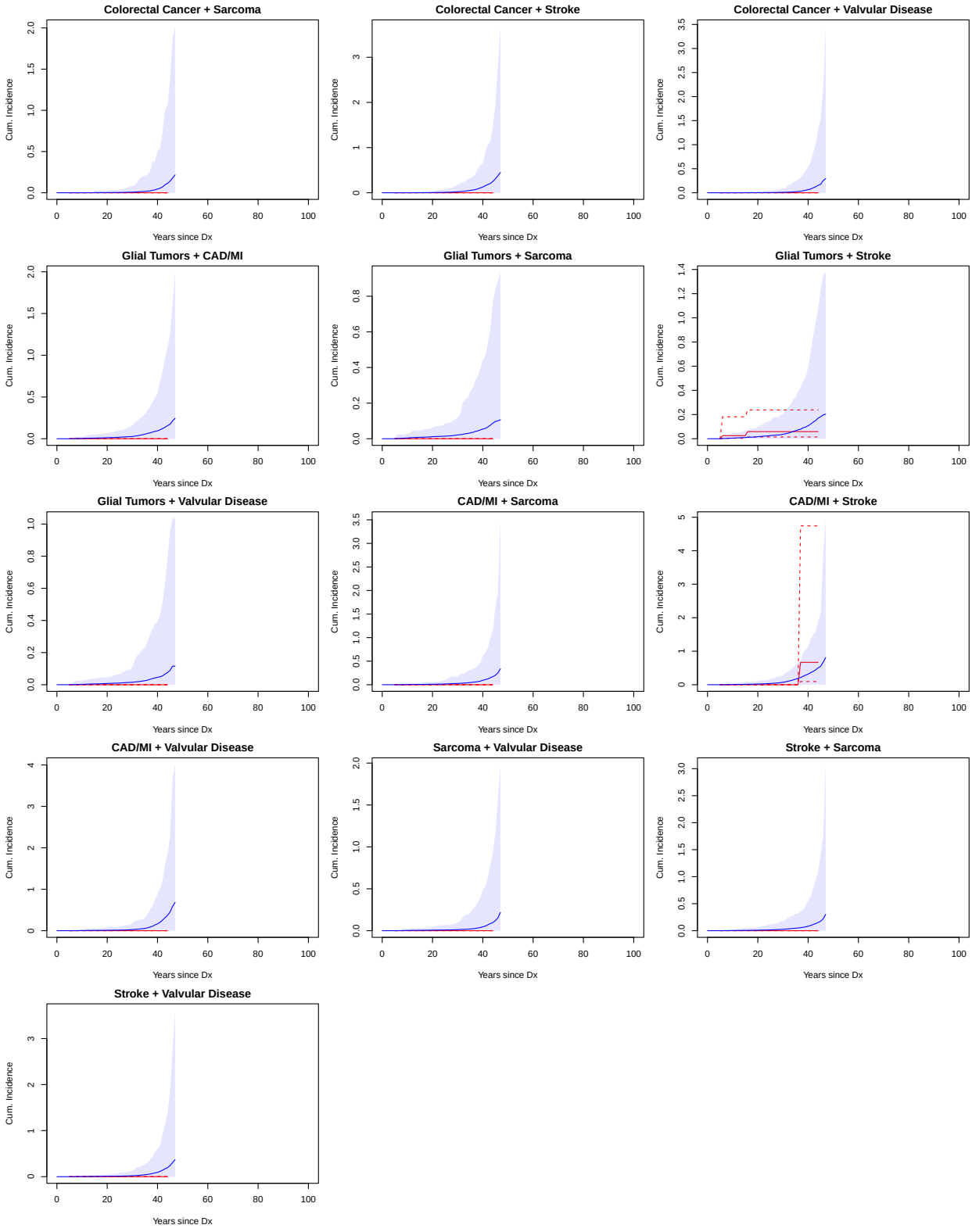
6.5.4.14 WT/NBL


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

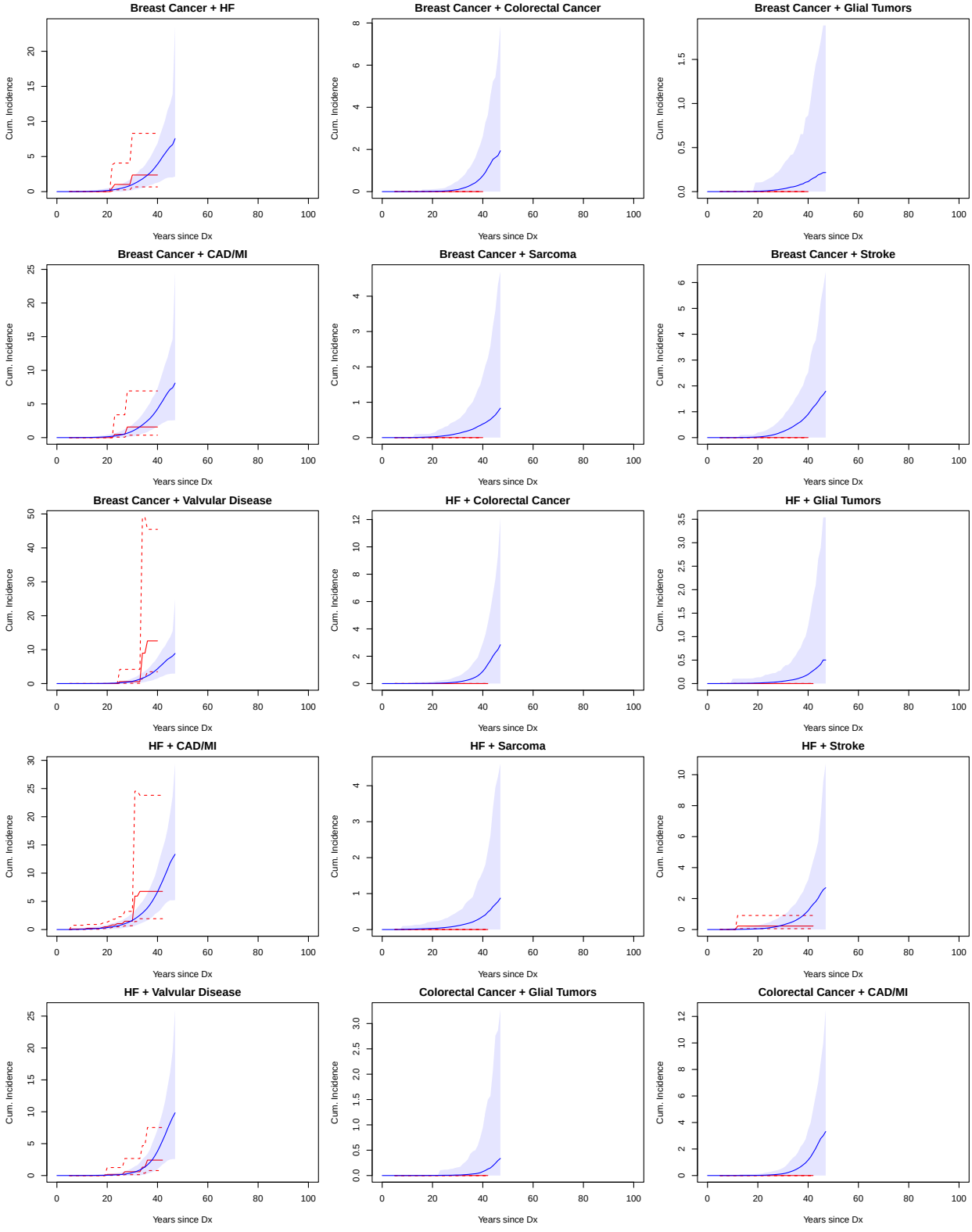

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

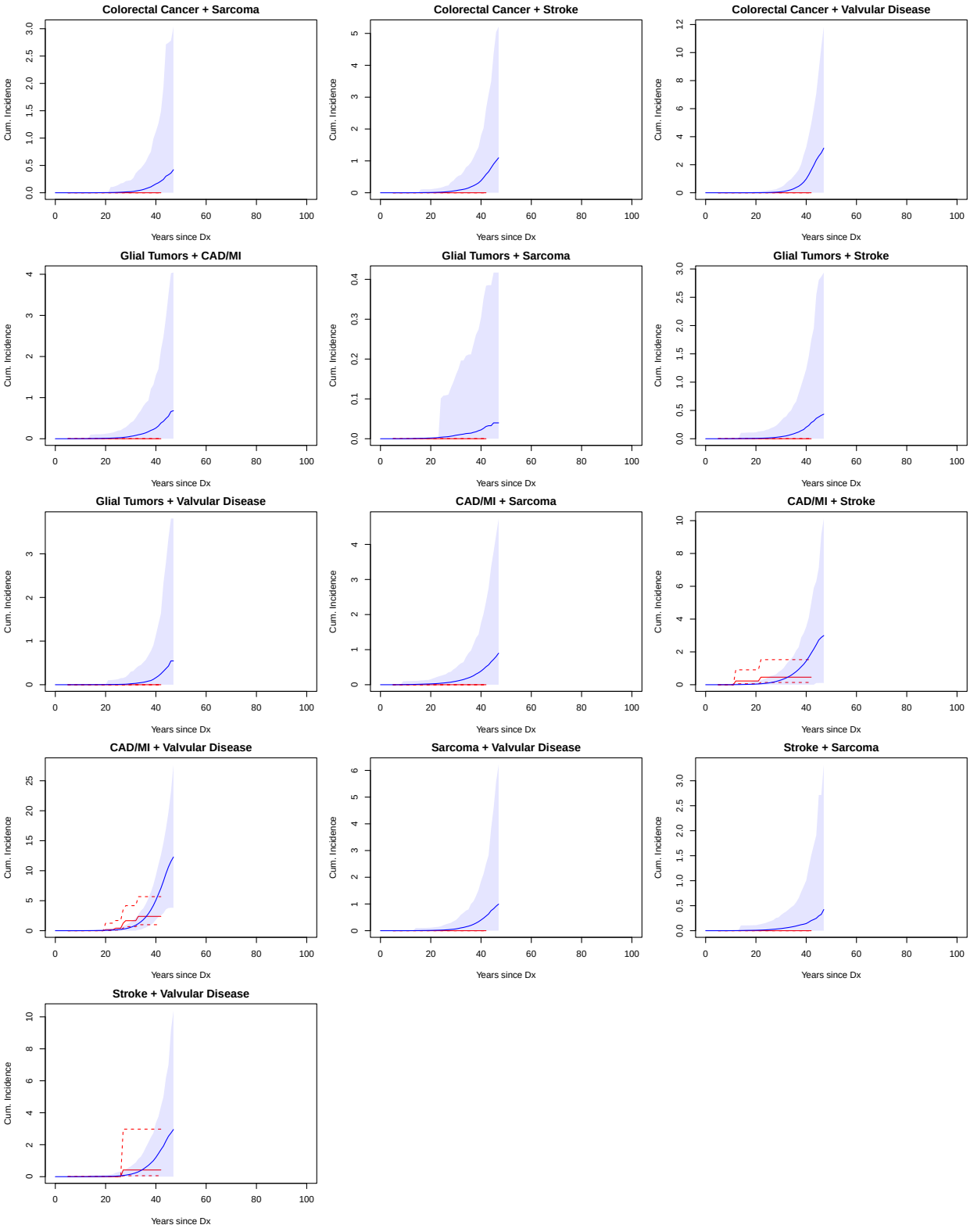
6.5.4.15 Leukemia



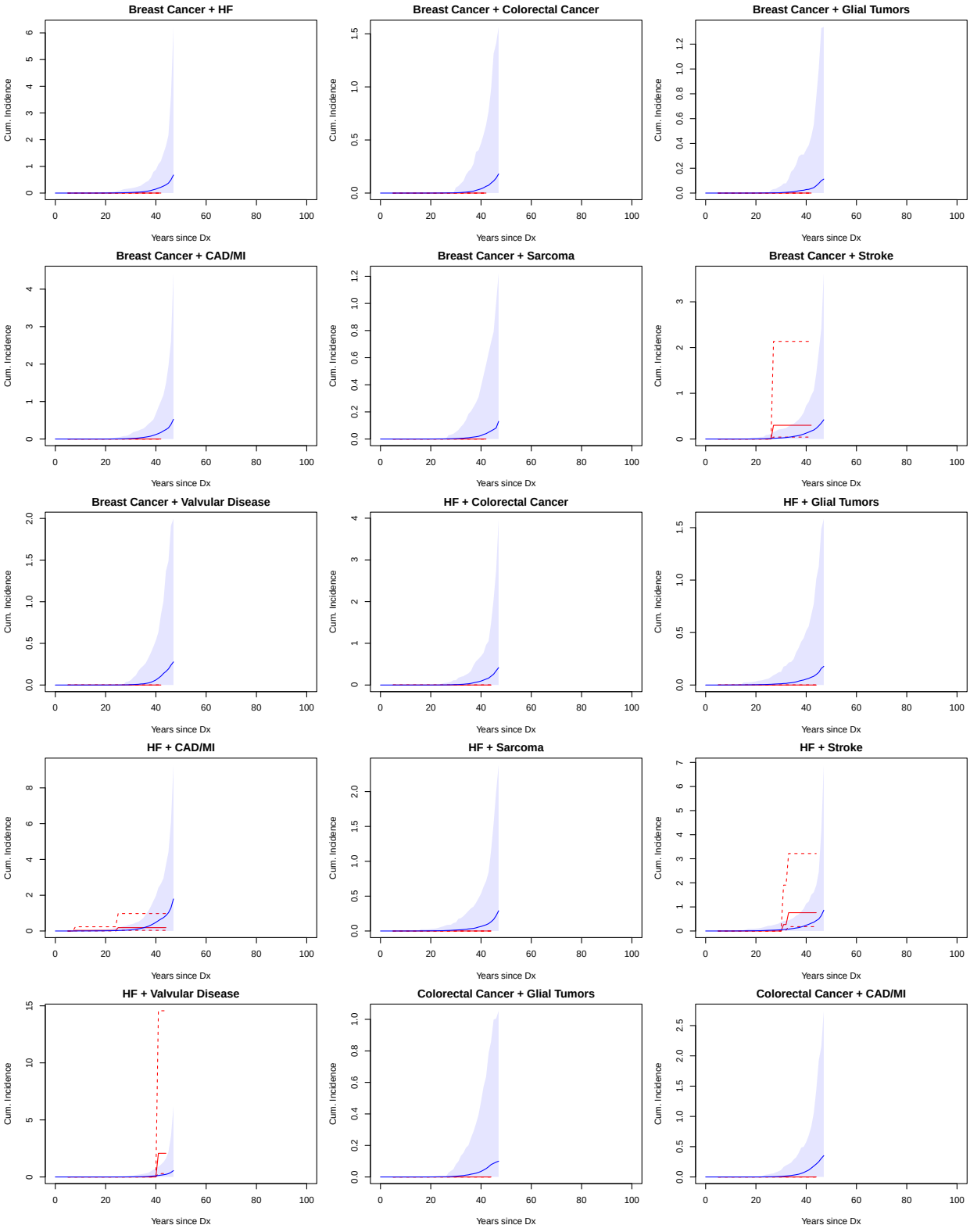

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

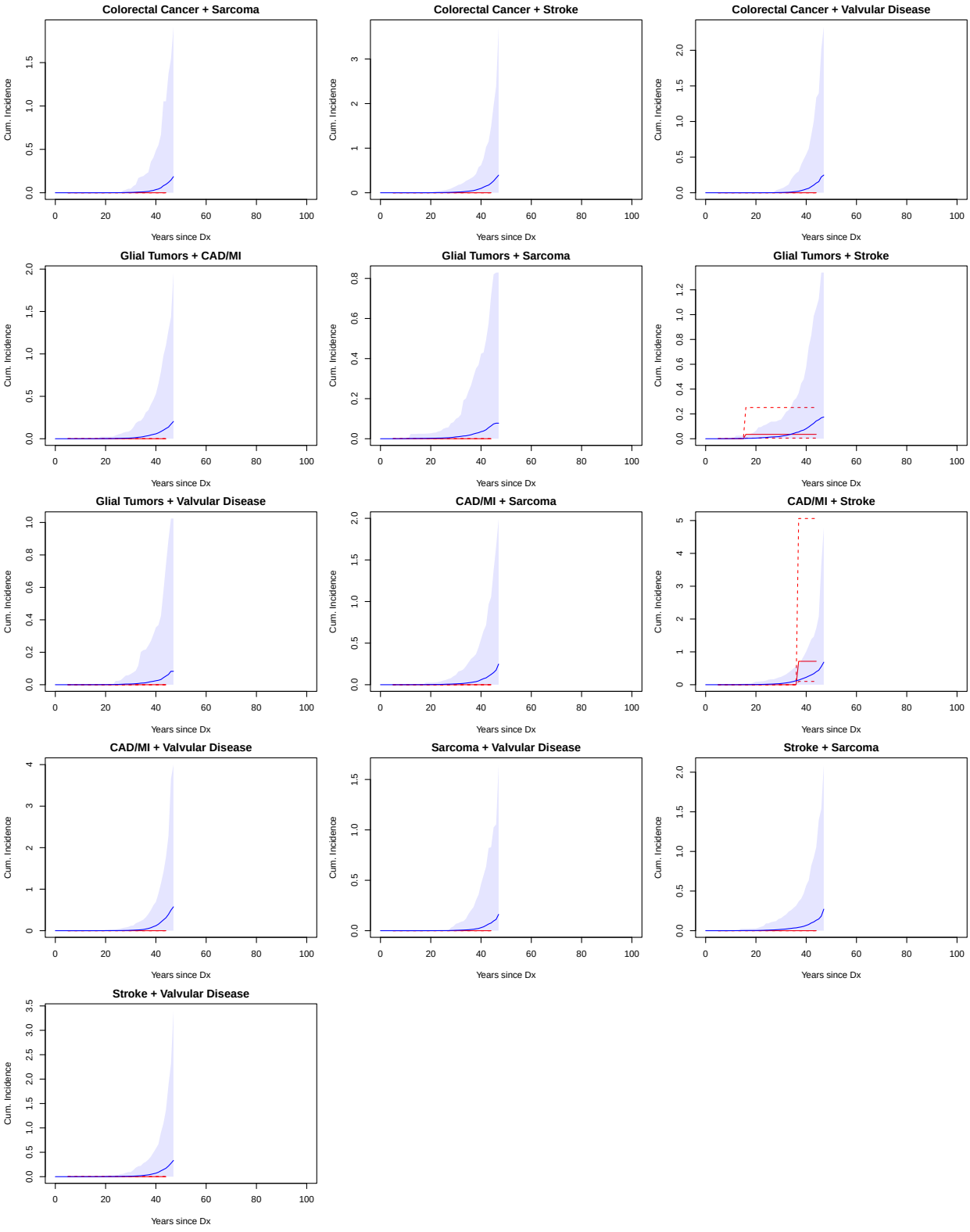
6.5.4.16 Lymphoma



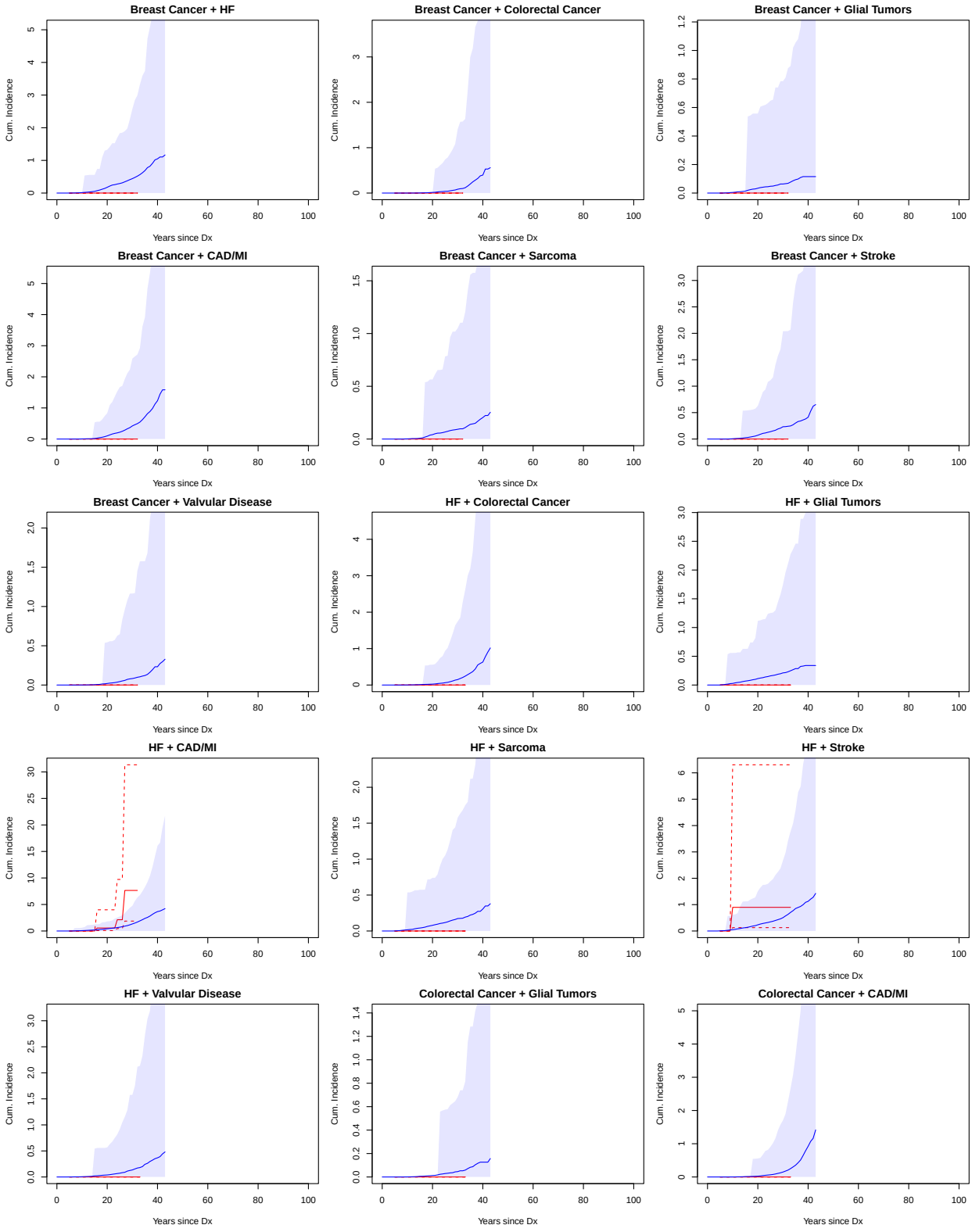

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

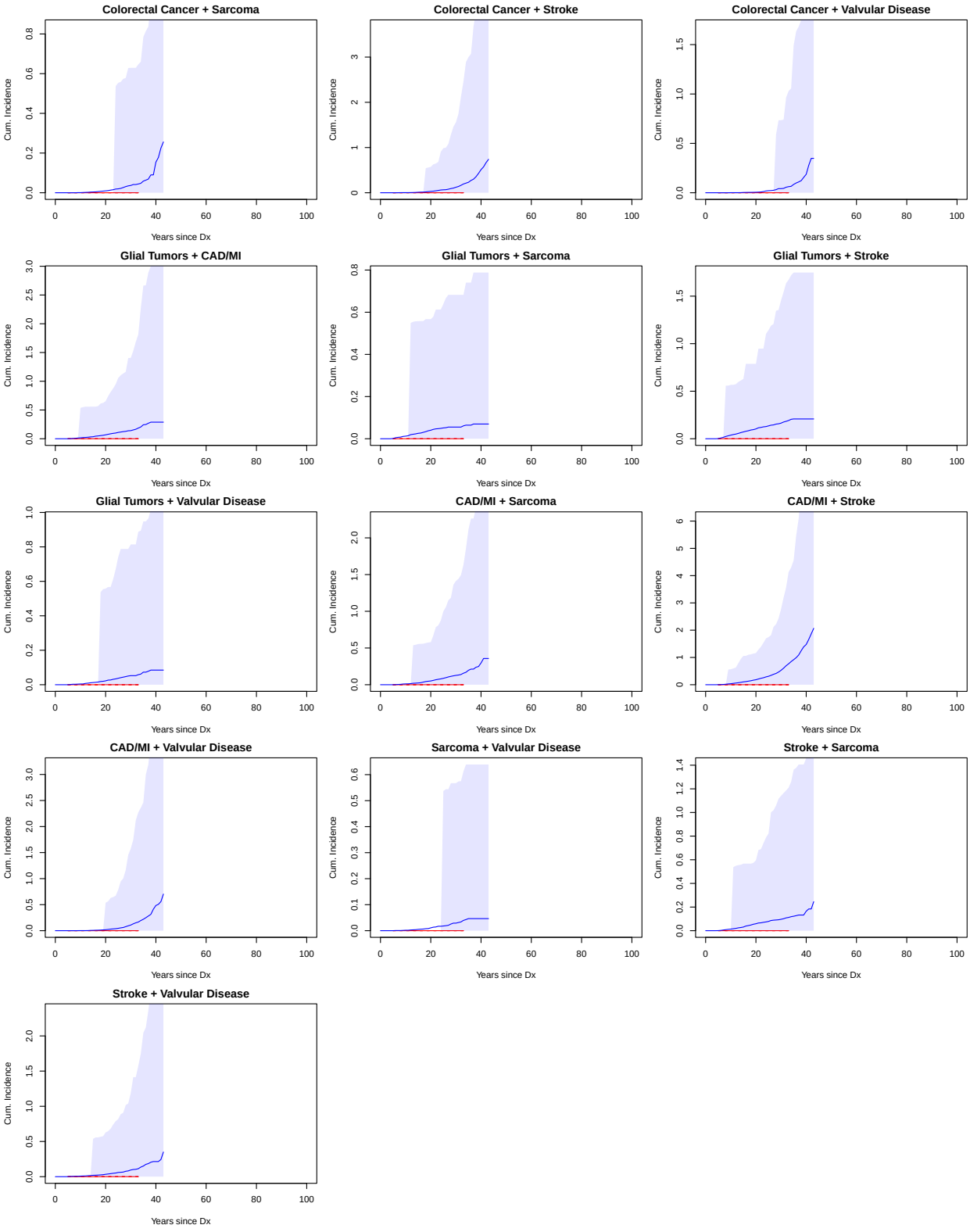
6.5.4.17 ALL


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

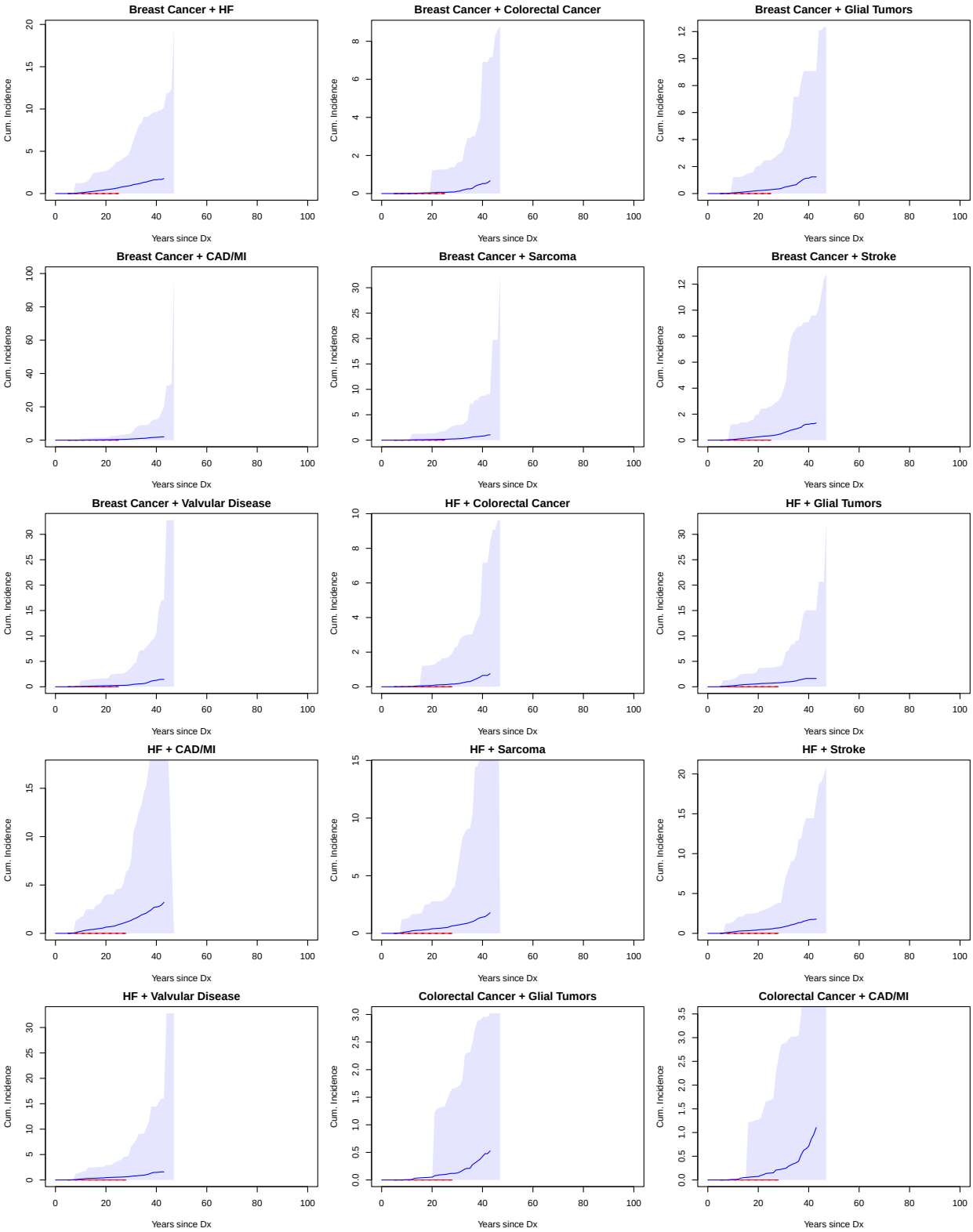

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

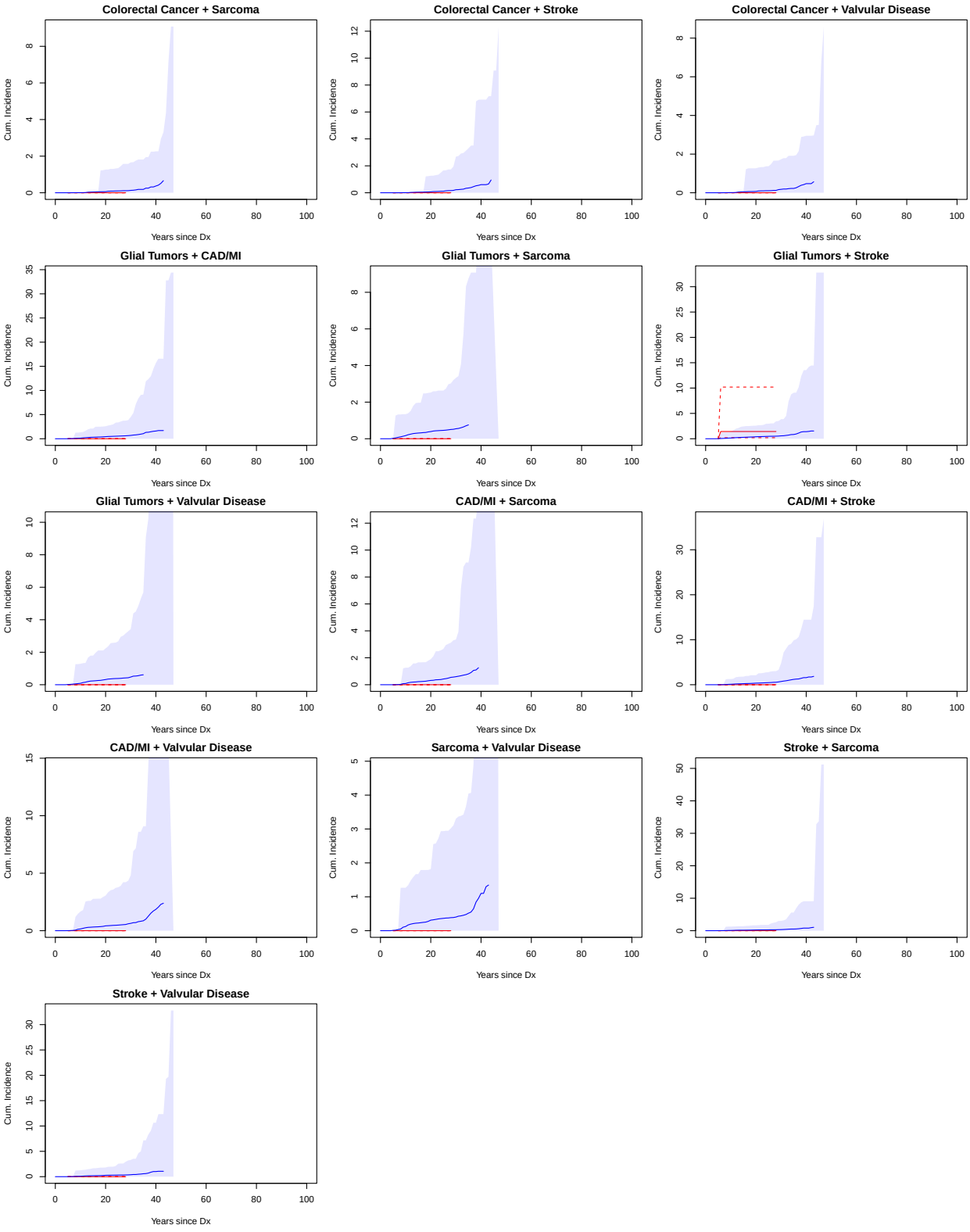
6.5.4.18 AML


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

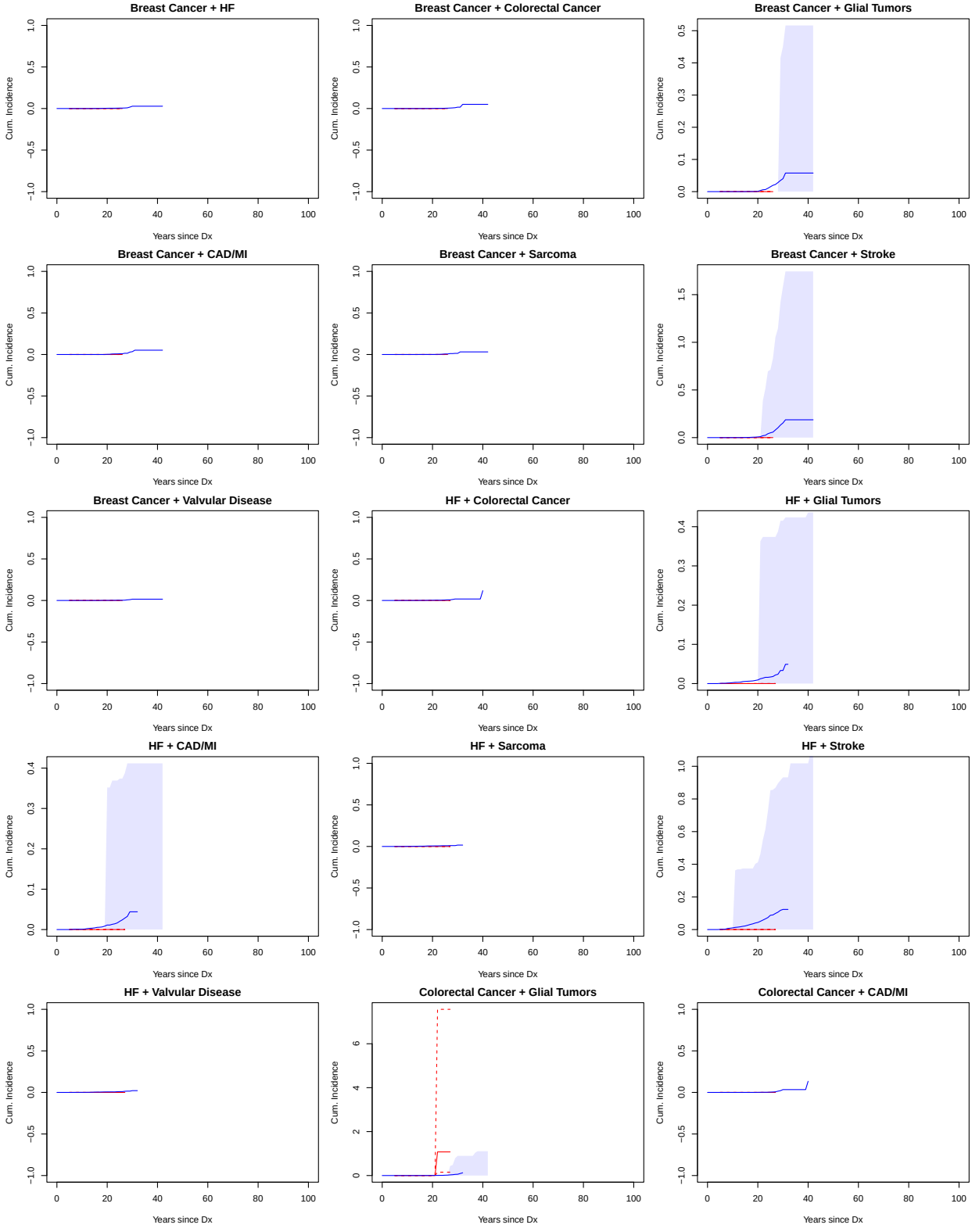

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

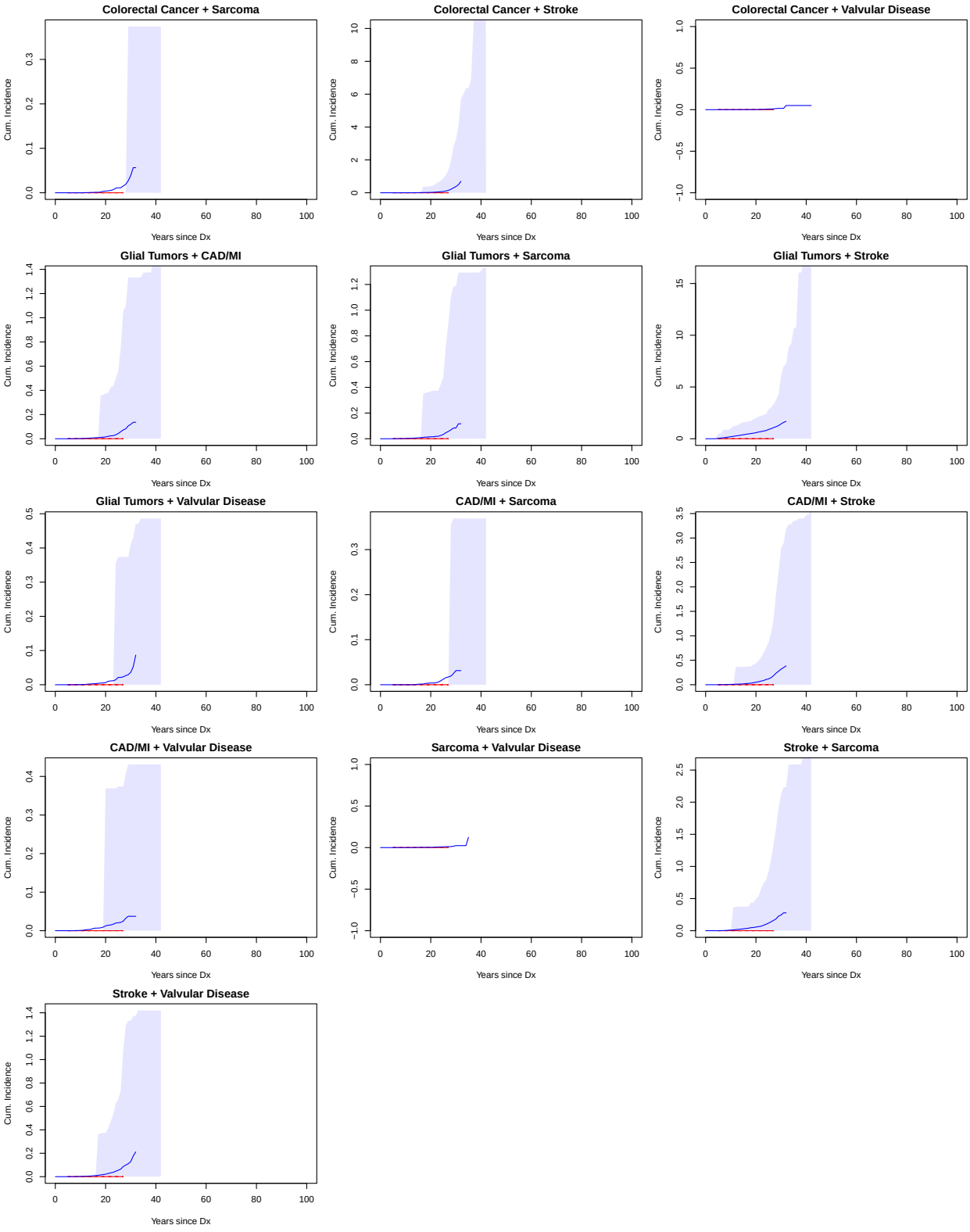
6.5.4.19 OtherLeukemia



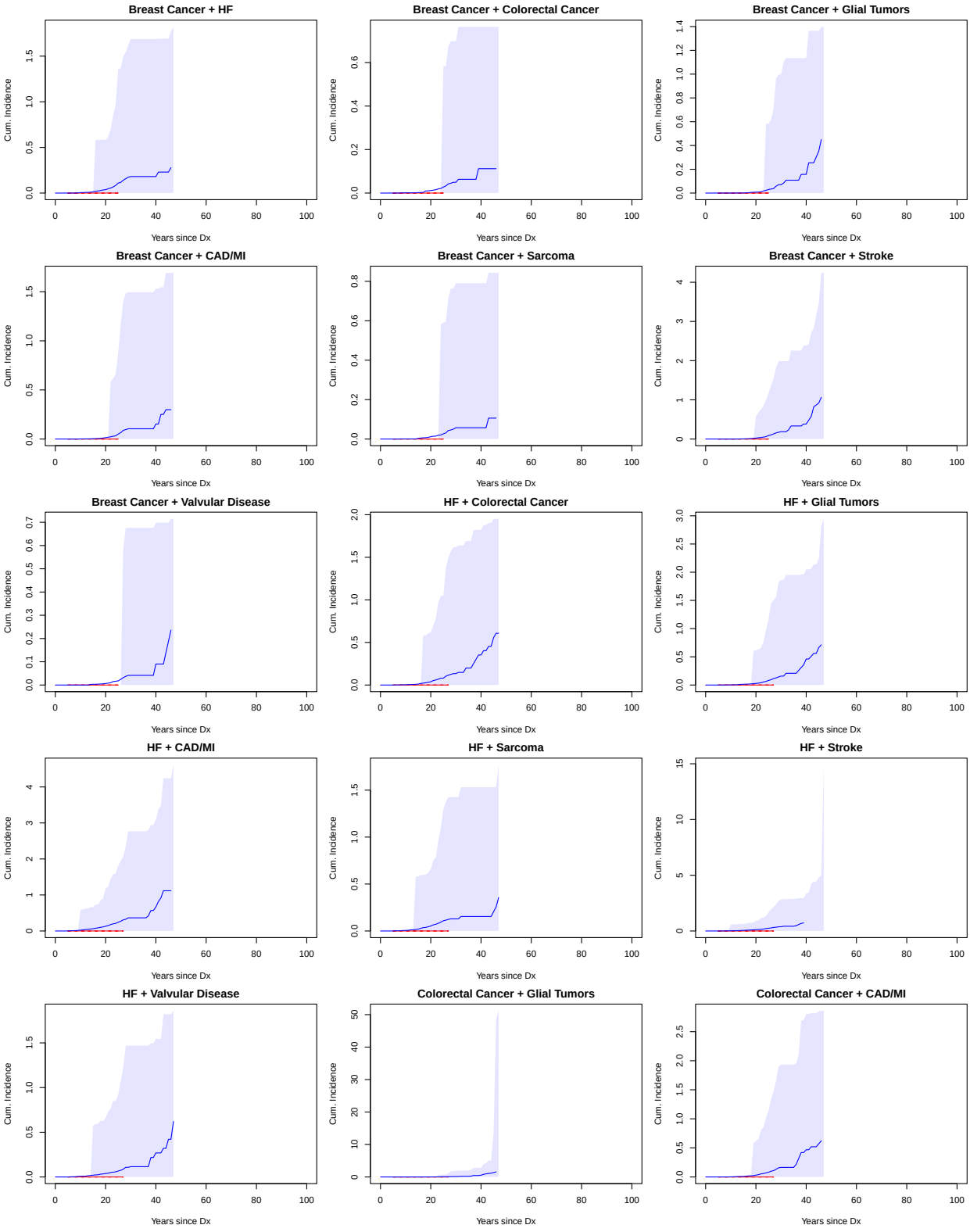

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

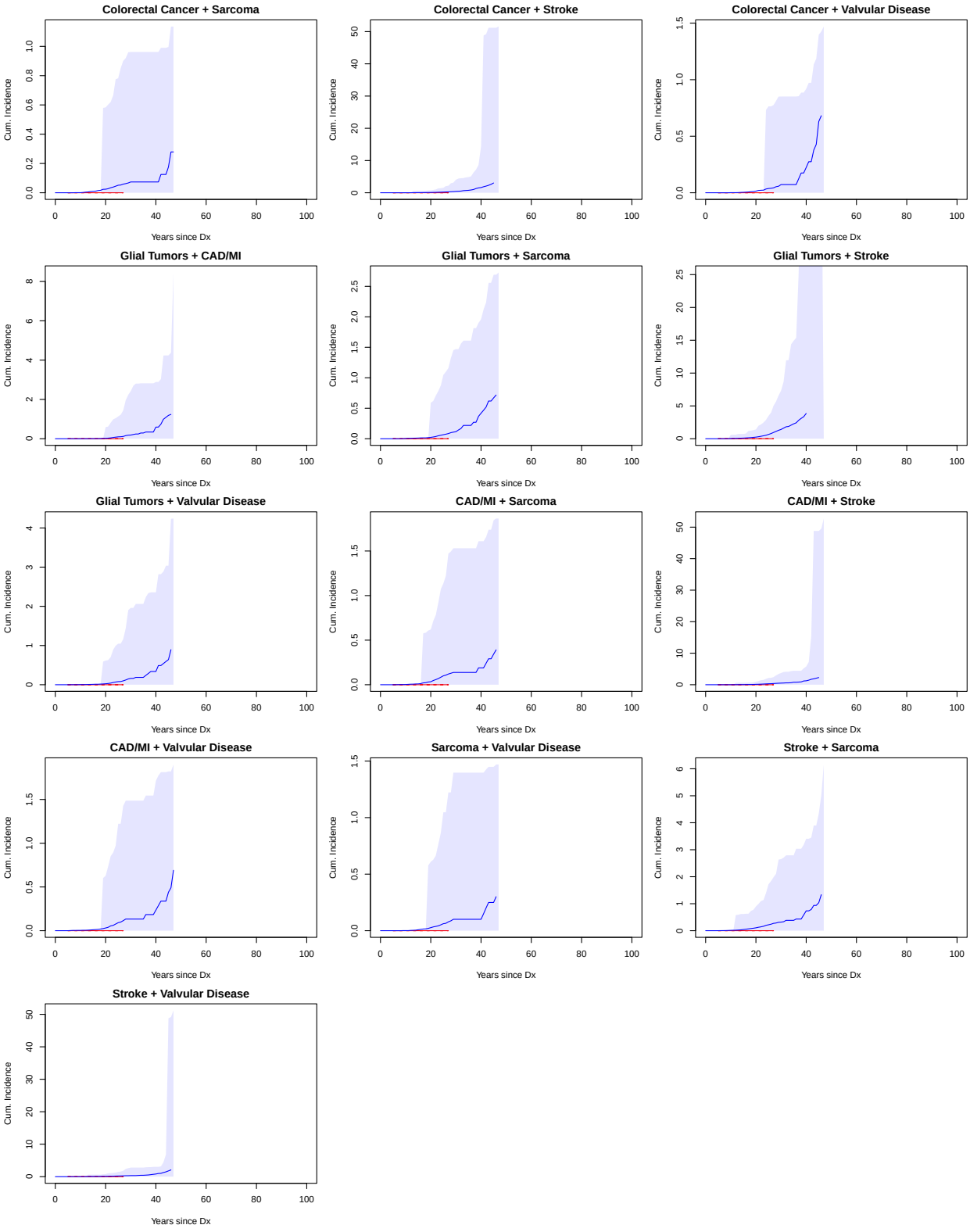
6.5.4.20 Astrocytoma



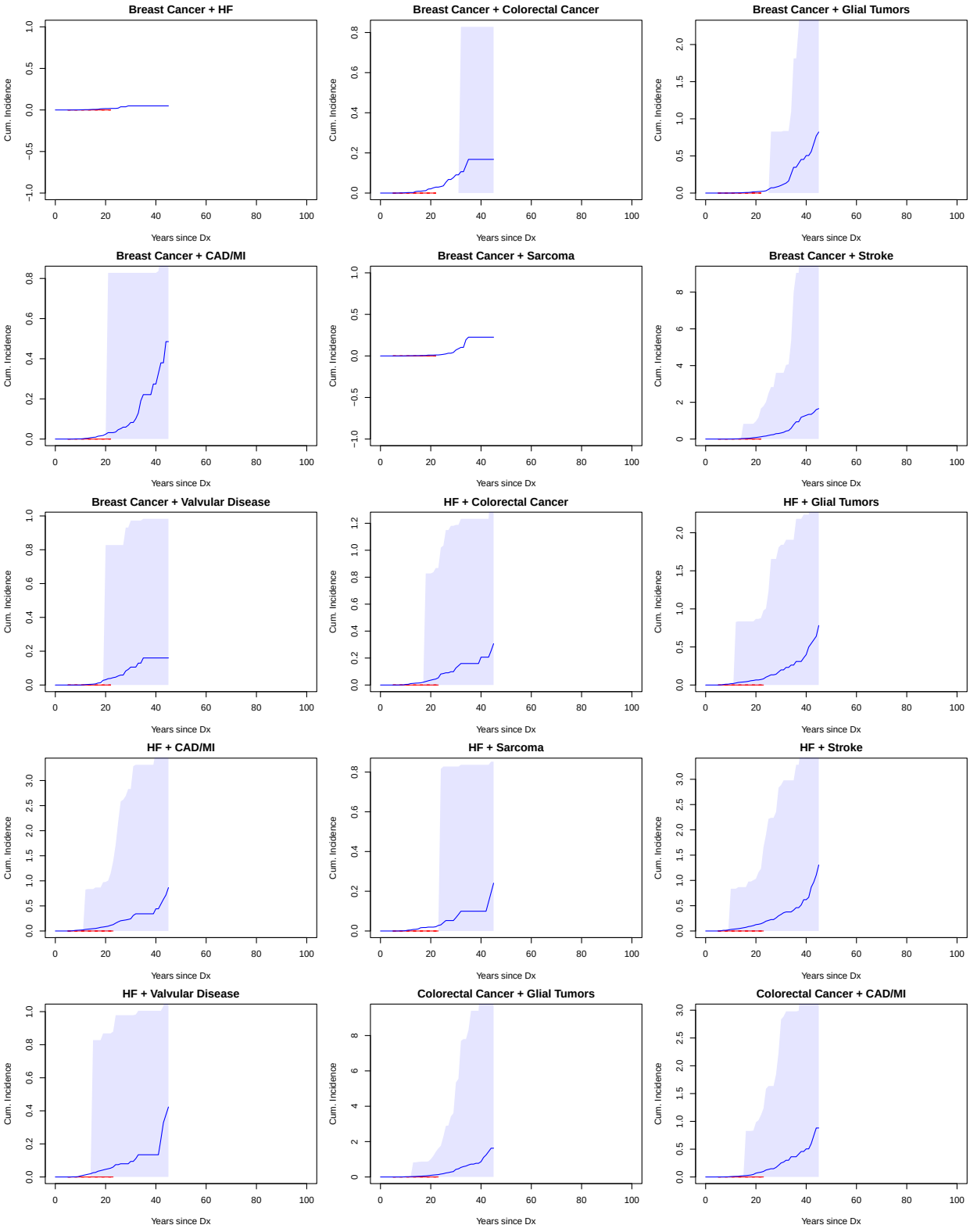

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

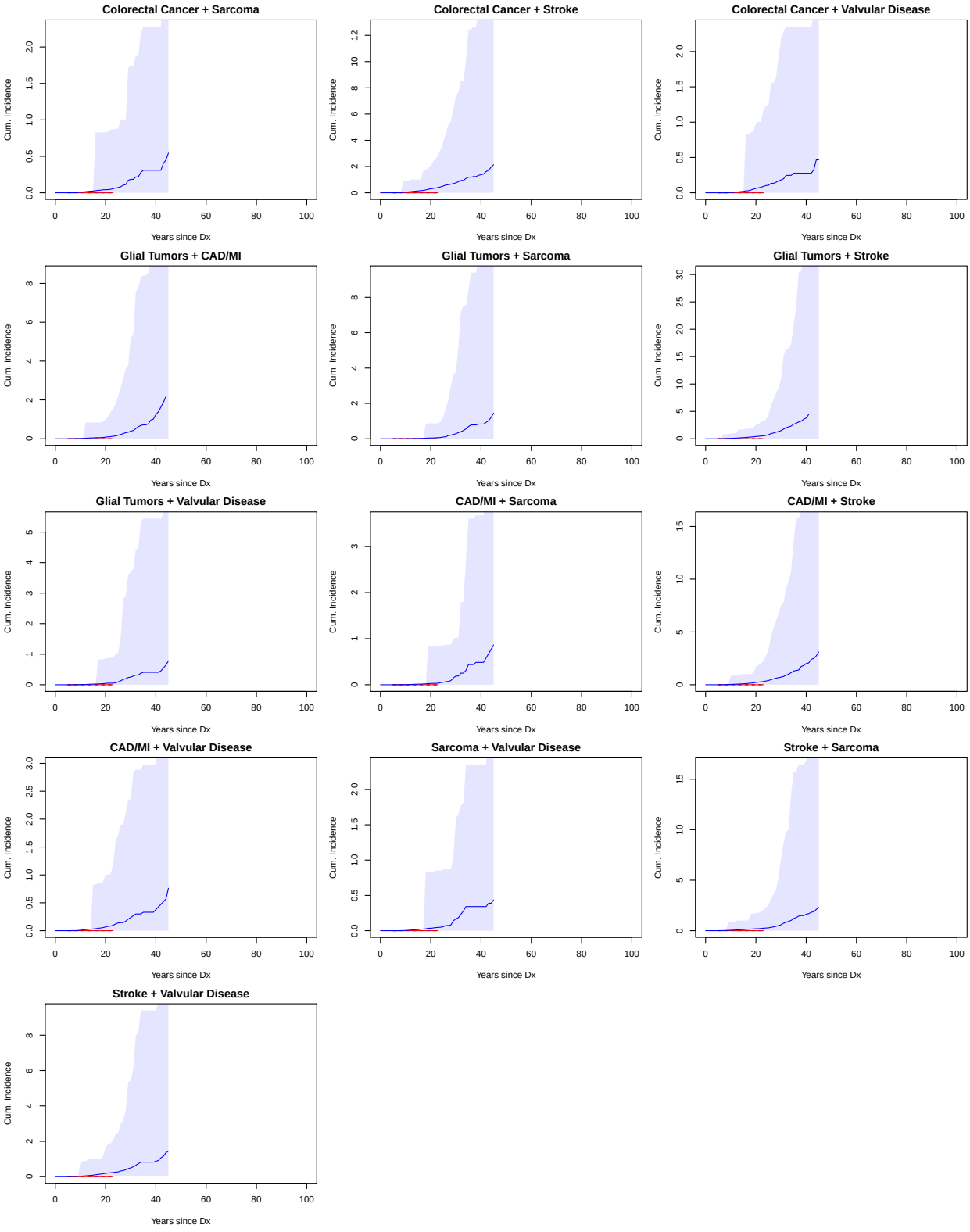
6.5.4.21 Medulloblastoma



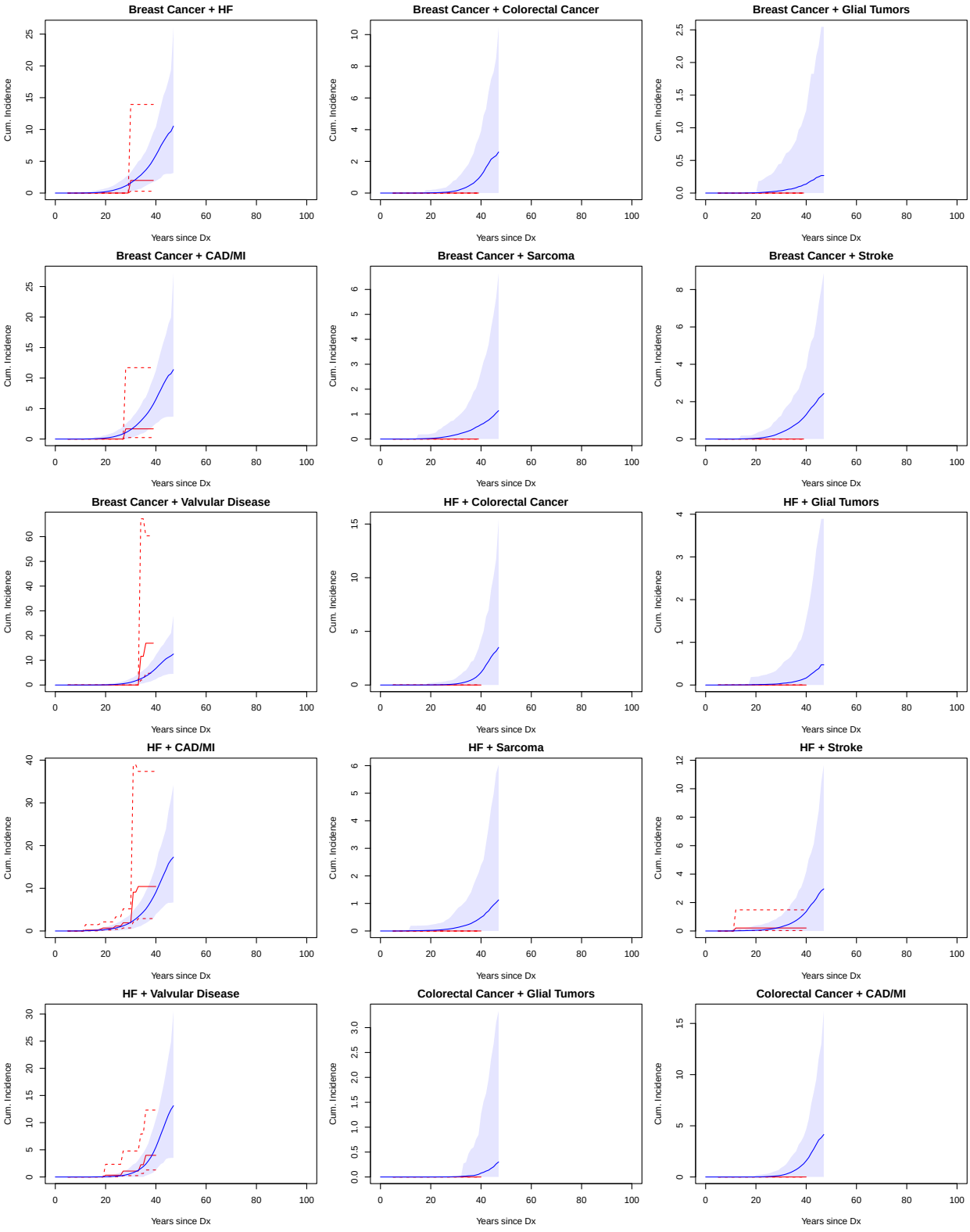

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

6.5.4.22 Other CNS




Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

6.5.4.23 HL


Breast Cancer + HF
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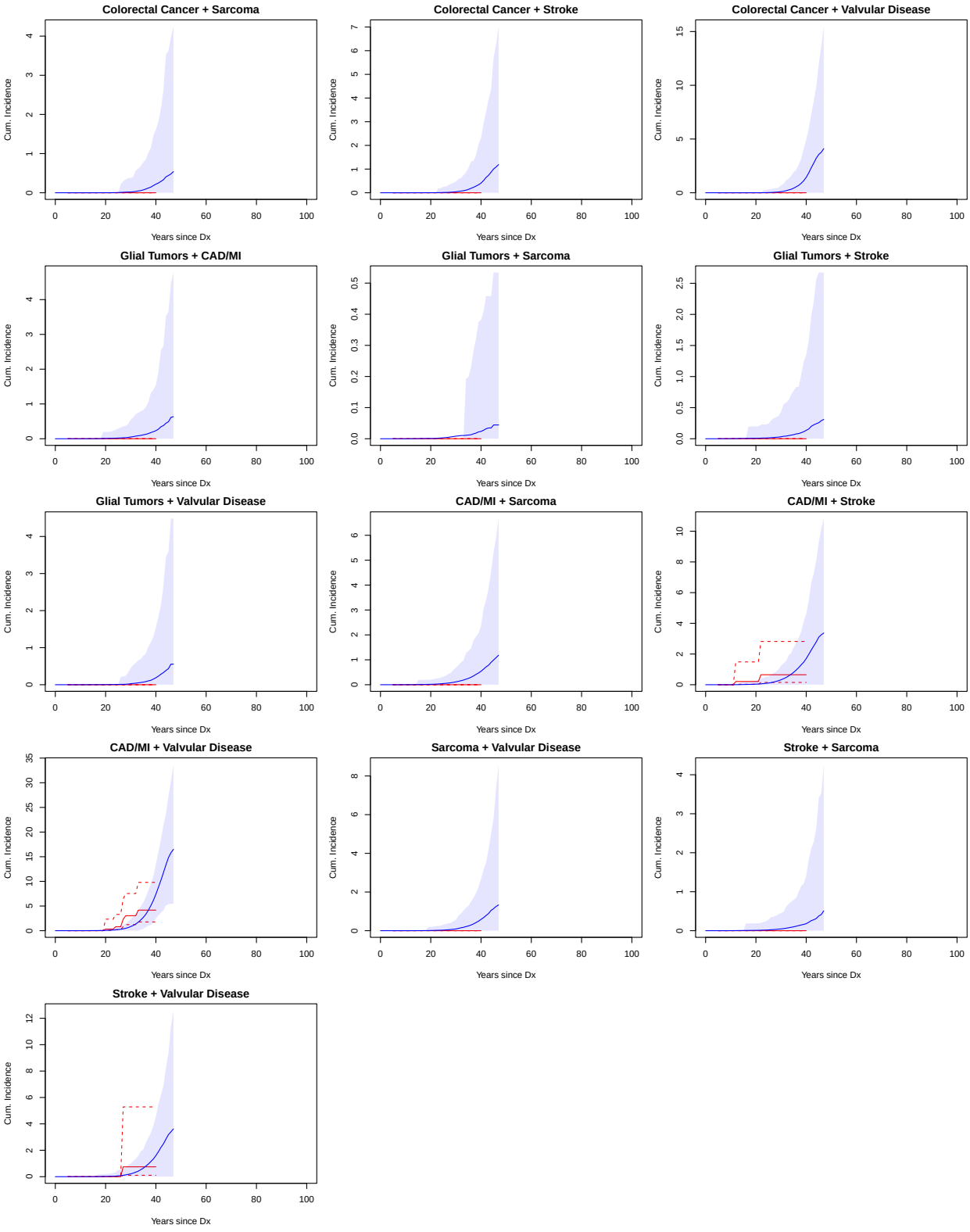
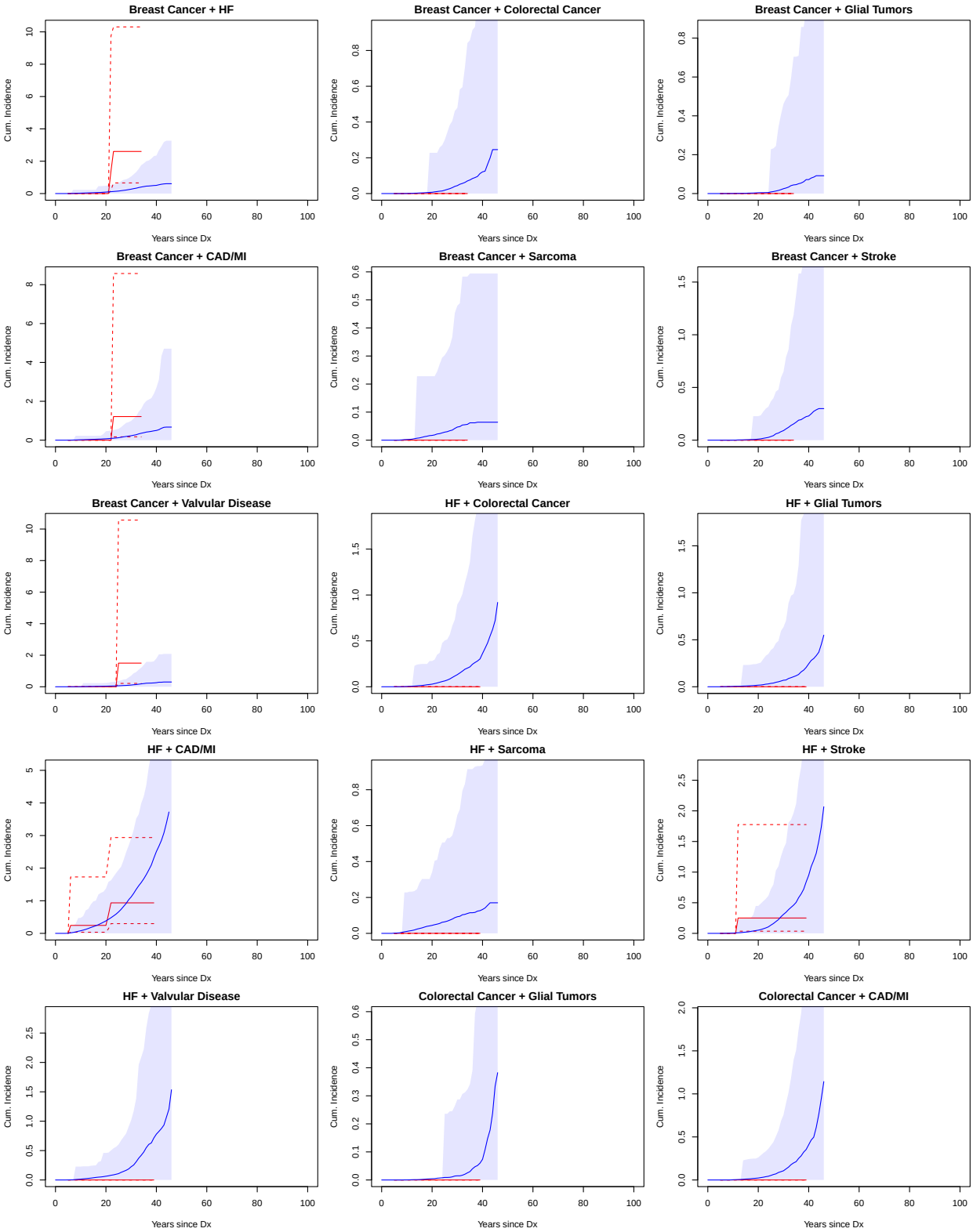
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx


Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

6.5.4.24 NHL


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
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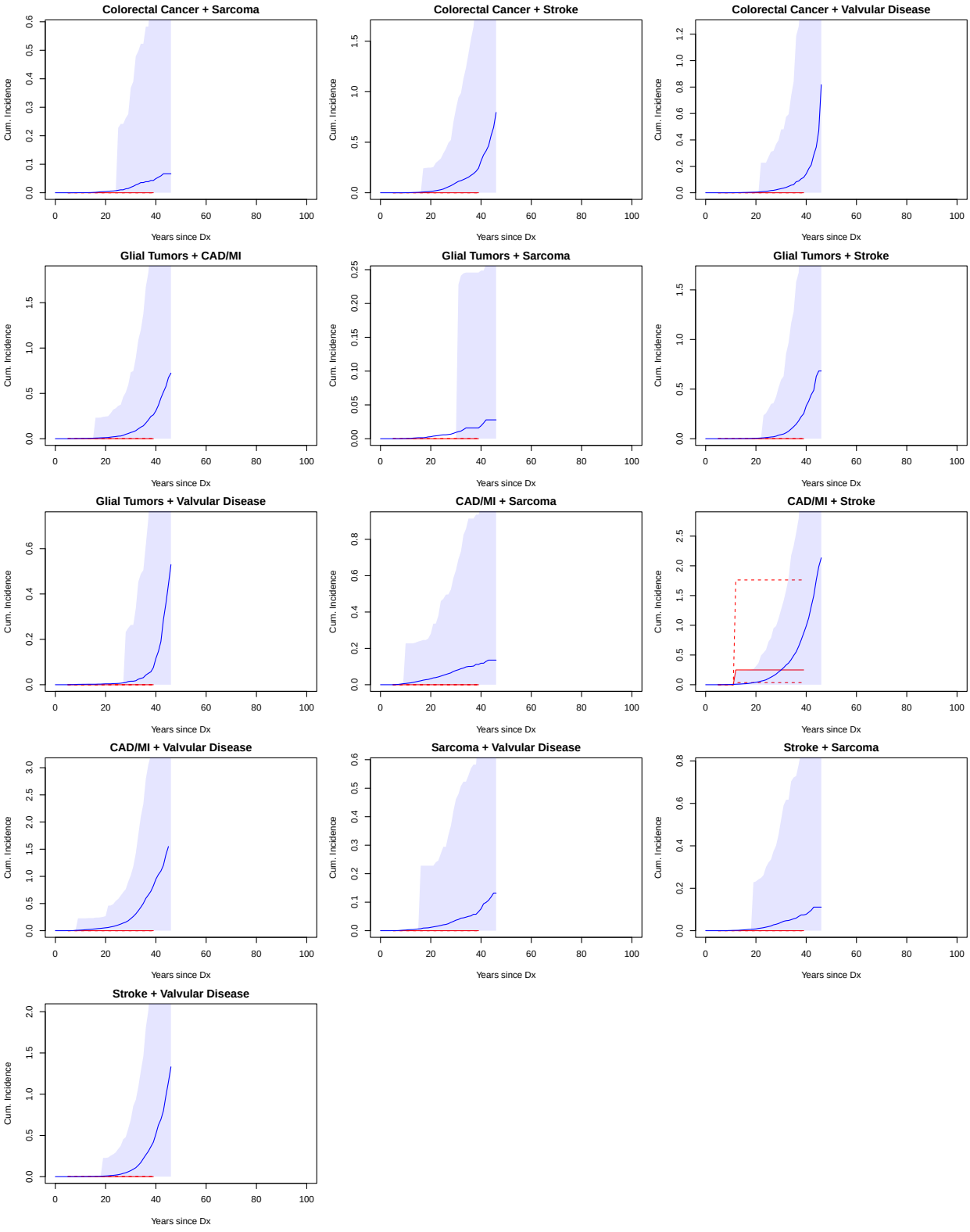
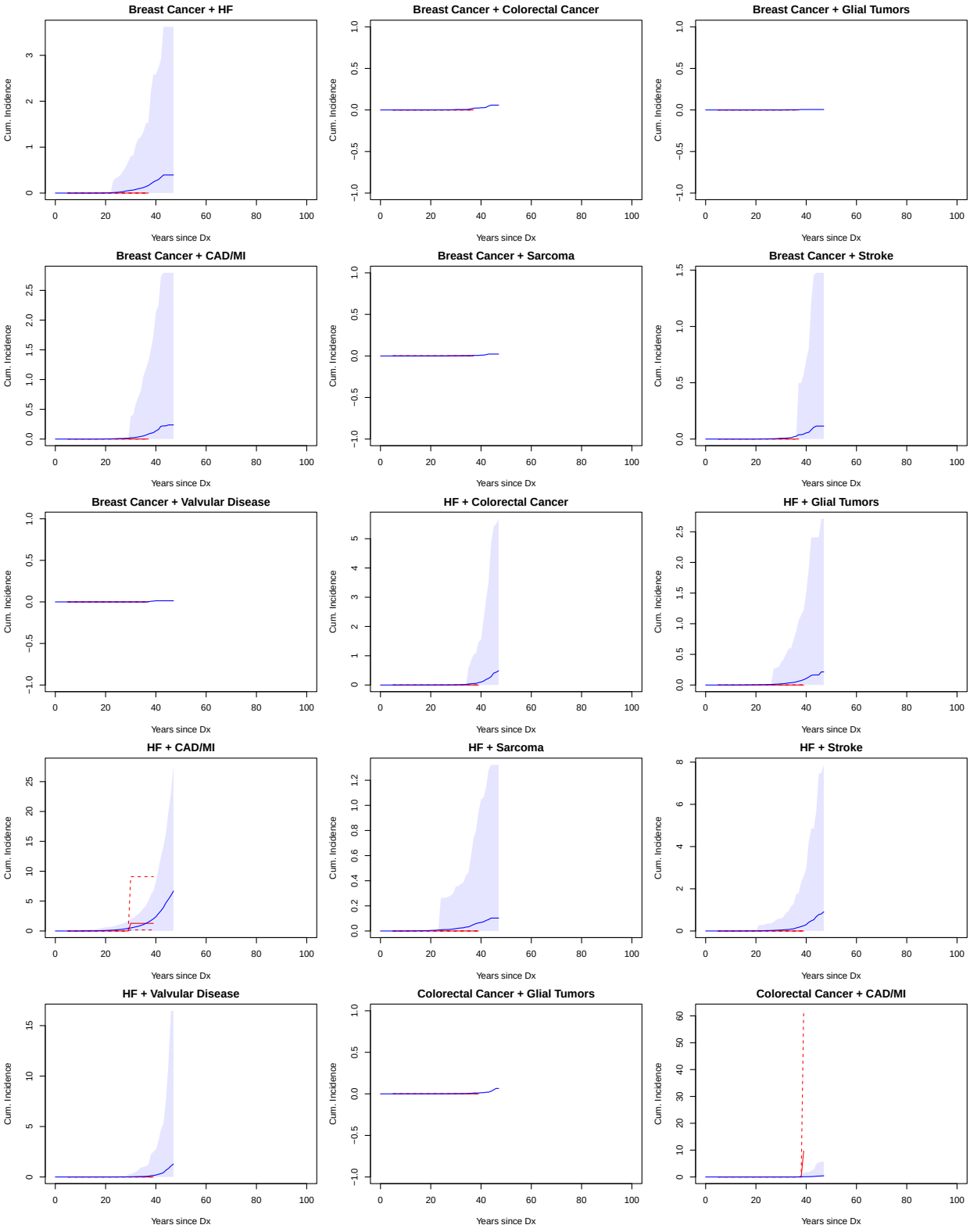
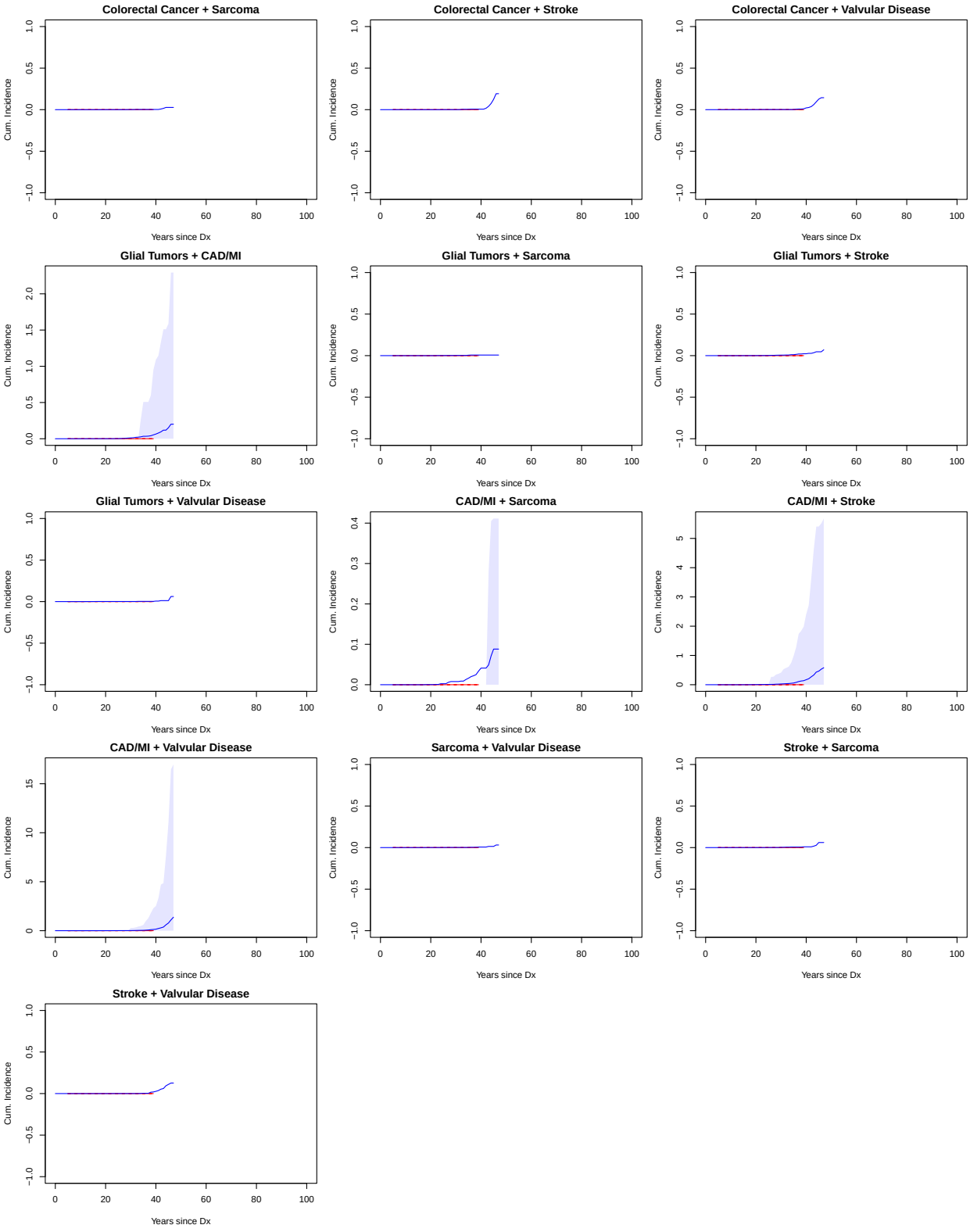
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

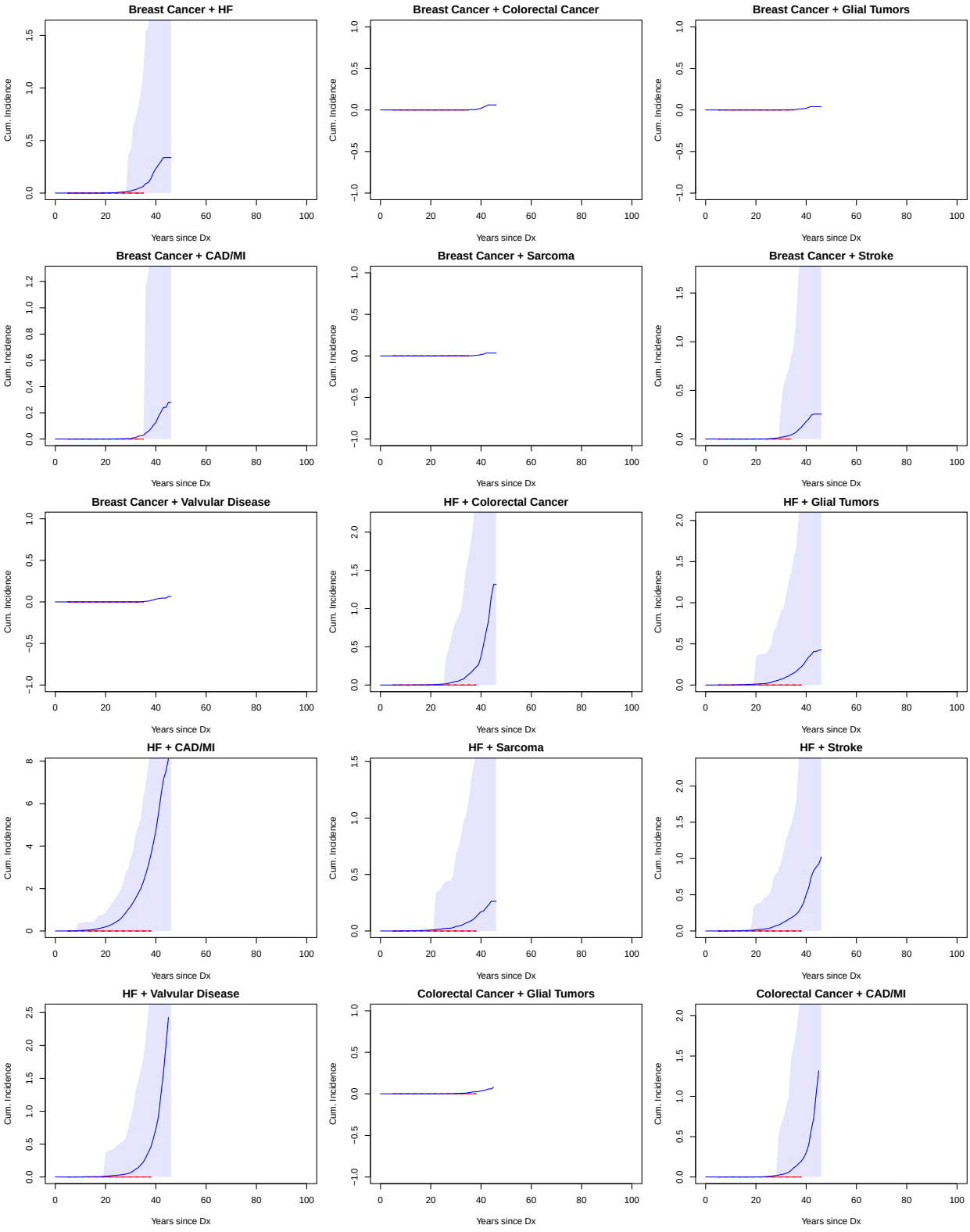

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

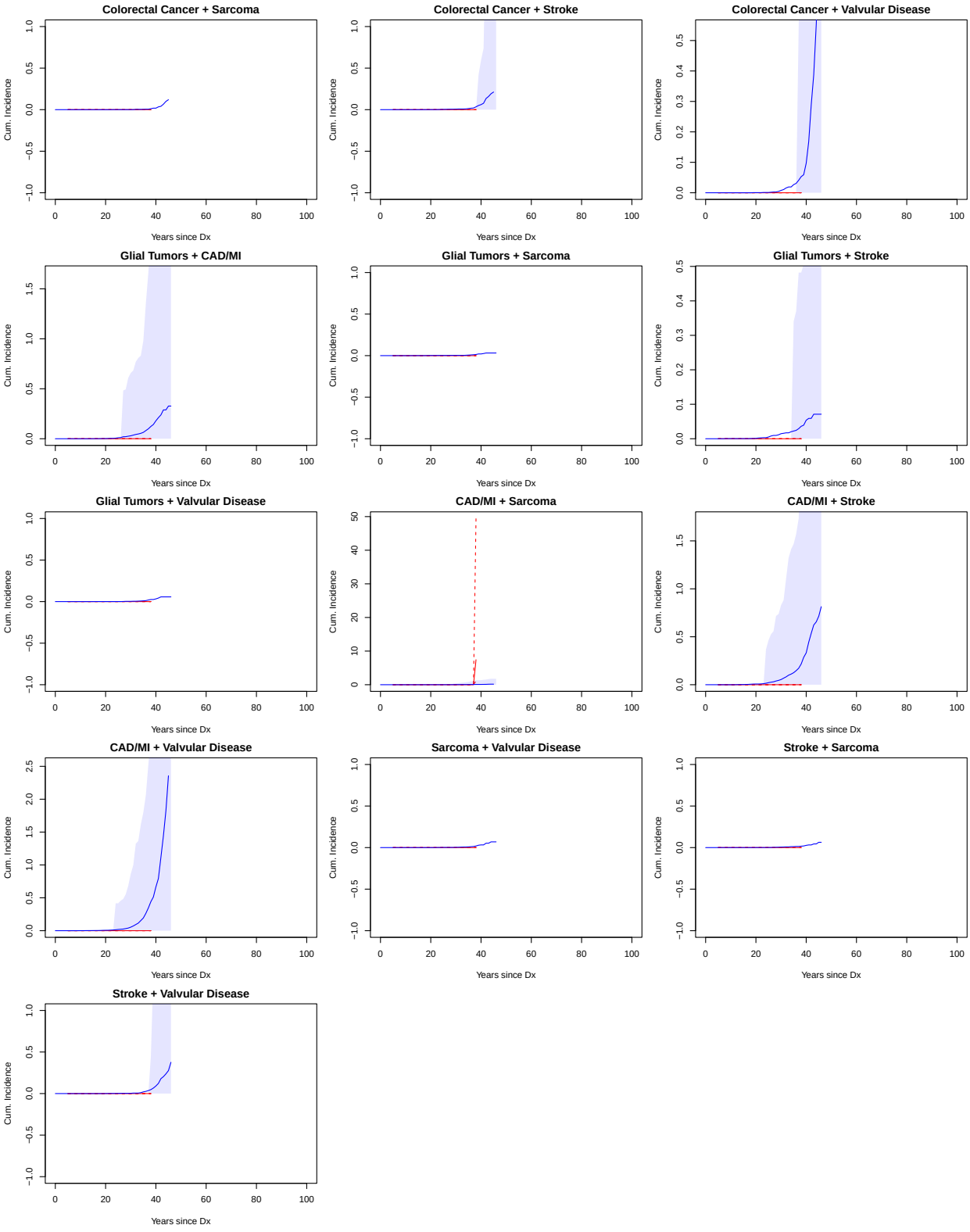
6.5.4.25 WT


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

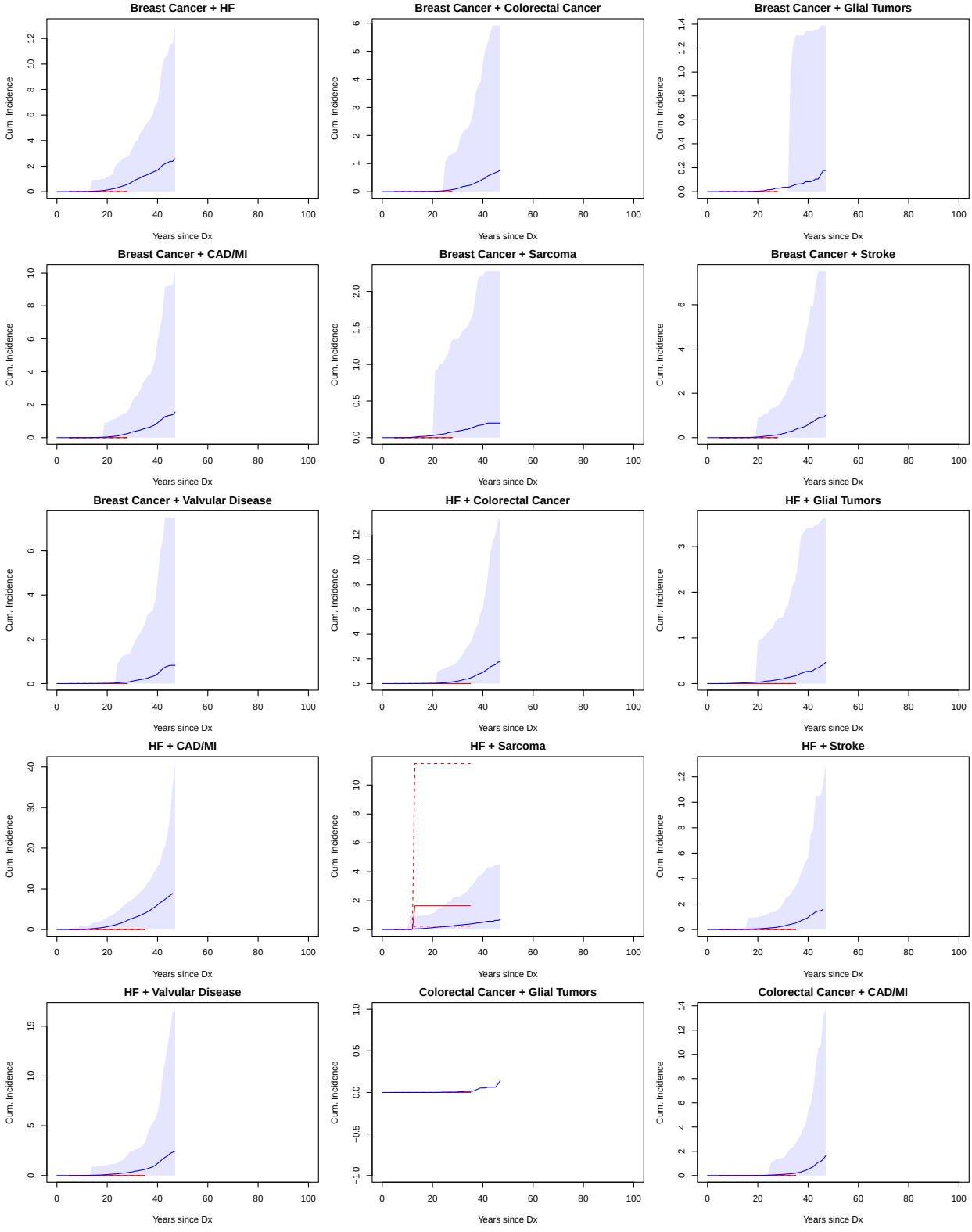

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

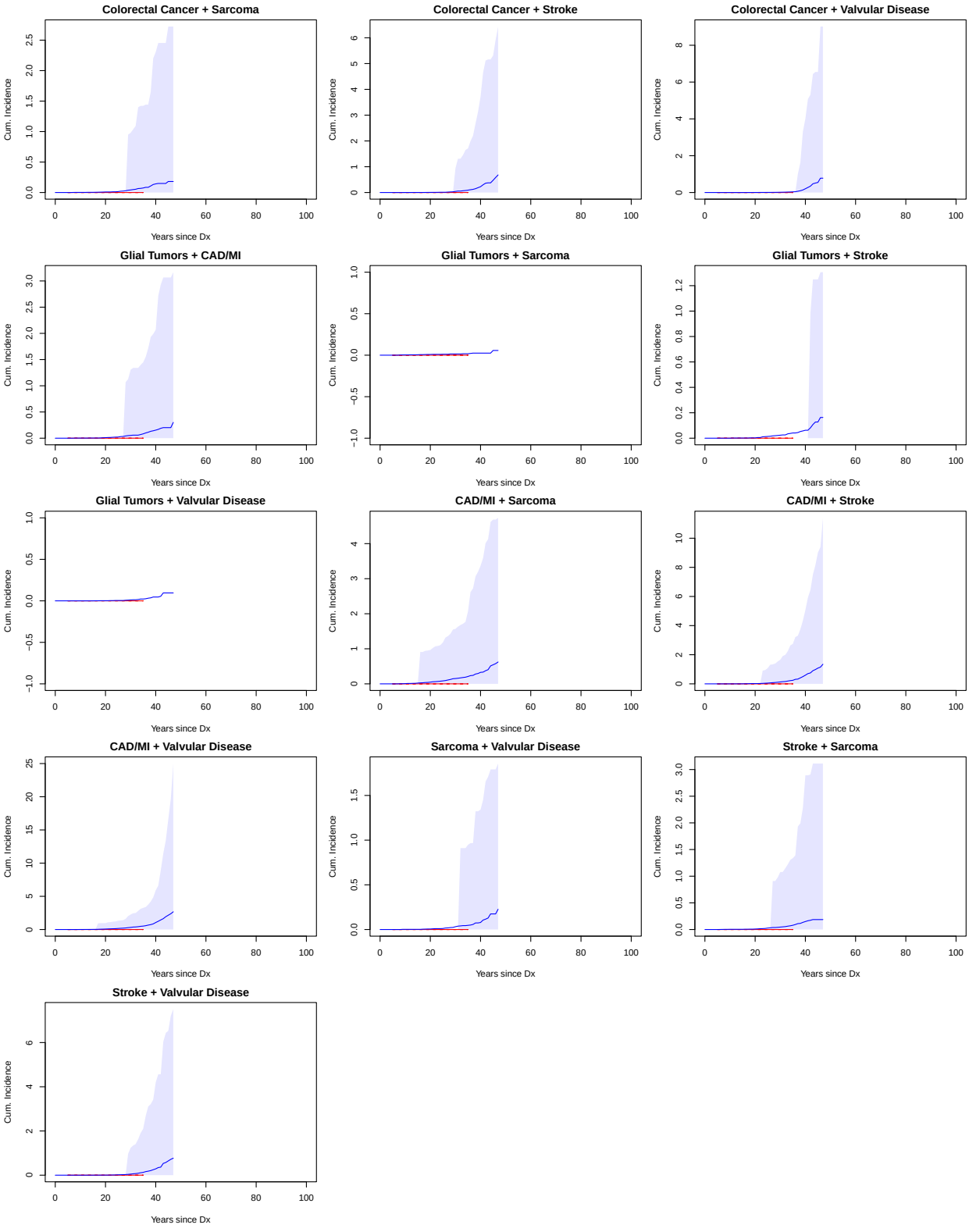
6.5.4.26 NBL


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

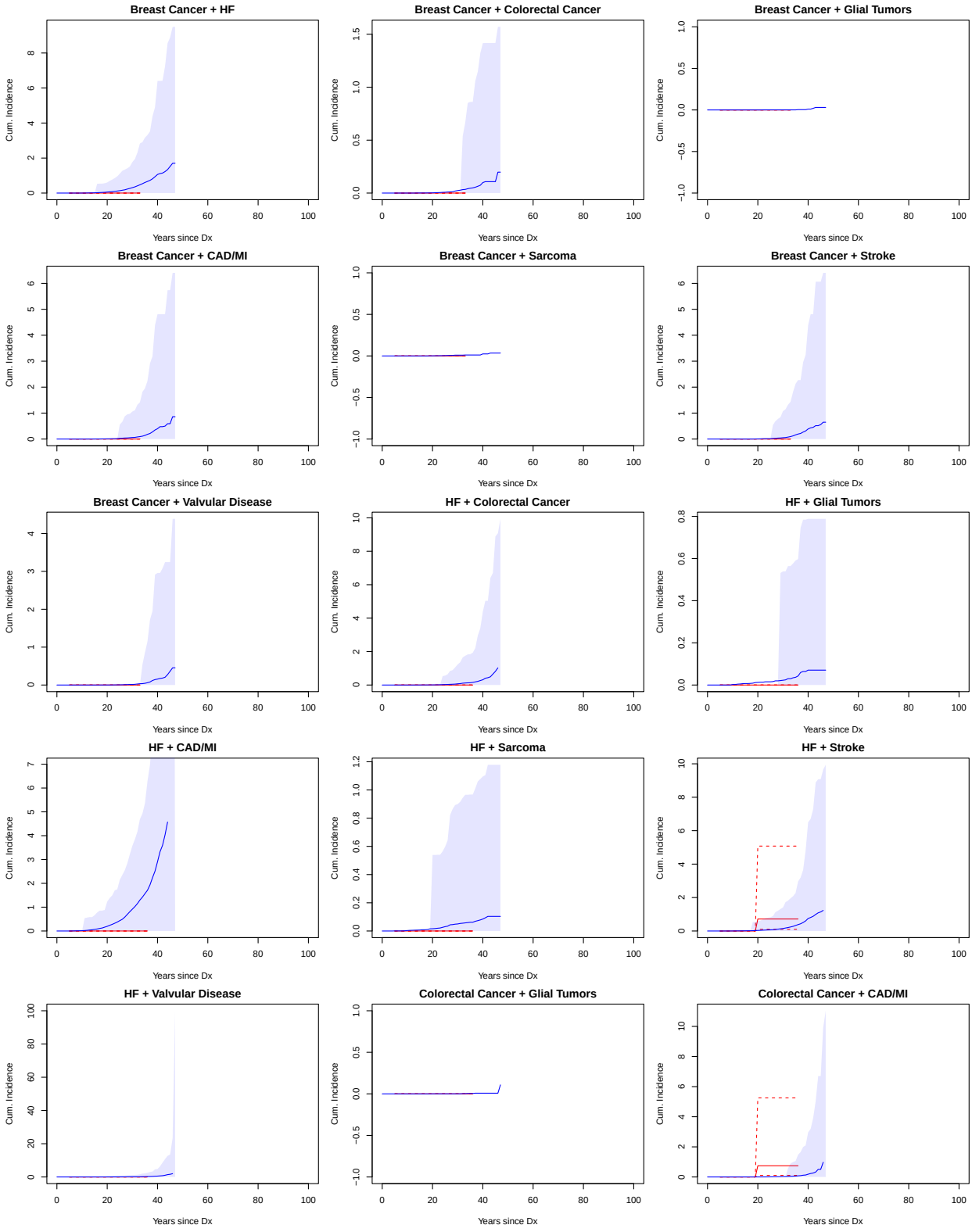

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

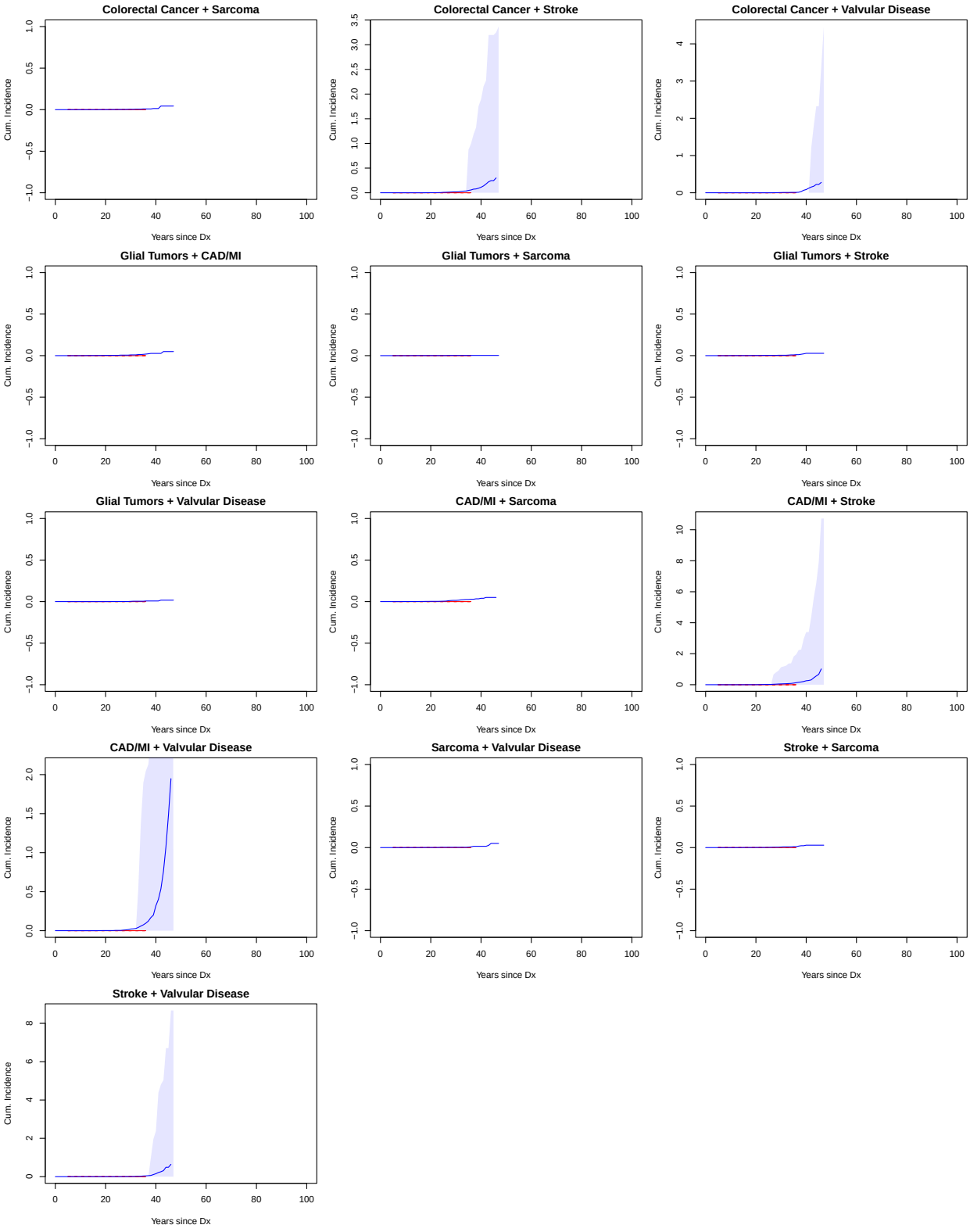
6.5.4.27 Ewings



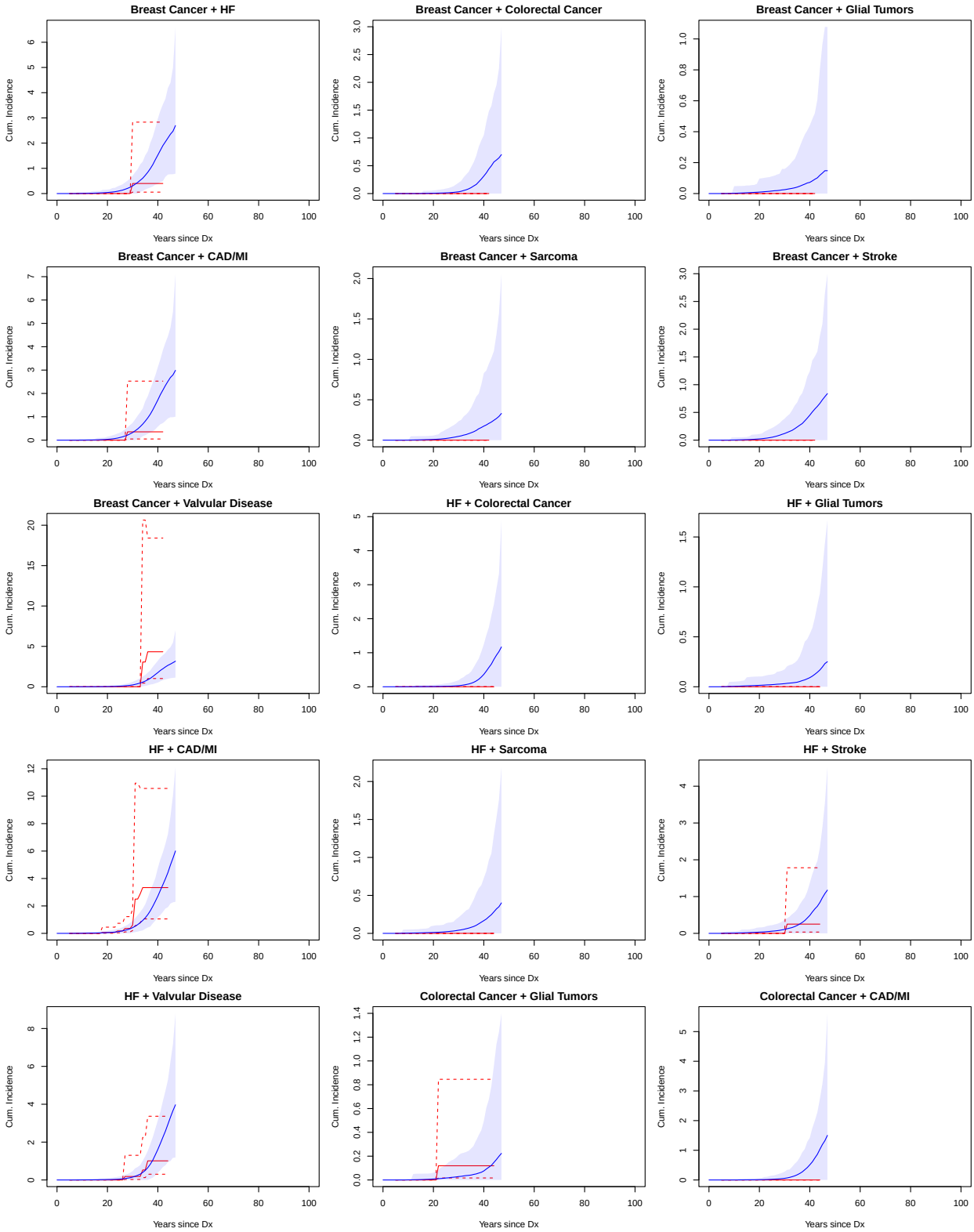

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

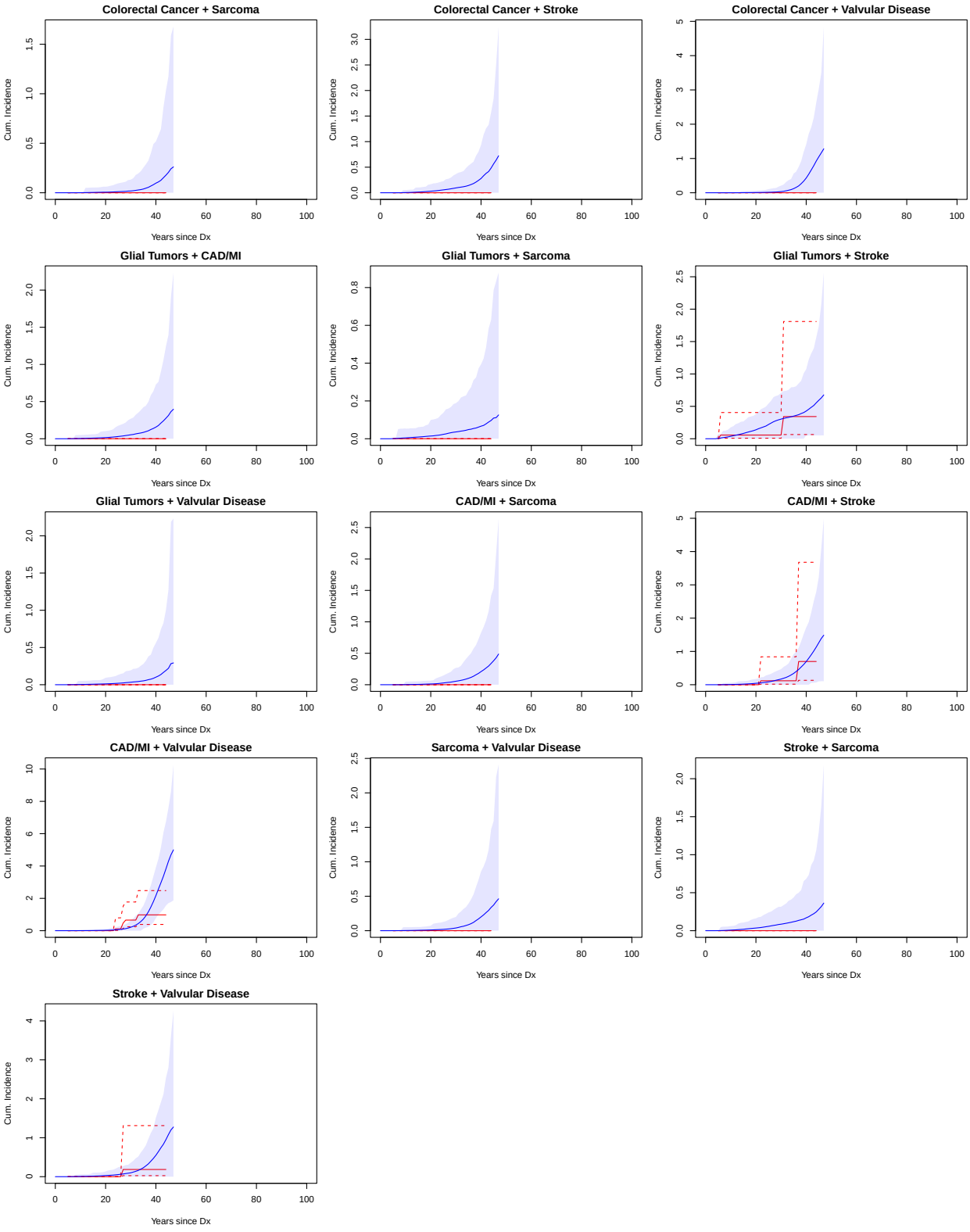
6.5.4.28 Osteosarcoma



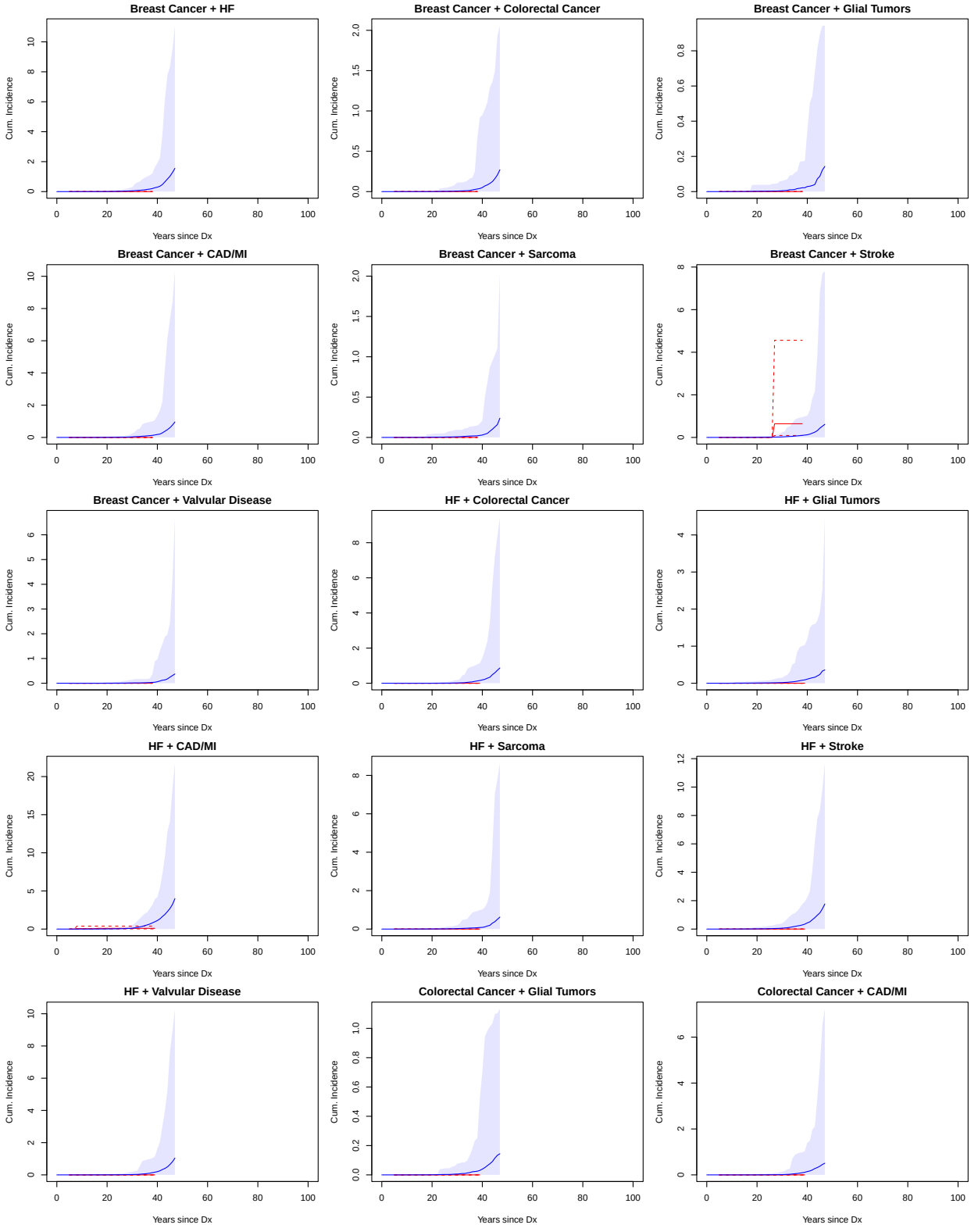

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

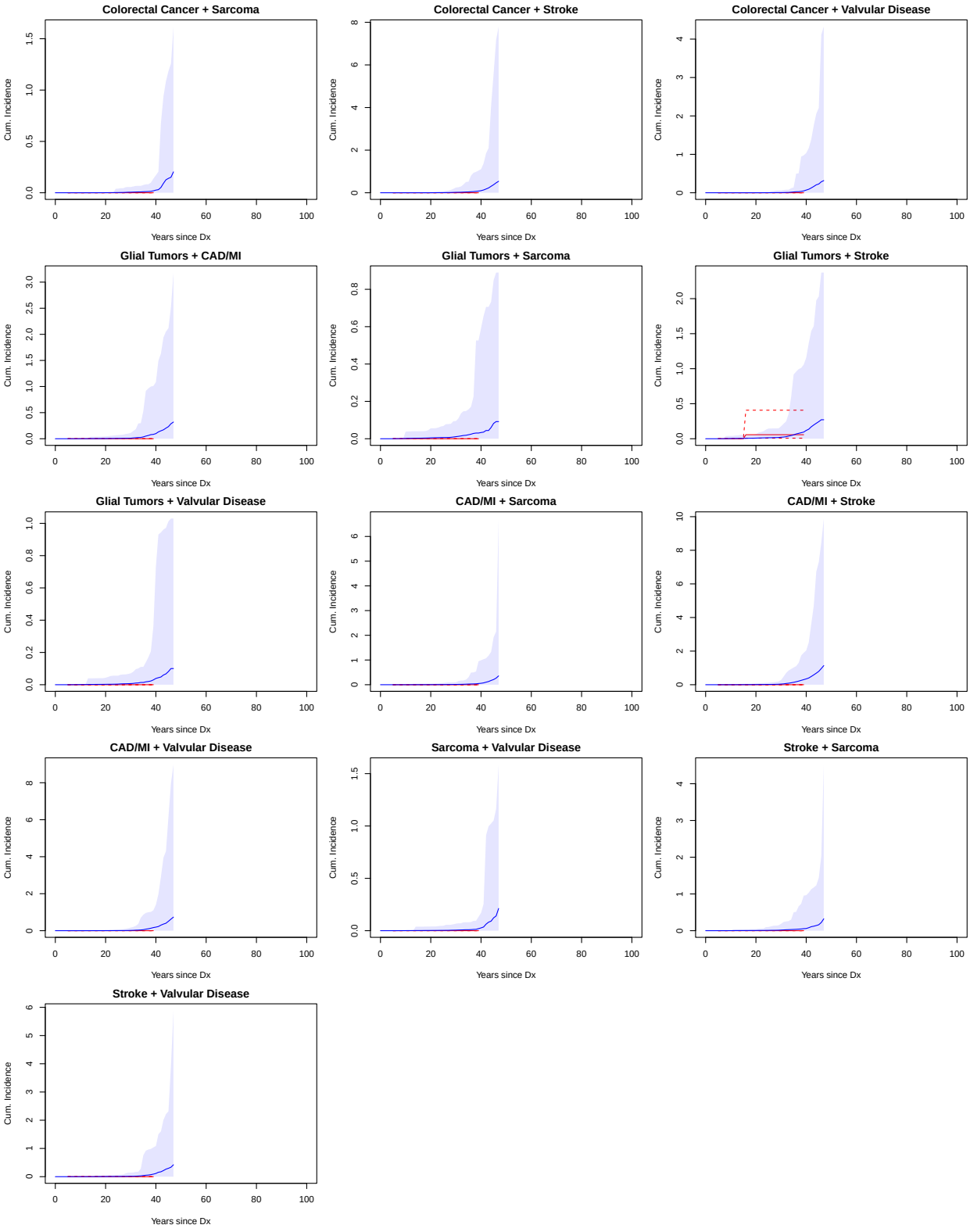
6.5.4.29 AnthNone



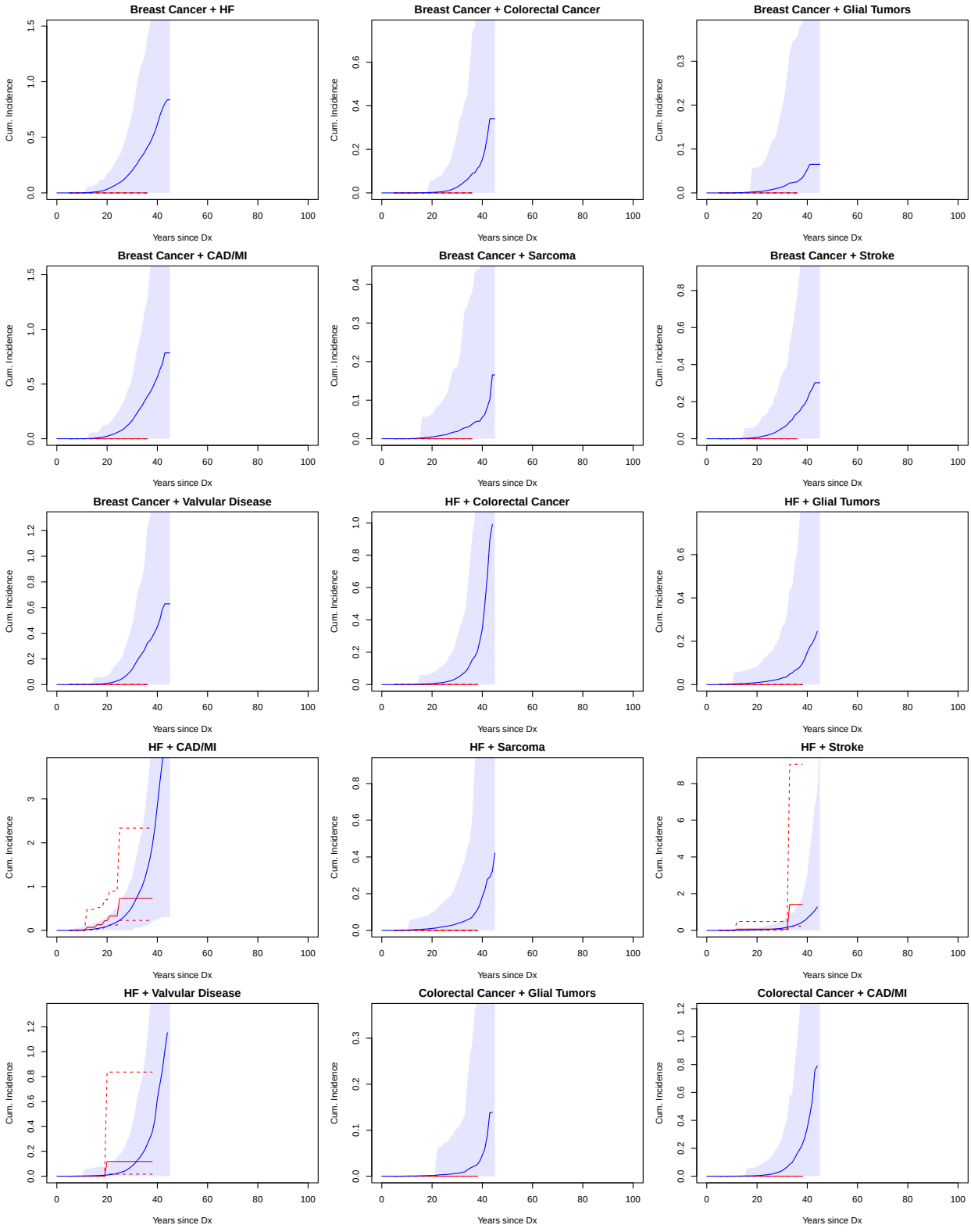

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

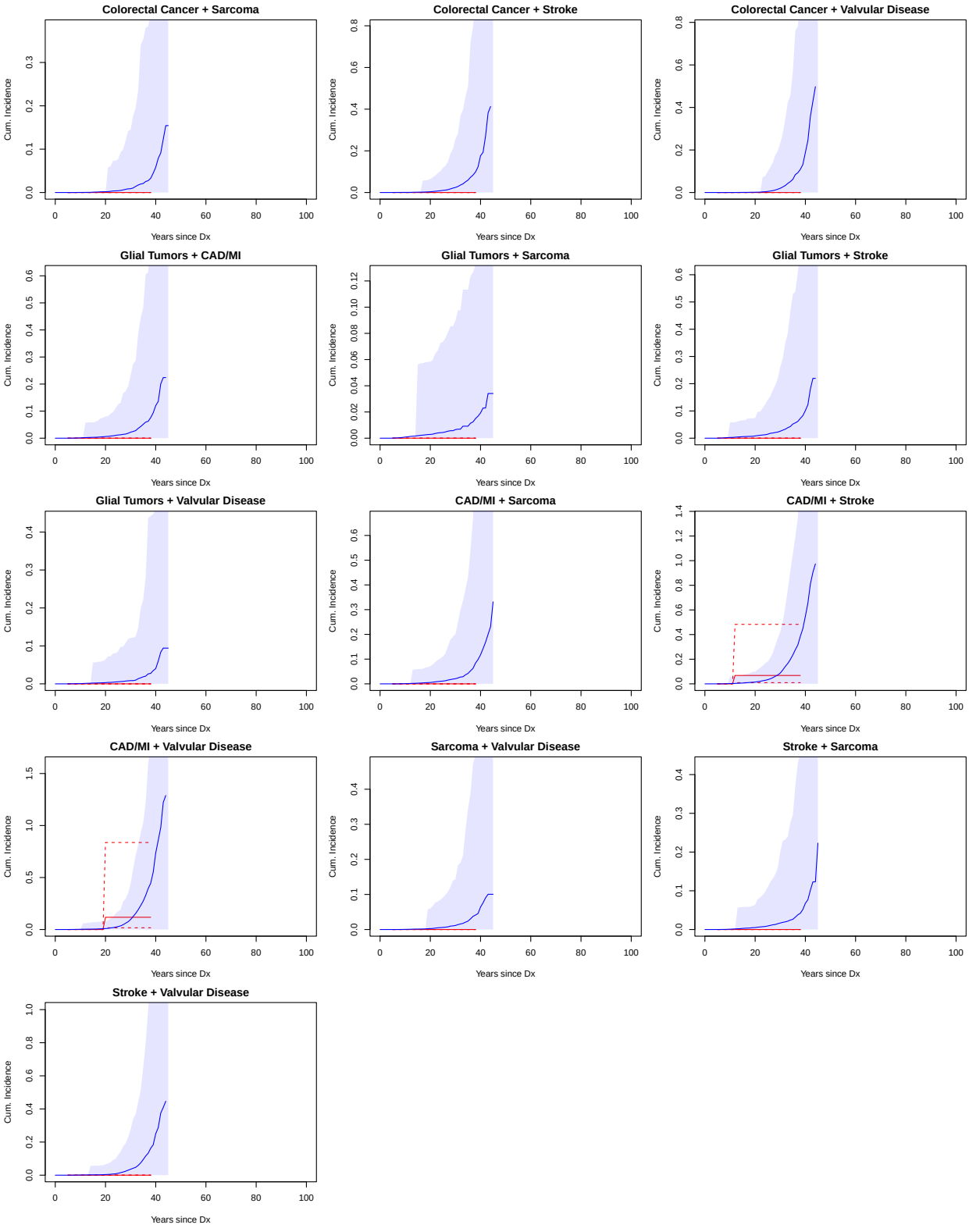
6.5.4.30 Anth<100



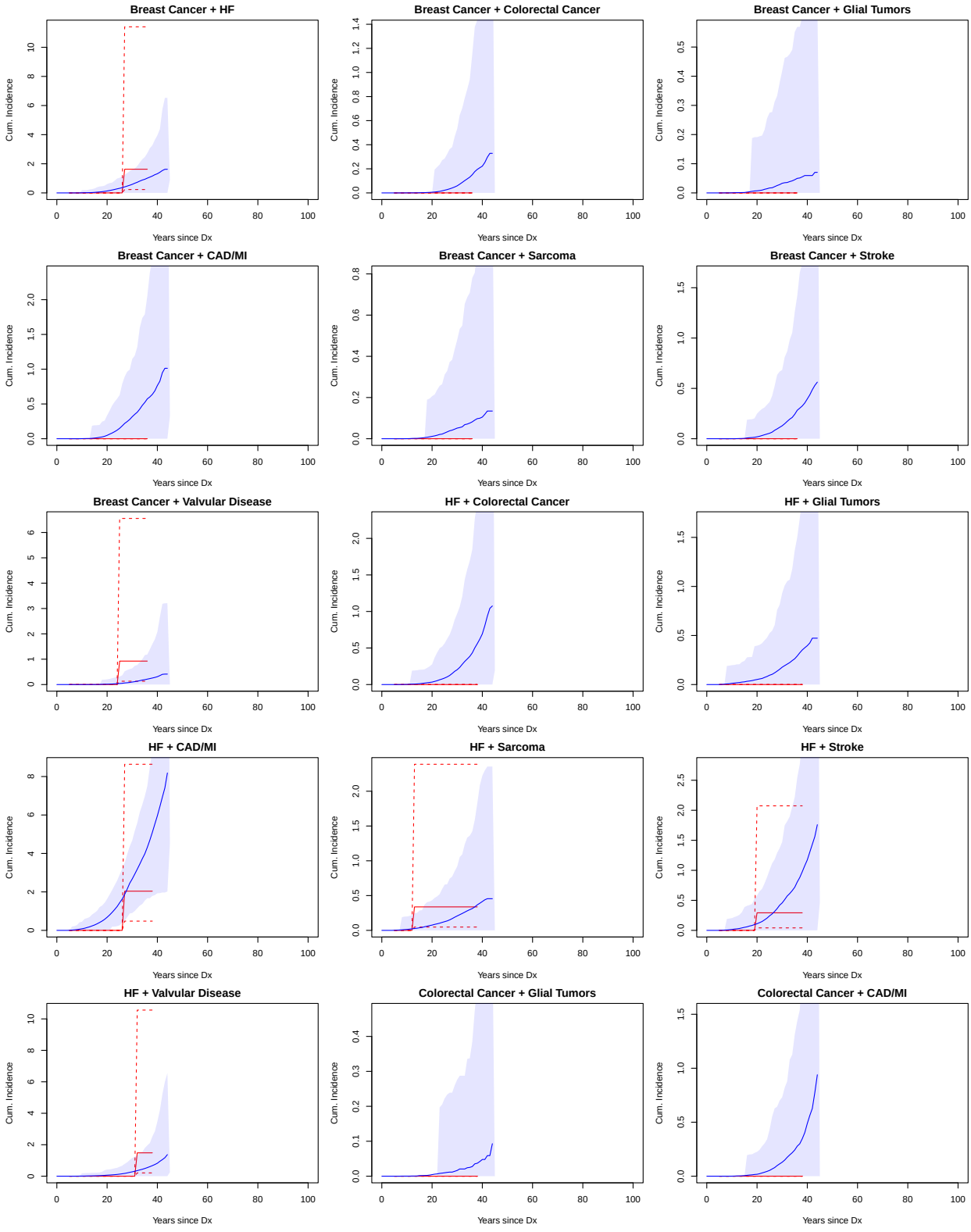

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

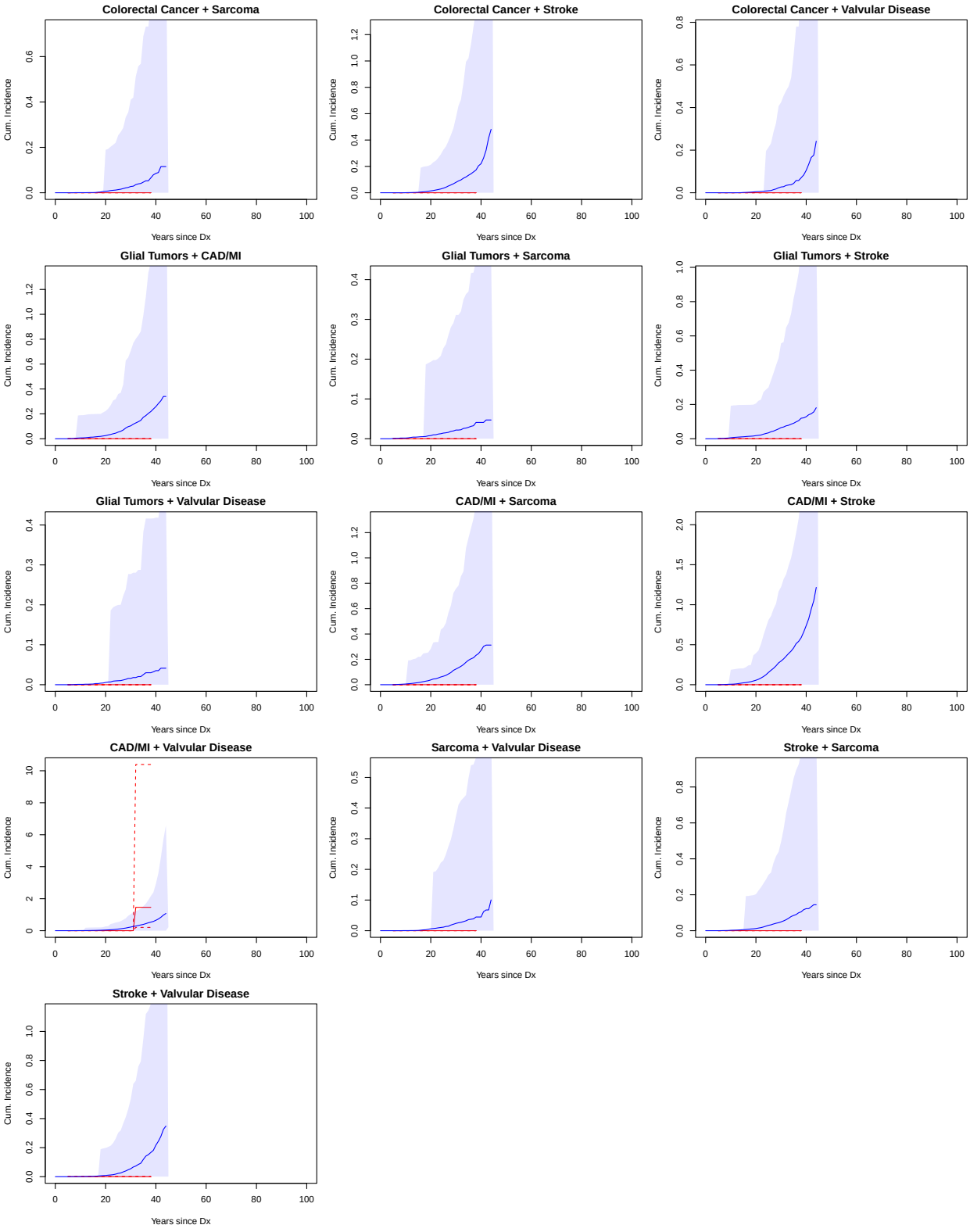
6.5.4.31 Anth100_249



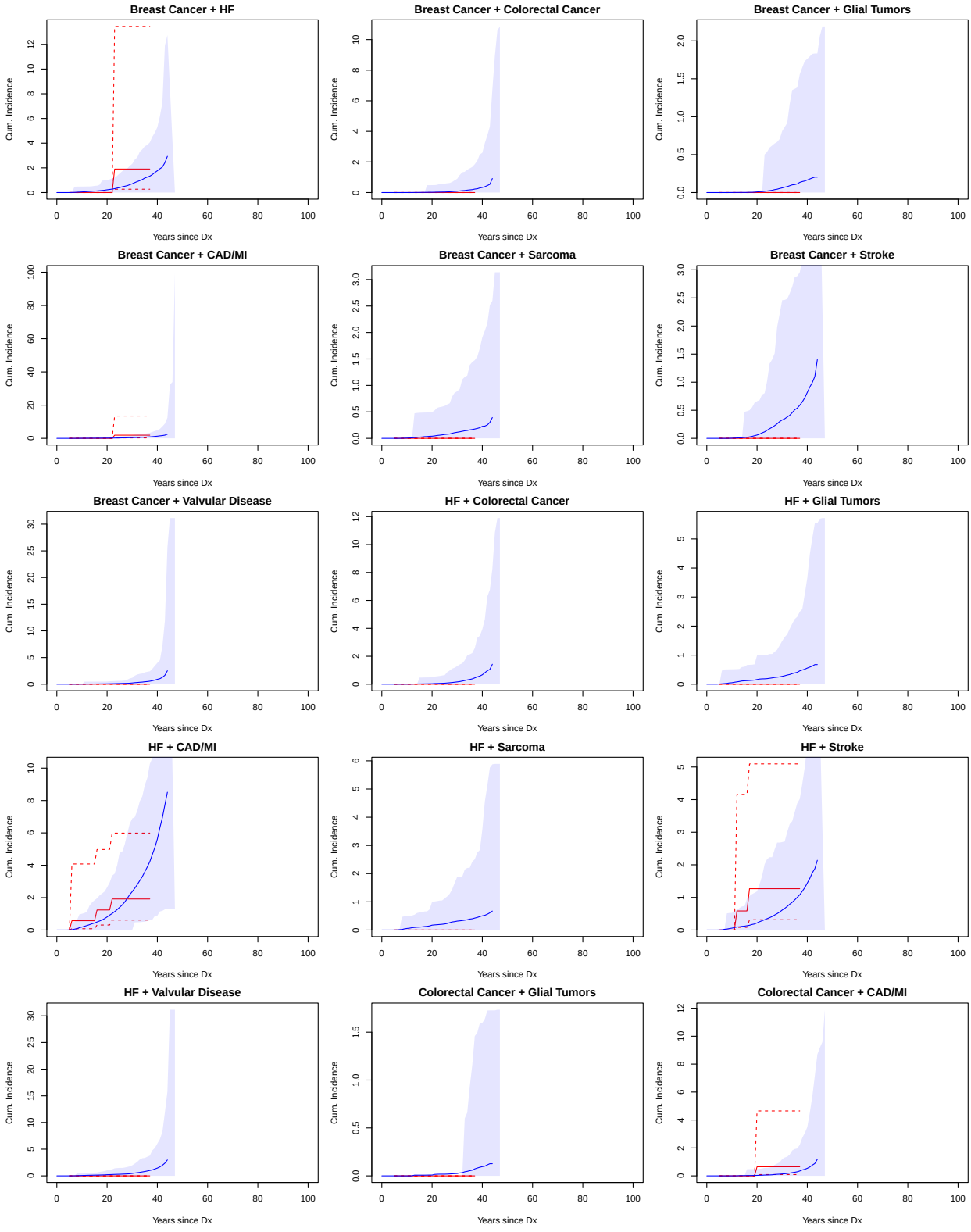

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

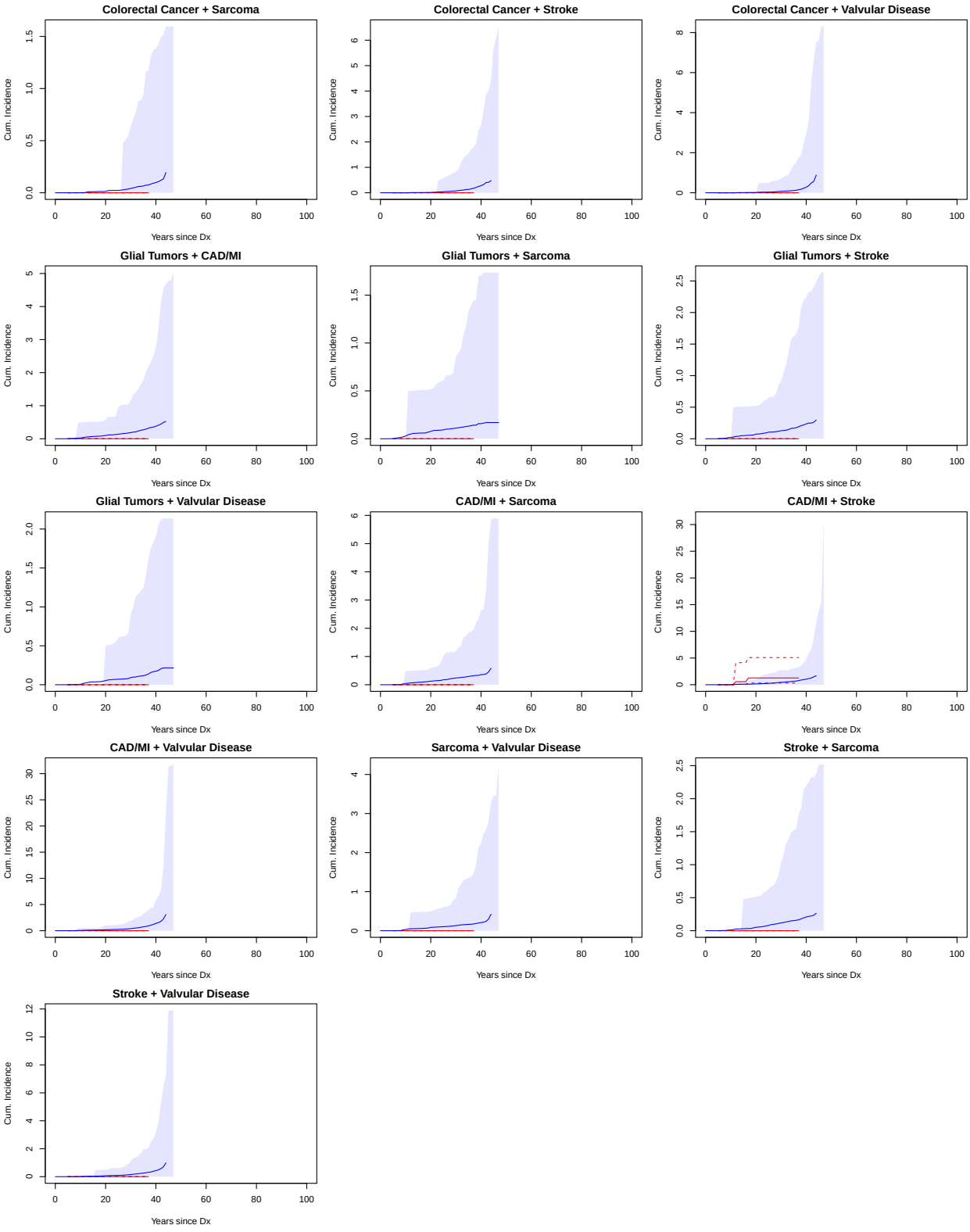
6.5.4.32 Anth250_399



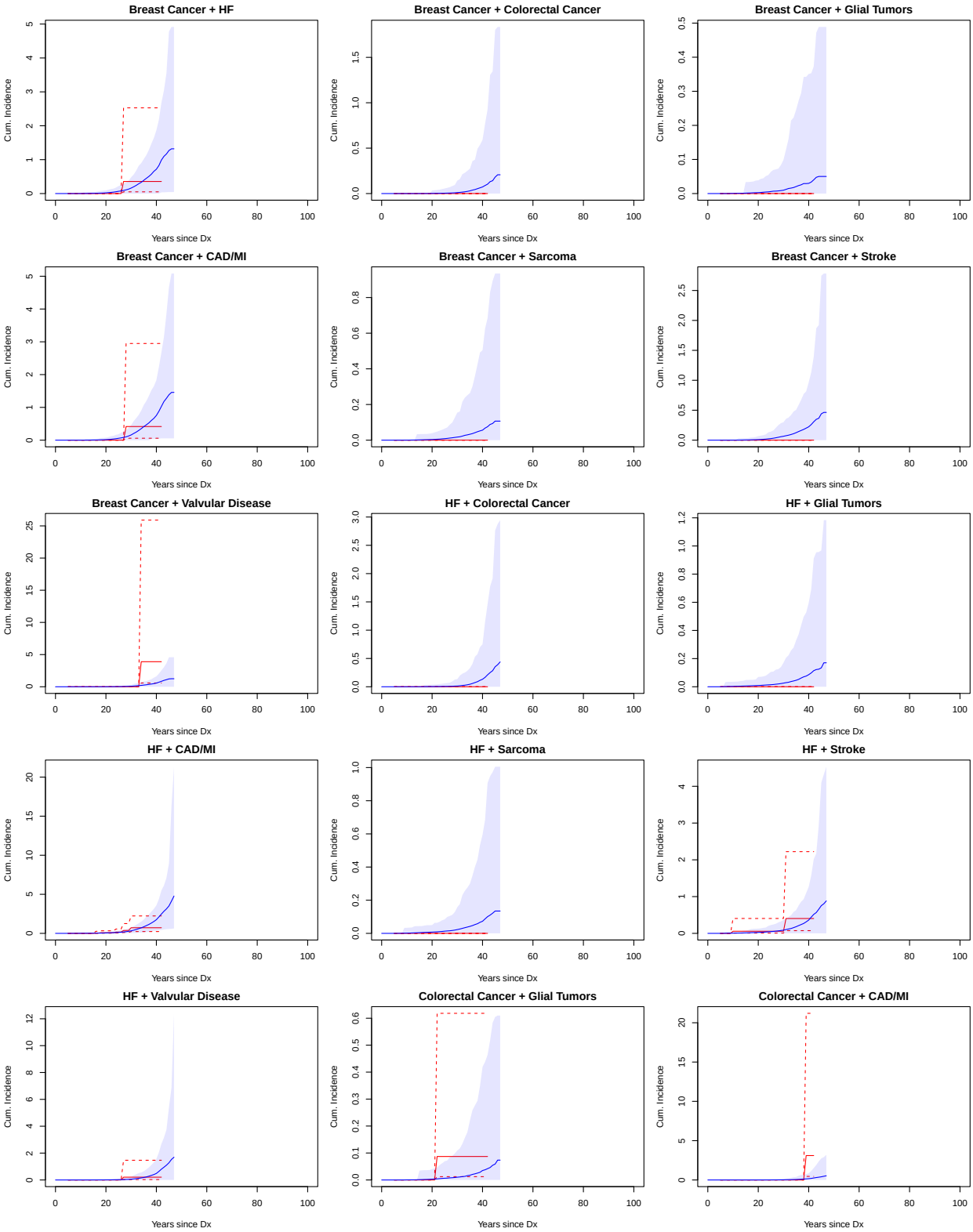

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

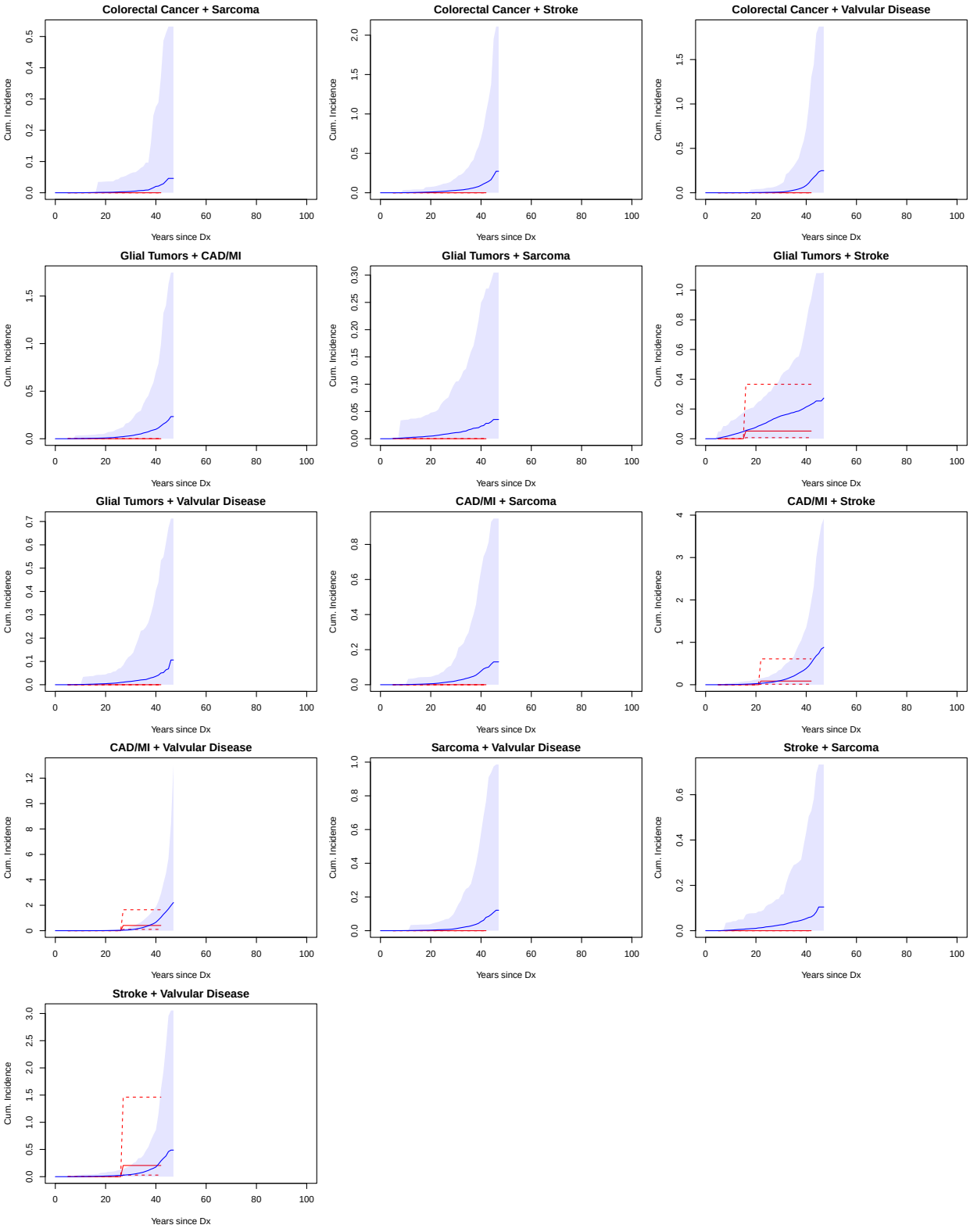
6.5.4.33 Anth400+



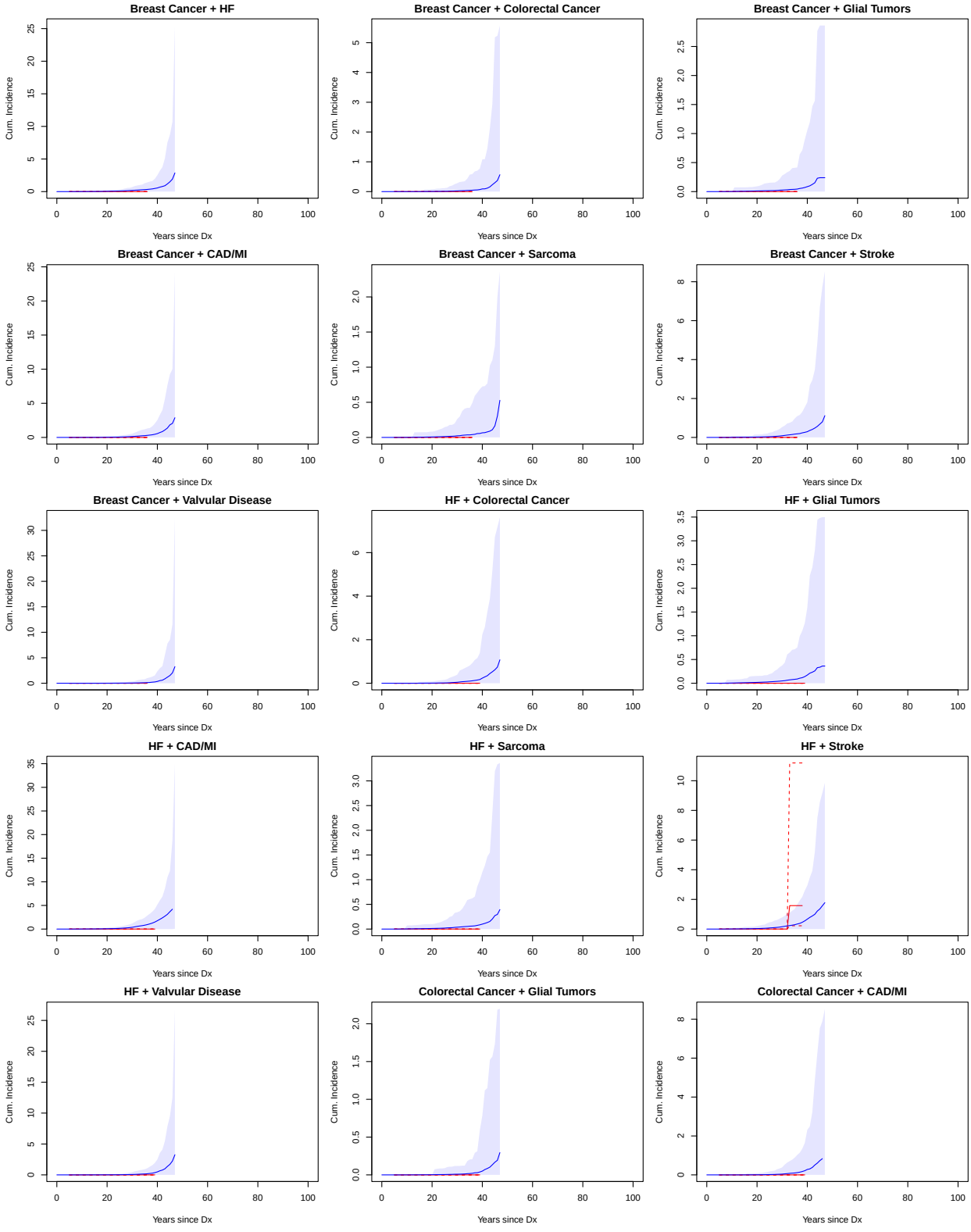

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

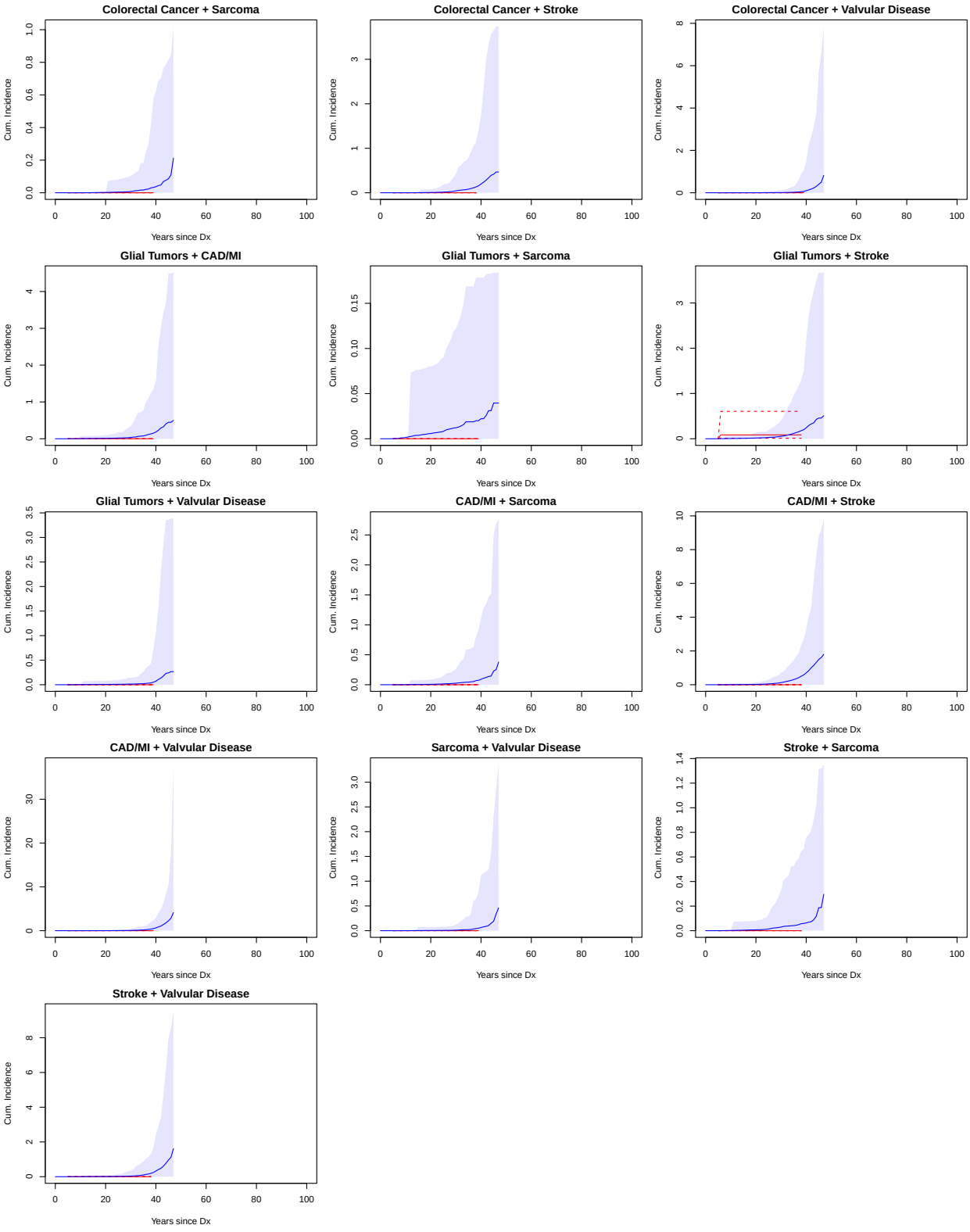
6.5.4.34 AlkNone



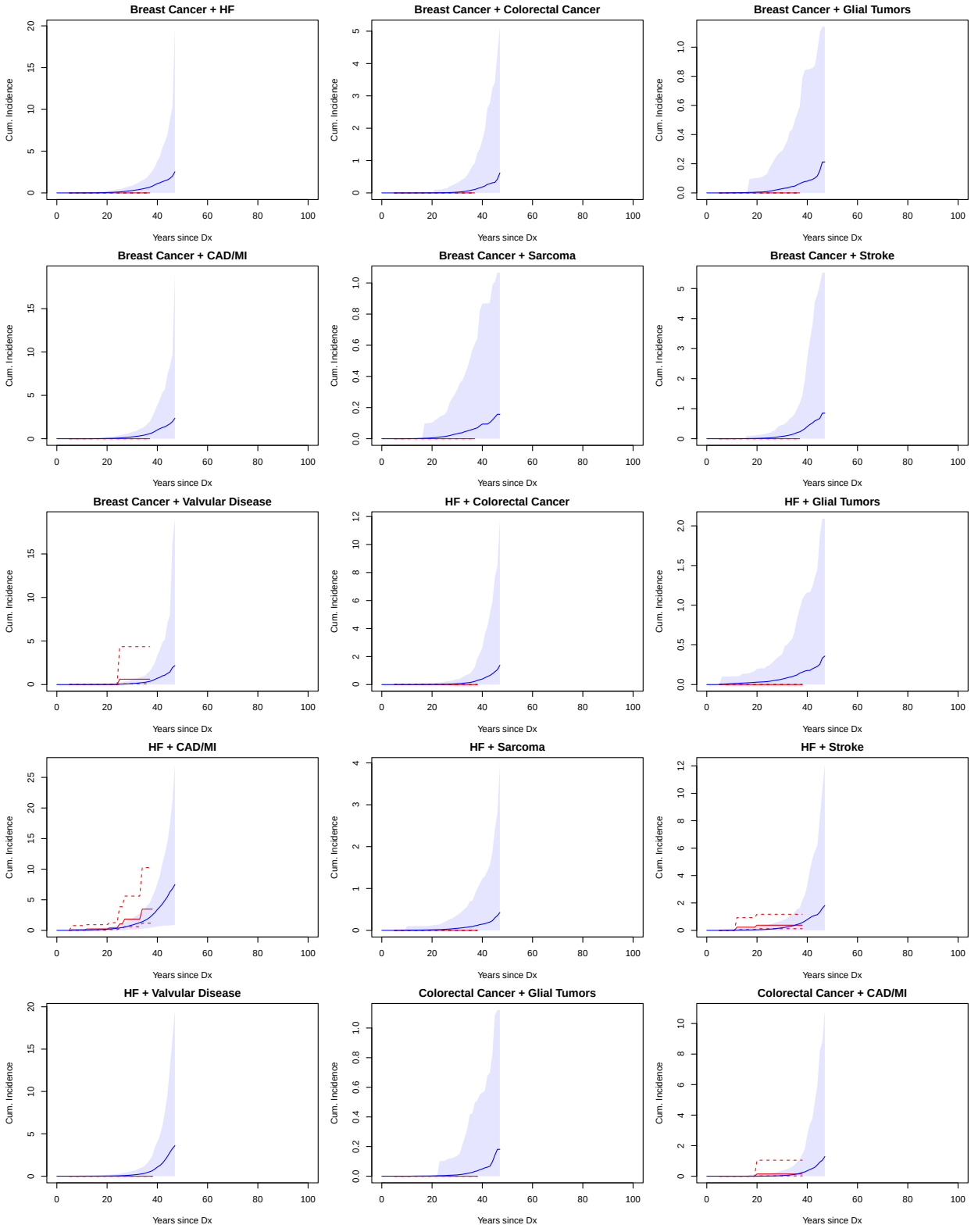

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

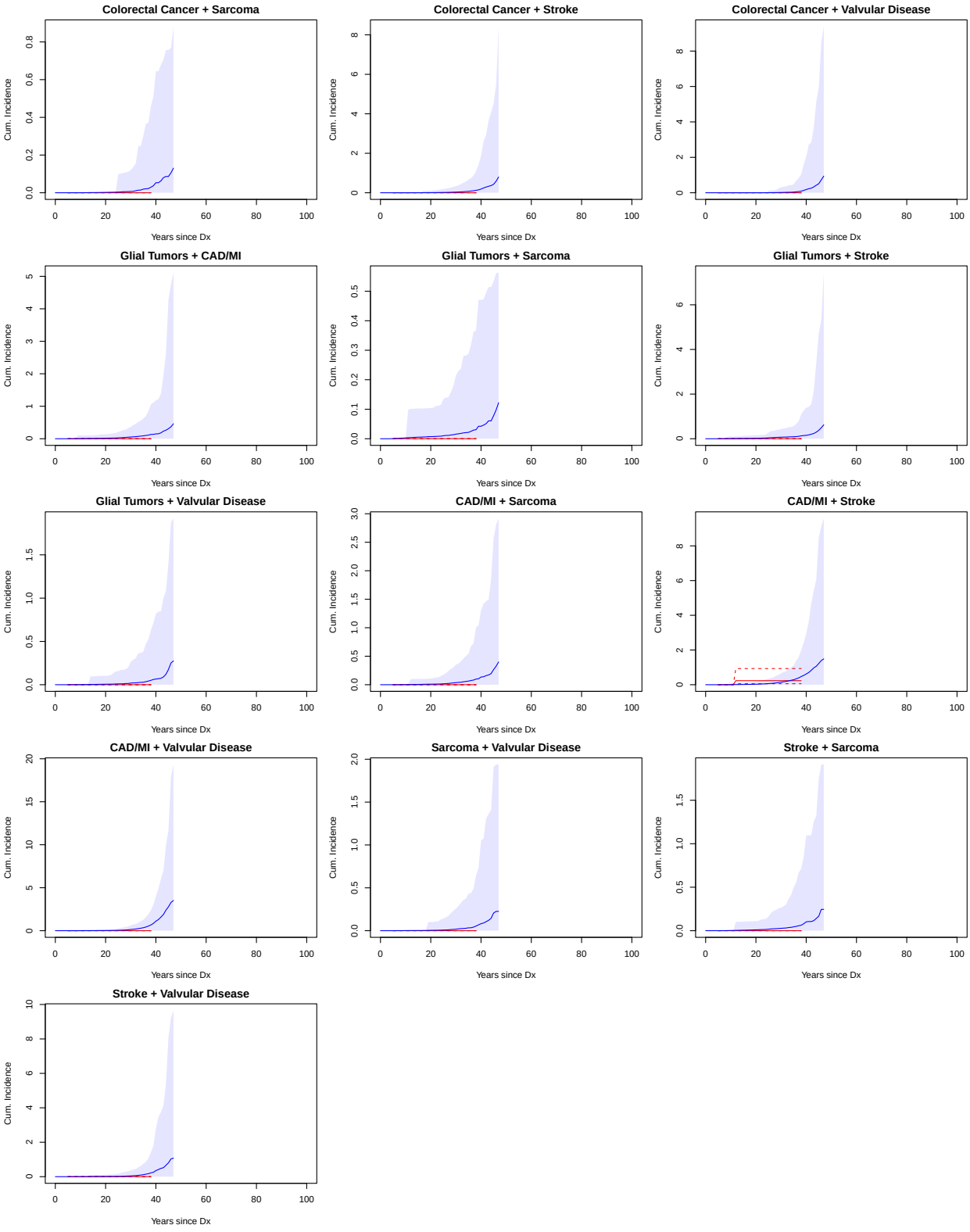
6.5.4.35 Alk<4000



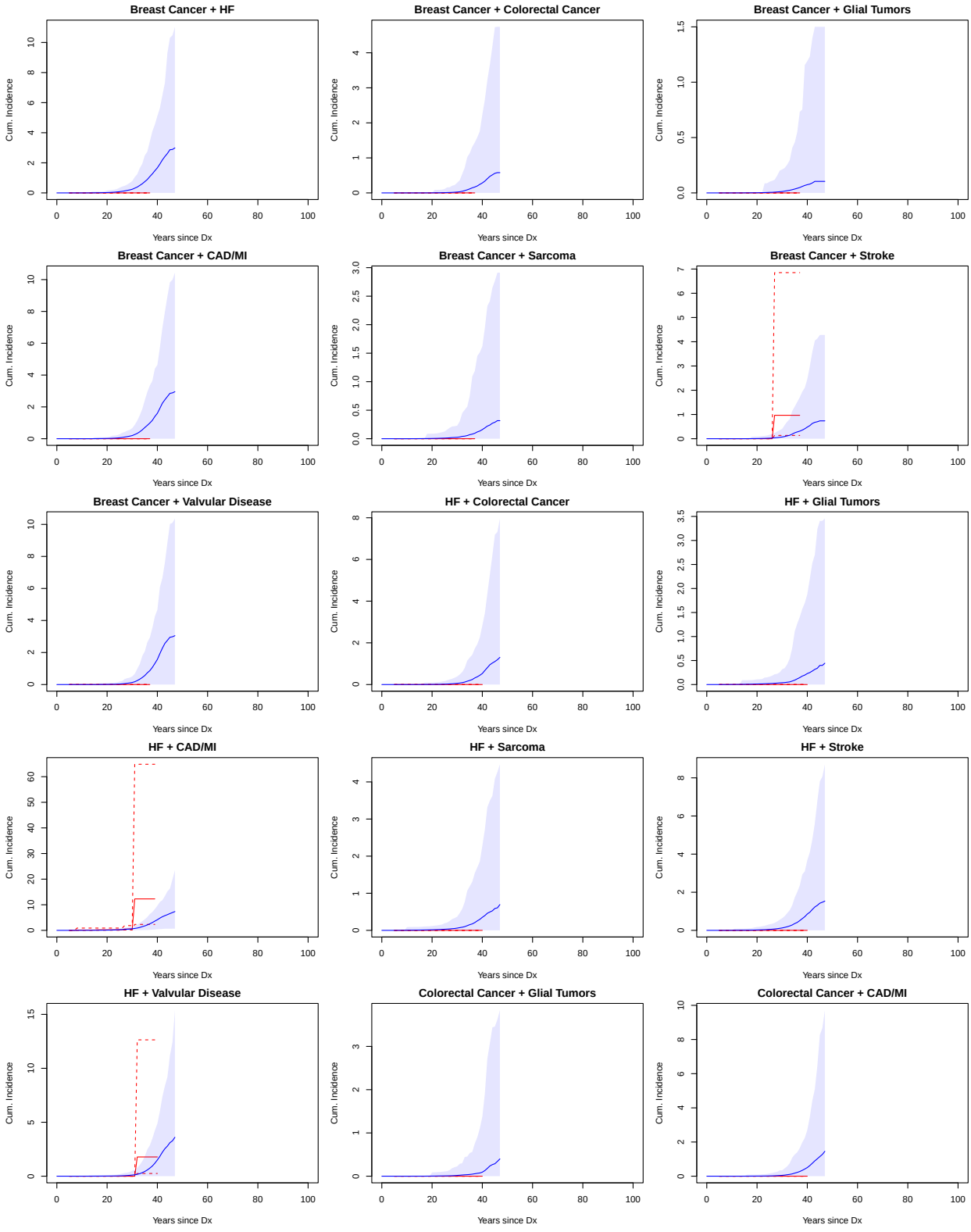

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

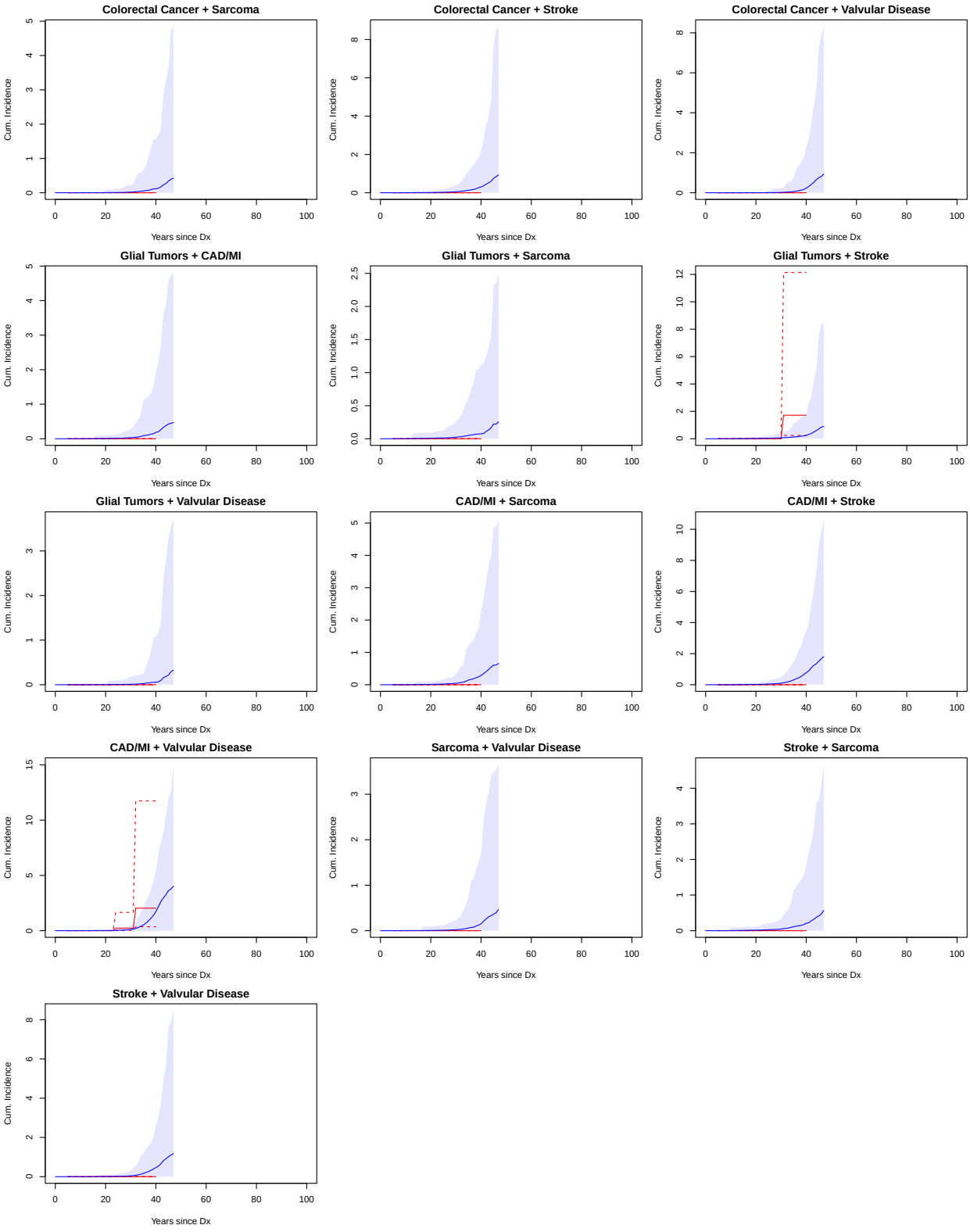
6.5.4.36 Alk4000_7999



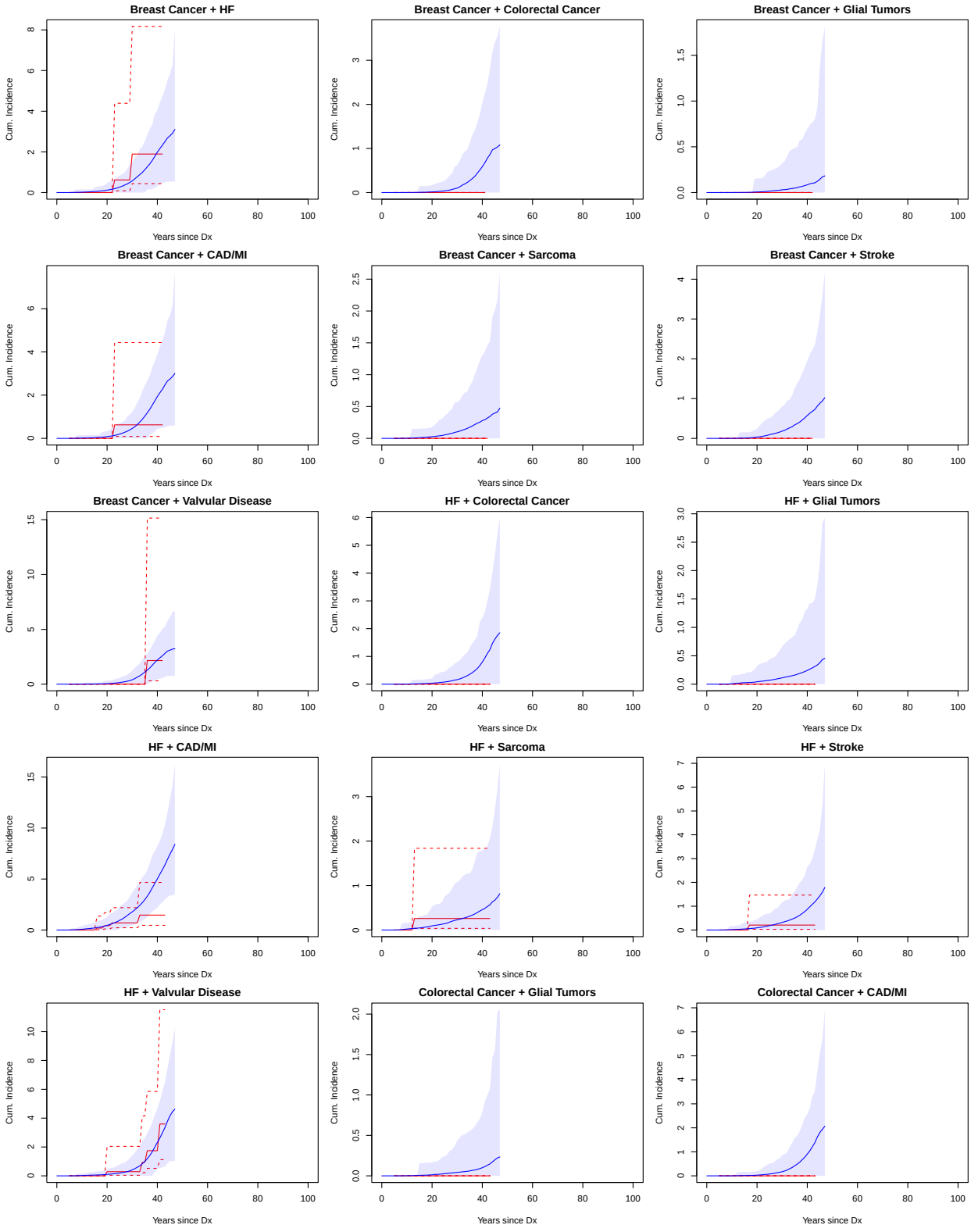

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

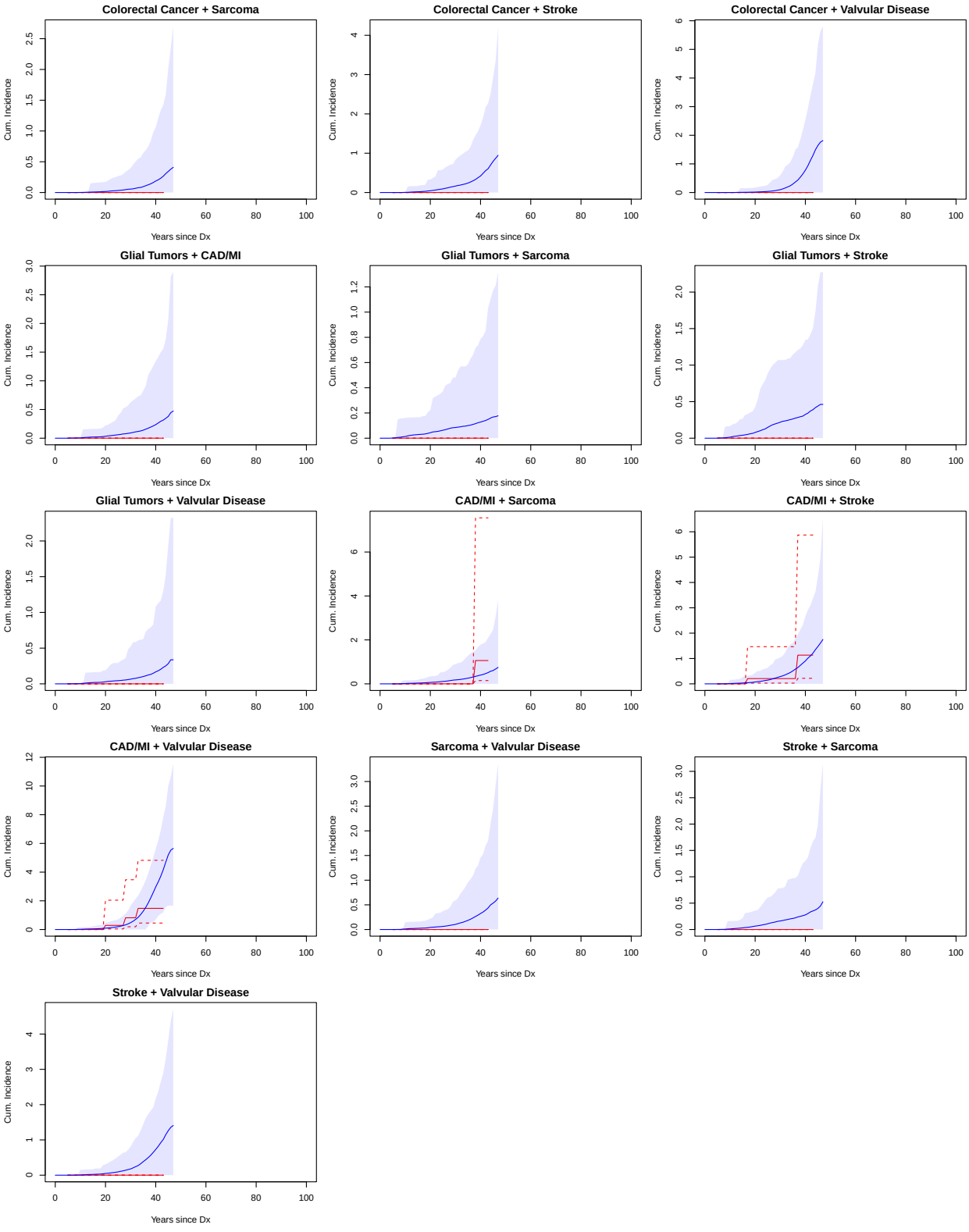
6.5.4.37 Alk8000_11999



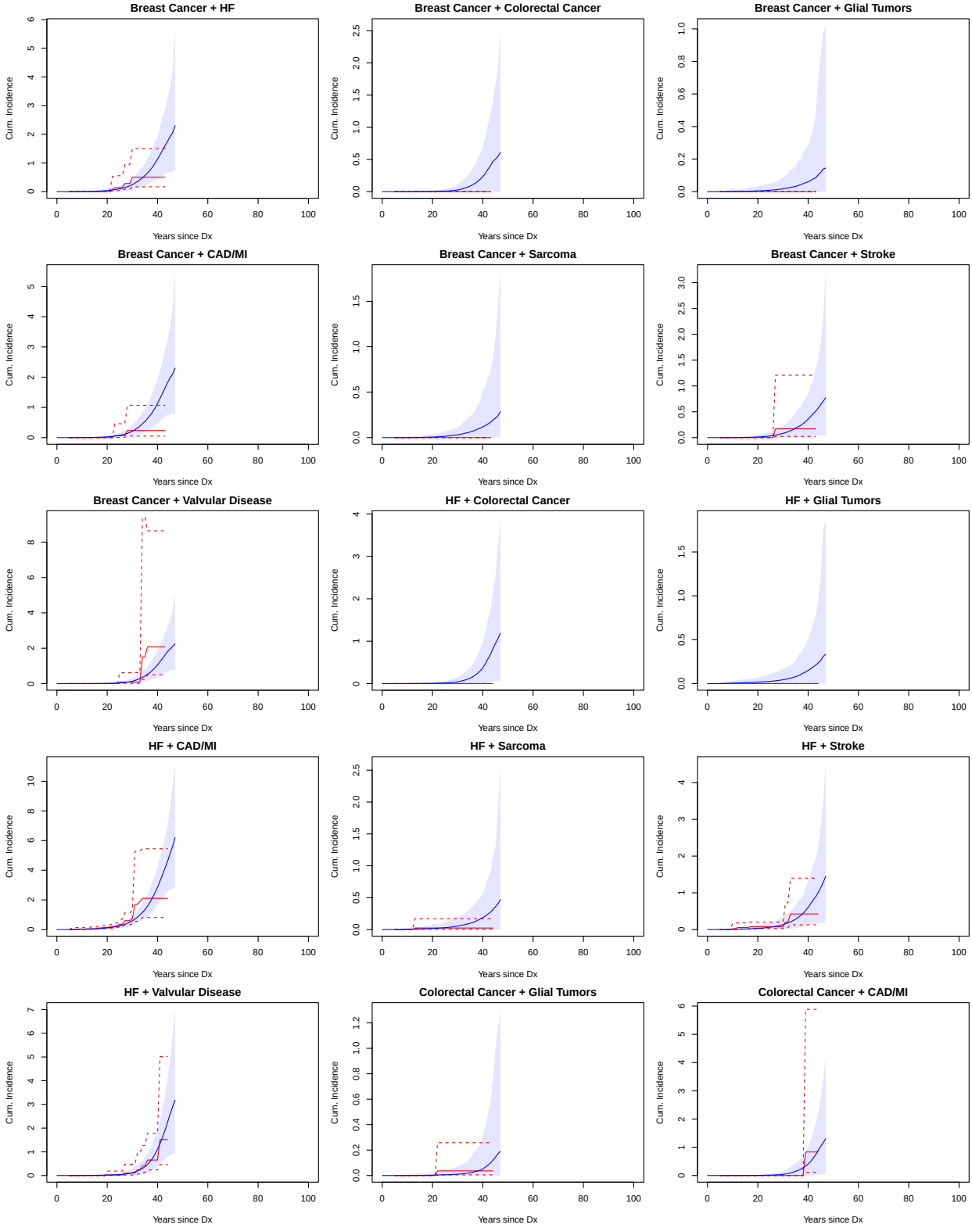

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

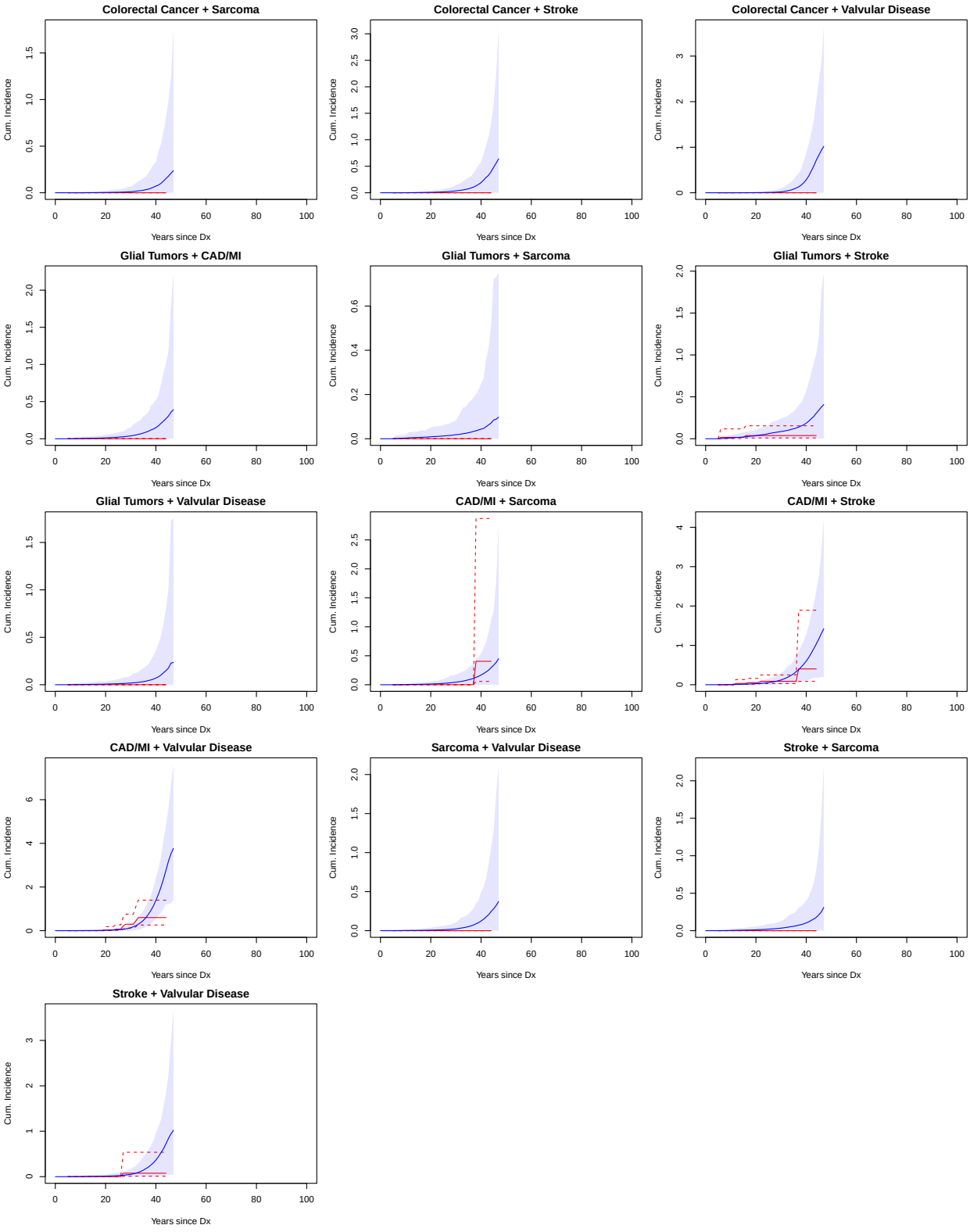
6.5.4.38 Alk12000+



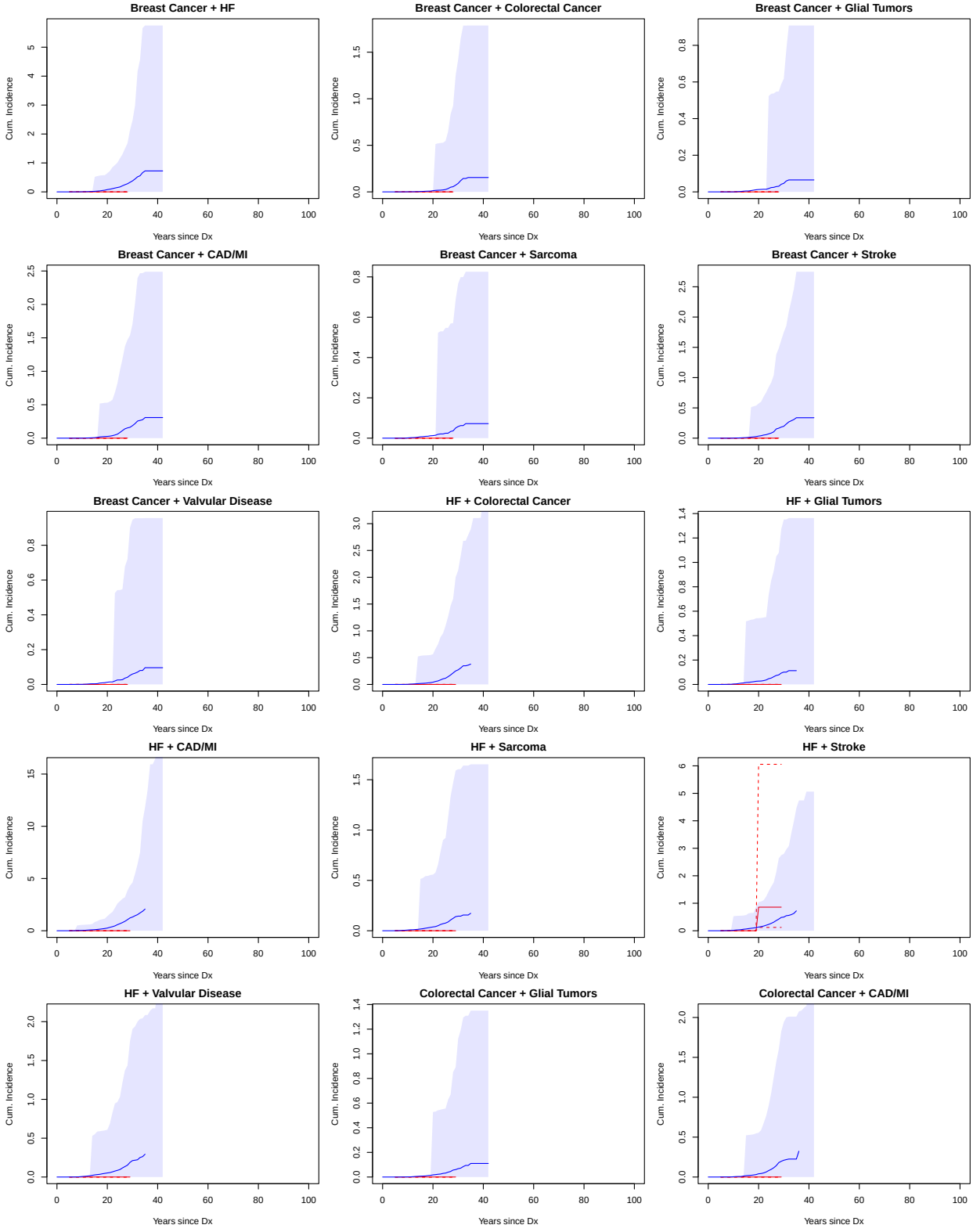

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

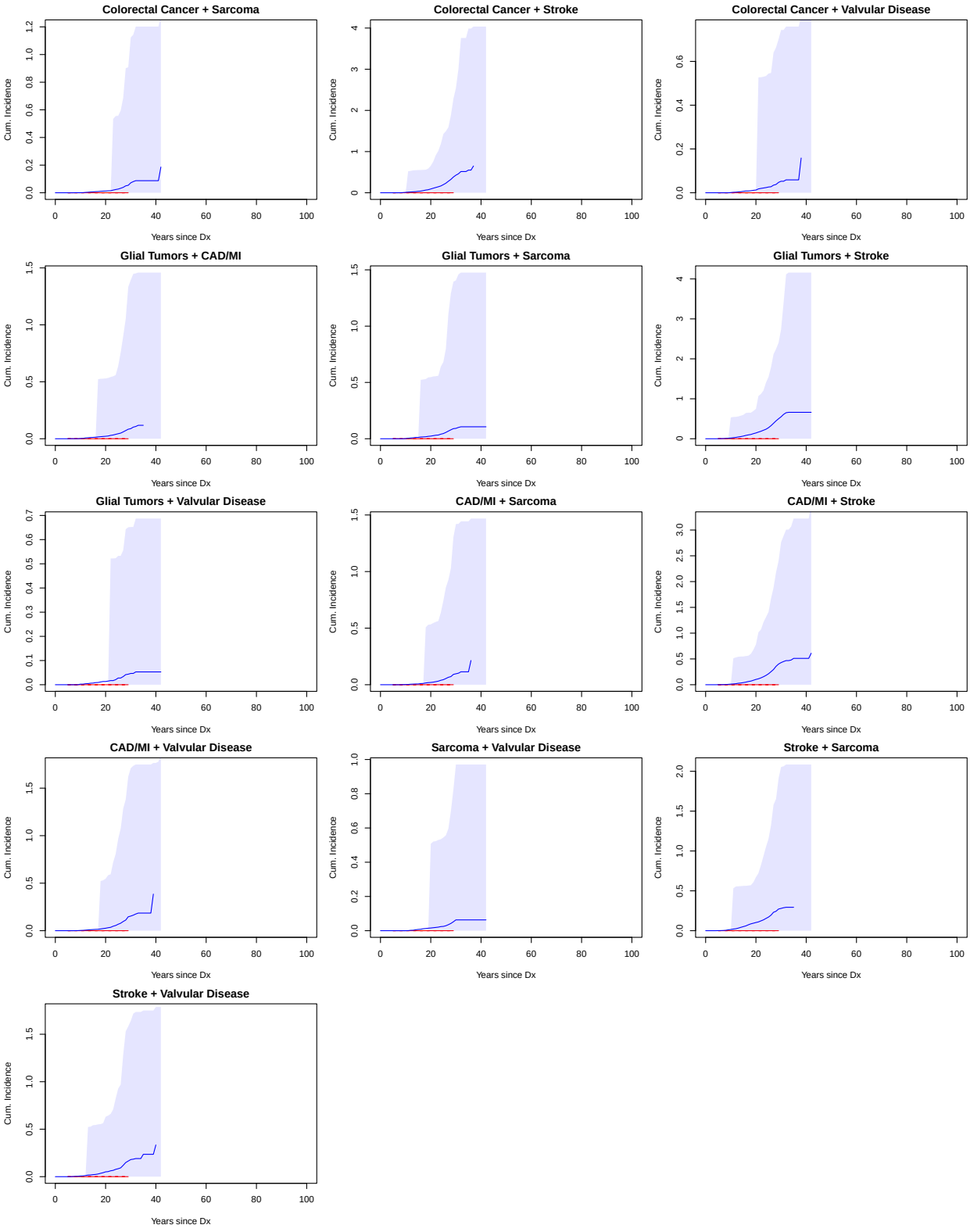
6.5.4.39 CispNone



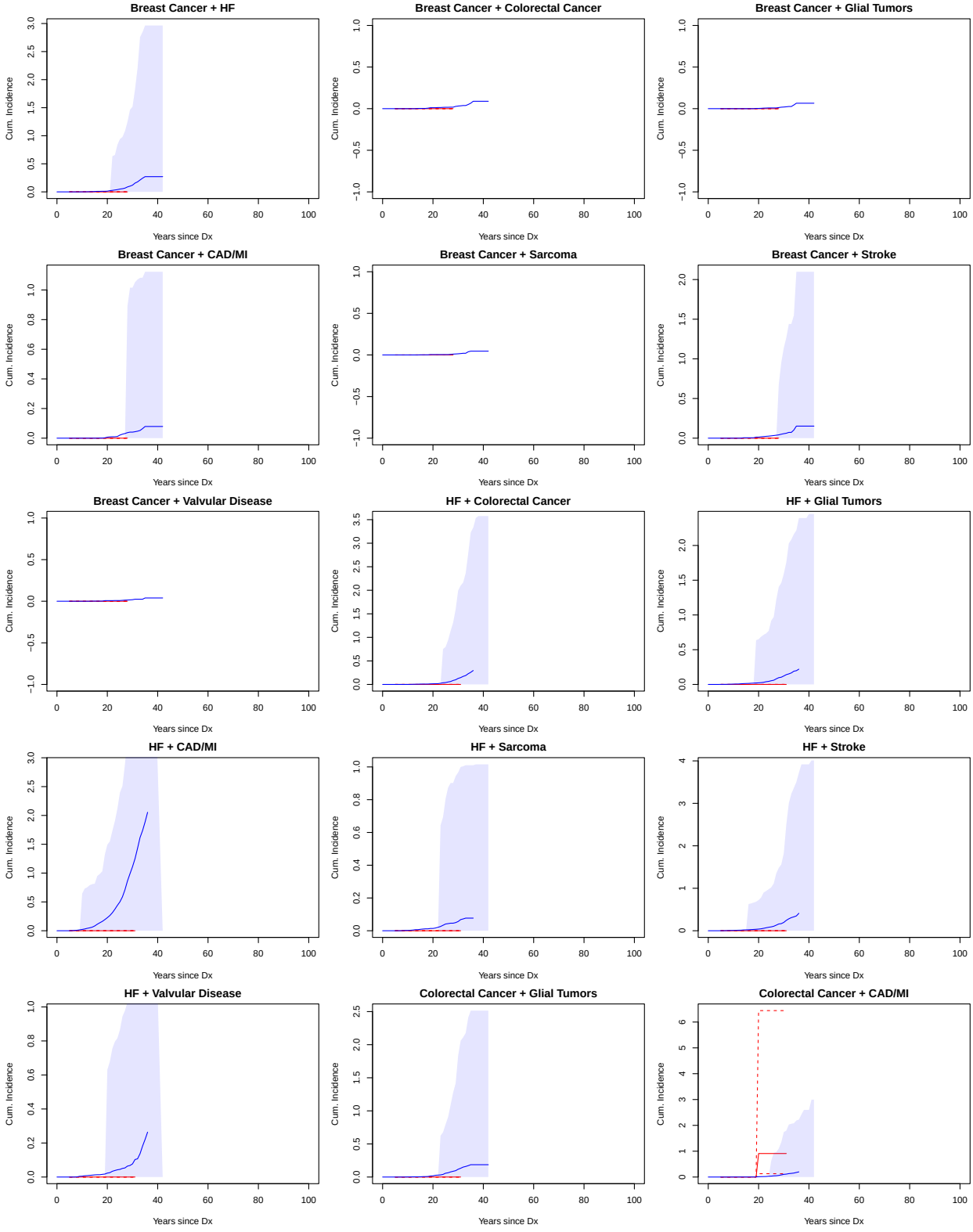

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

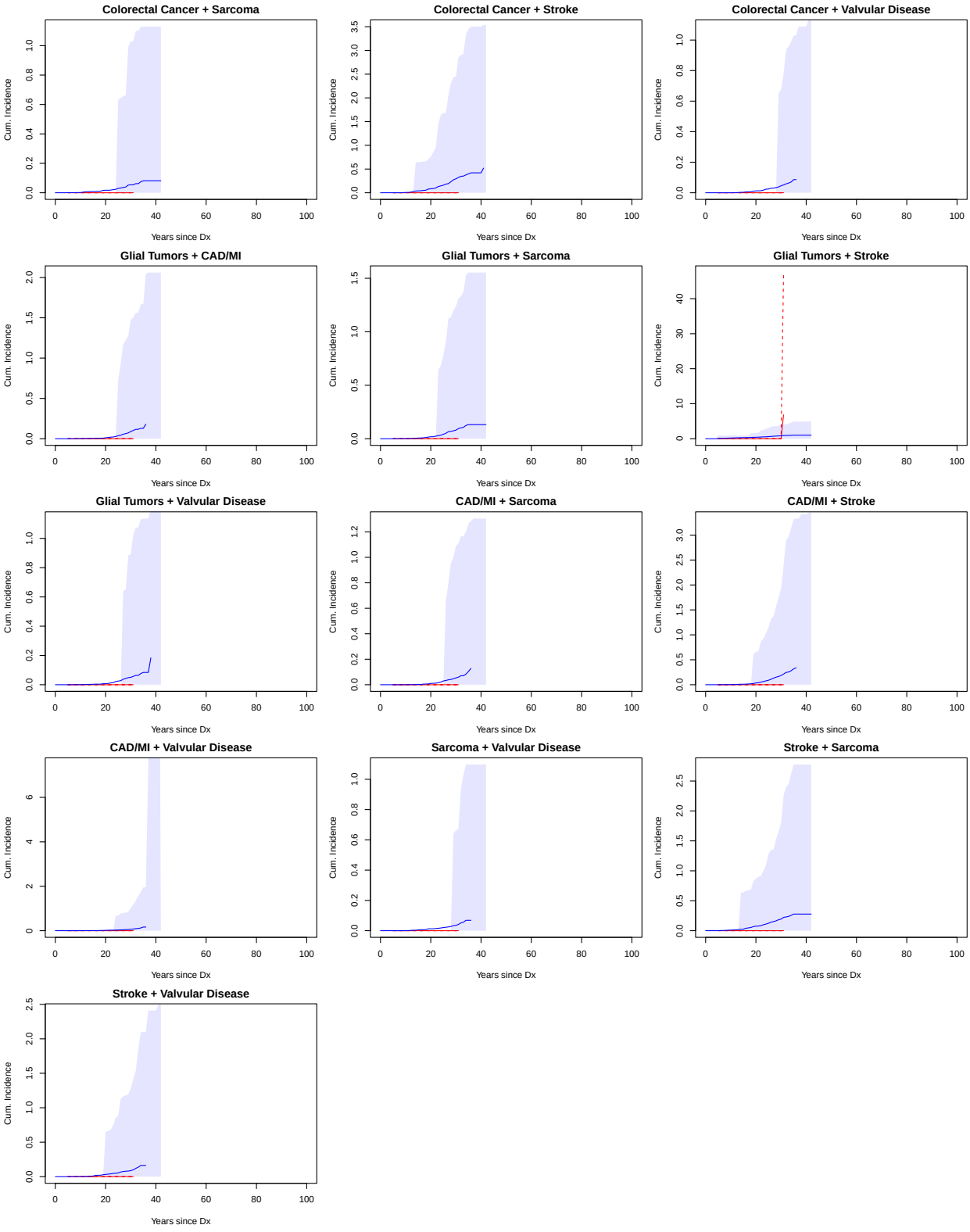
6.5.4.40 Cisp<400



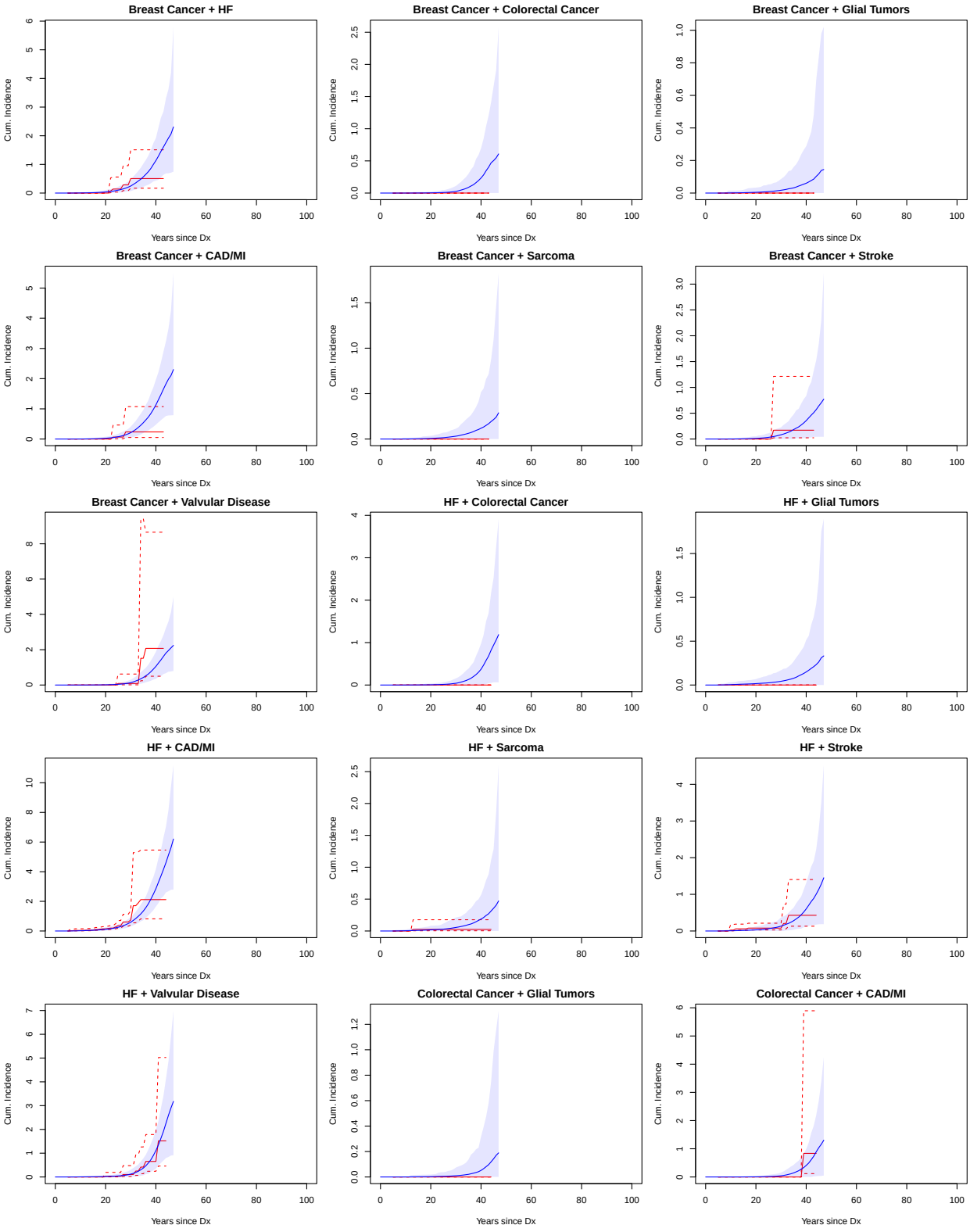

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

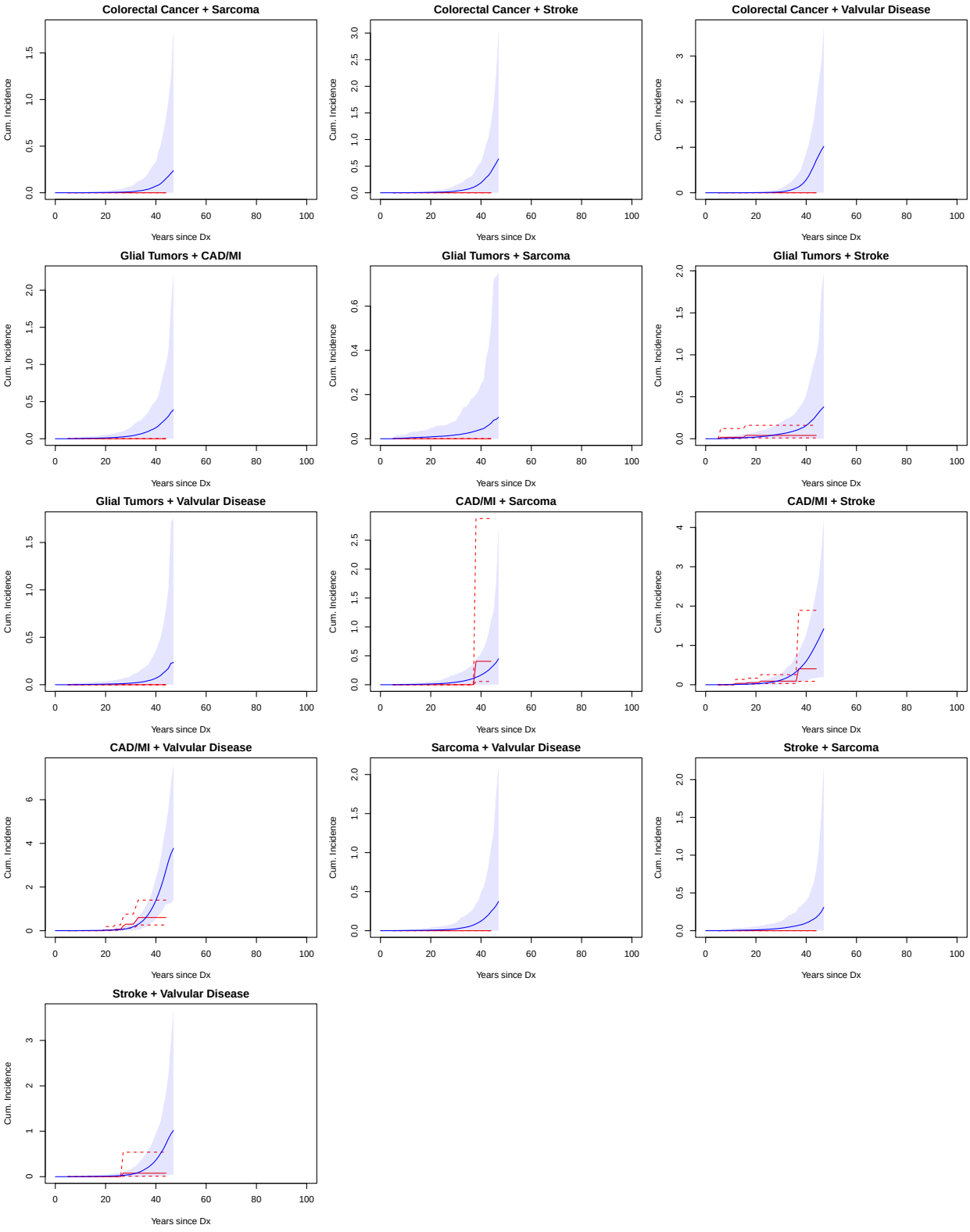
6.5.4.41 Cisp400+



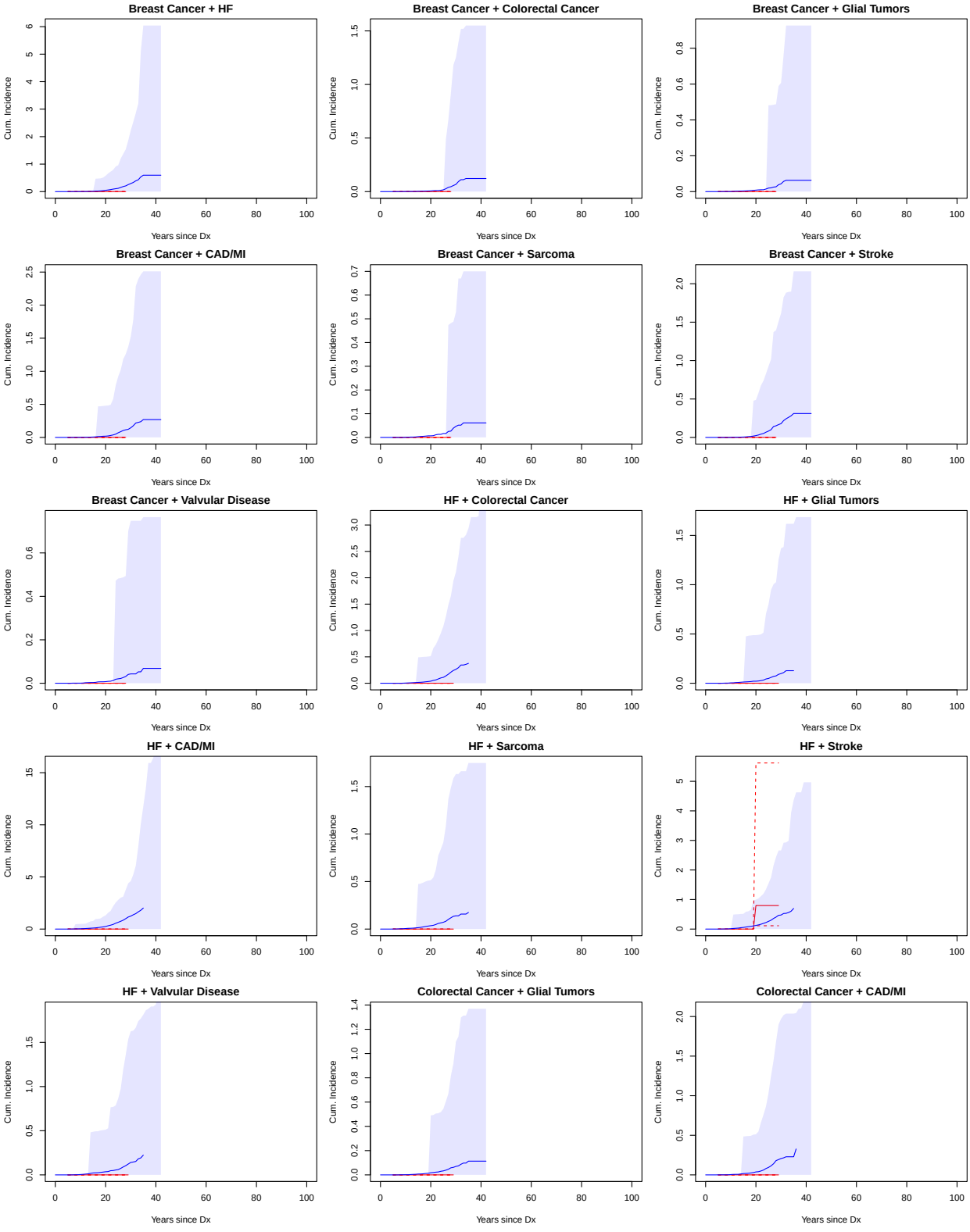

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

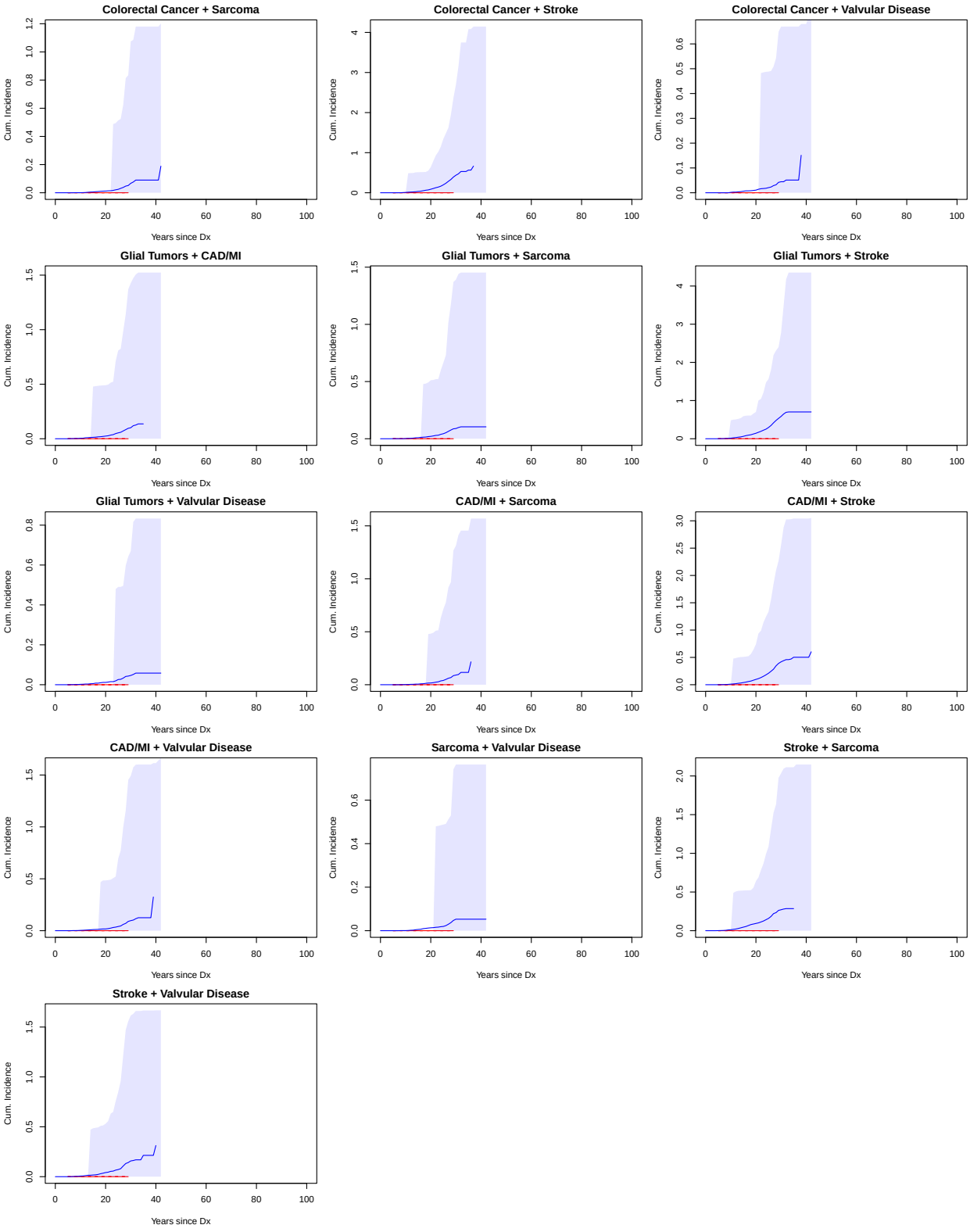
6.5.4.42 PlatNone



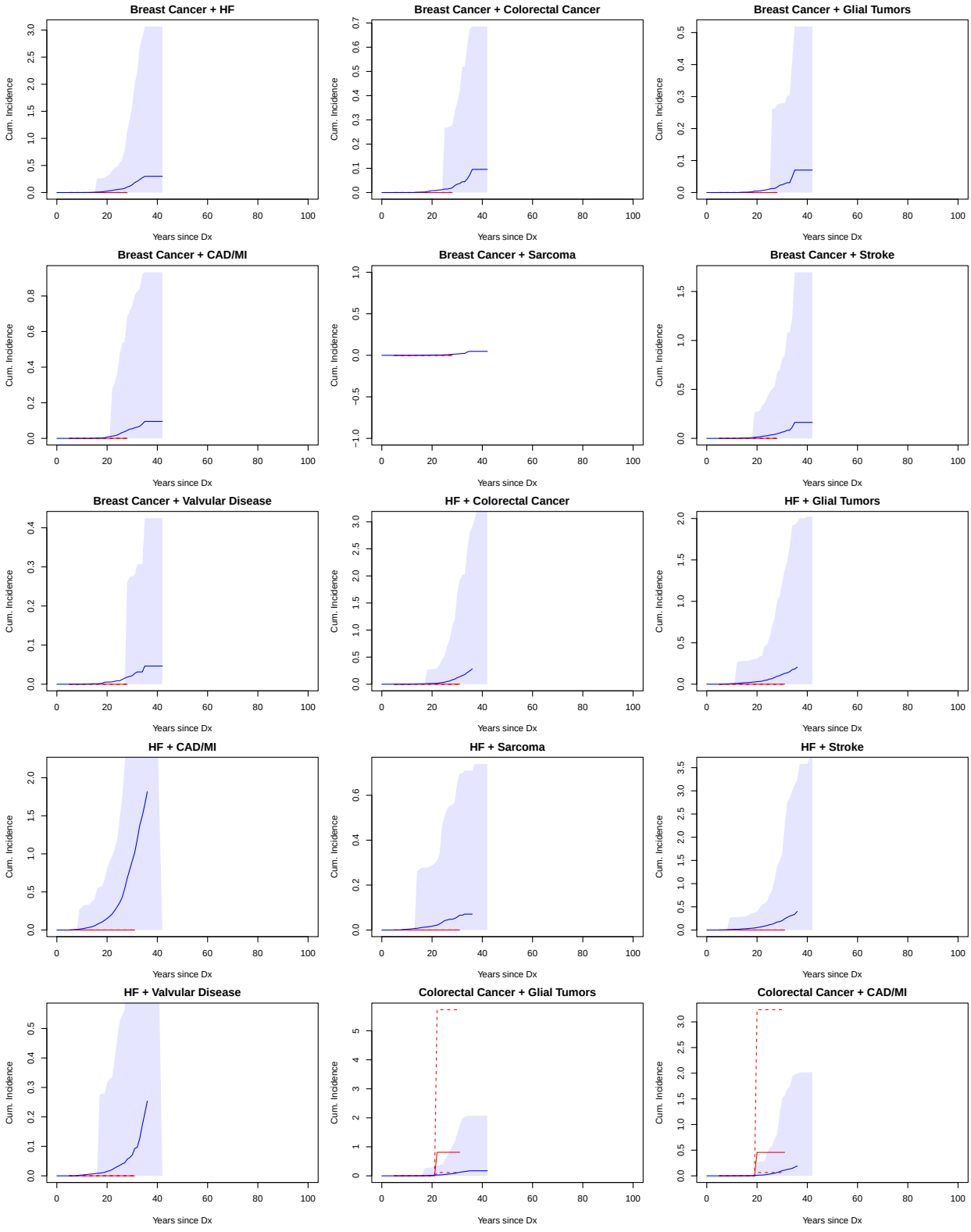

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

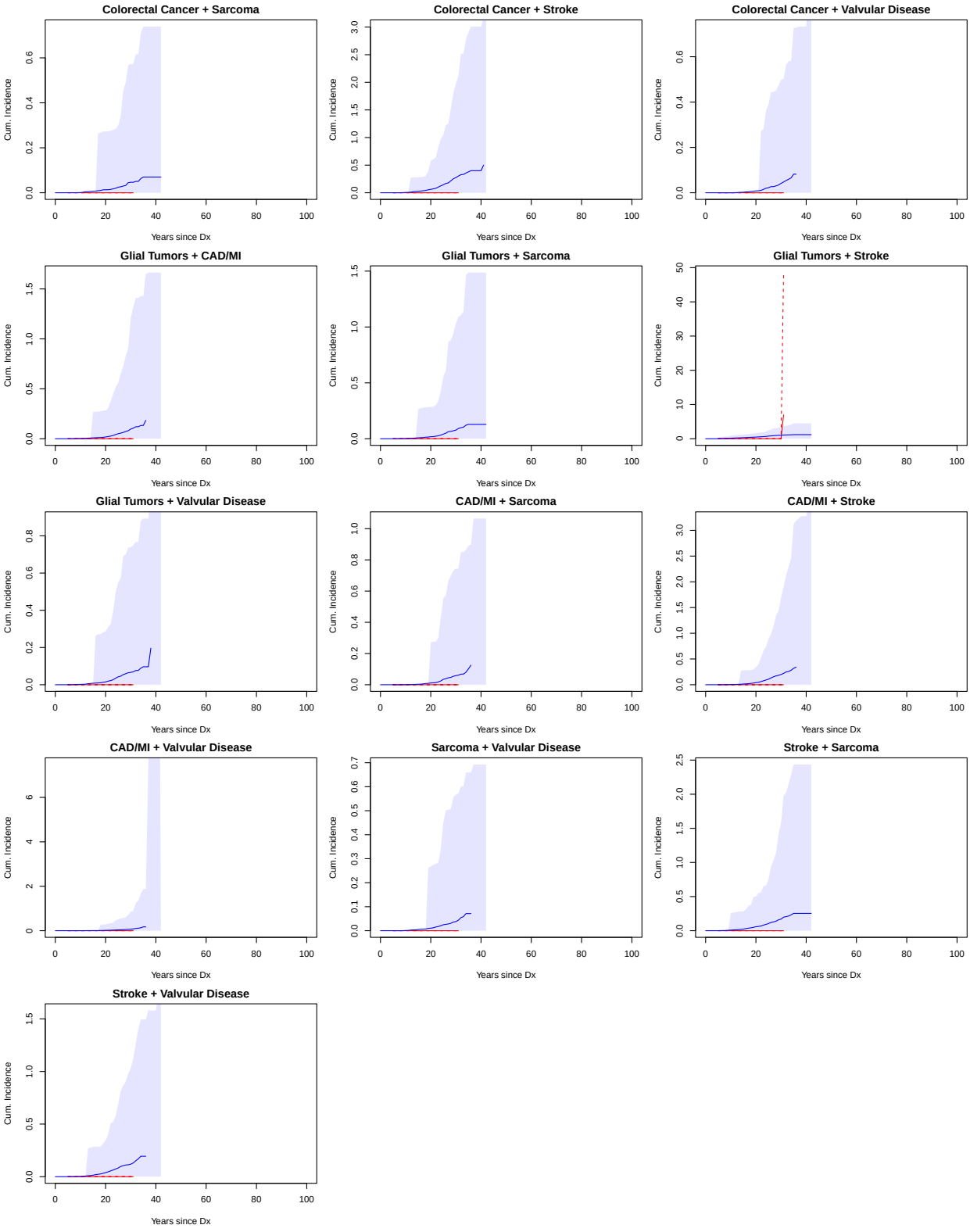
6.5.4.43 Plat<400



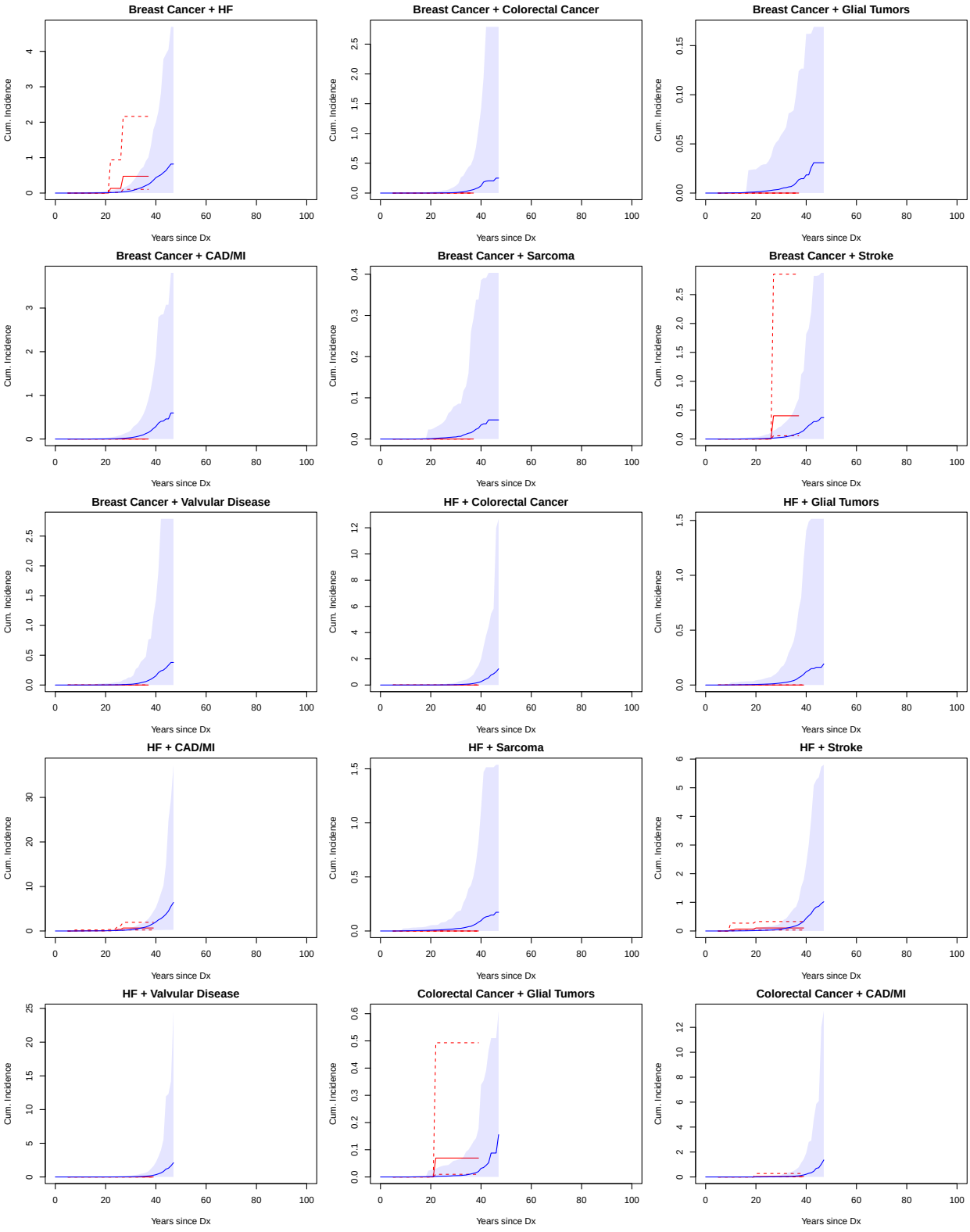

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

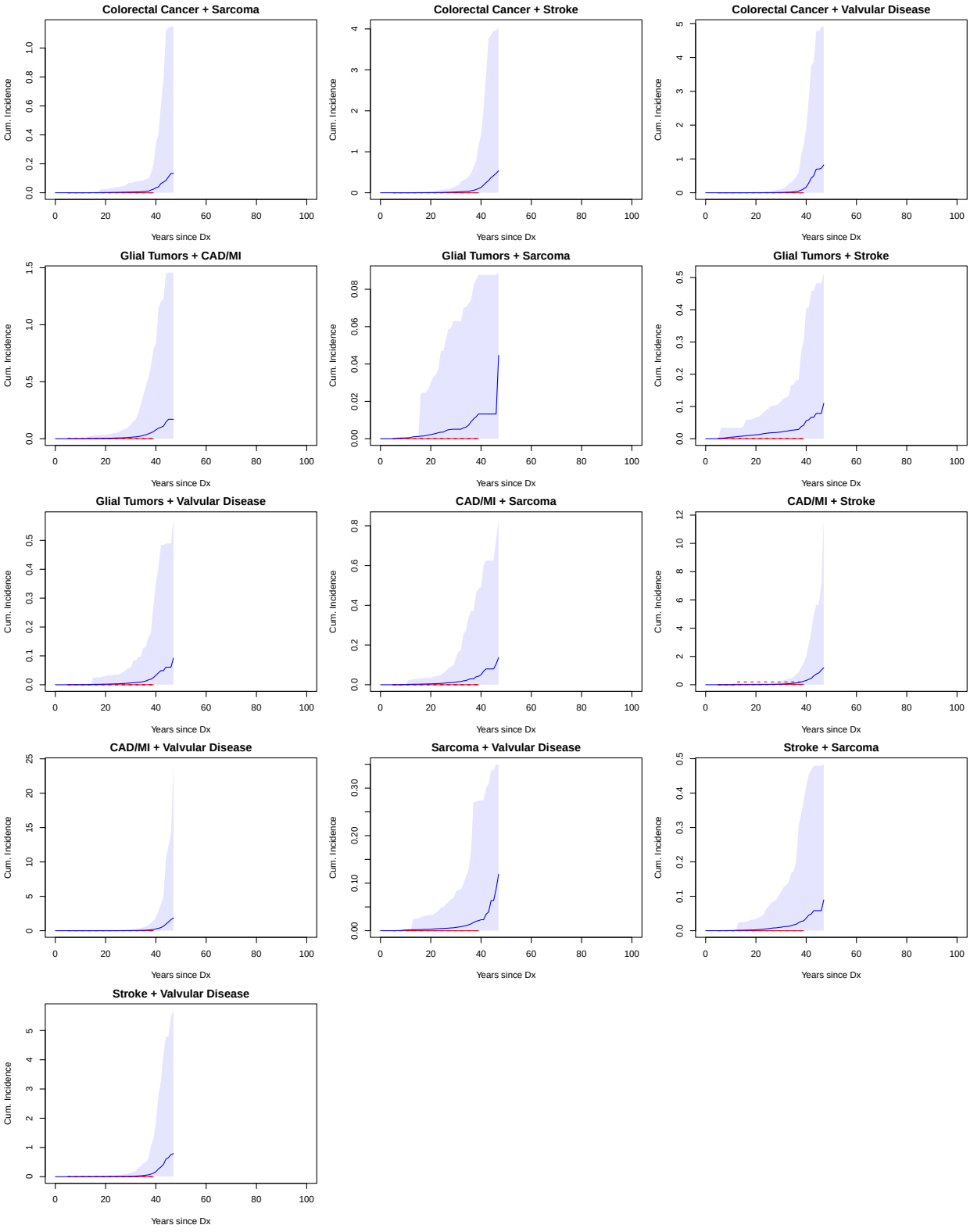
6.5.4.44 Plat400+



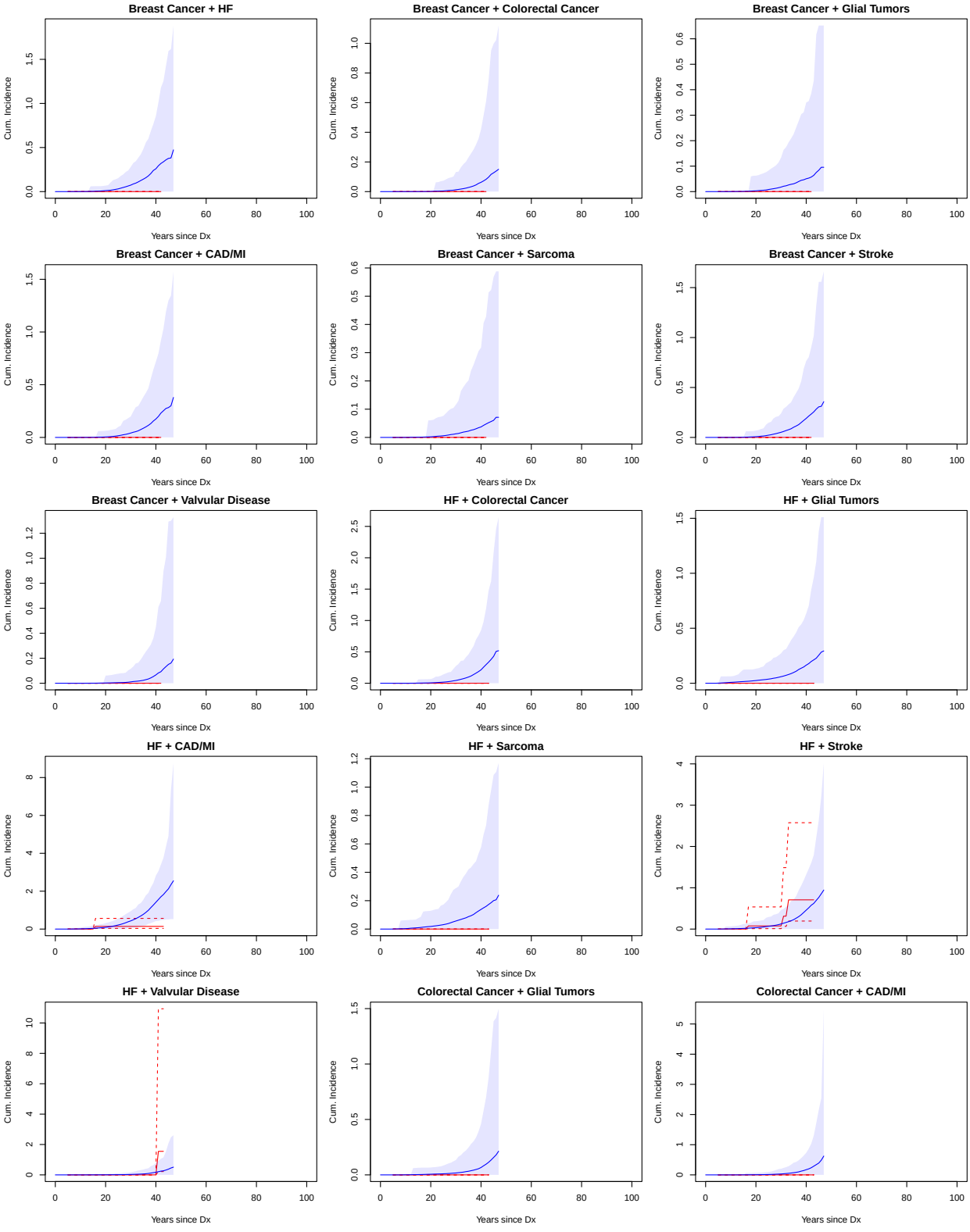

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

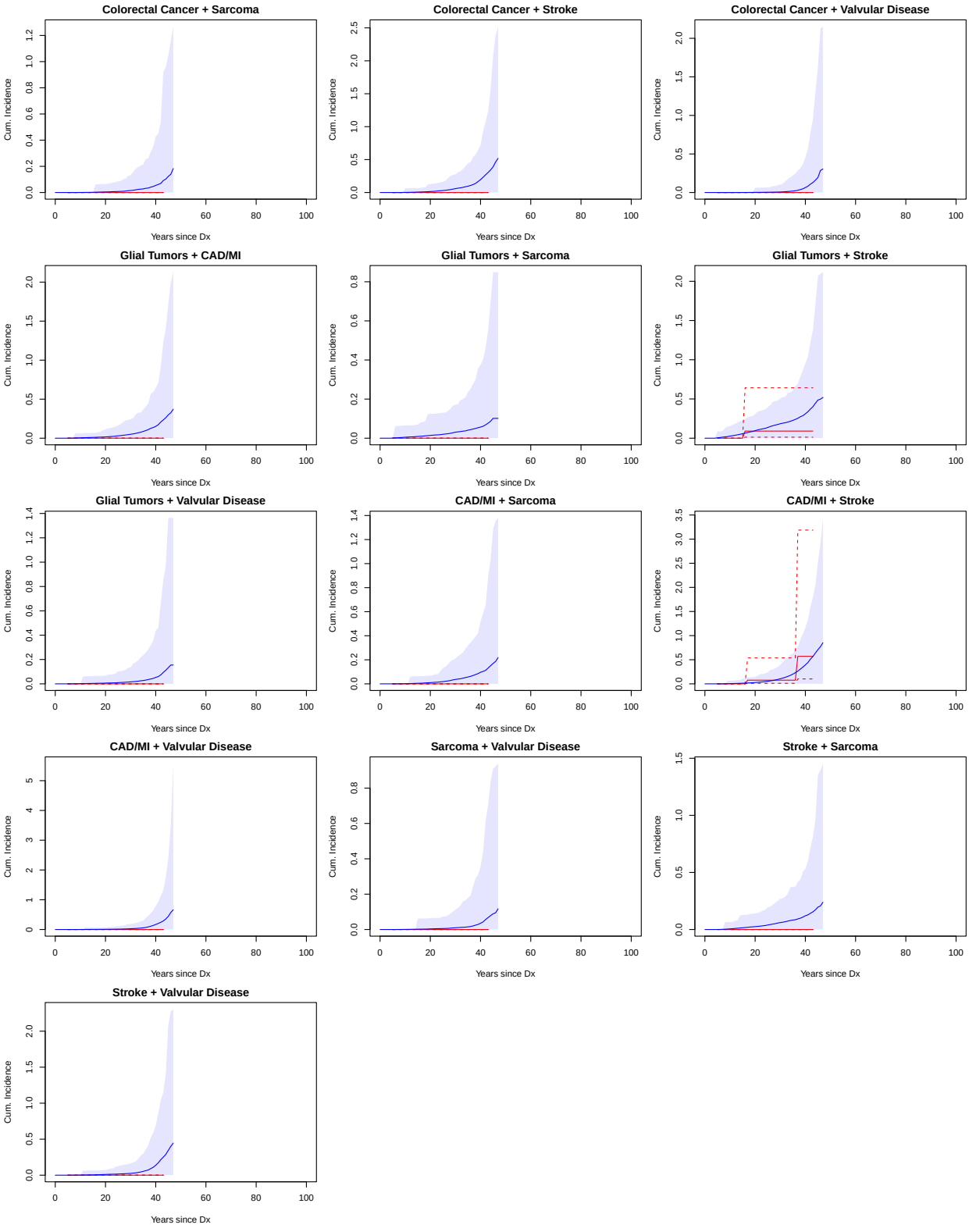
6.5.4.45 ChestNone



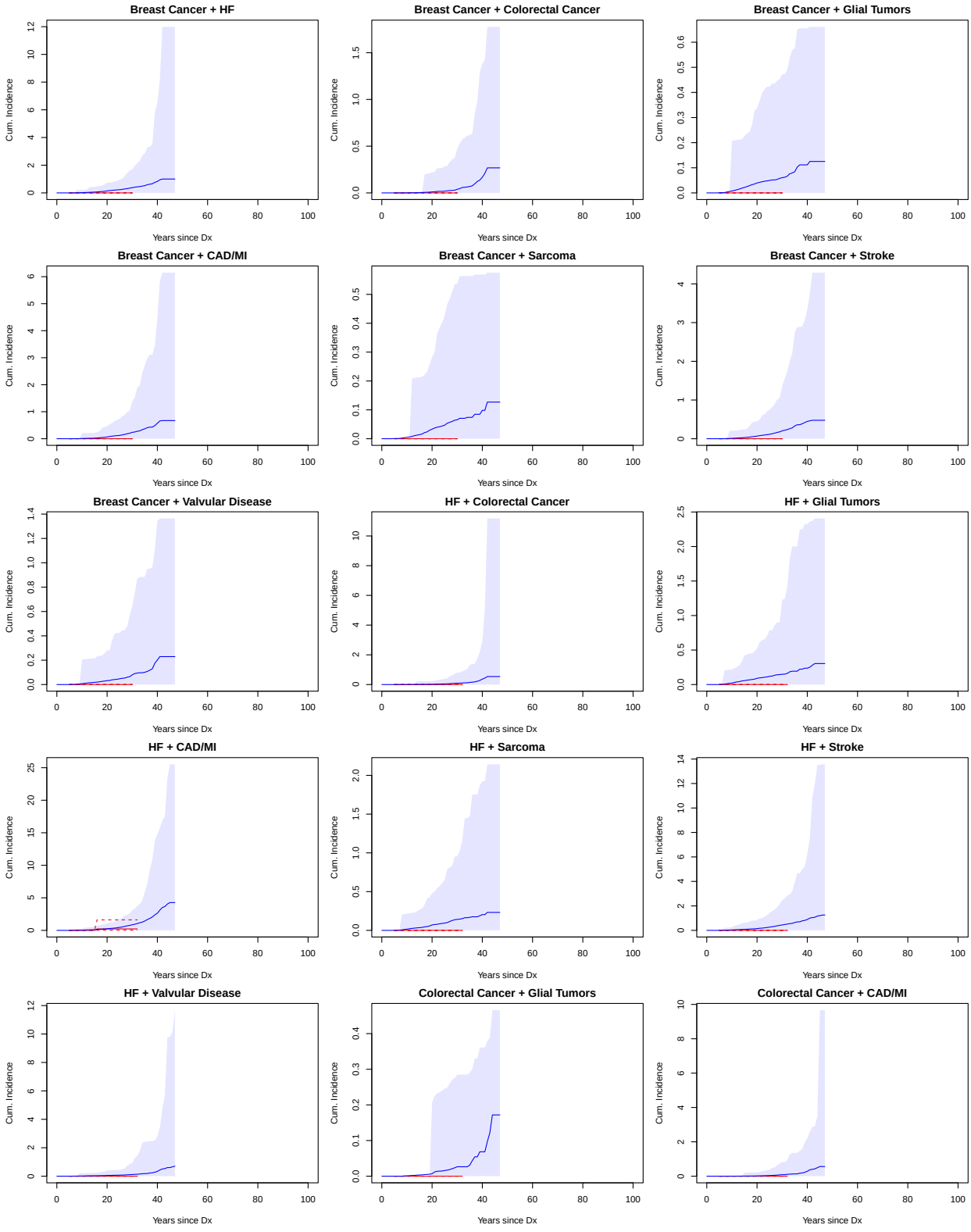

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

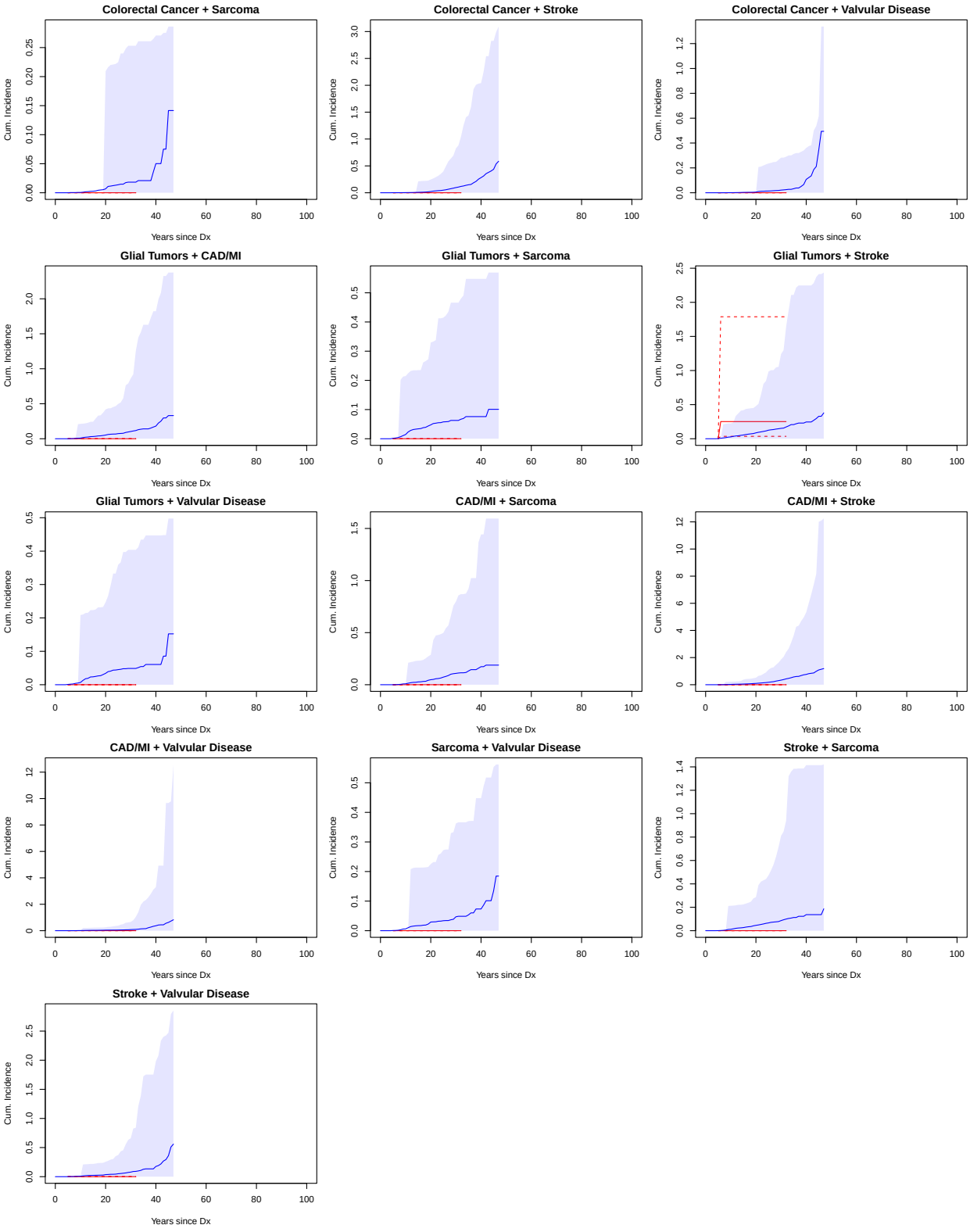
6.5.4.46 Chest<10



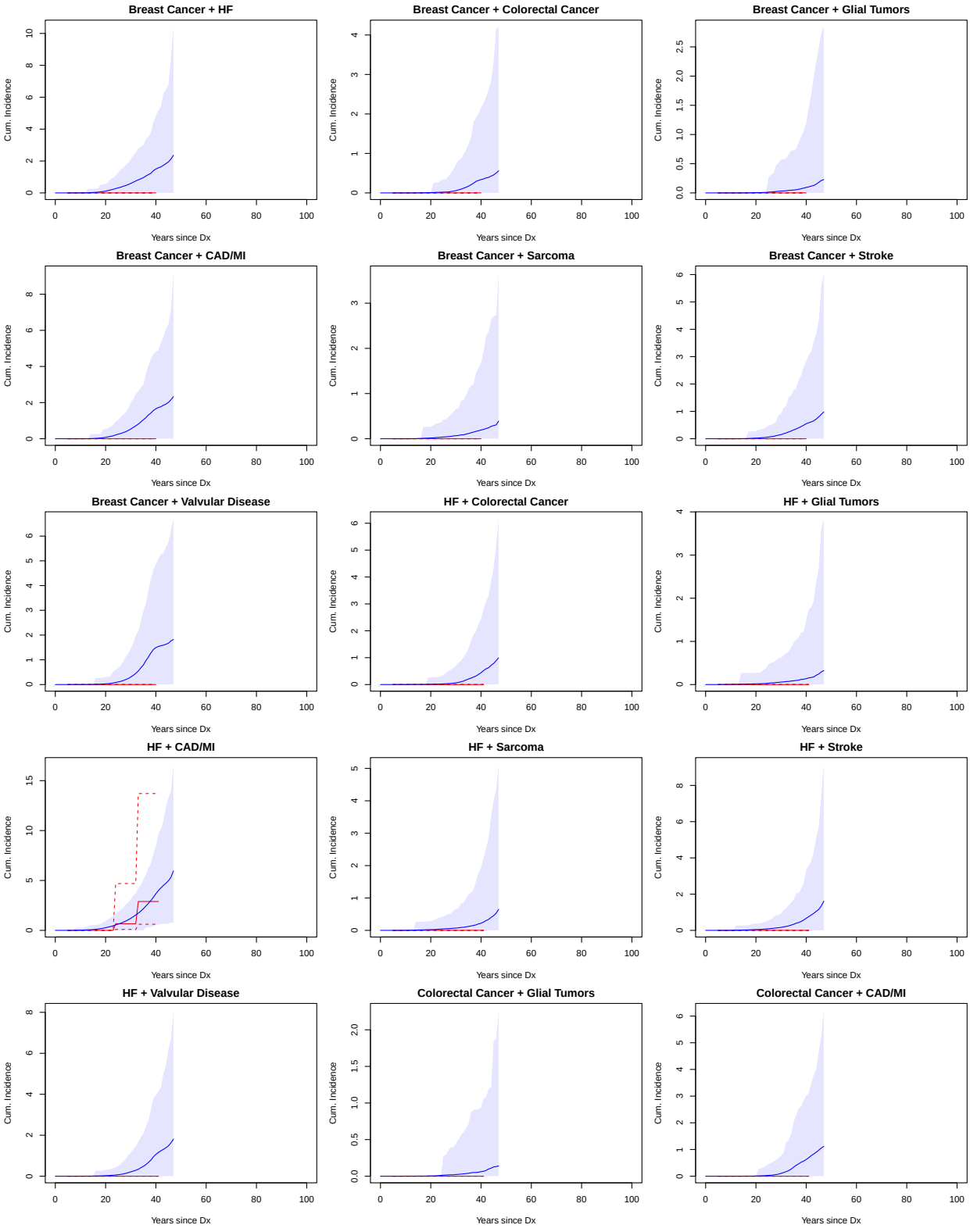

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

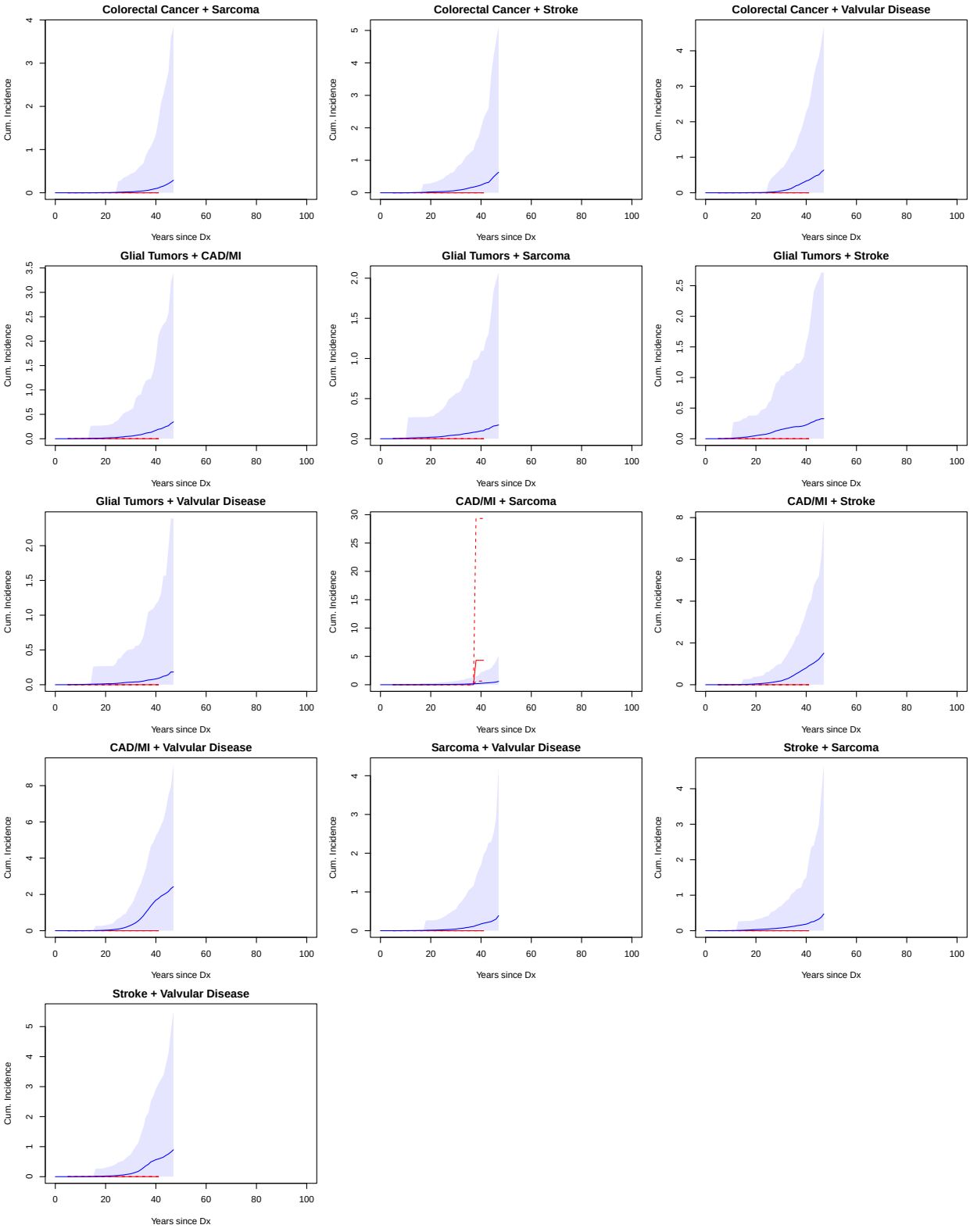
6.5.4.47 Chest10_19



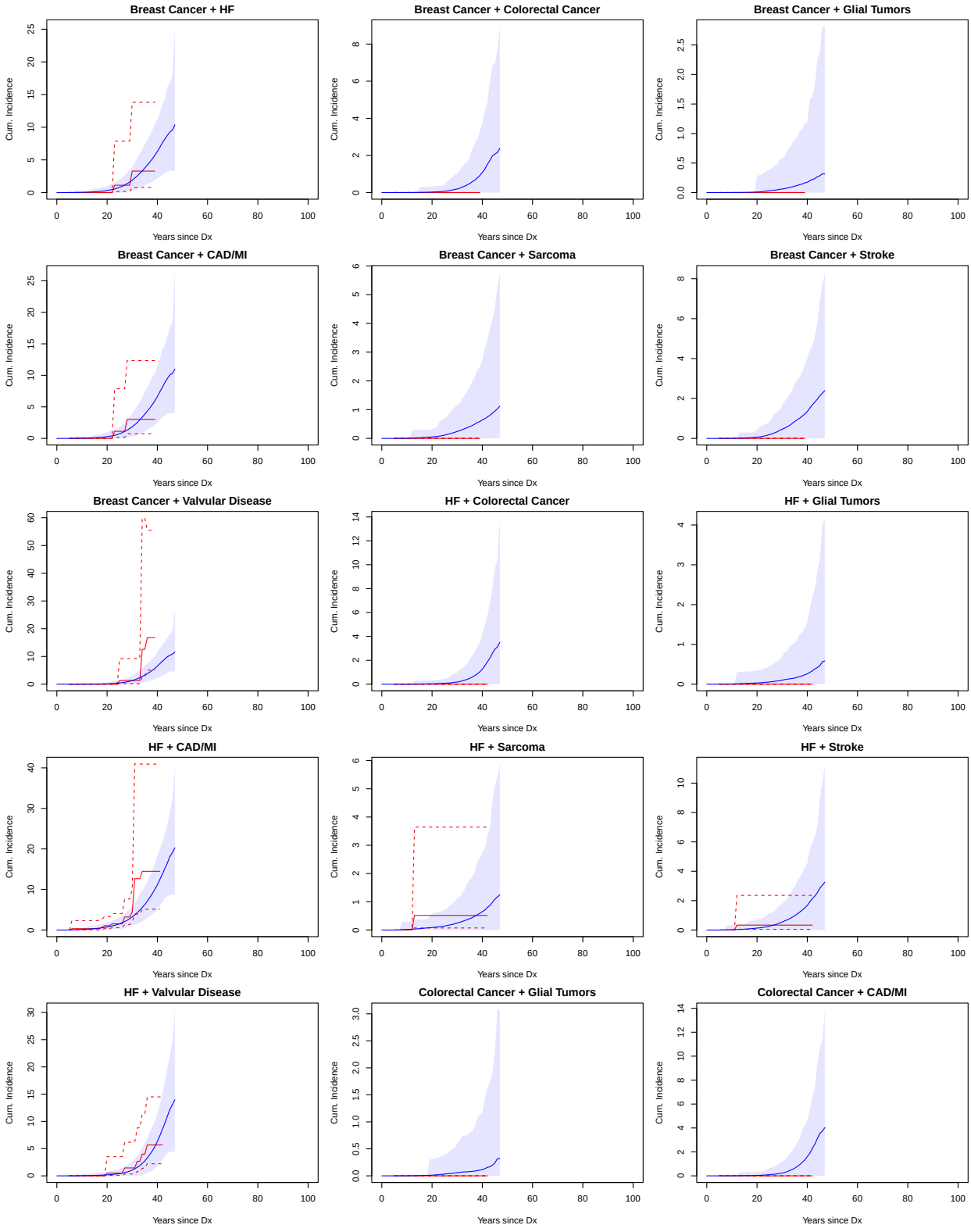

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

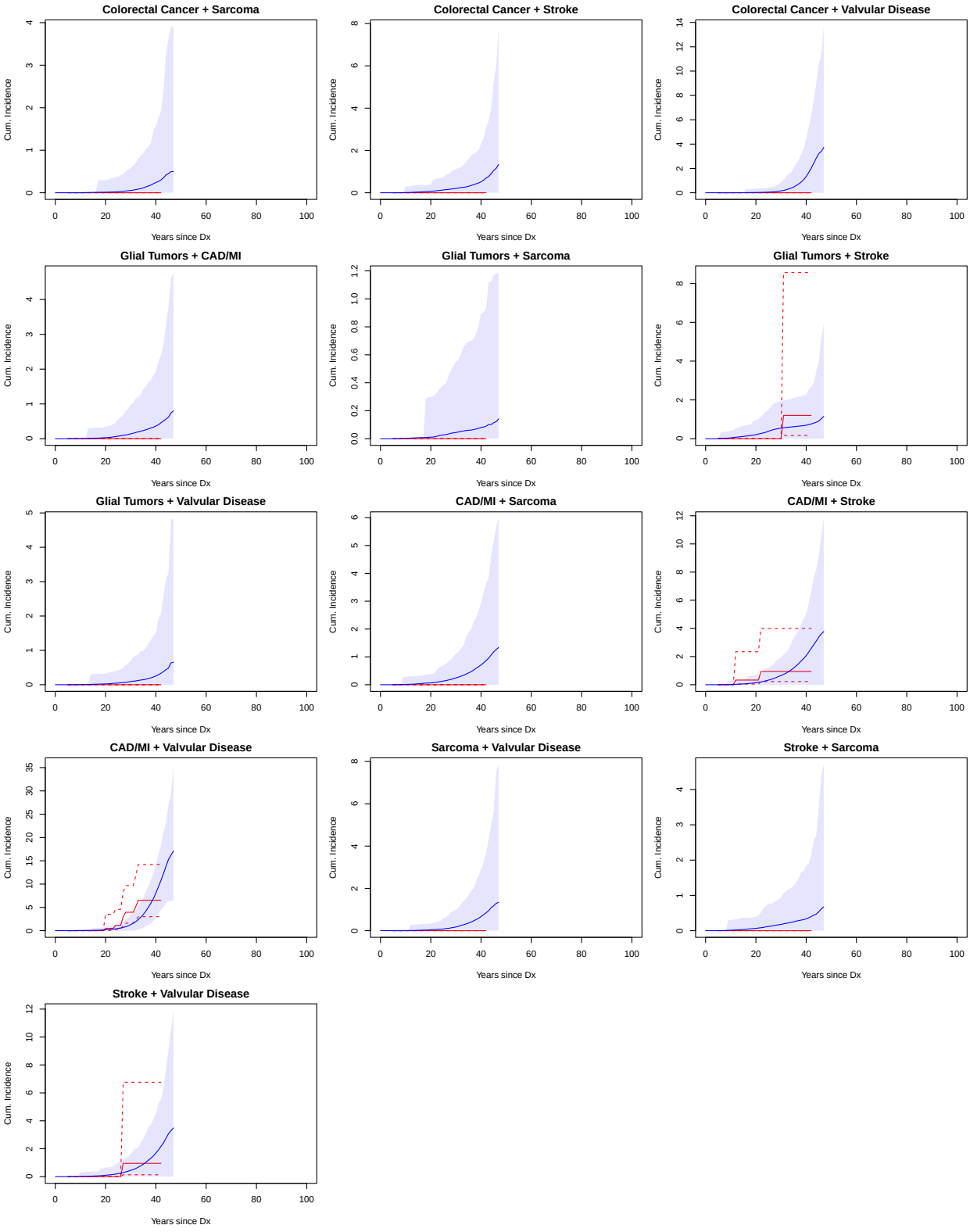
6.5.4.48 Chest20_29



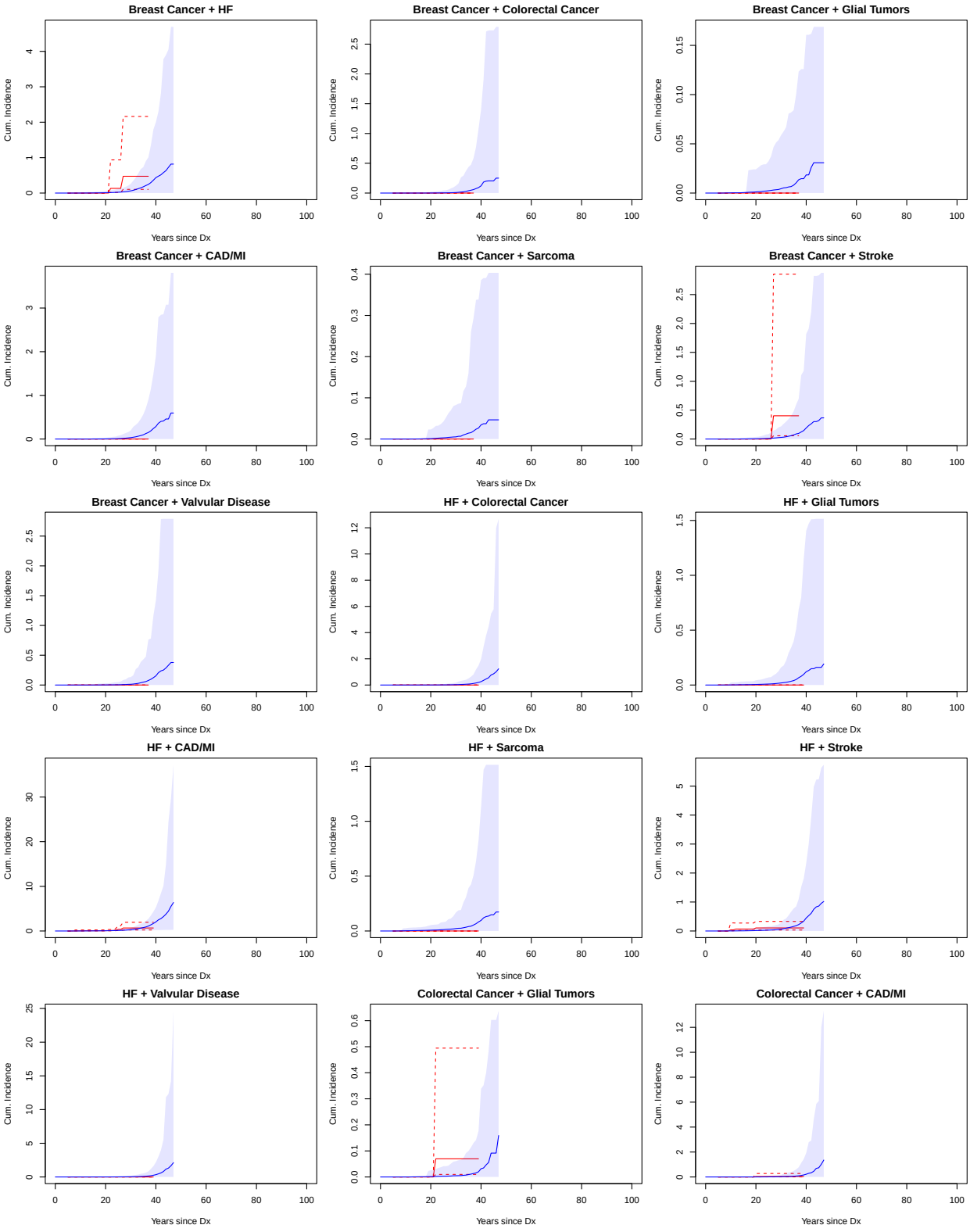

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

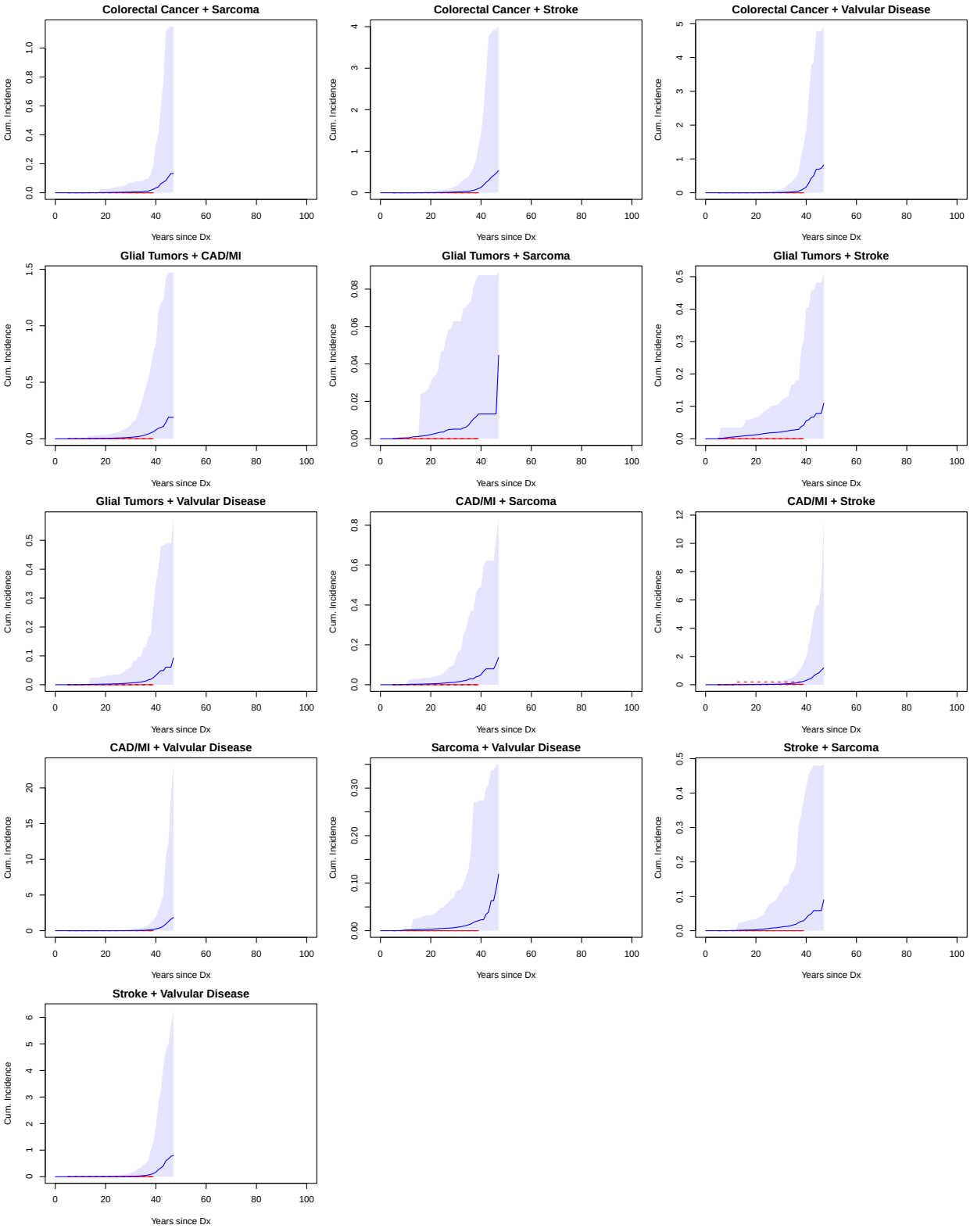
6.5.4.49 Chest30+



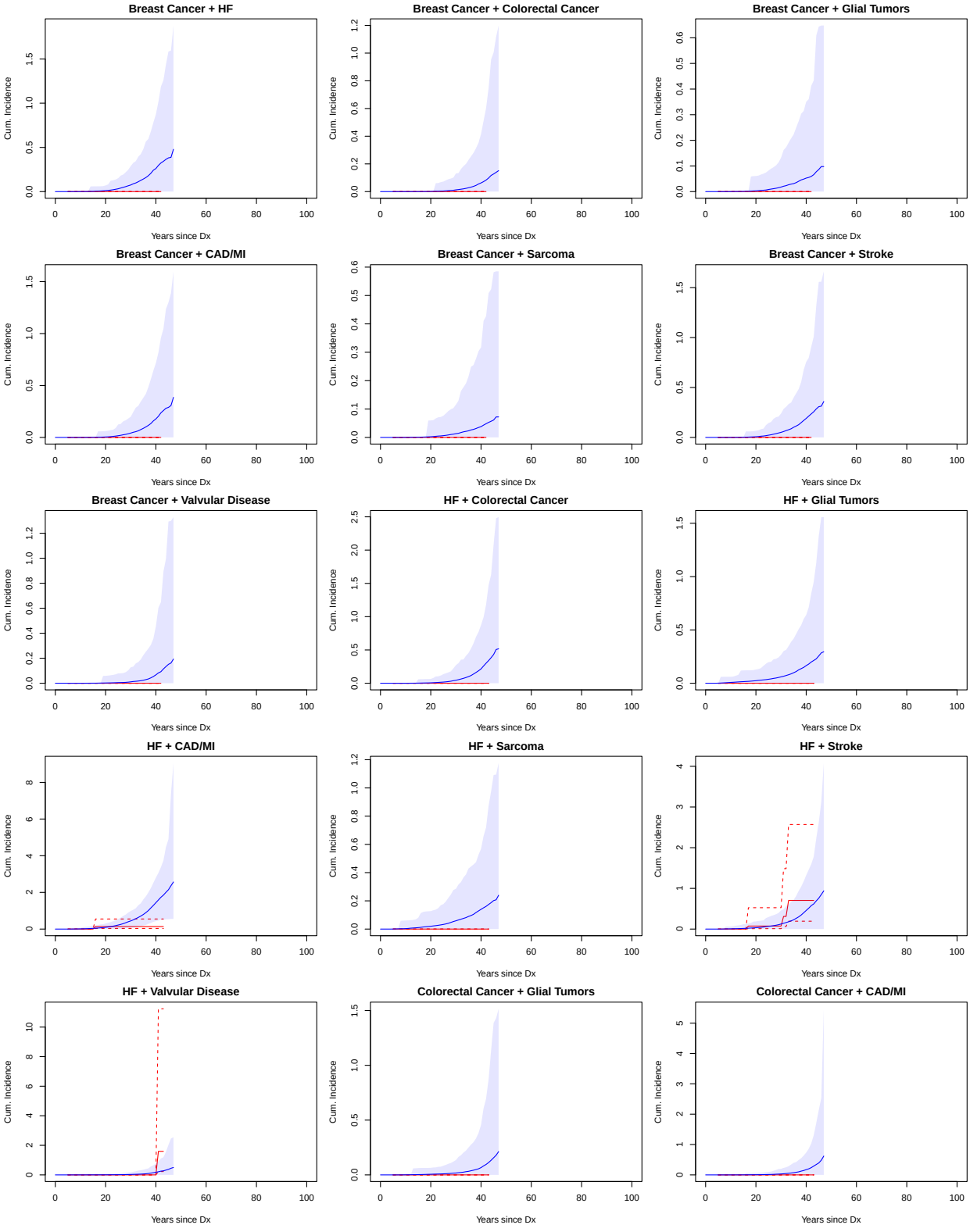

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

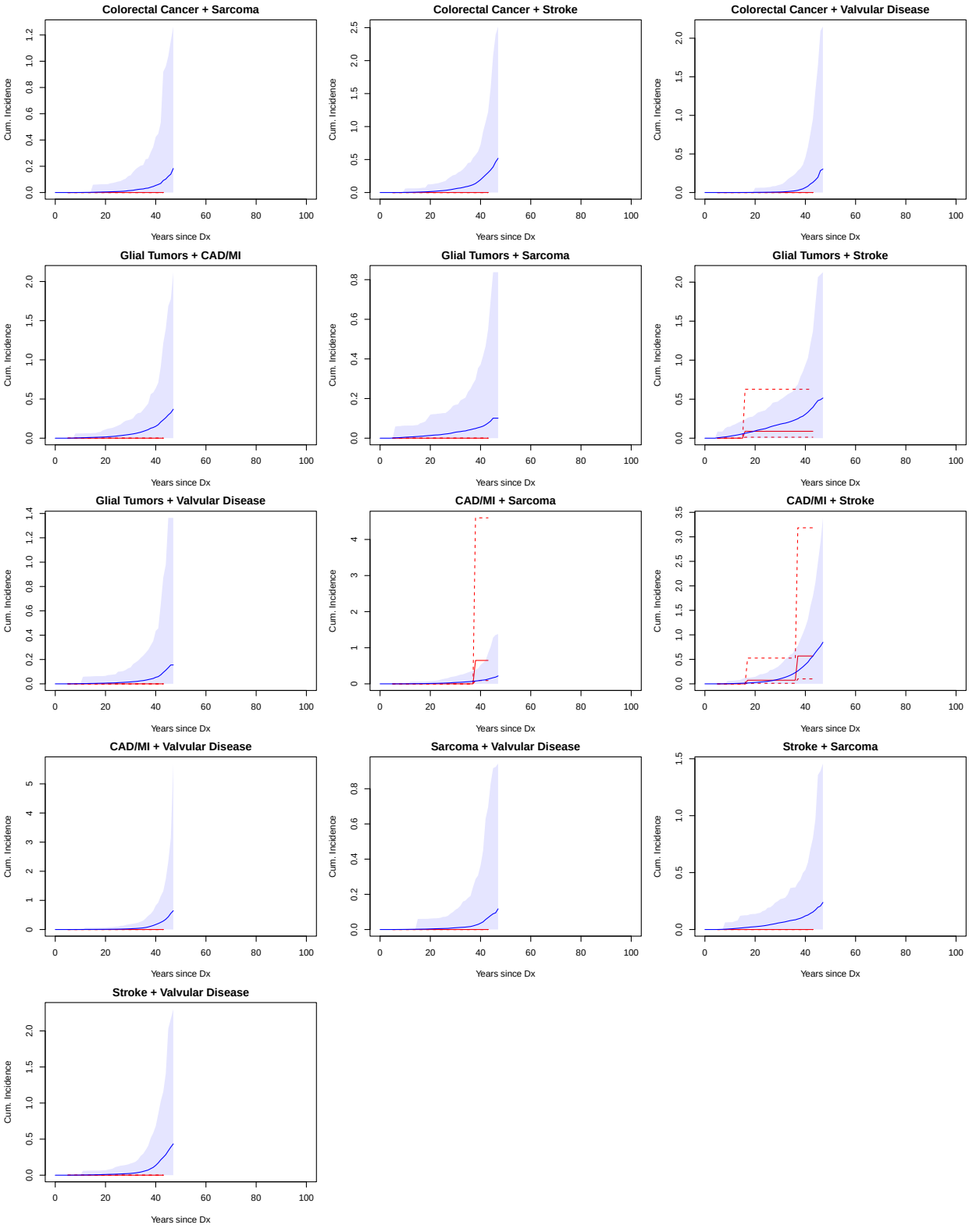
6.5.4.50 HeartNone



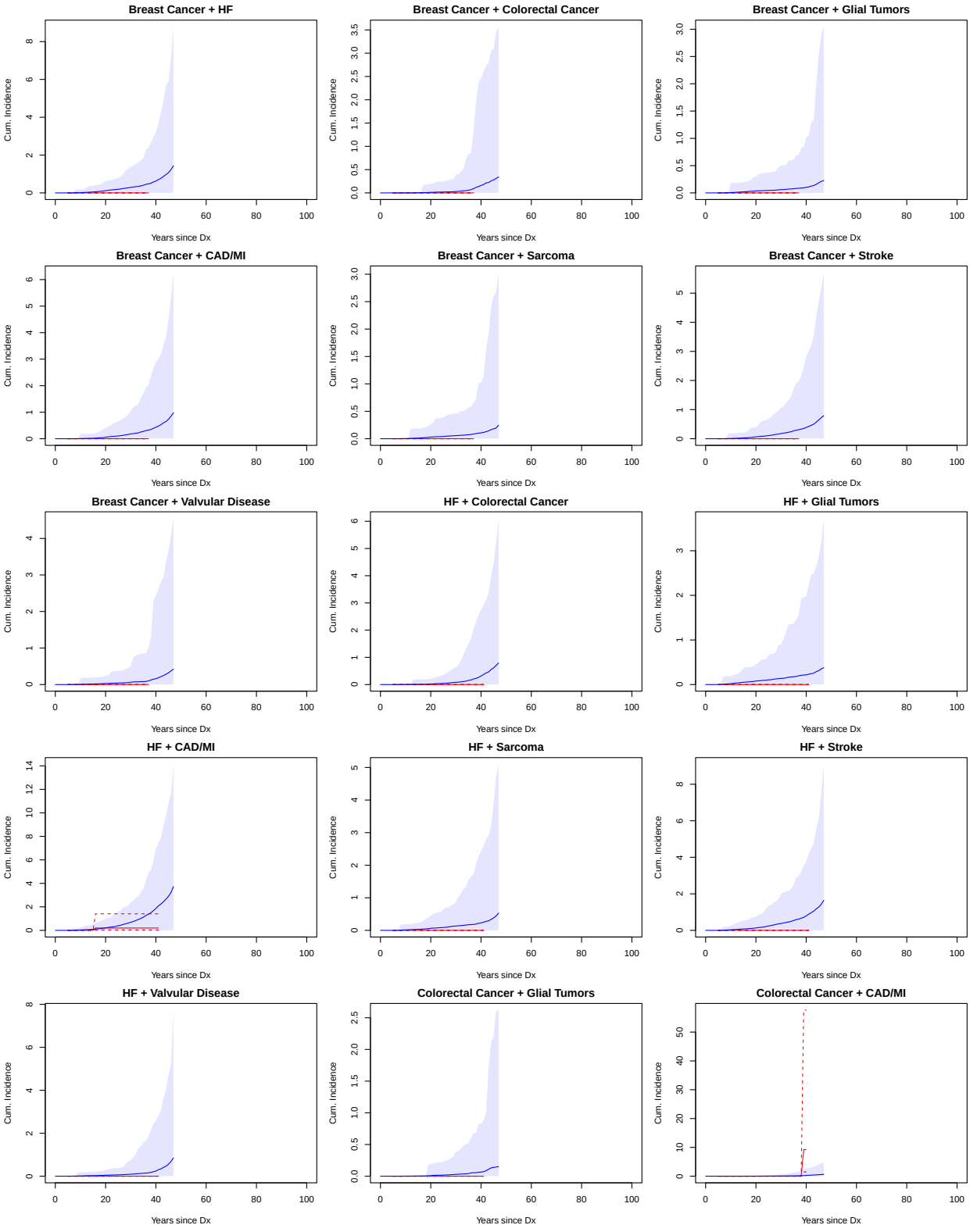

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

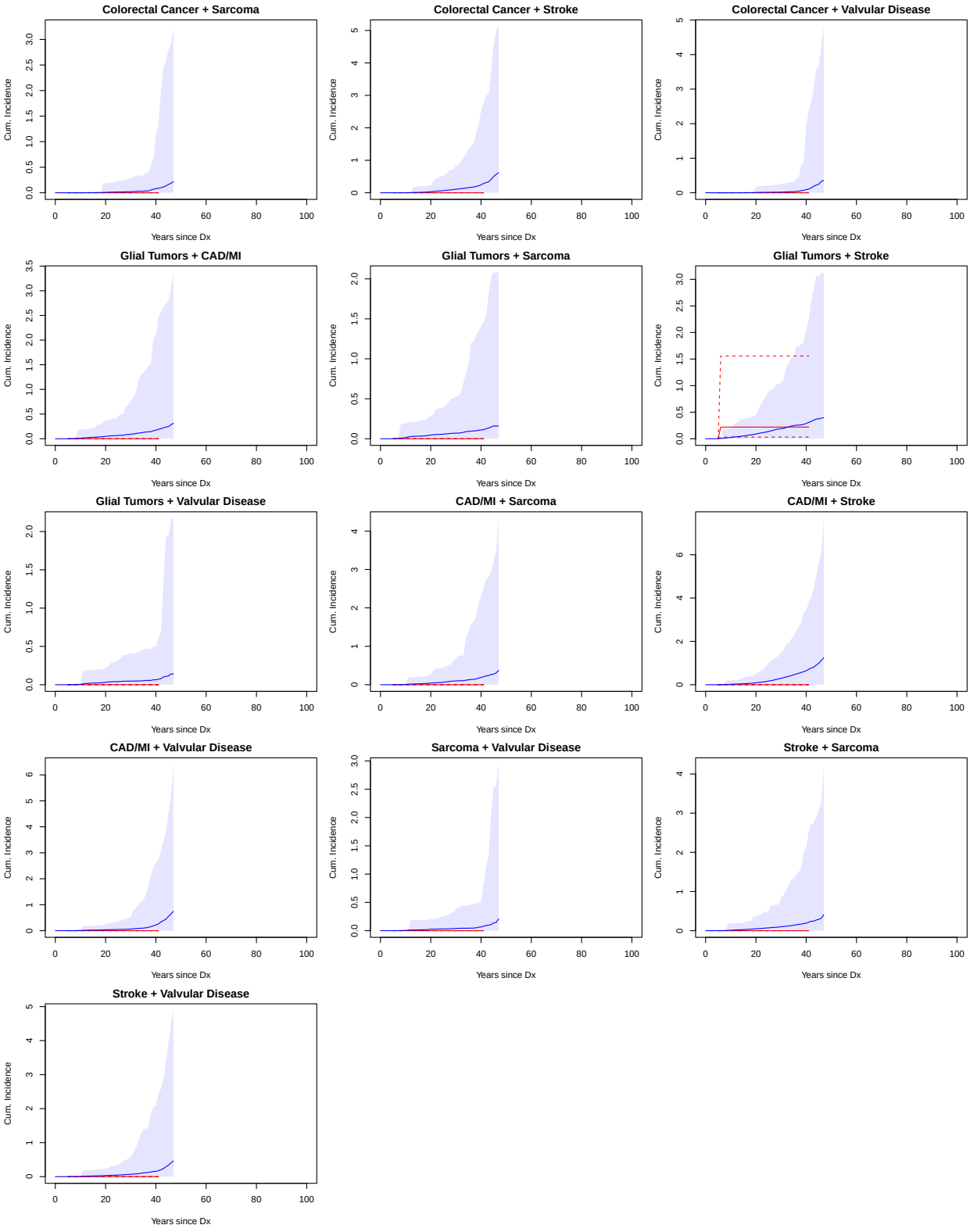
6.5.4.51 Heart<5



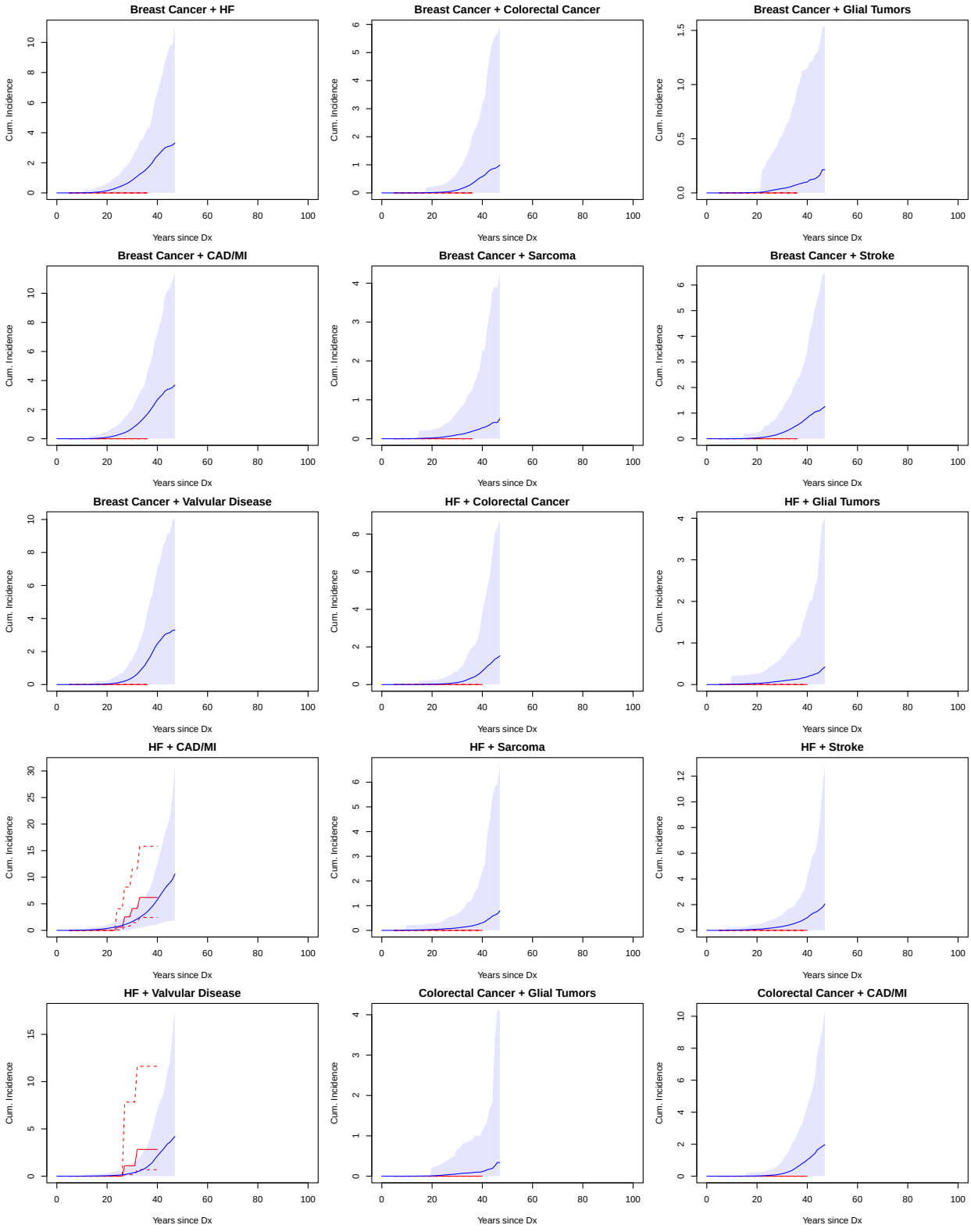

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

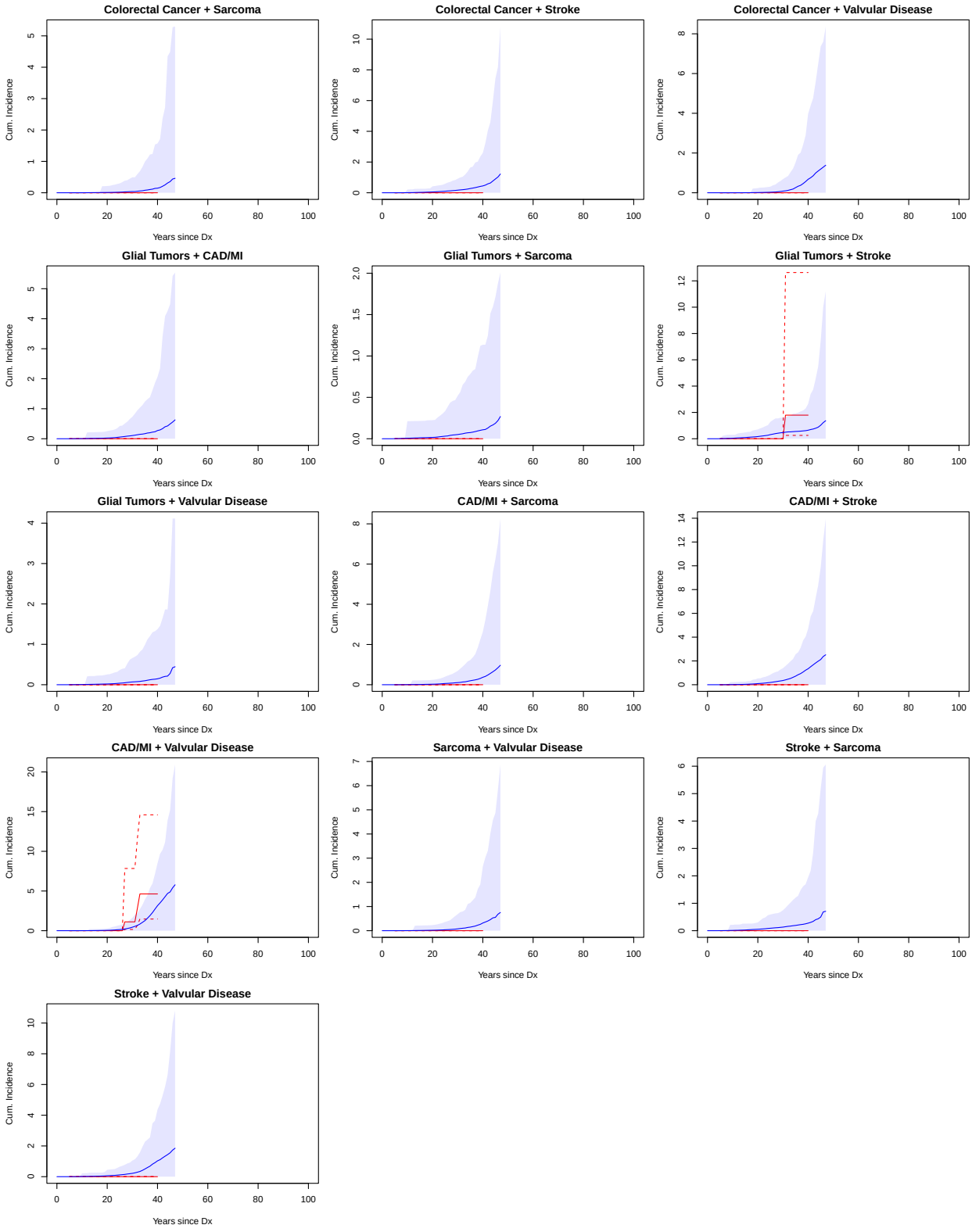
6.5.4.52 Heart5_14



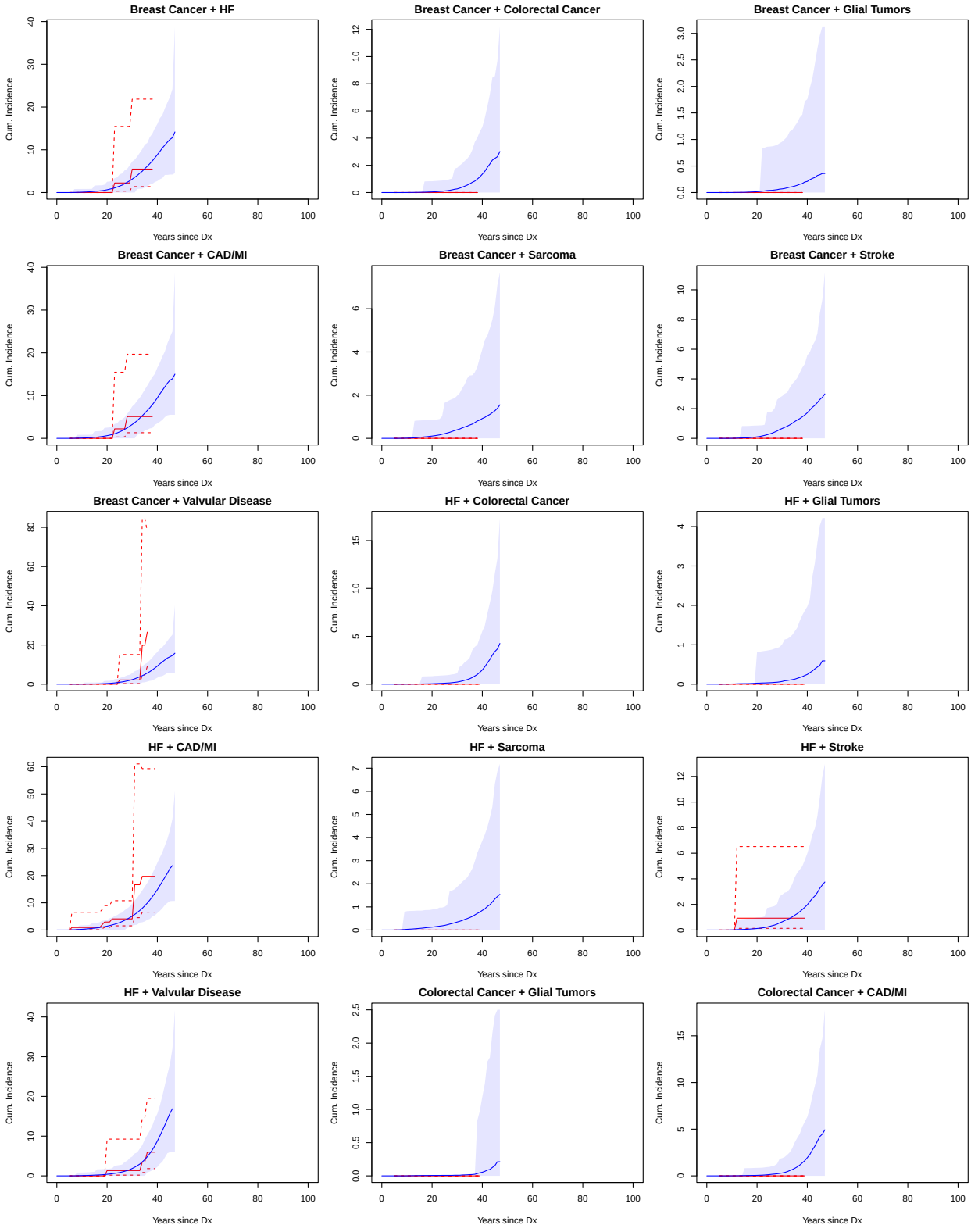

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

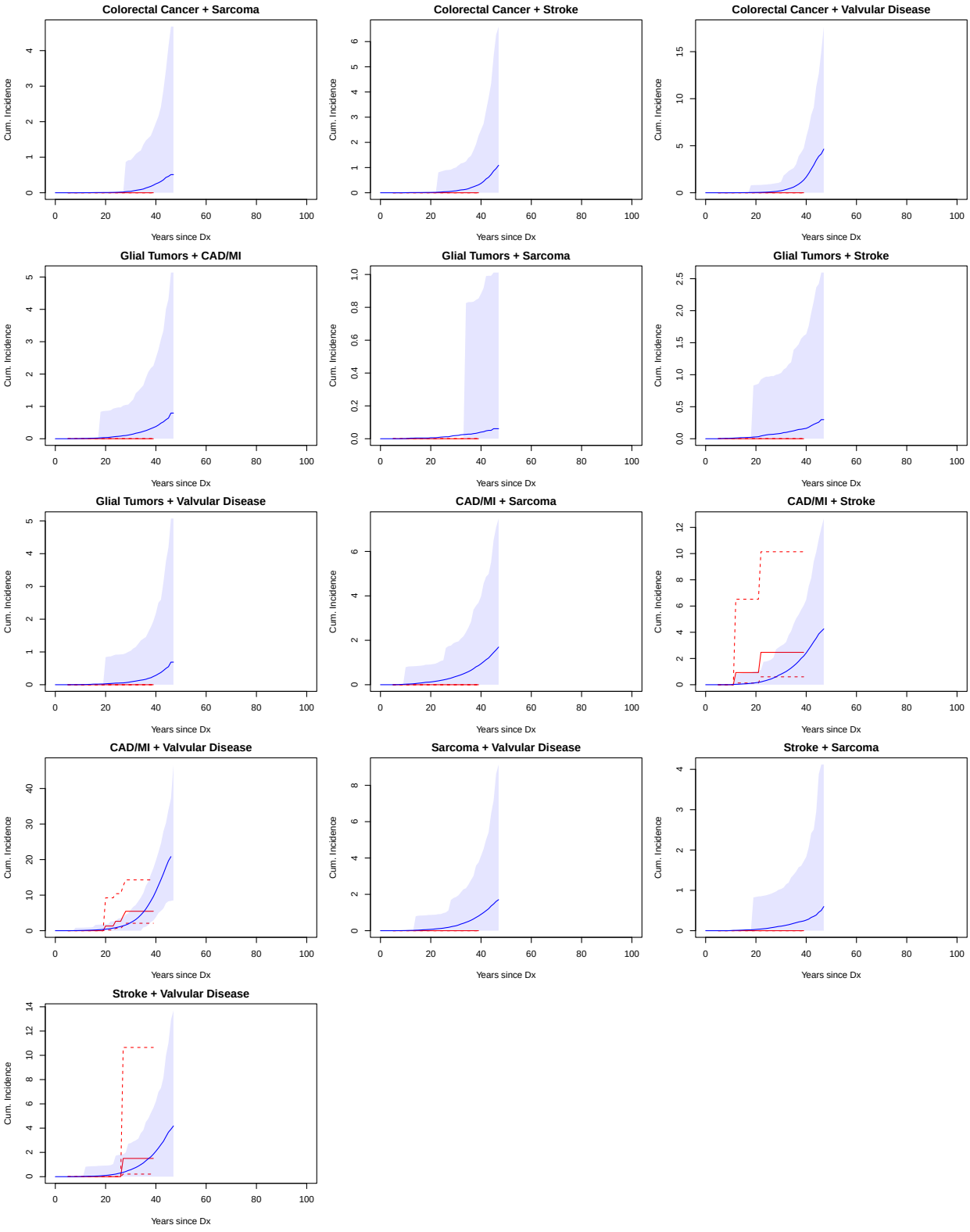
6.5.4.53 Heart15_34



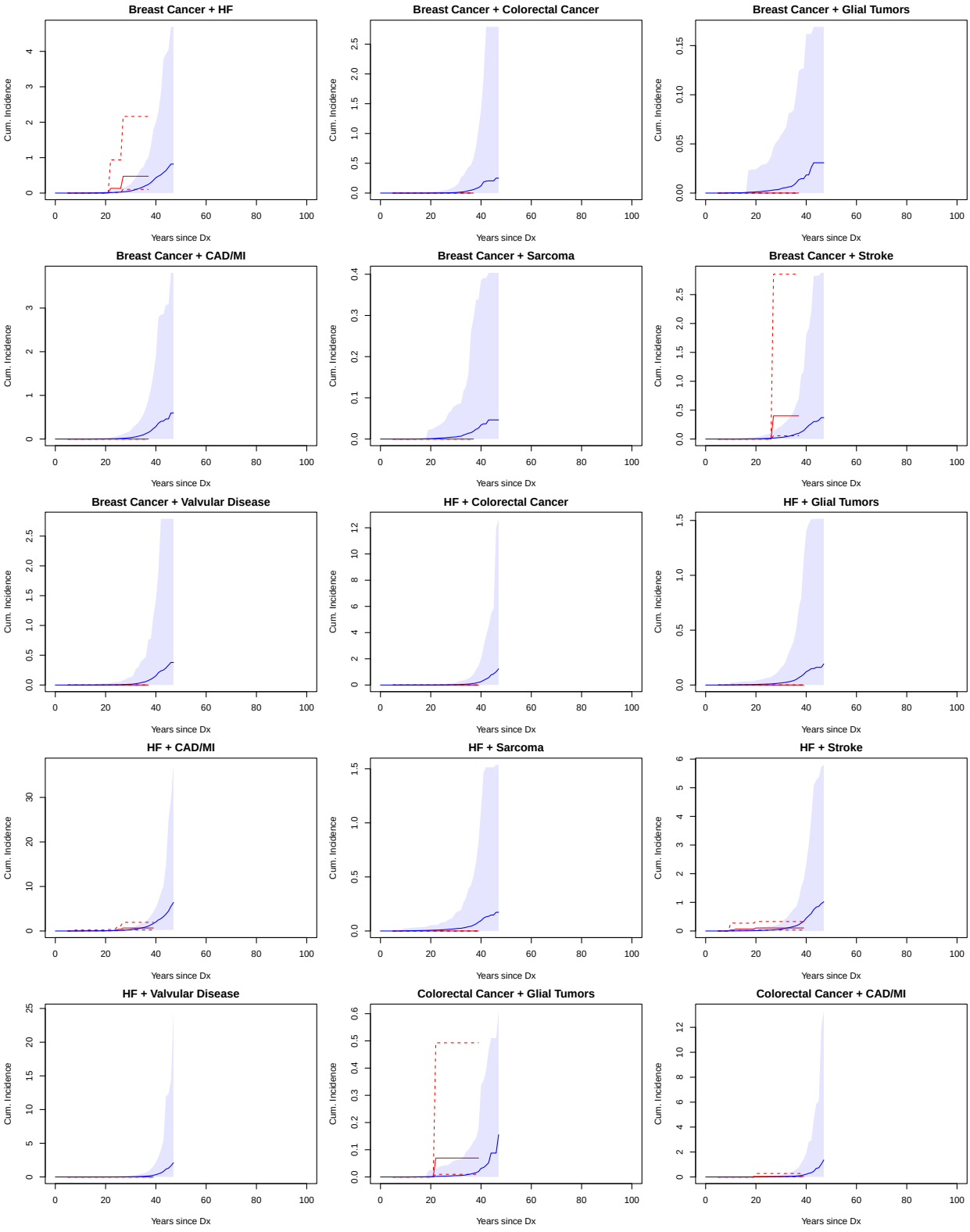

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

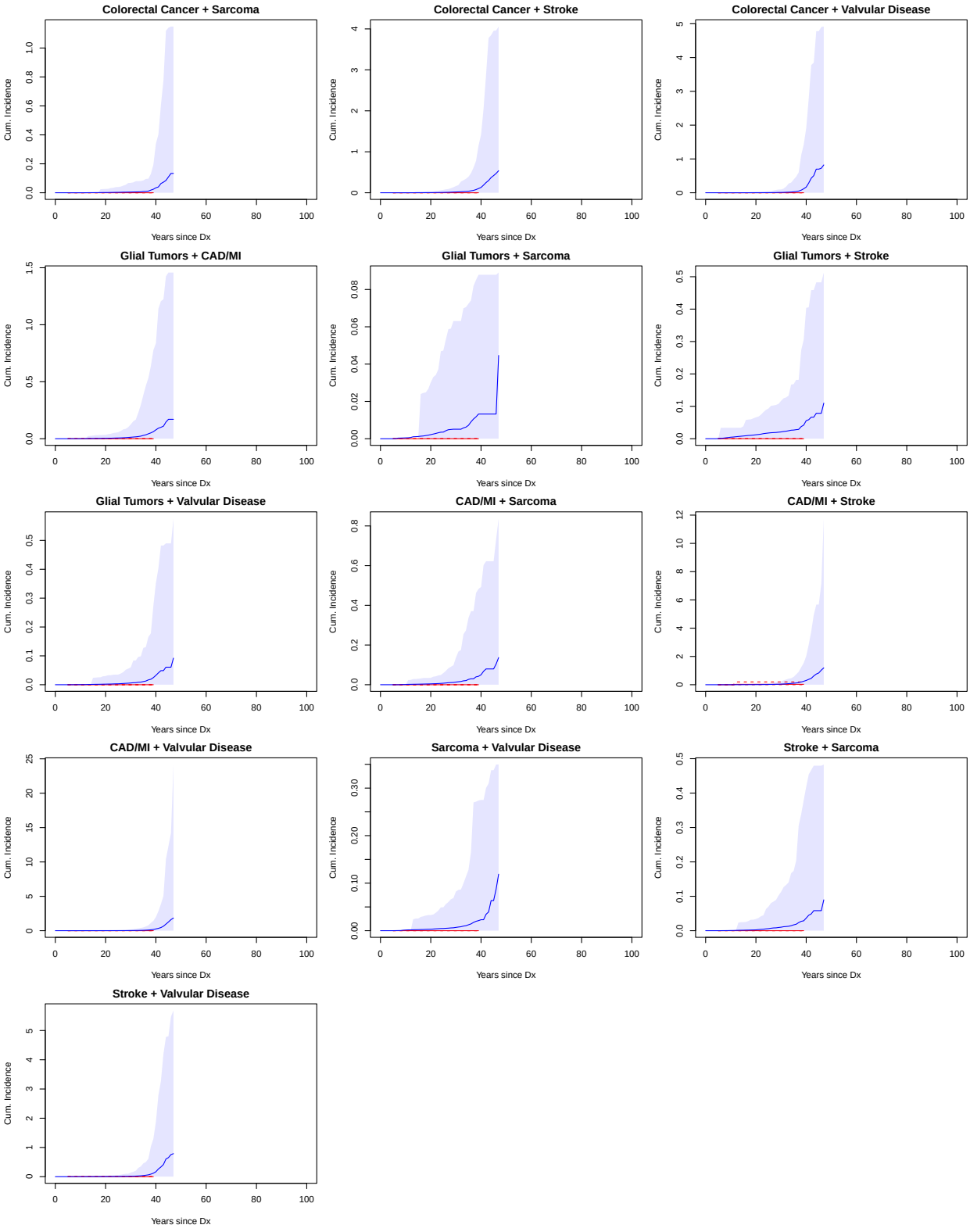
6.5.4.54 Heart35+



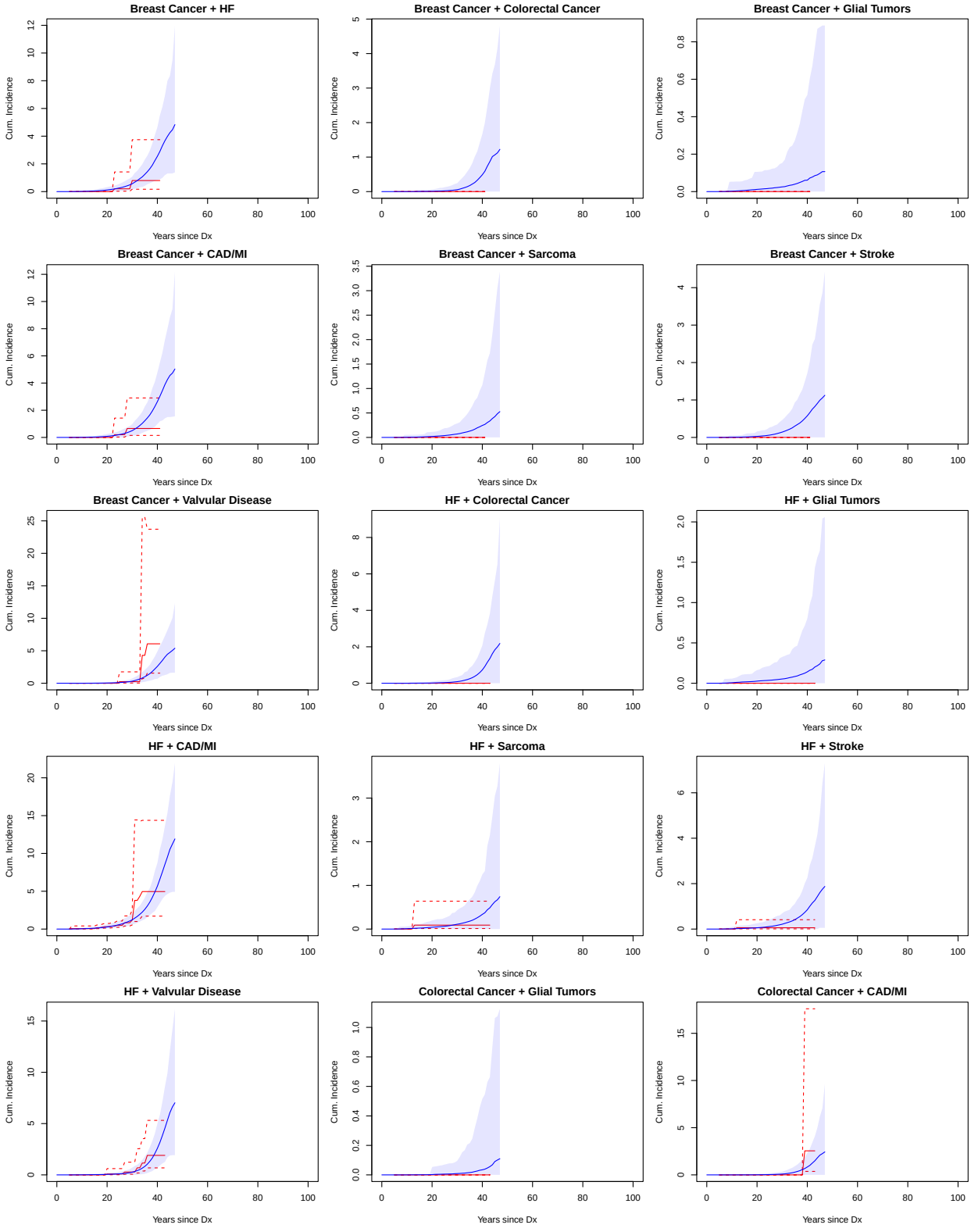

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

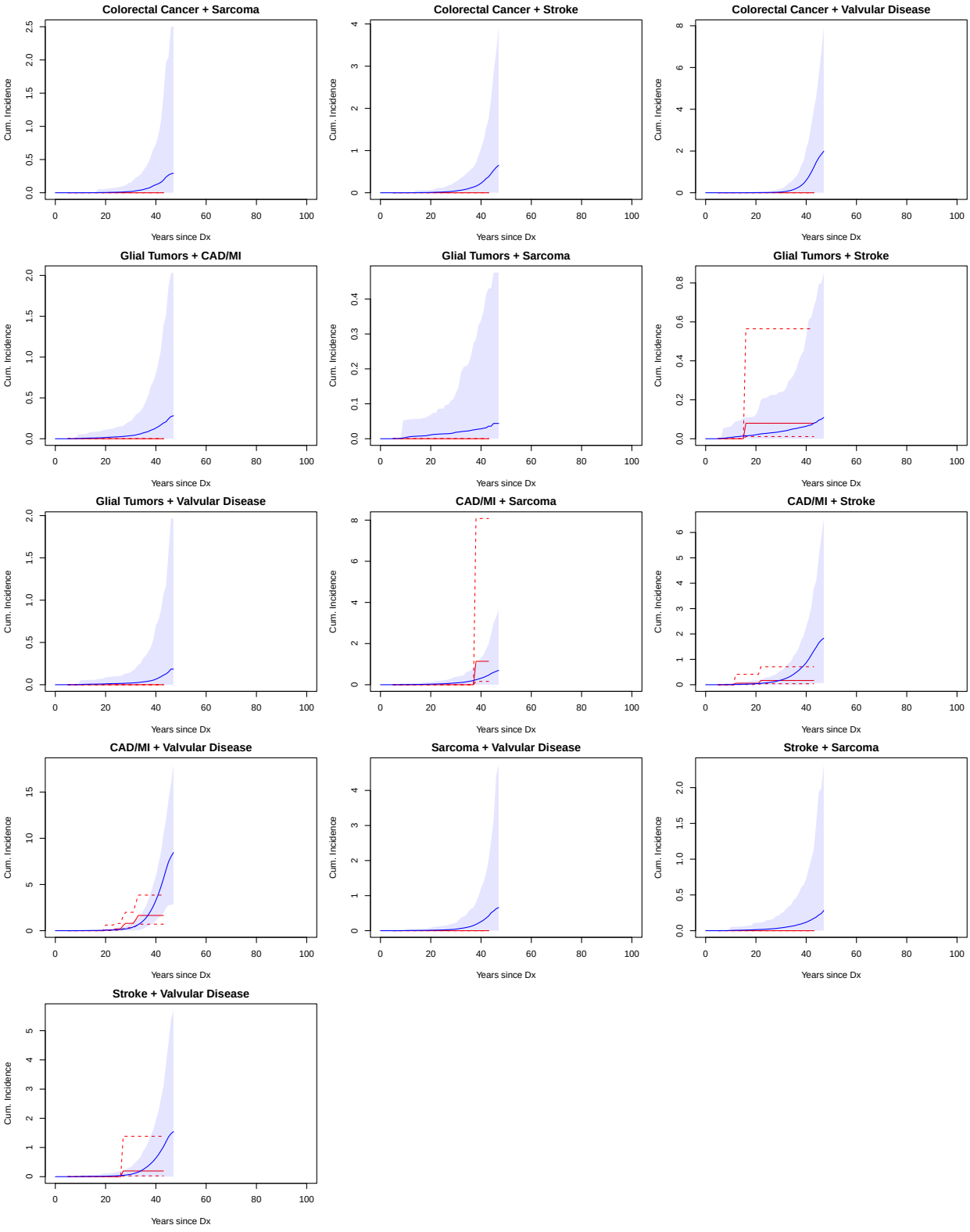
6.5.4.55 CRTNone



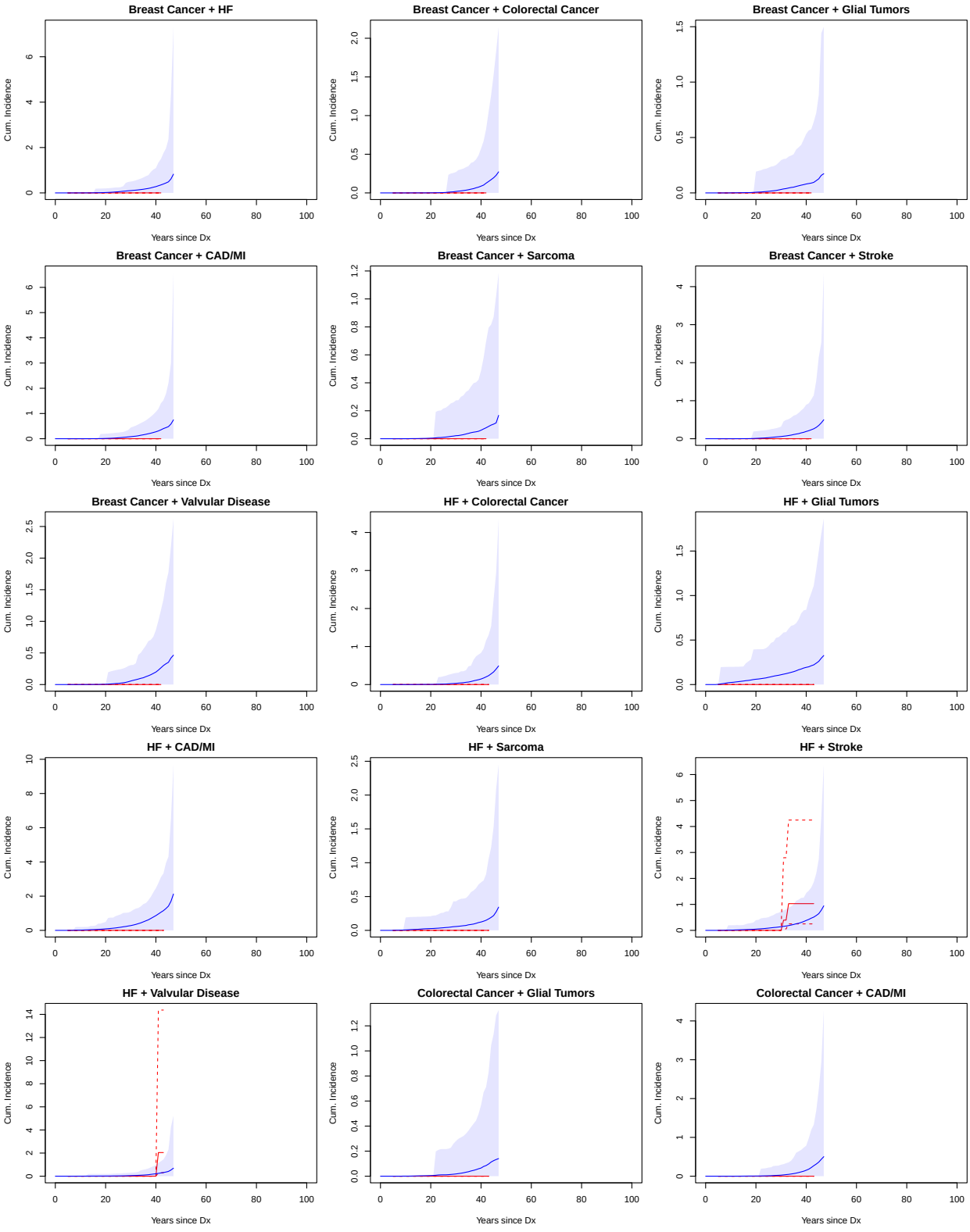

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

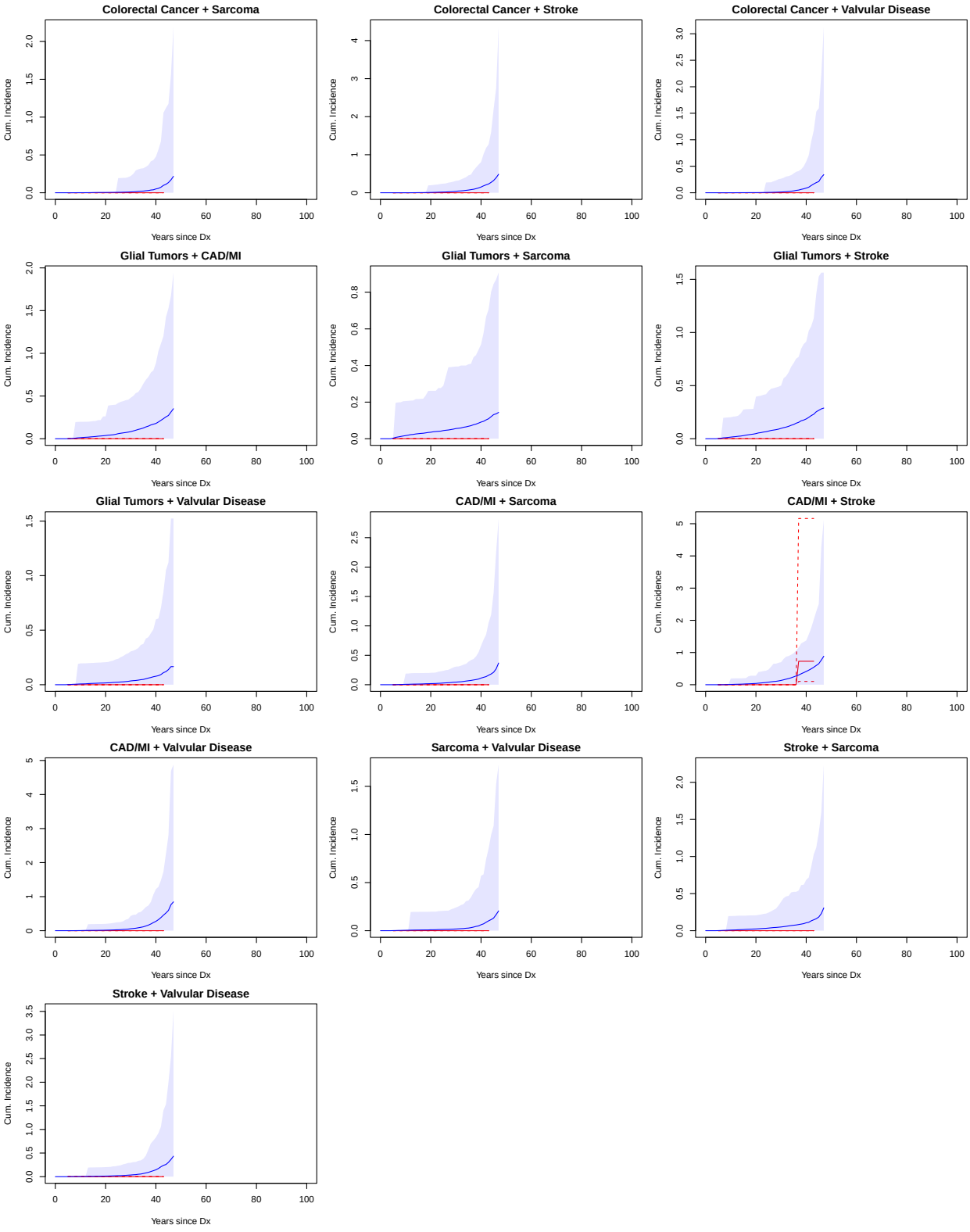
6.5.4.56 CRT<20


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

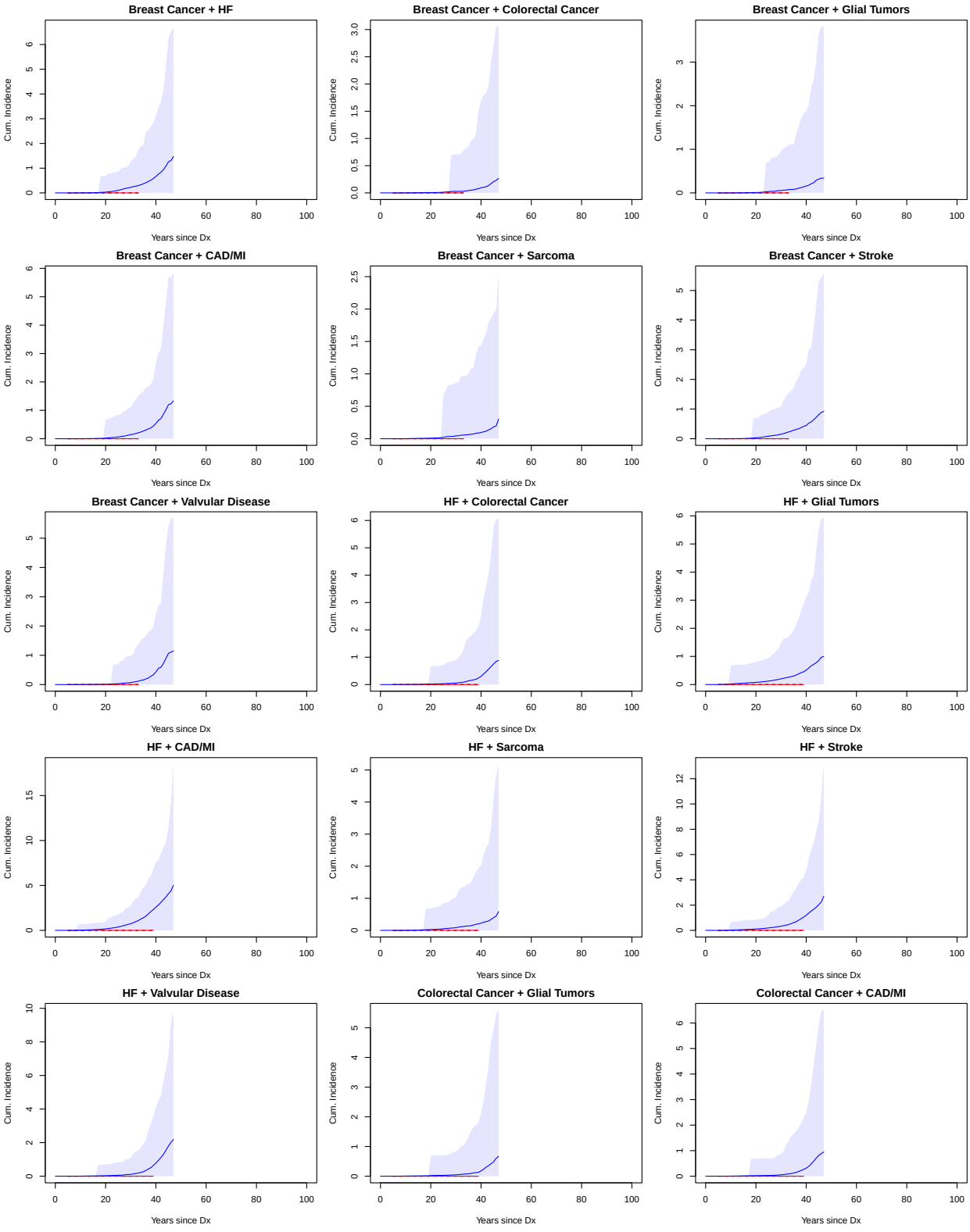

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

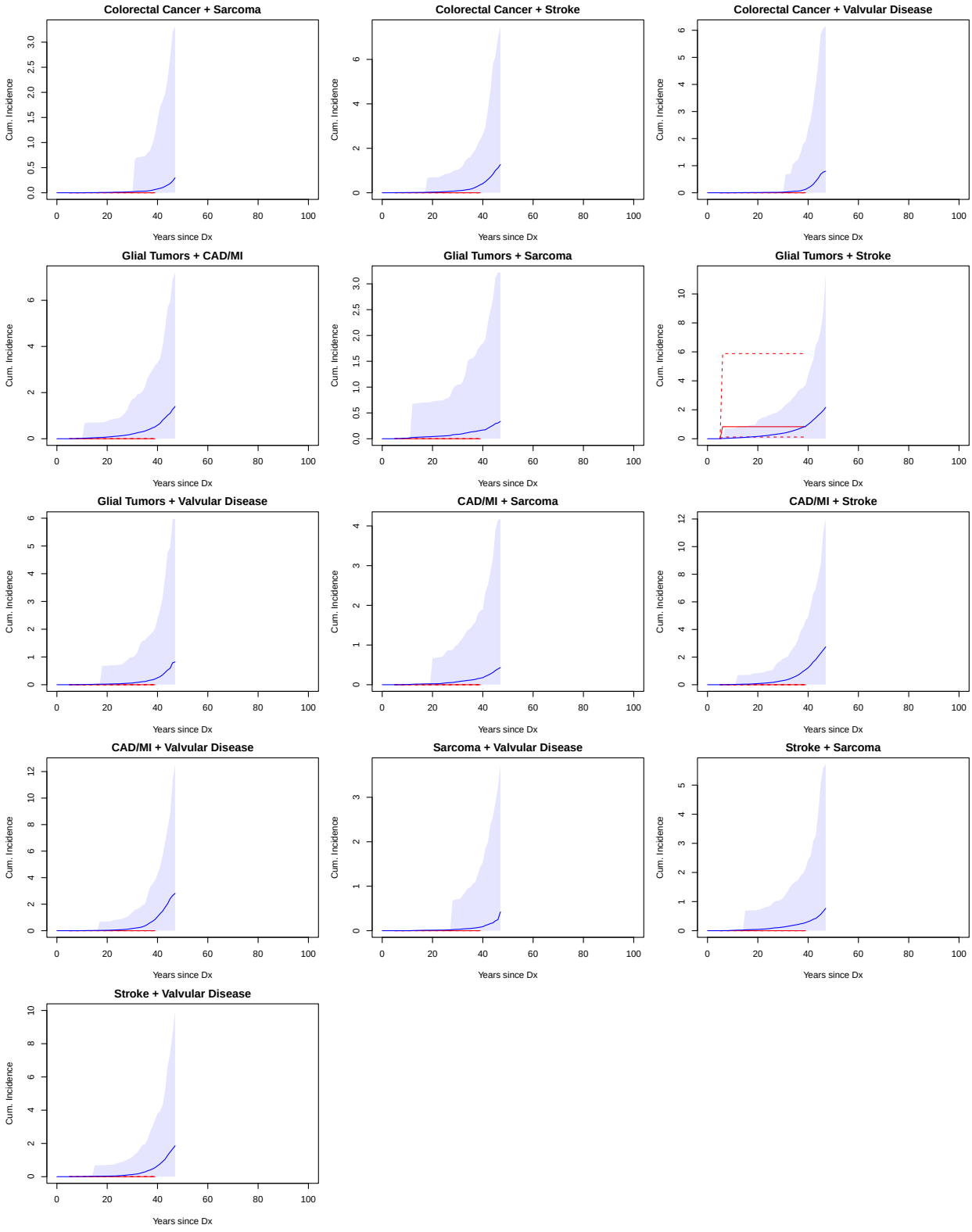
6.5.4.57 CRT20_29



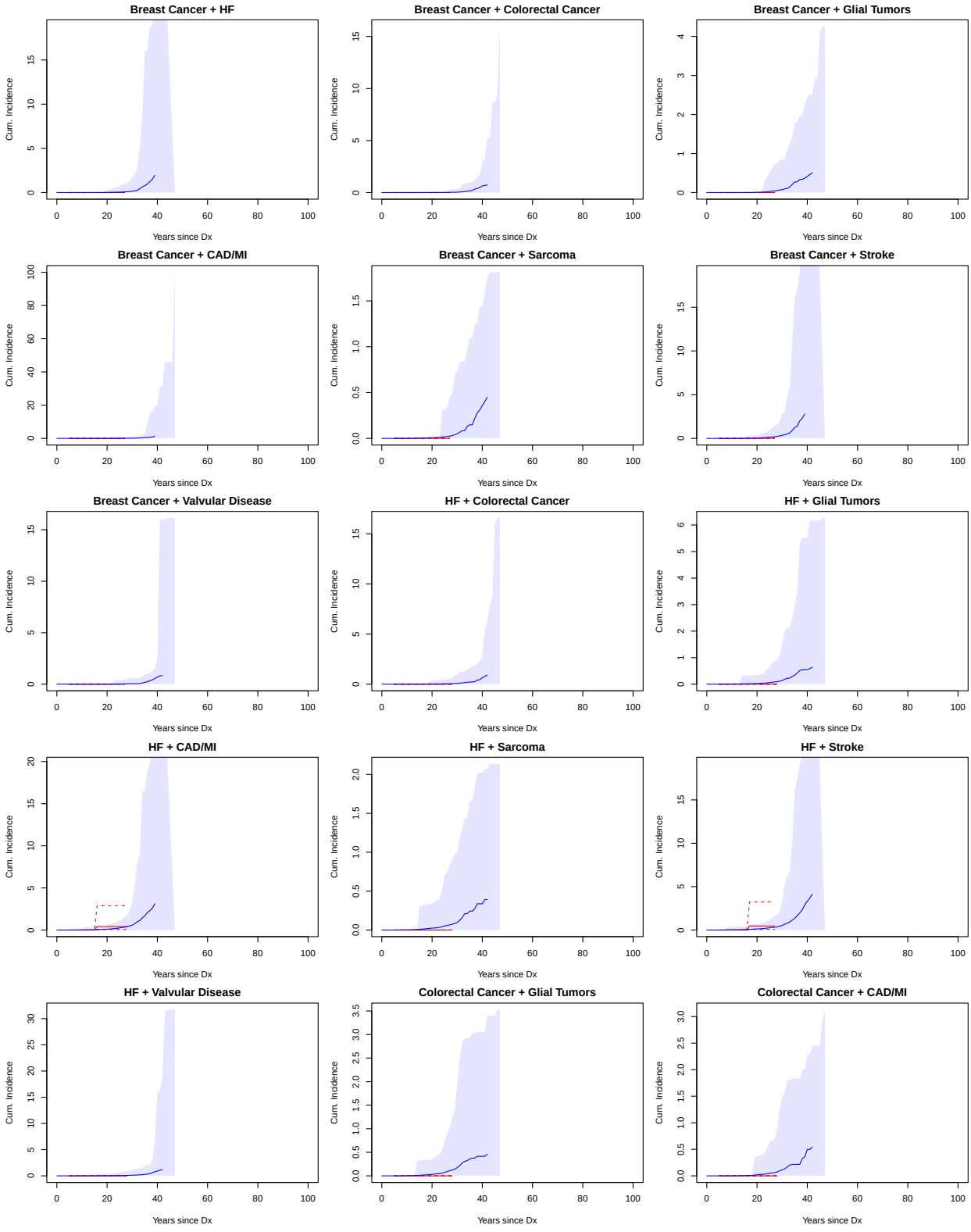

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

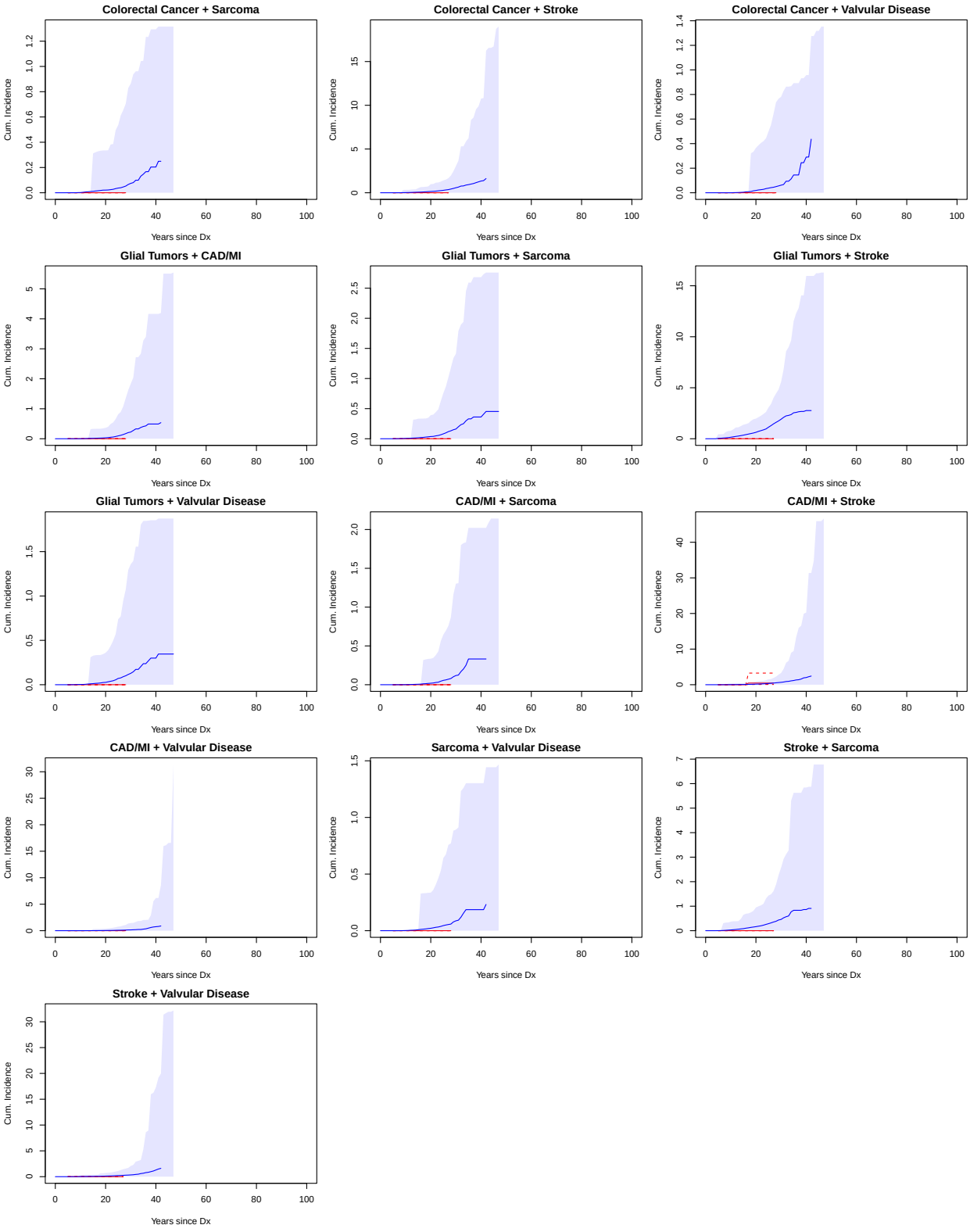
6.5.4.58 CRT30_49



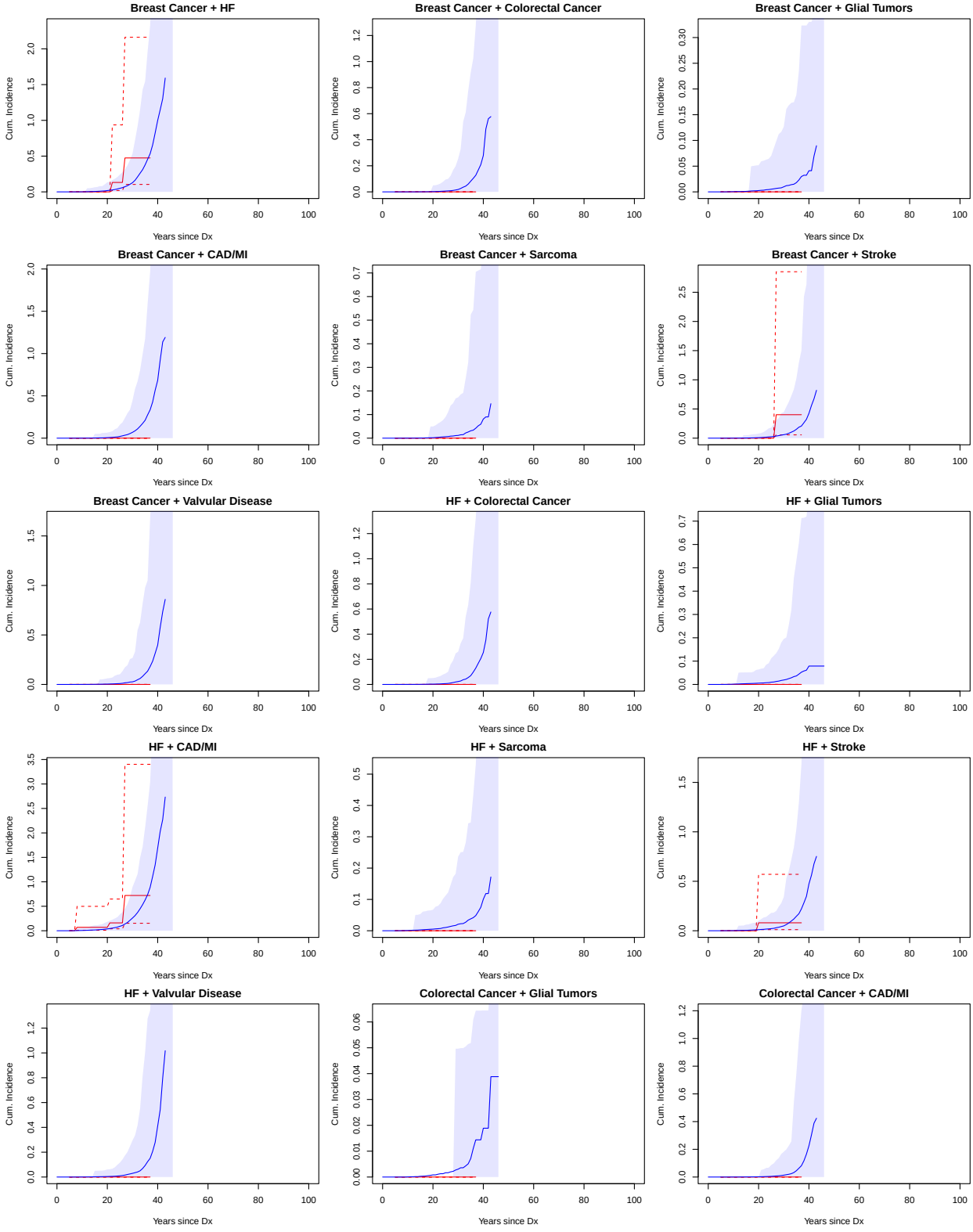

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

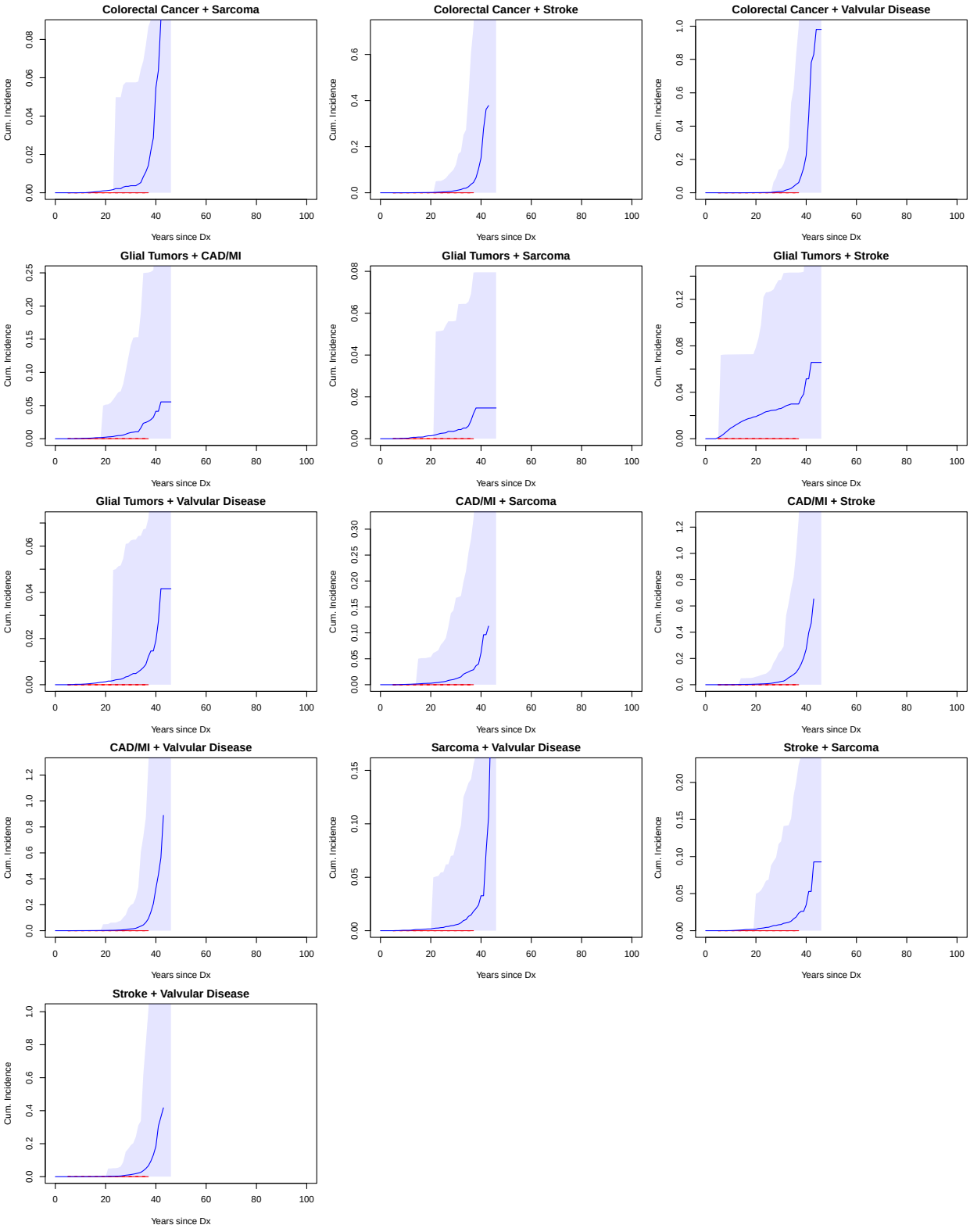
6.5.4.59 CRT50+


Breast Cancer + HF
Breast Cancer + Colorectal Cancer
Breast Cancer + Glial Tumors
Breast Cancer + CAD/MI
Breast Cancer + Sarcoma
Breast Cancer + Stroke
Breast Cancer + Valvular Disease
HF + Colorectal Cancer
HF + Glial Tumors
HF + CAD/MI
HF + Sarcoma
HF + Stroke
HF + Valvular Disease
Colorectal Cancer + Glial Tumors
Colorectal Cancer + CAD/MI
Cum. Incidence
Years since Dx

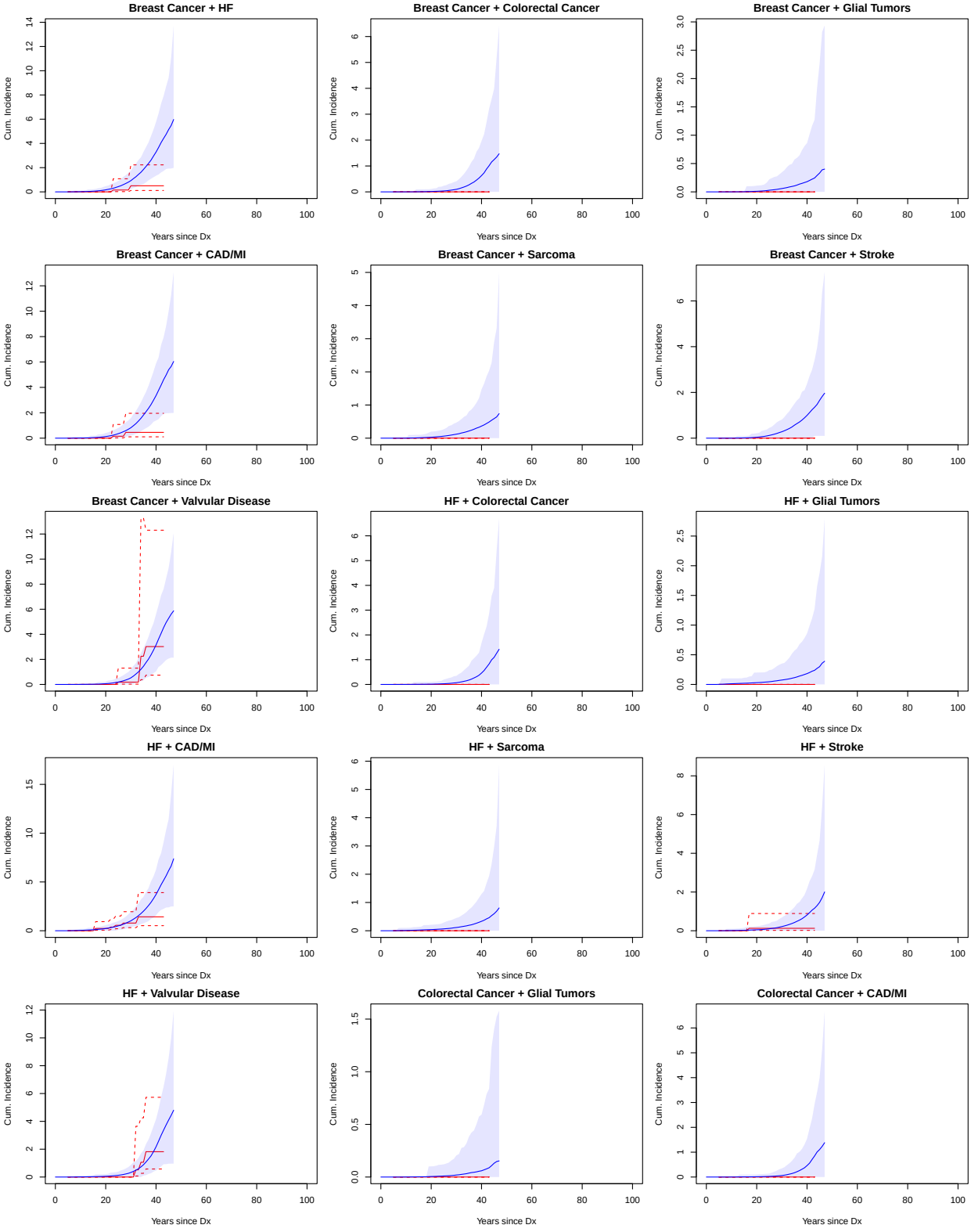

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

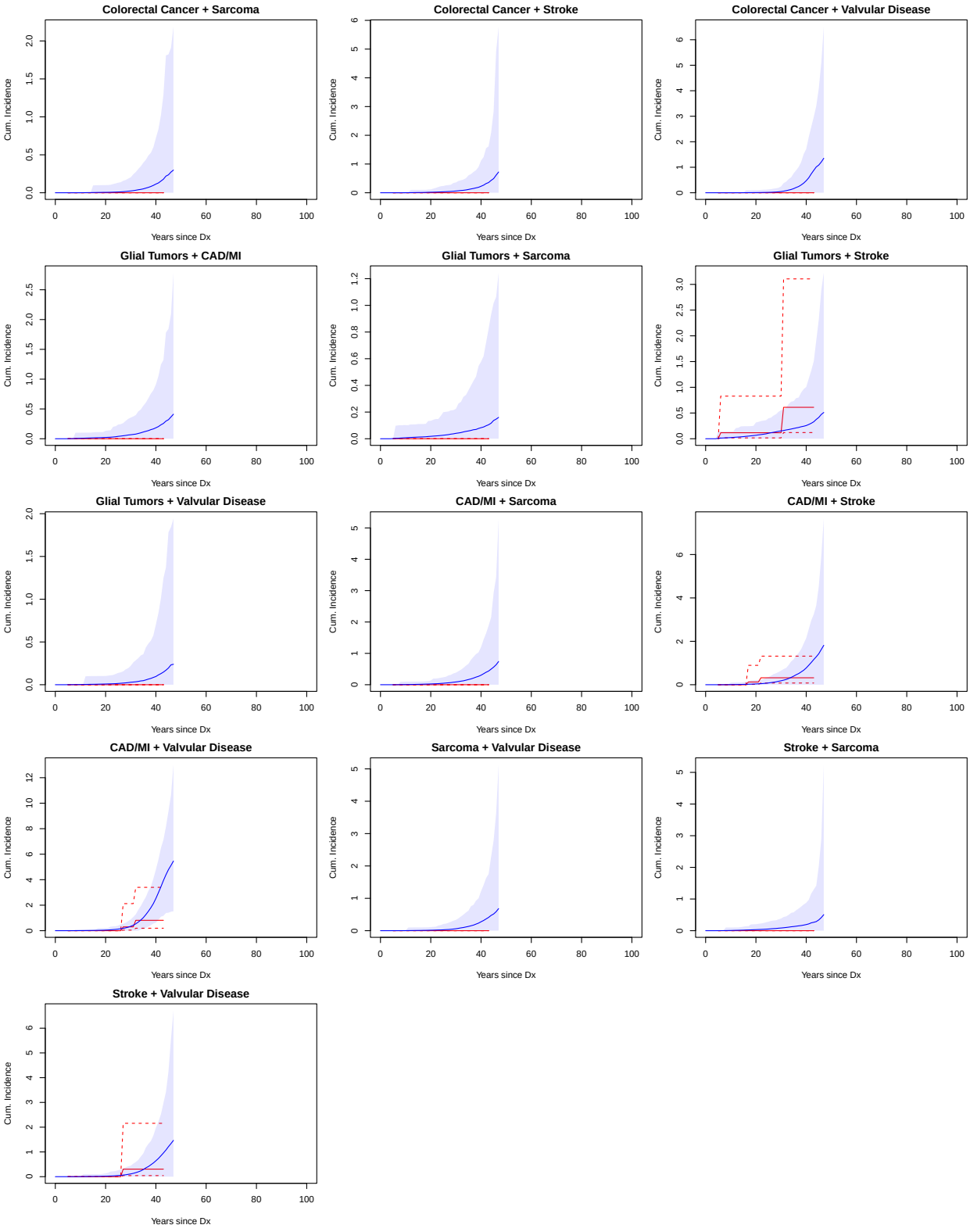
6.5.4.60 OvaryNone



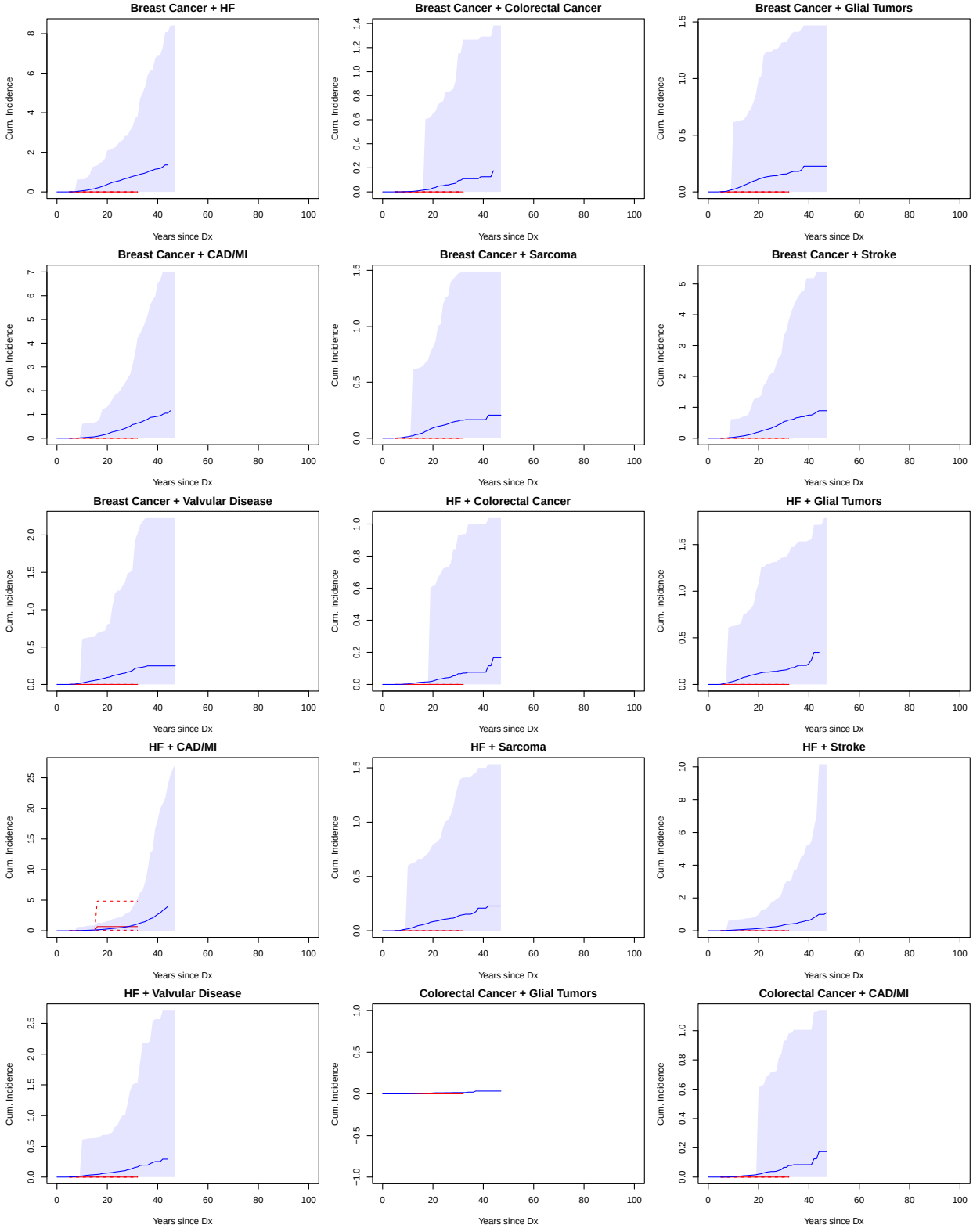

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

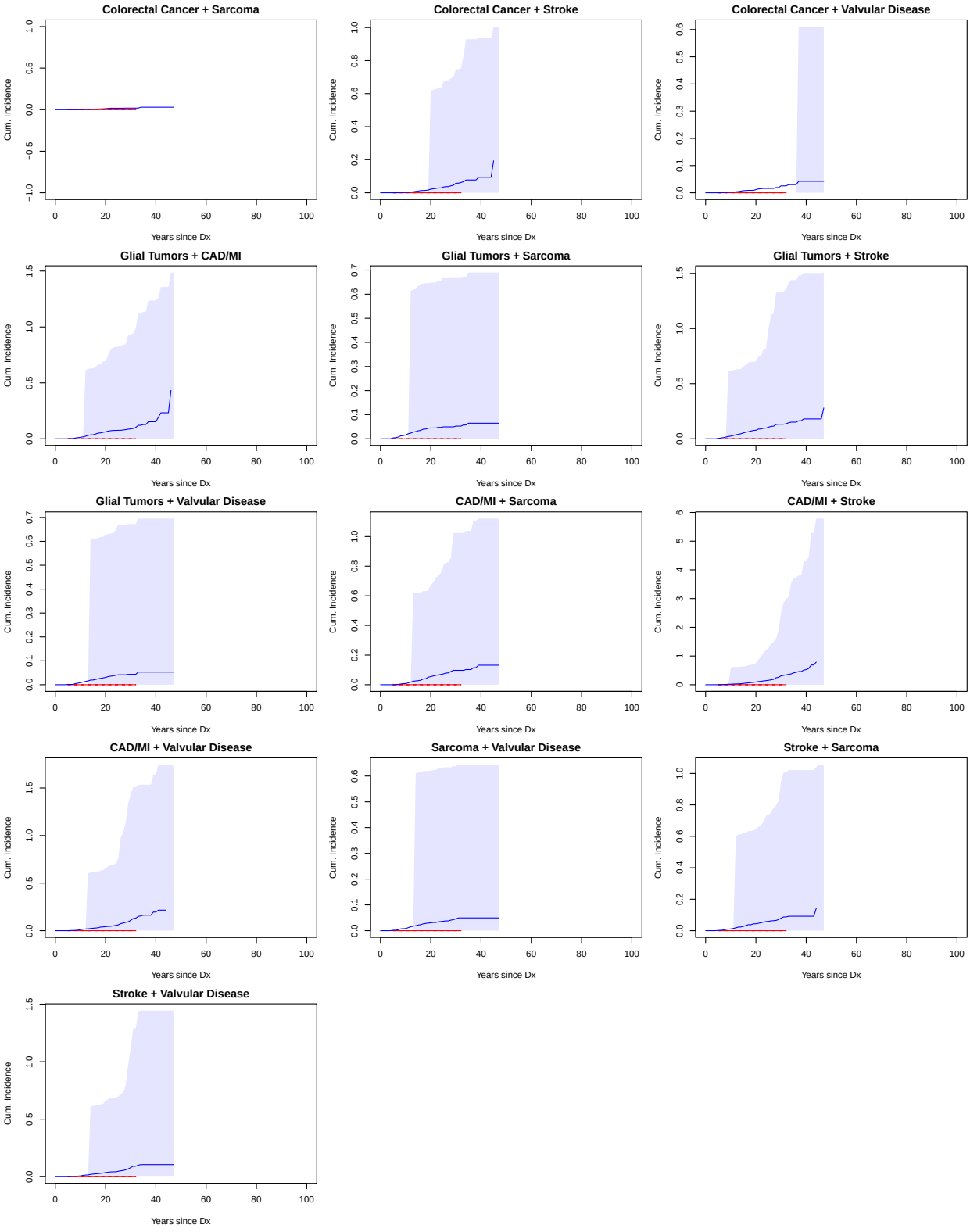
6.5.4.61 Ovary<10




Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

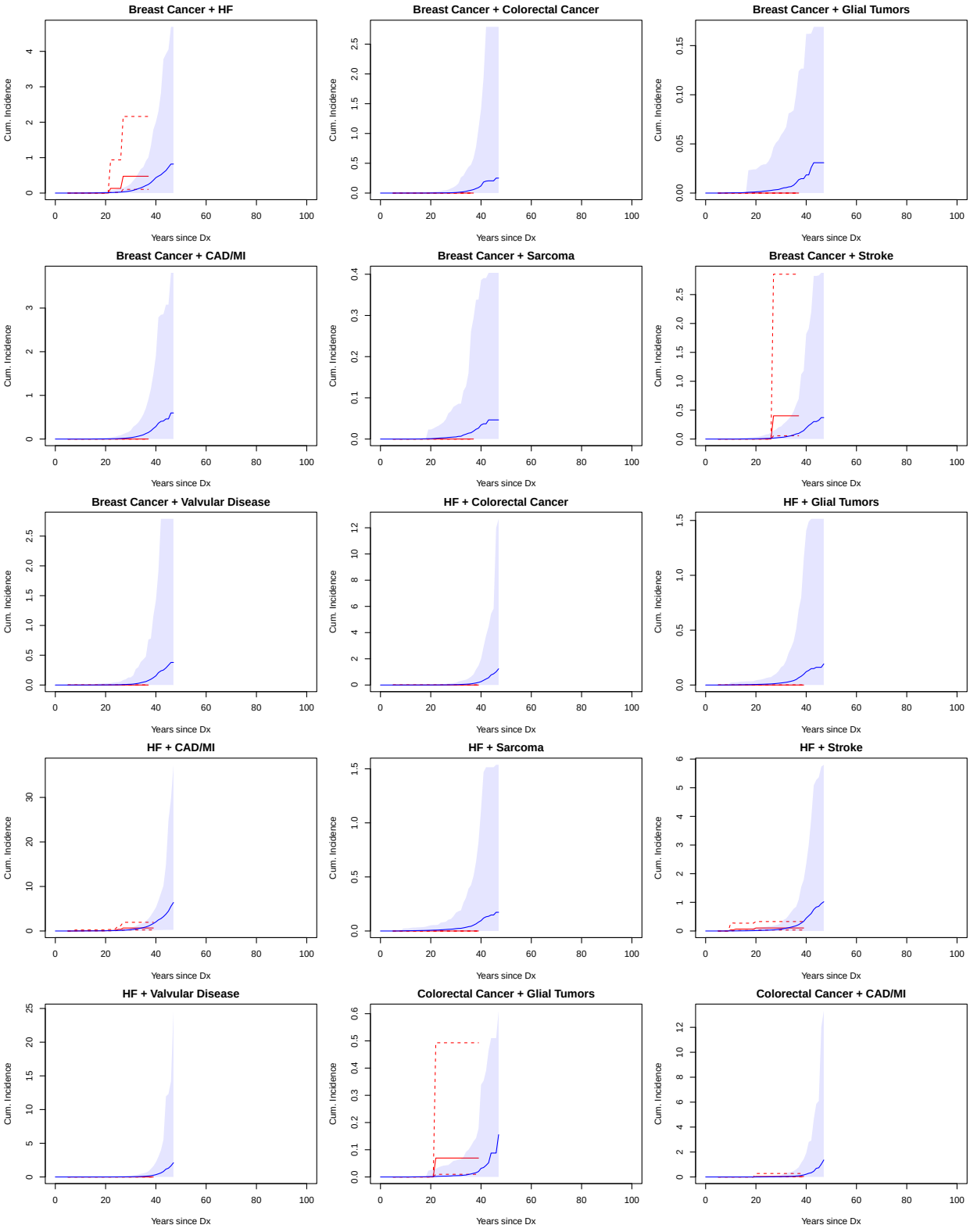
6.5.4.62 Ovary10-19

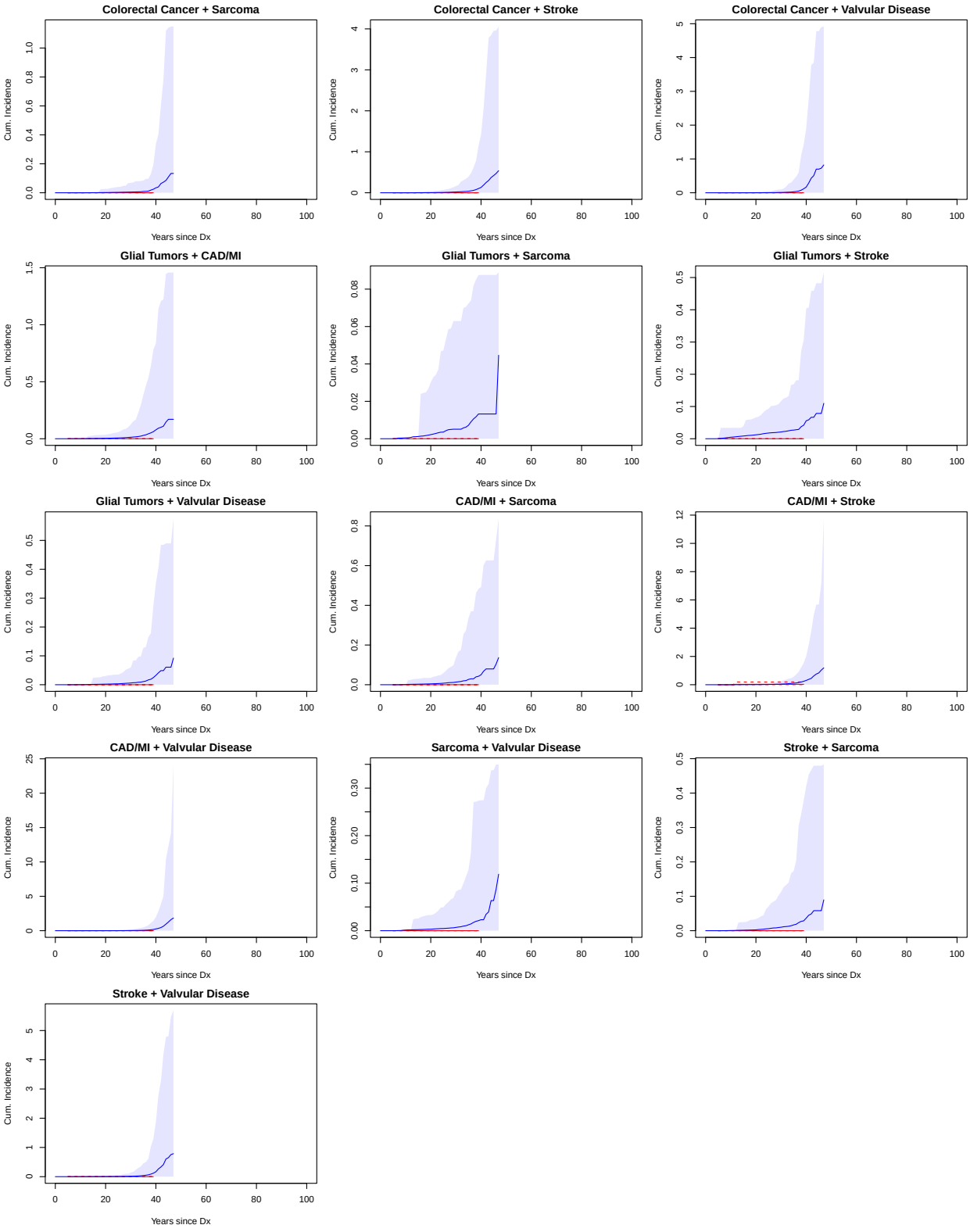



Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

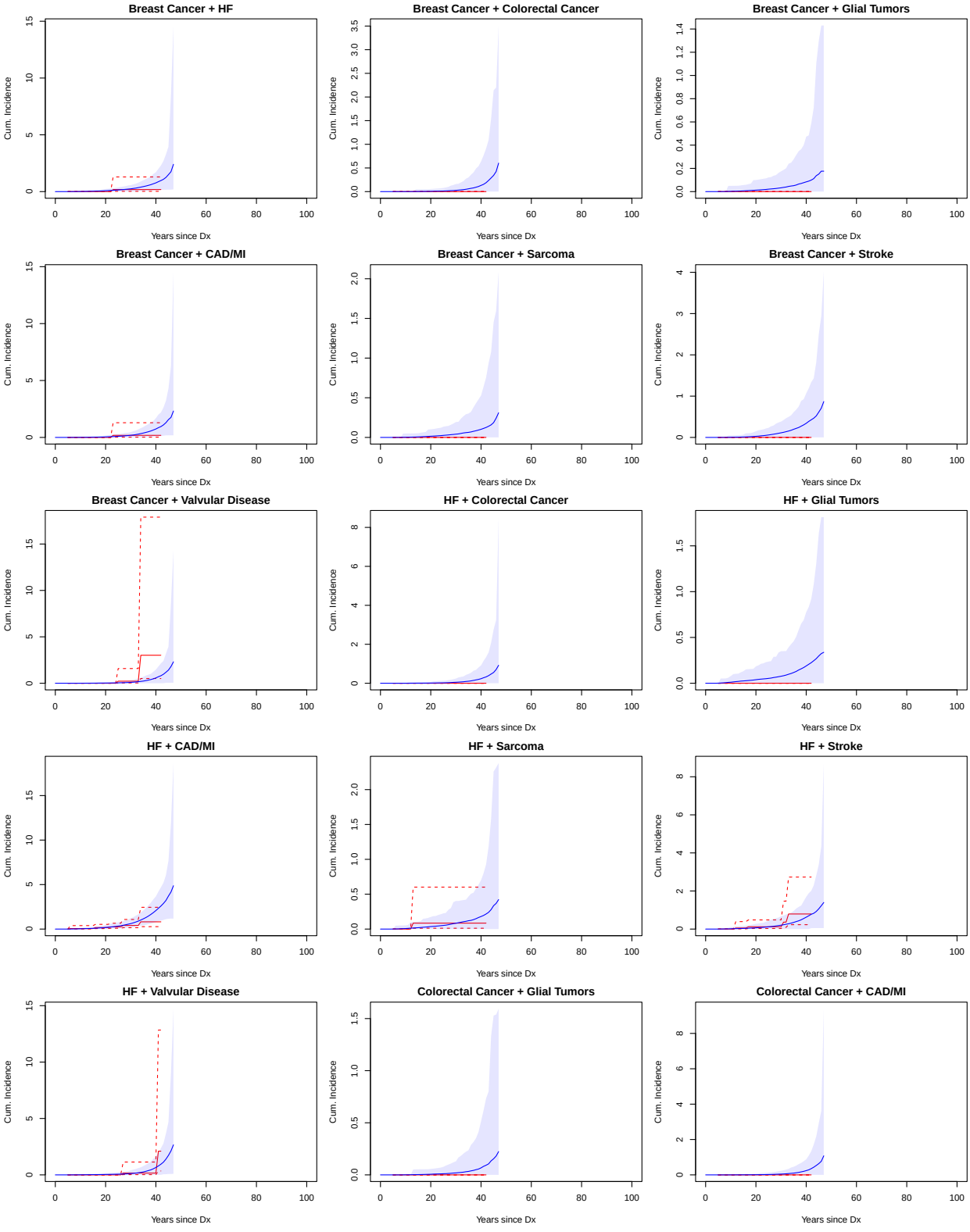
6.5.4.63 Ovary20+

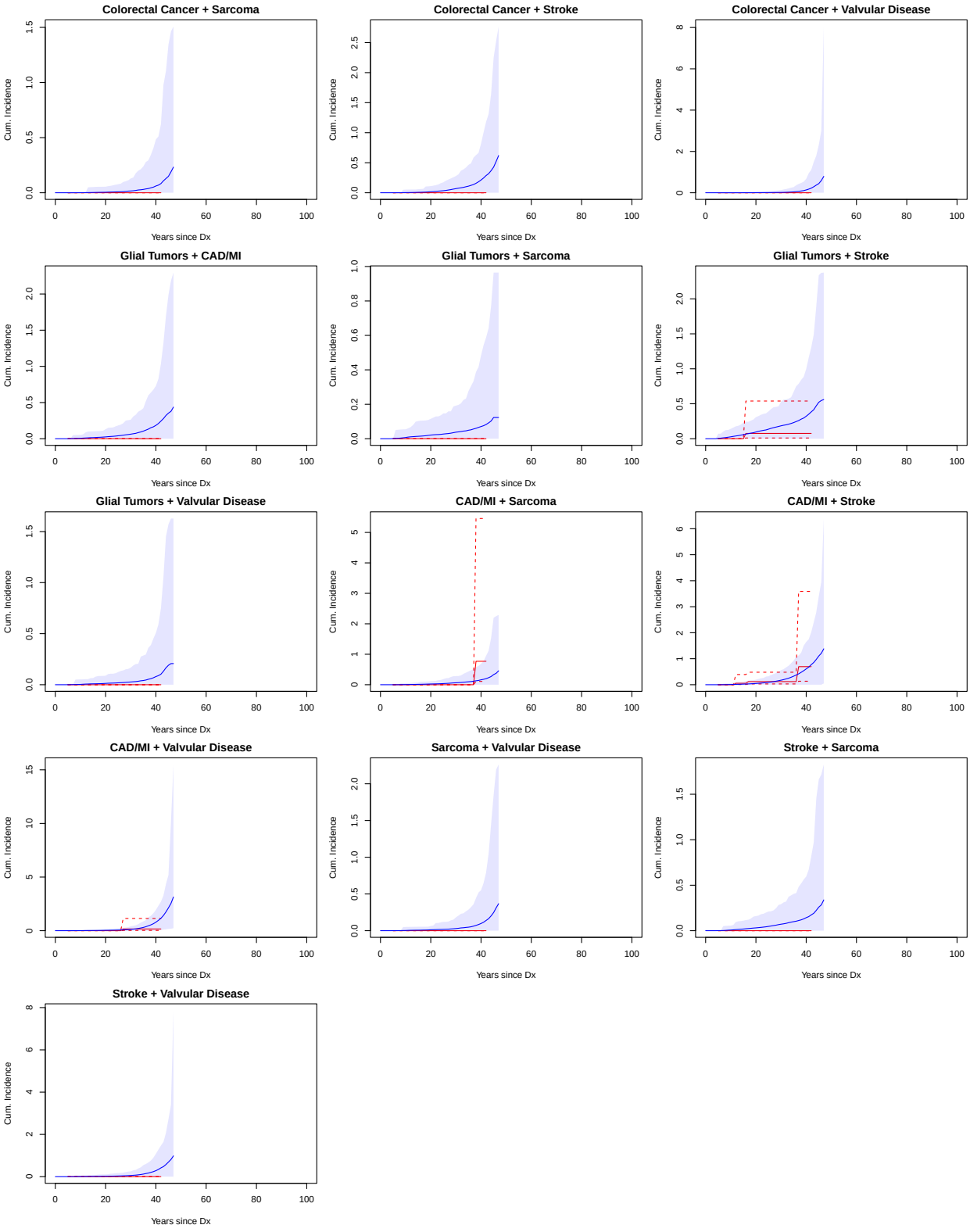
6.5.4.64 AbdPelNone



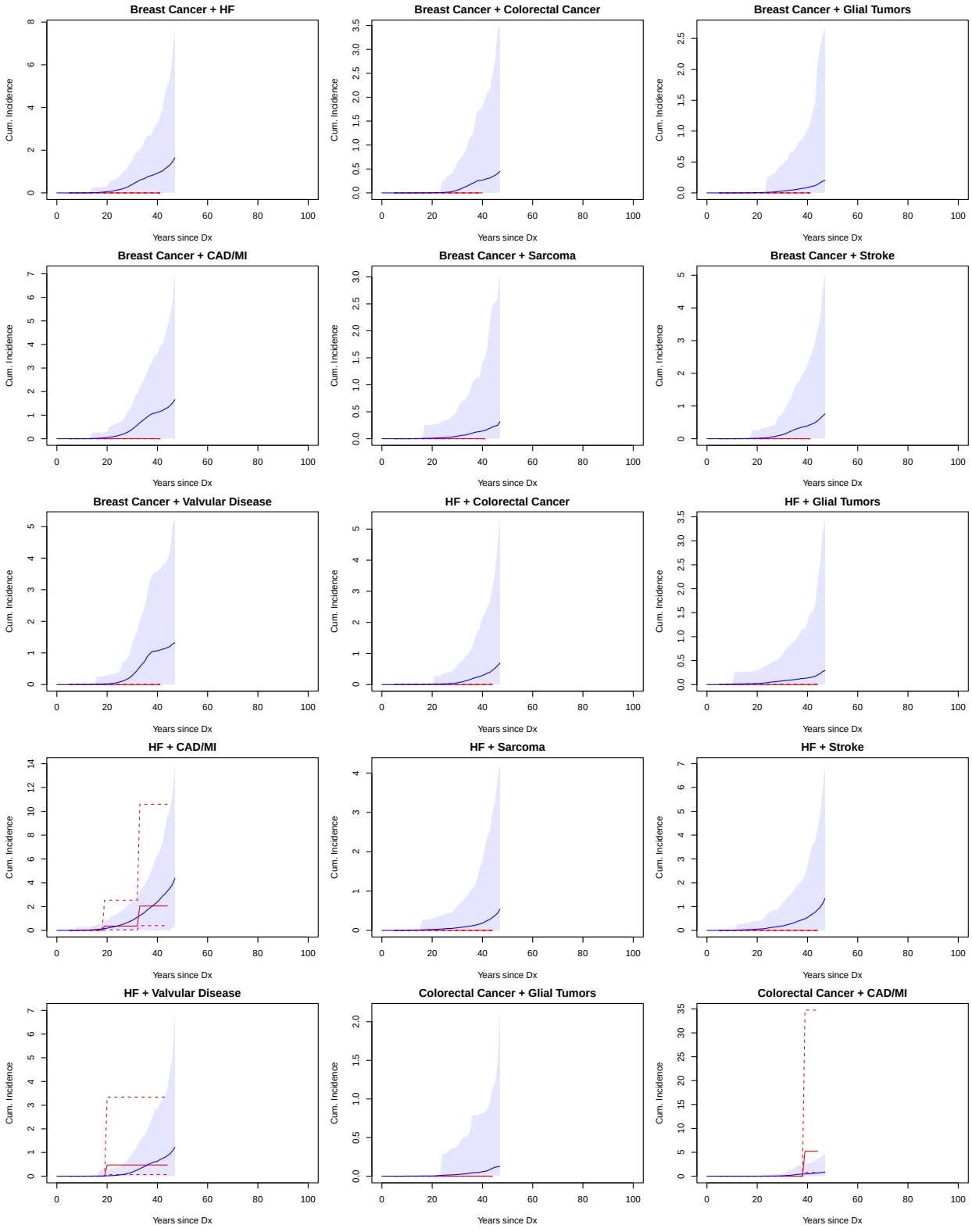

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

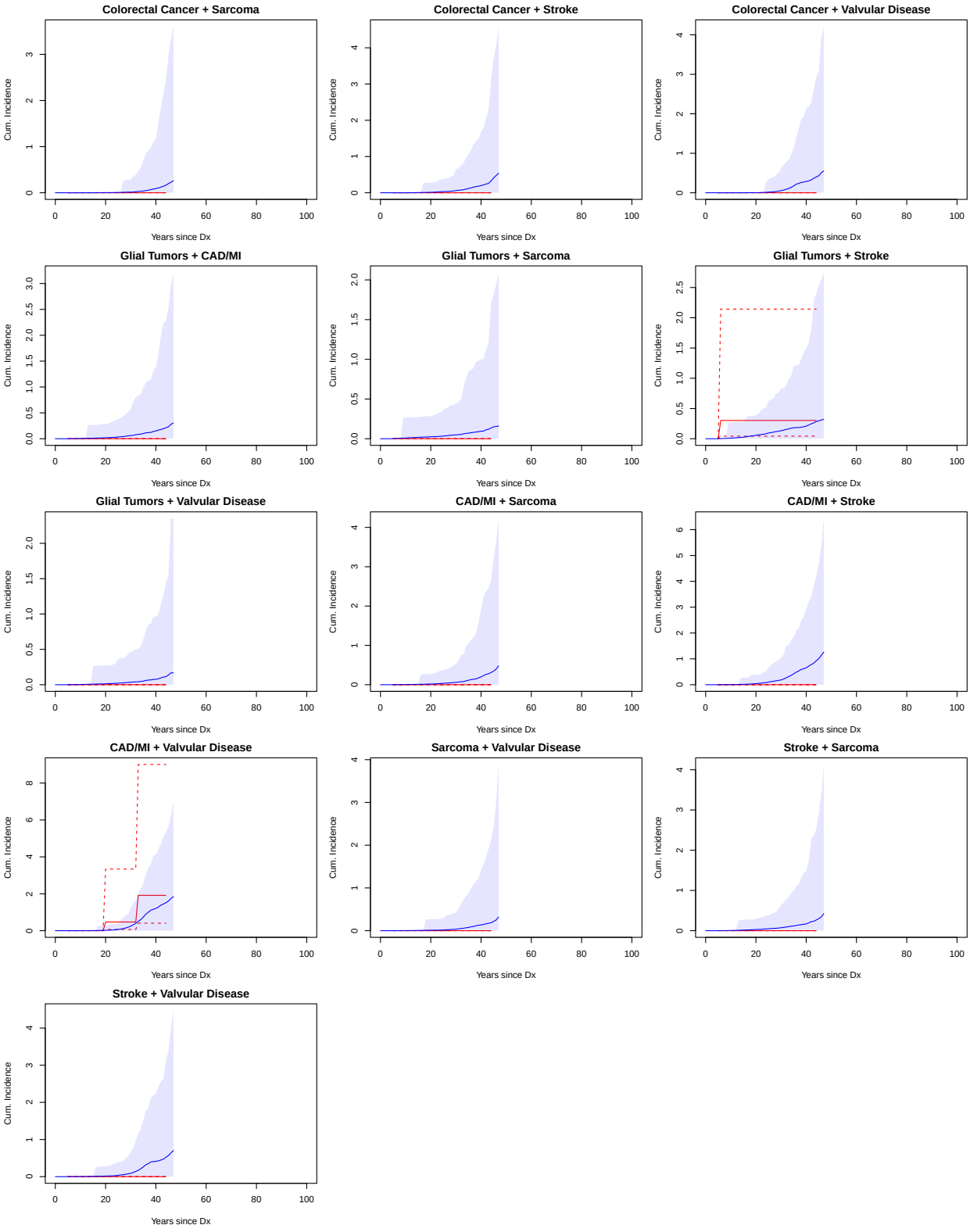
6.5.4.65 AbdPel<15



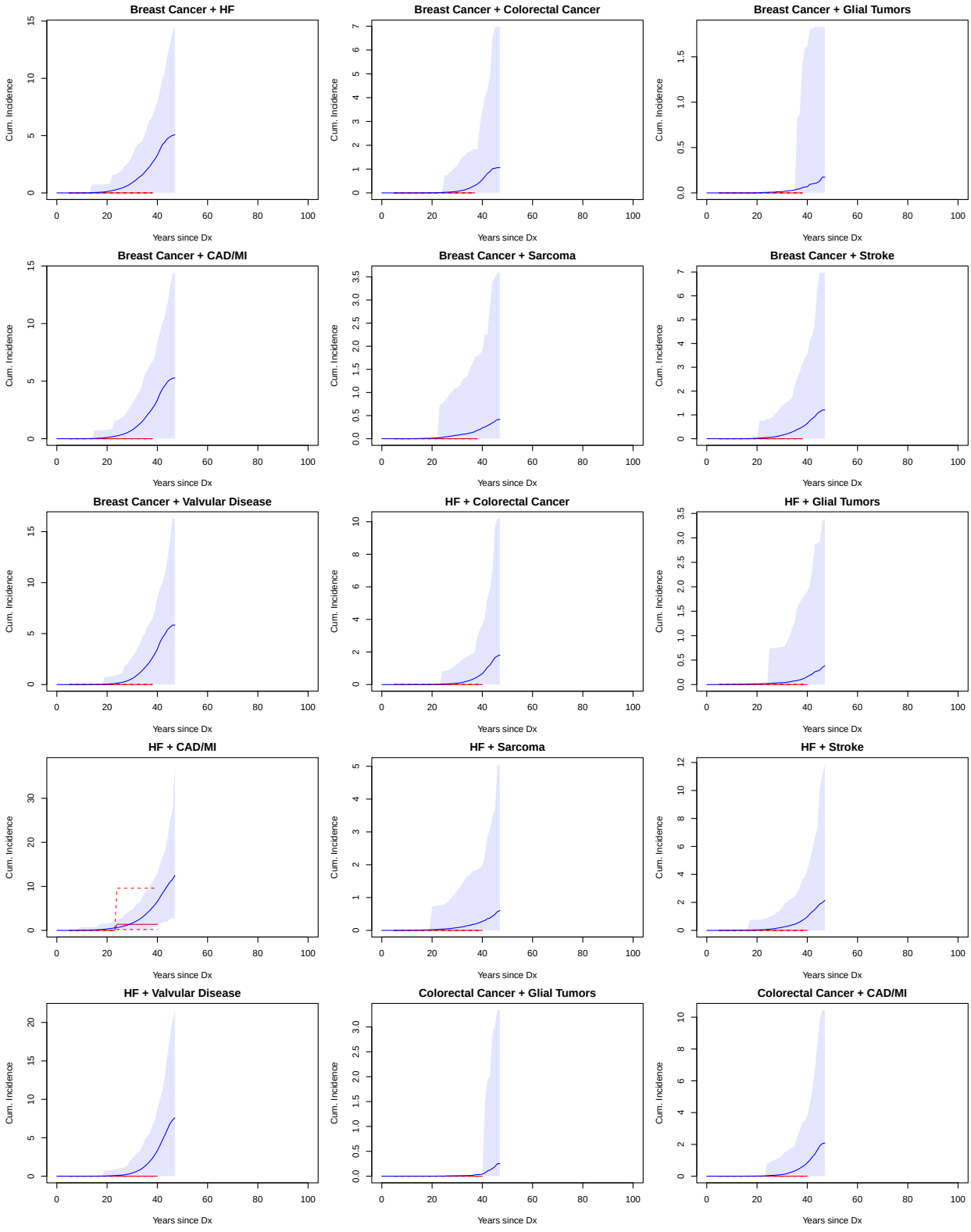

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

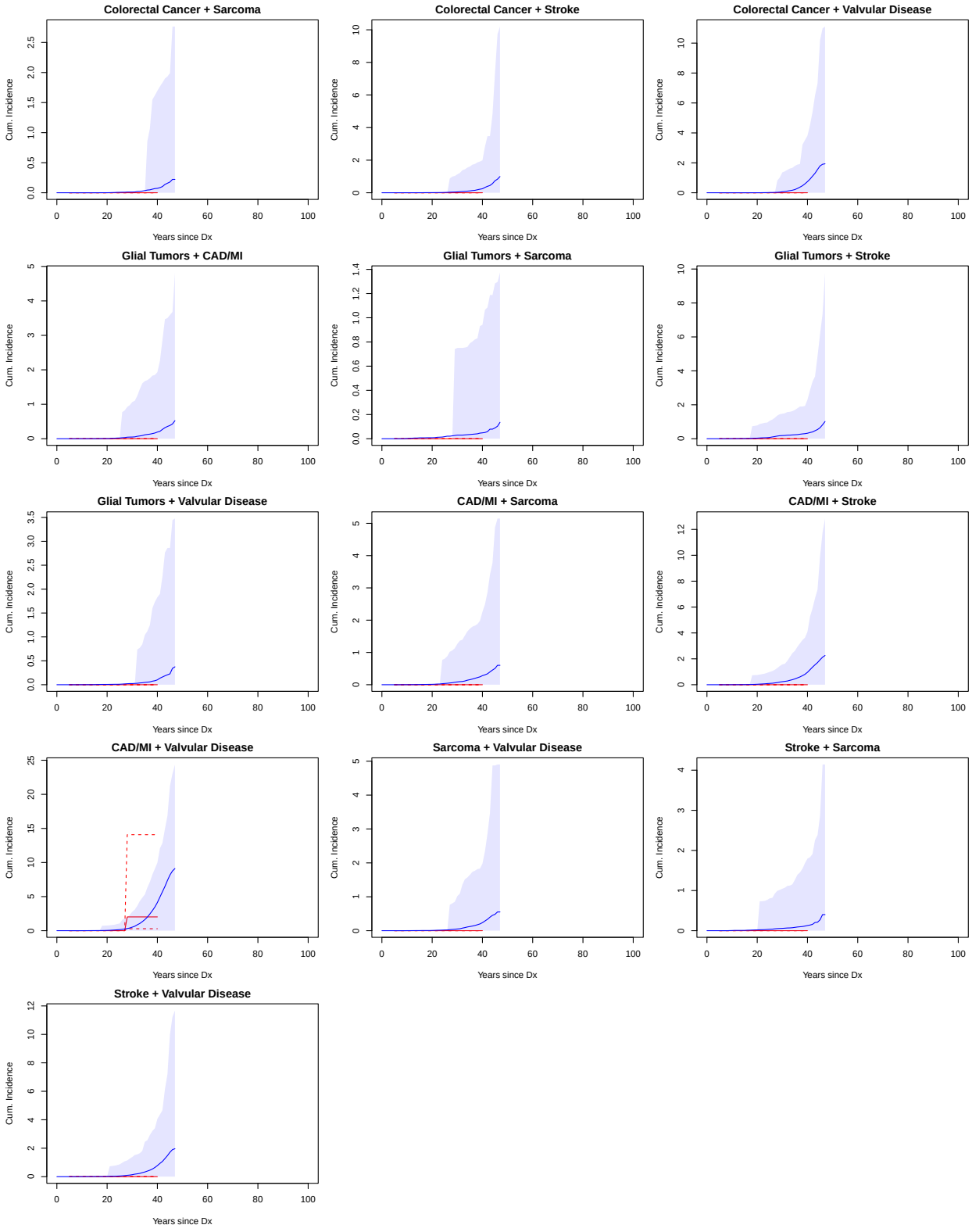
6.5.4.66 AbdPel15_24



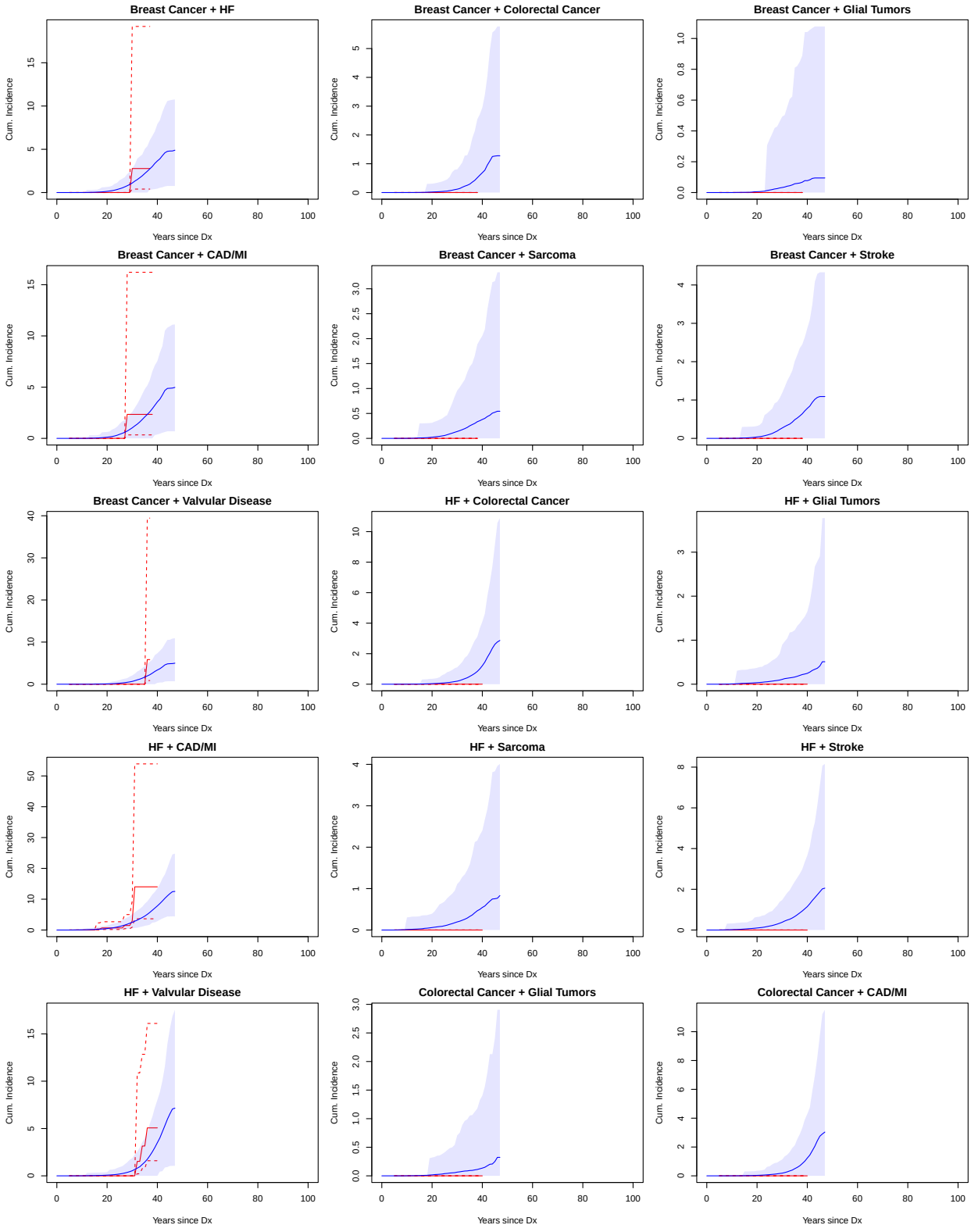

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

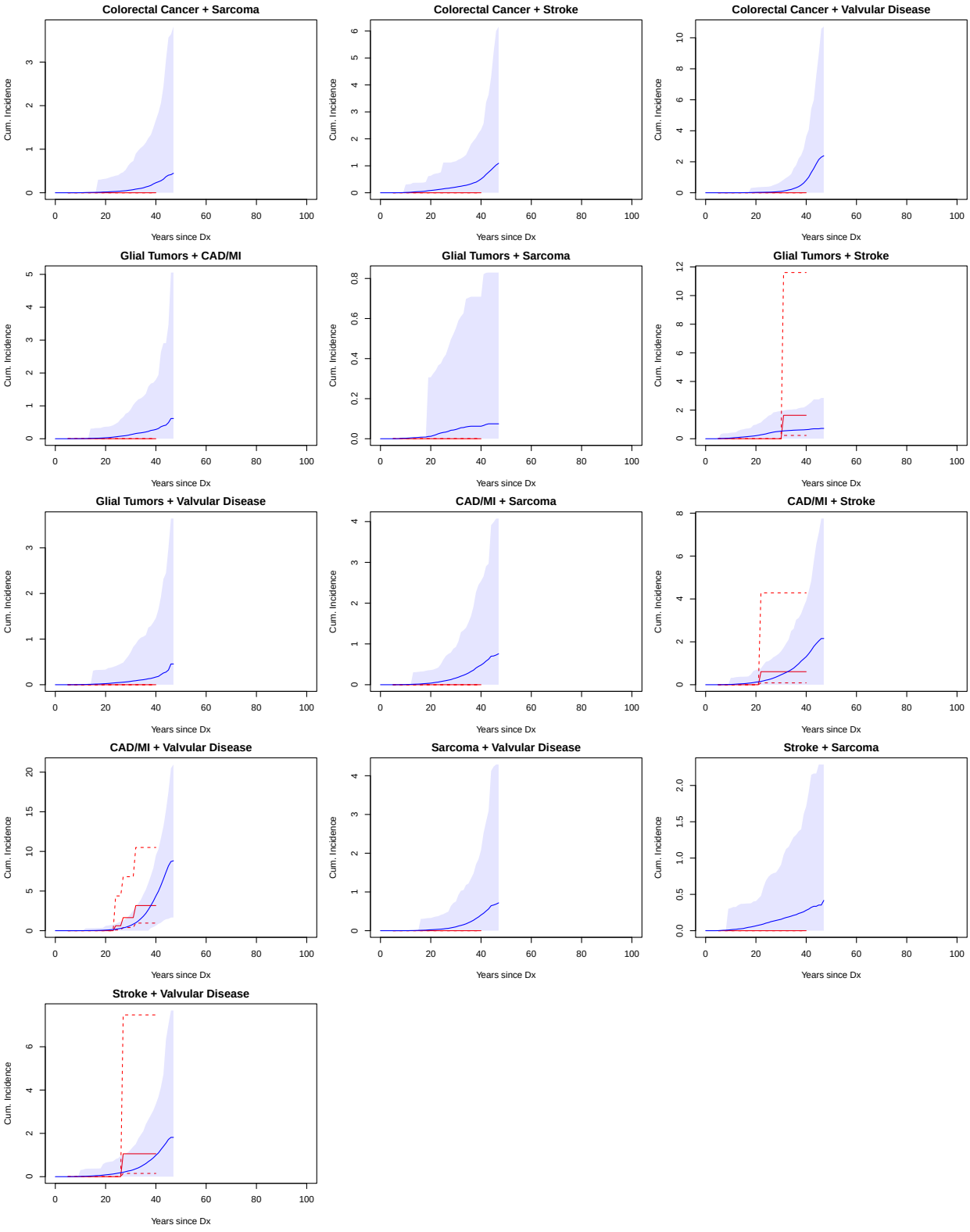
6.5.4.67 AbdPel25_34



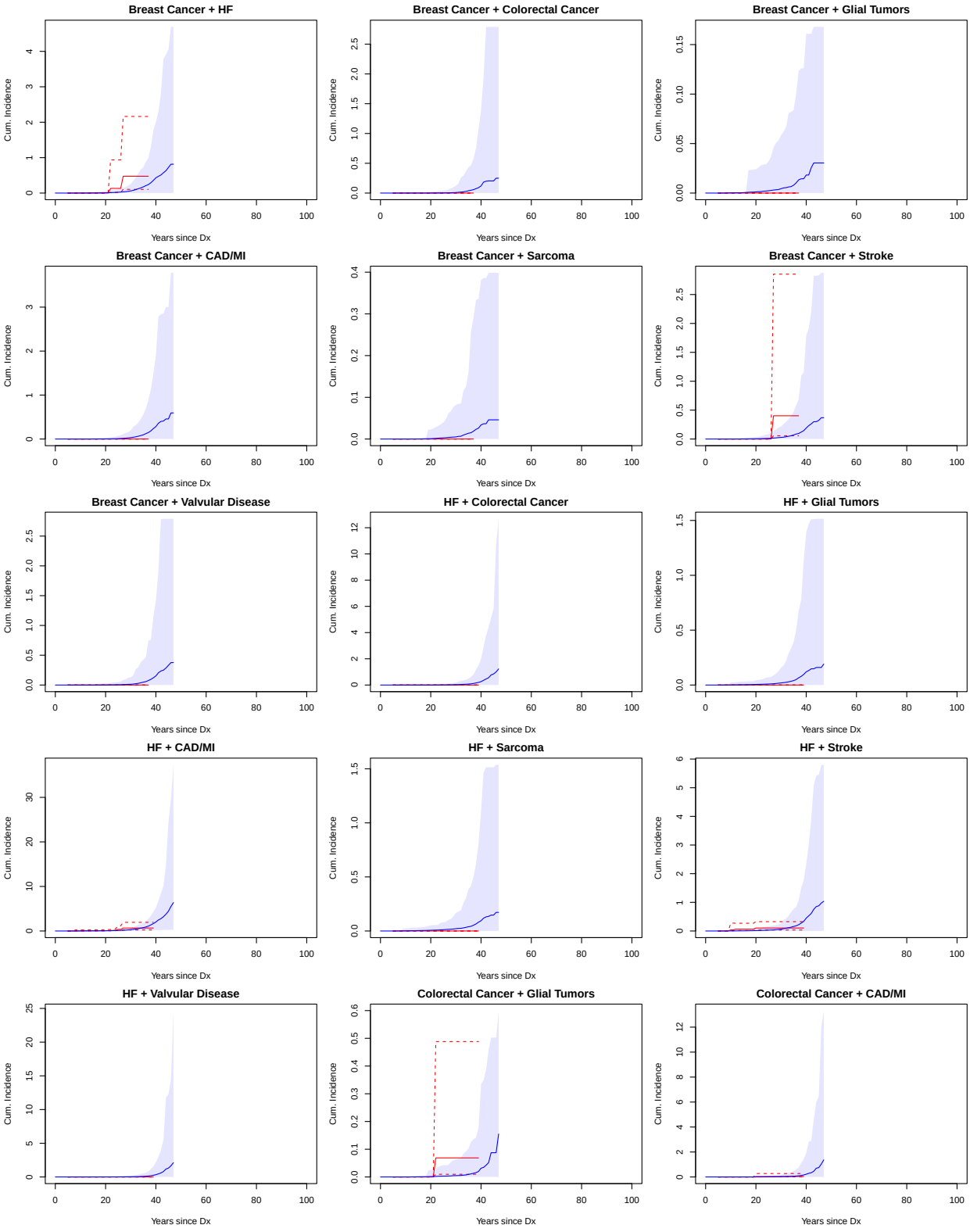

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

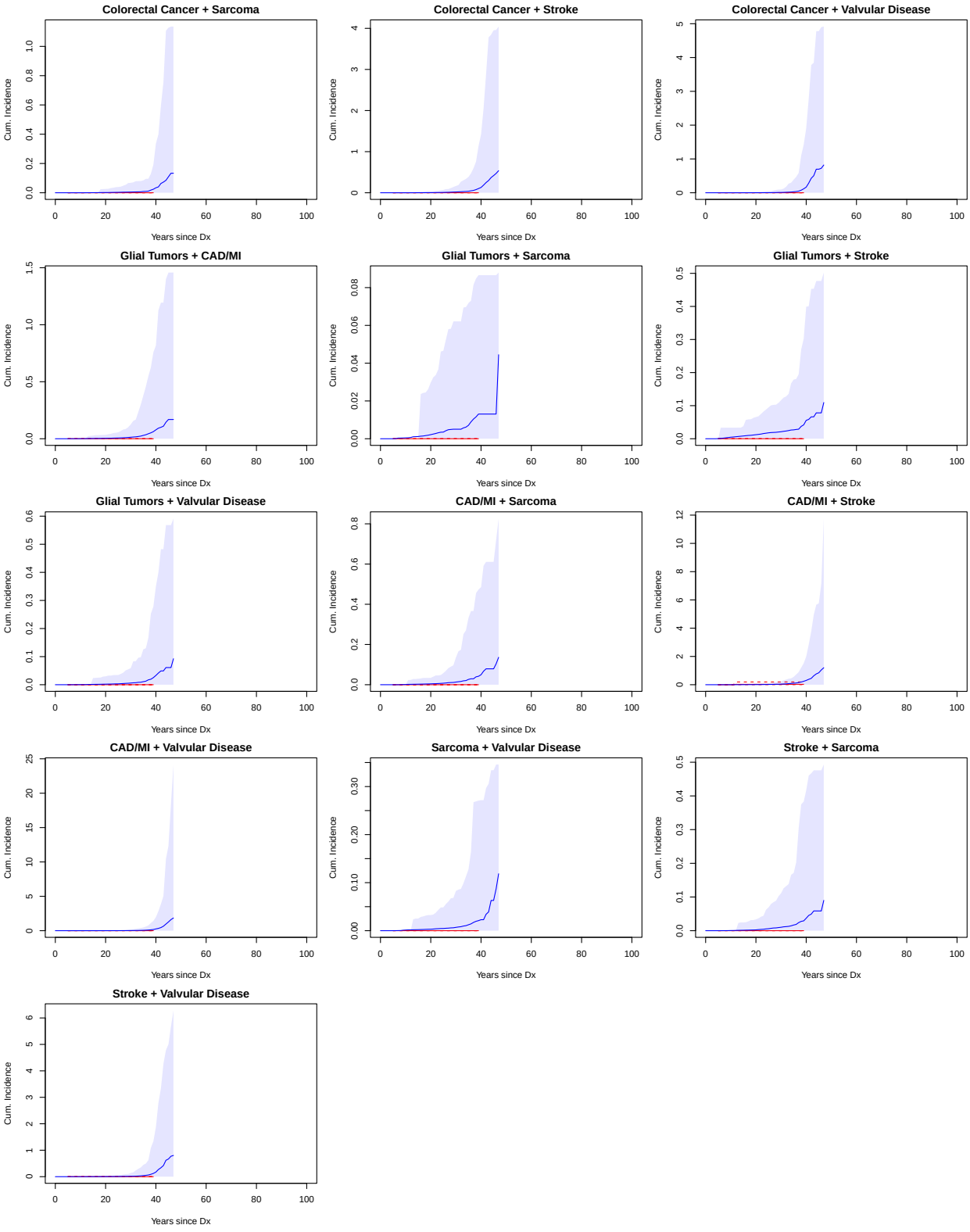
6.5.4.68 AbdPel35+



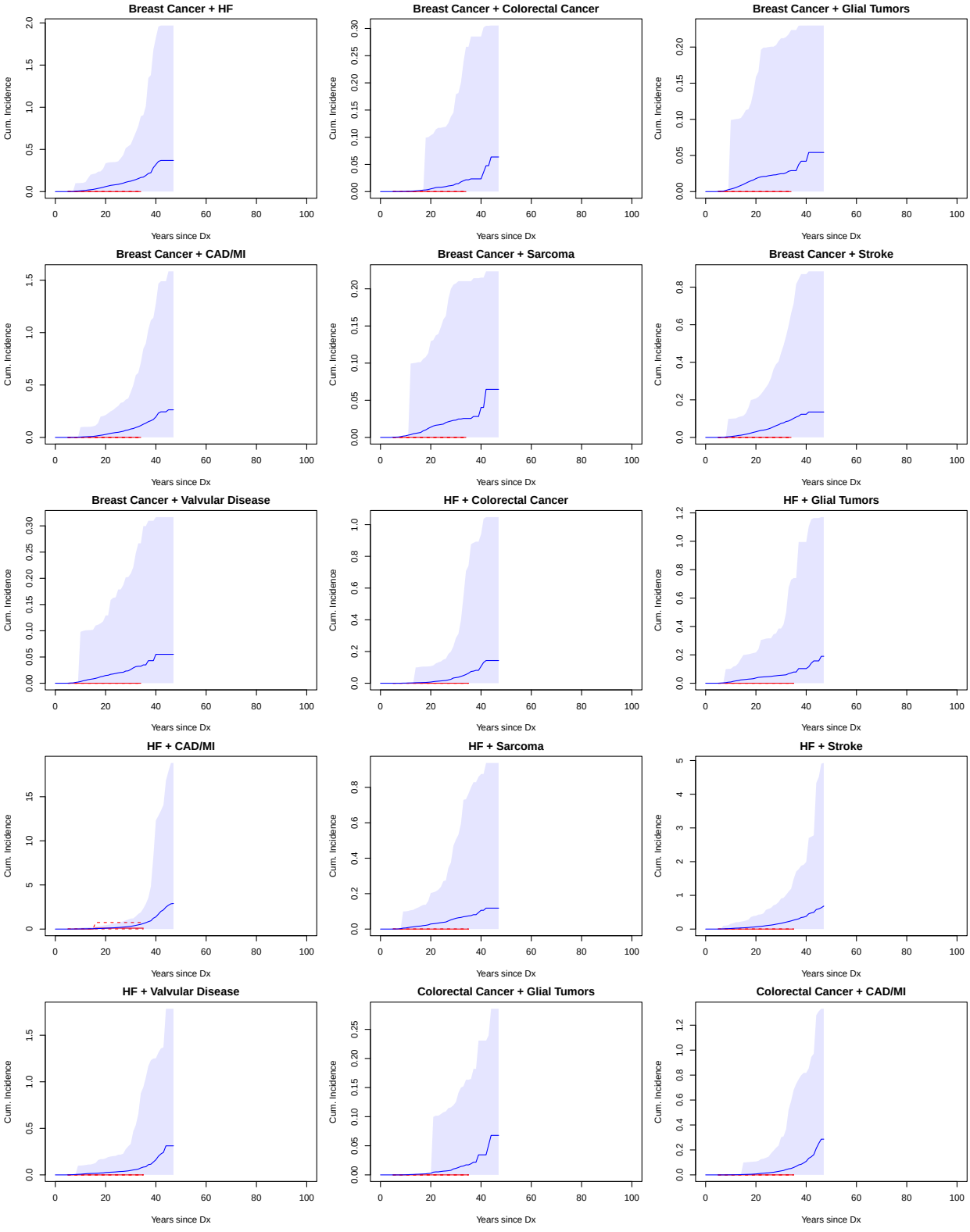

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

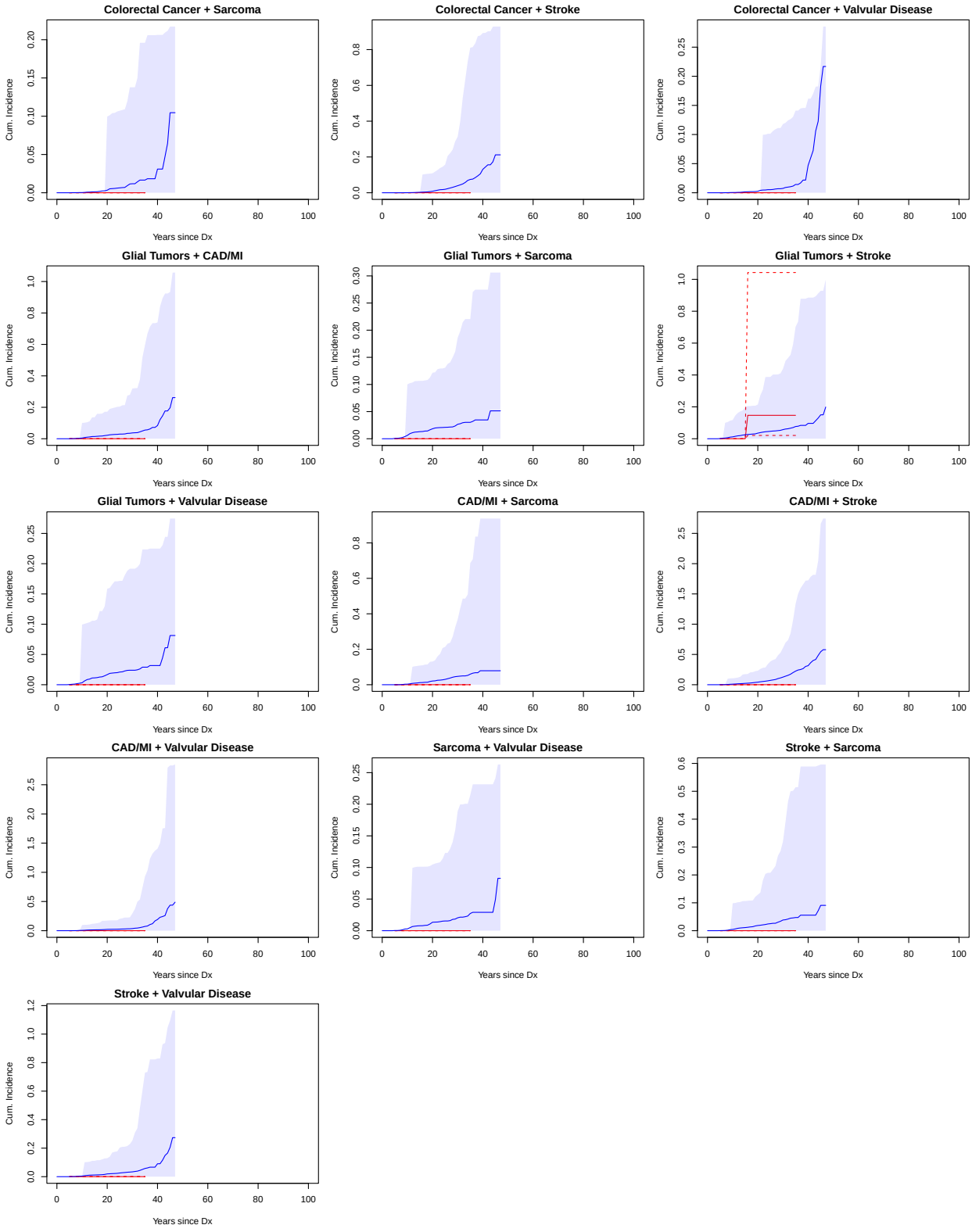
6.5.4.69 MaxRTNone



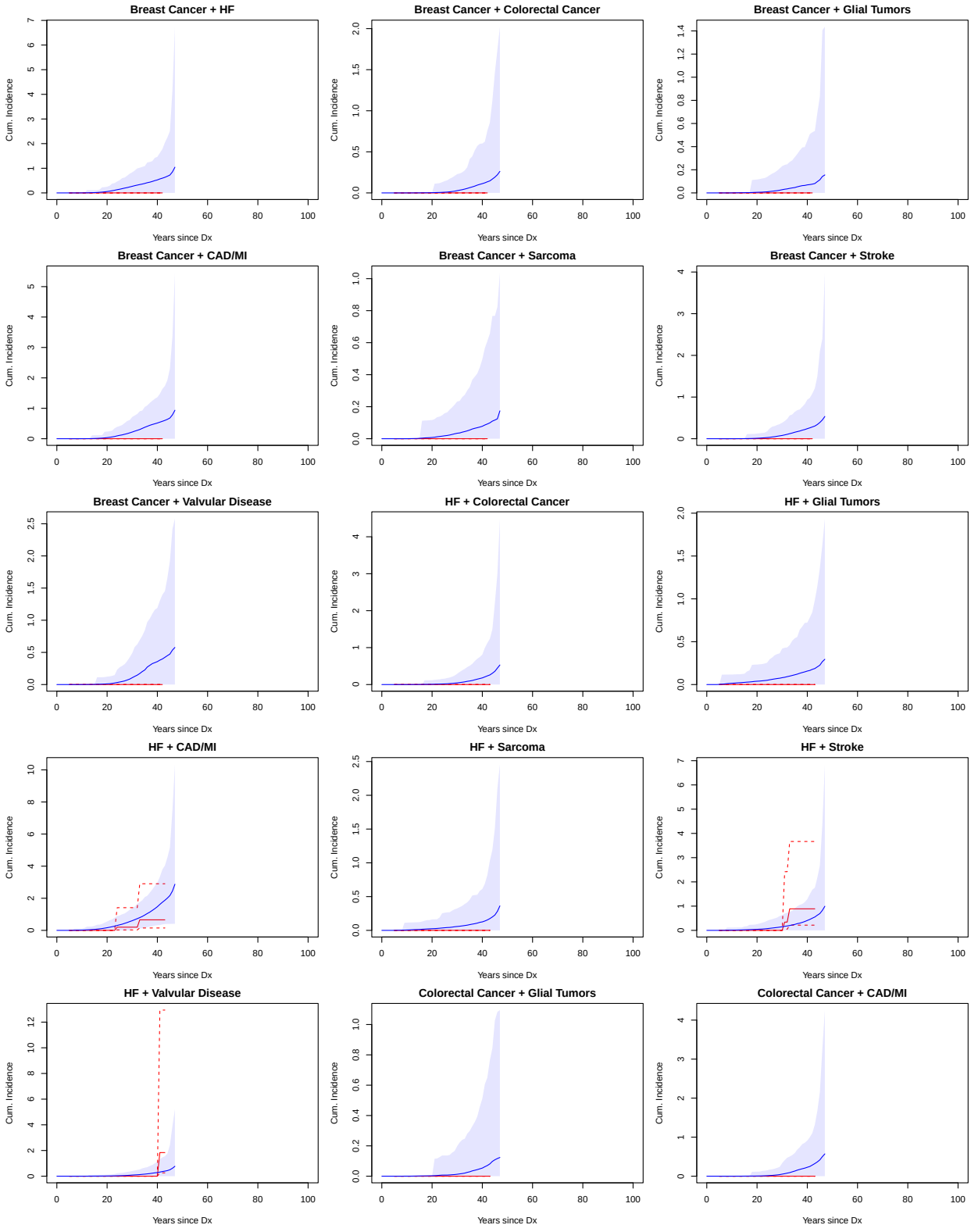

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

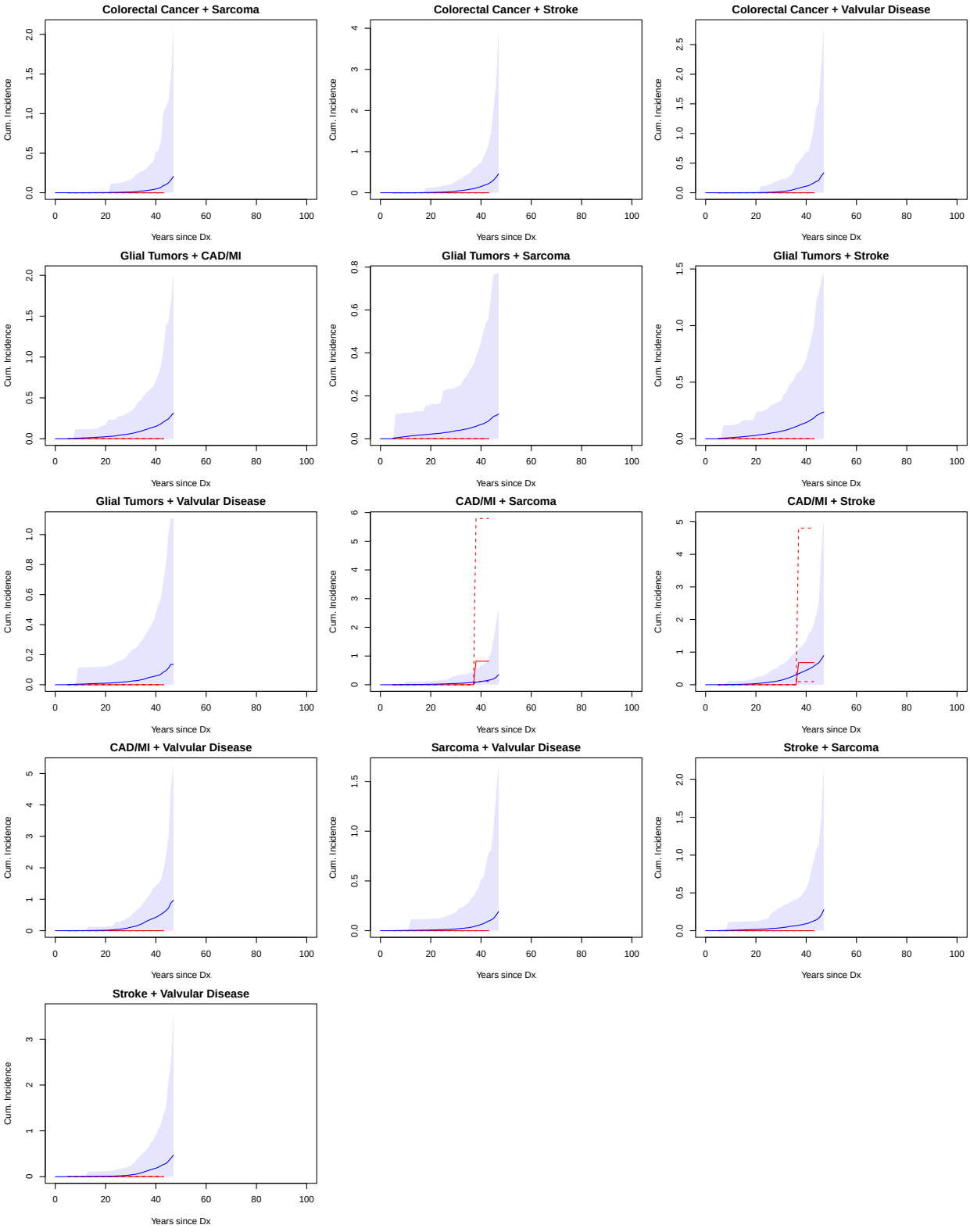
6.5.4.70 MaxRT<20



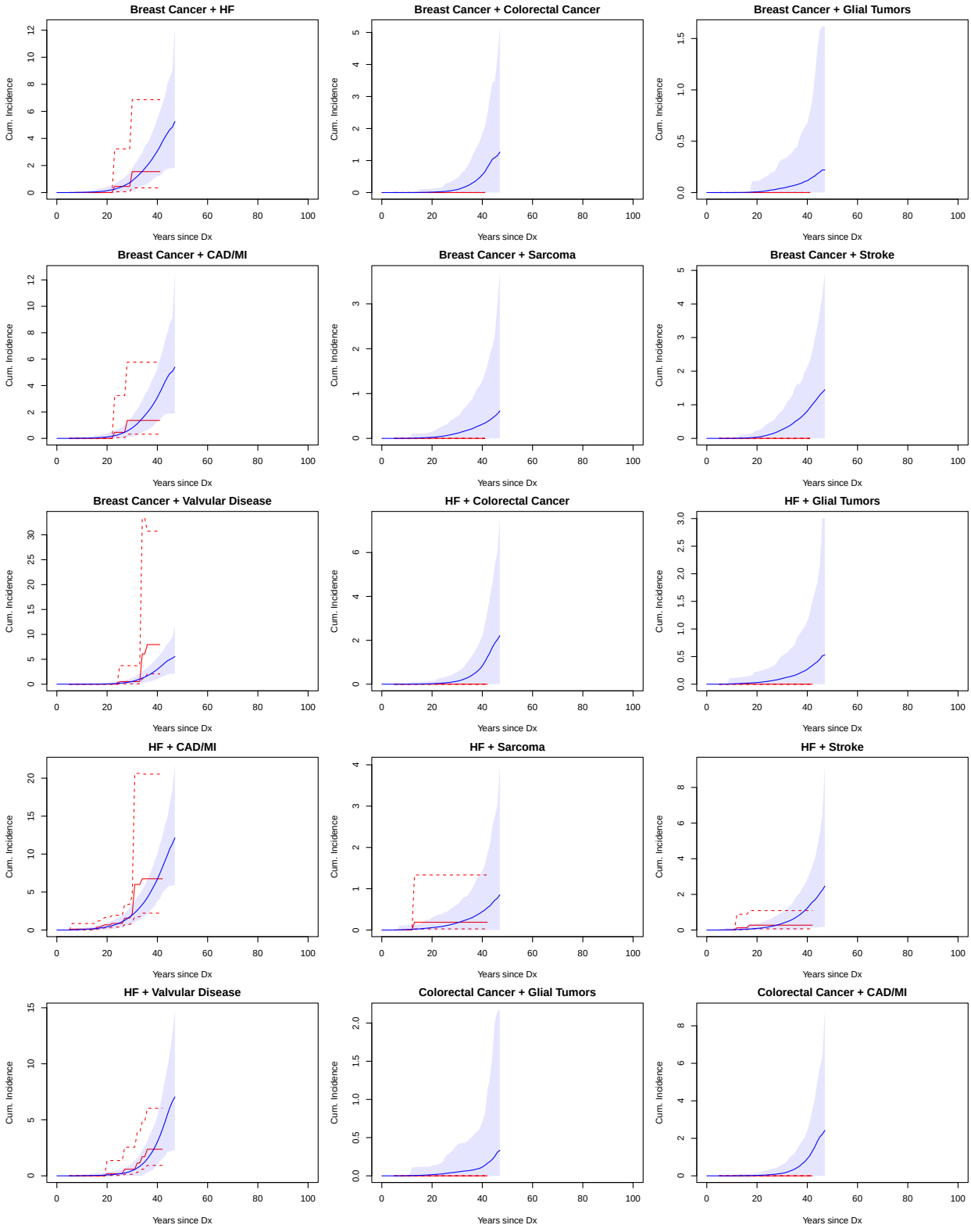

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

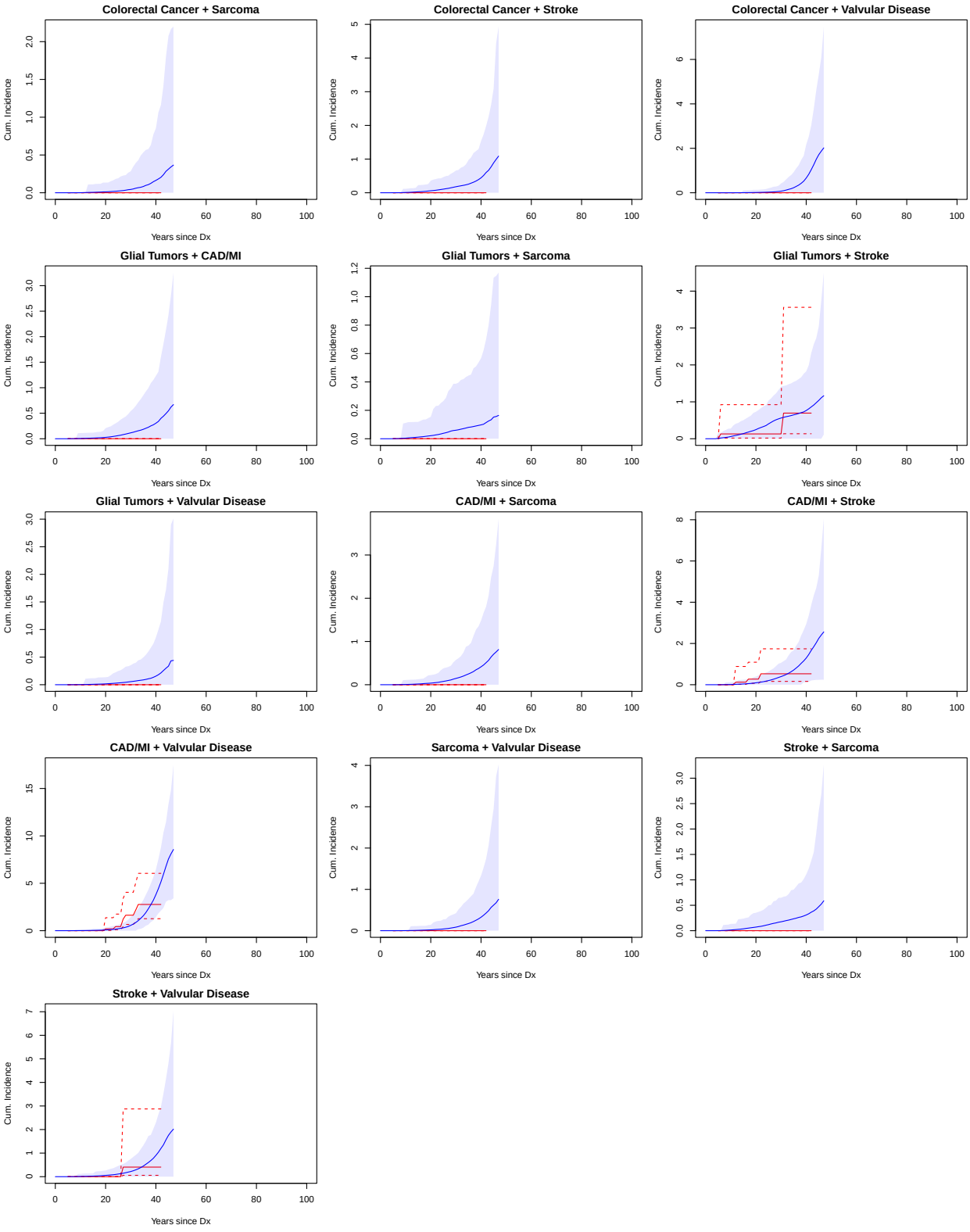
6.5.4.71 MaxRT20_29



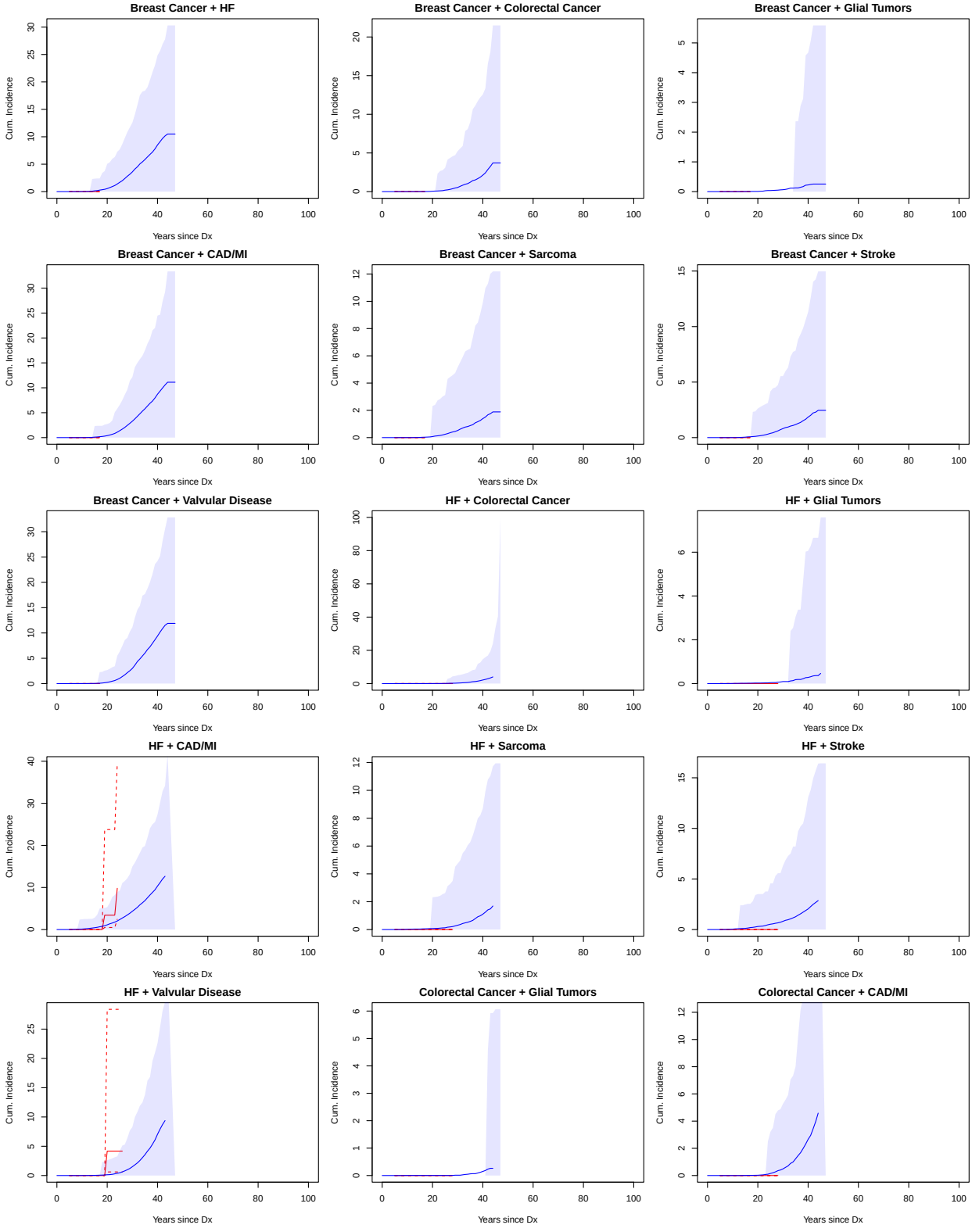

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

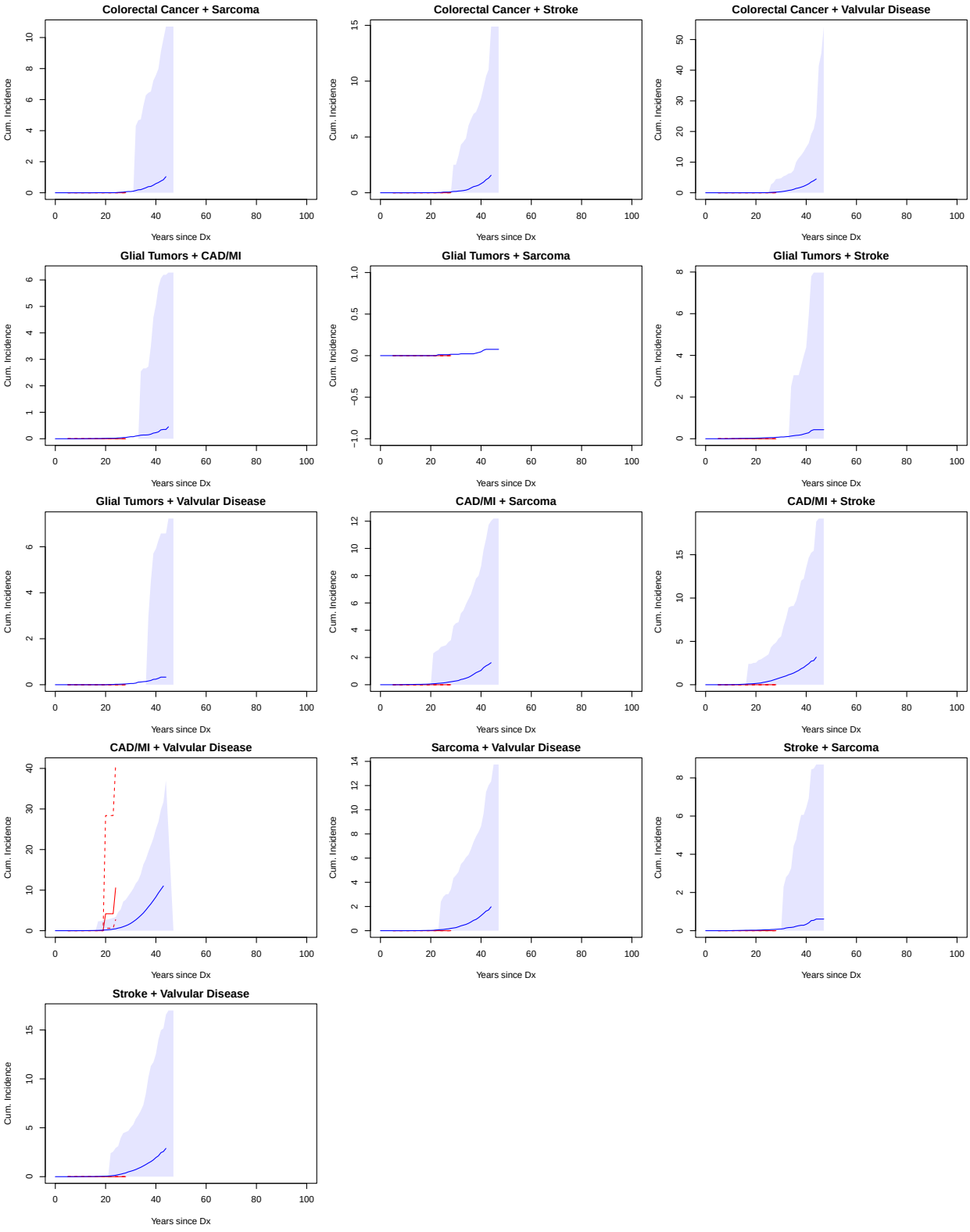
6.5.4.72 MaxRT30+



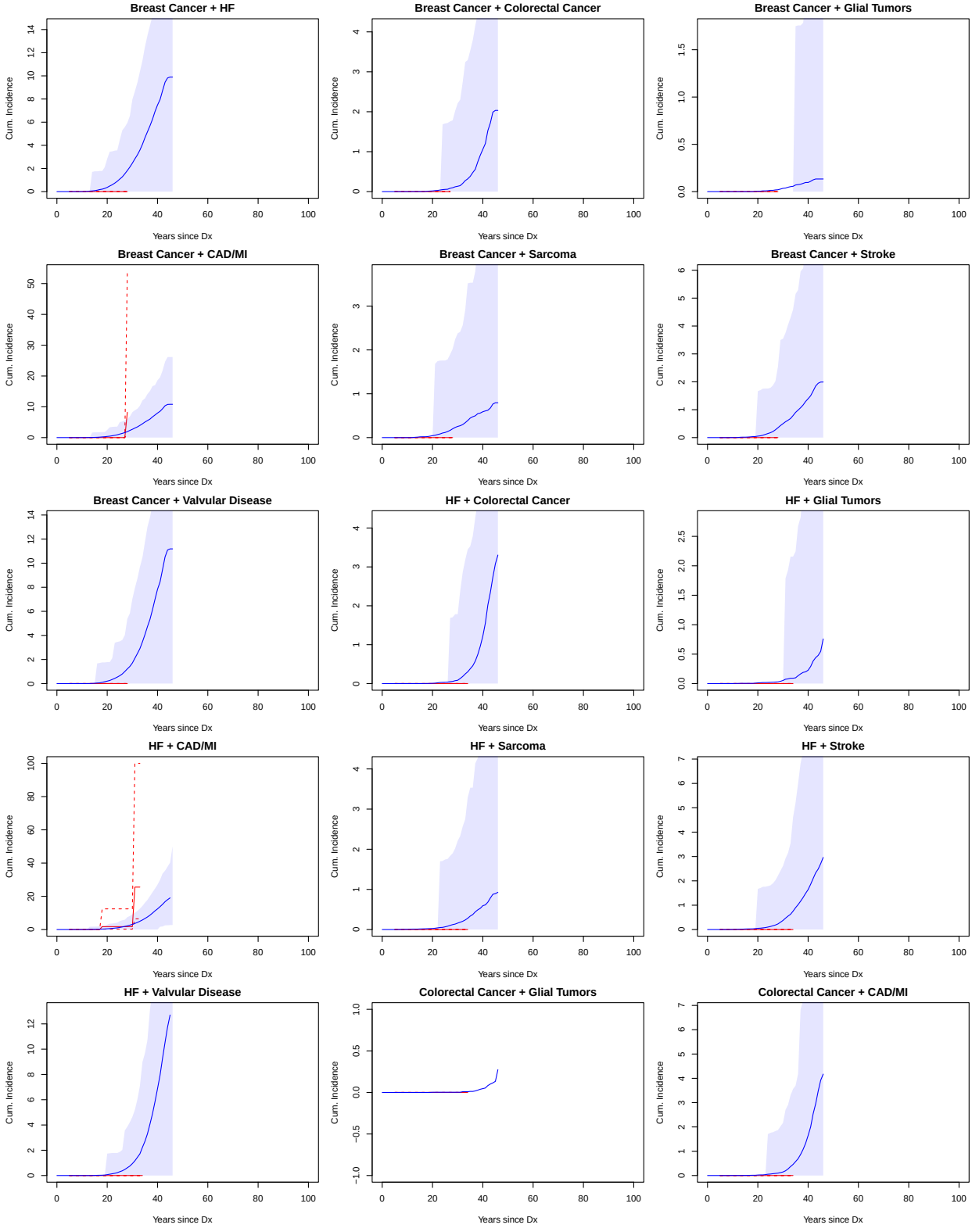

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

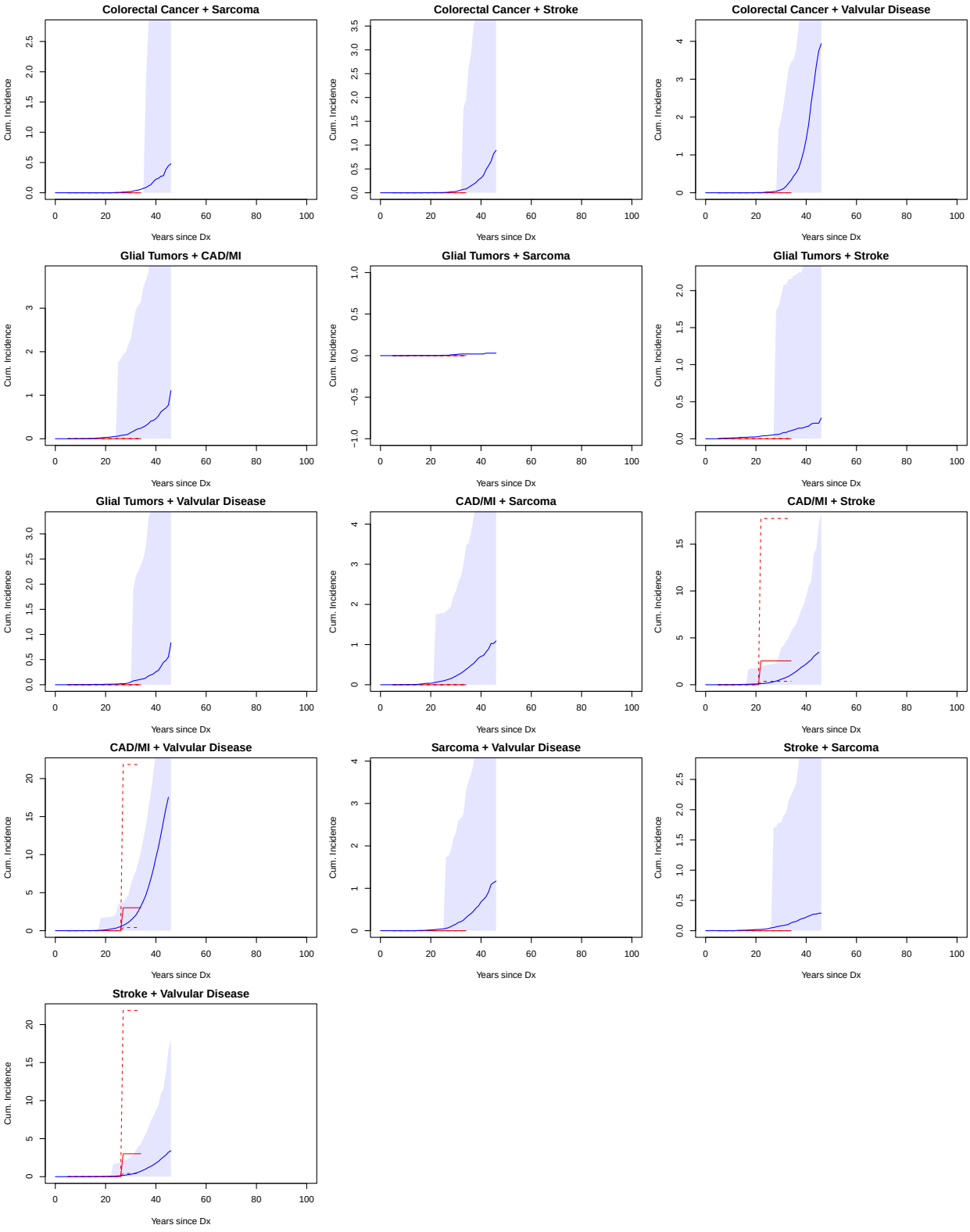
6.5.4.73 HL grp: Salvage



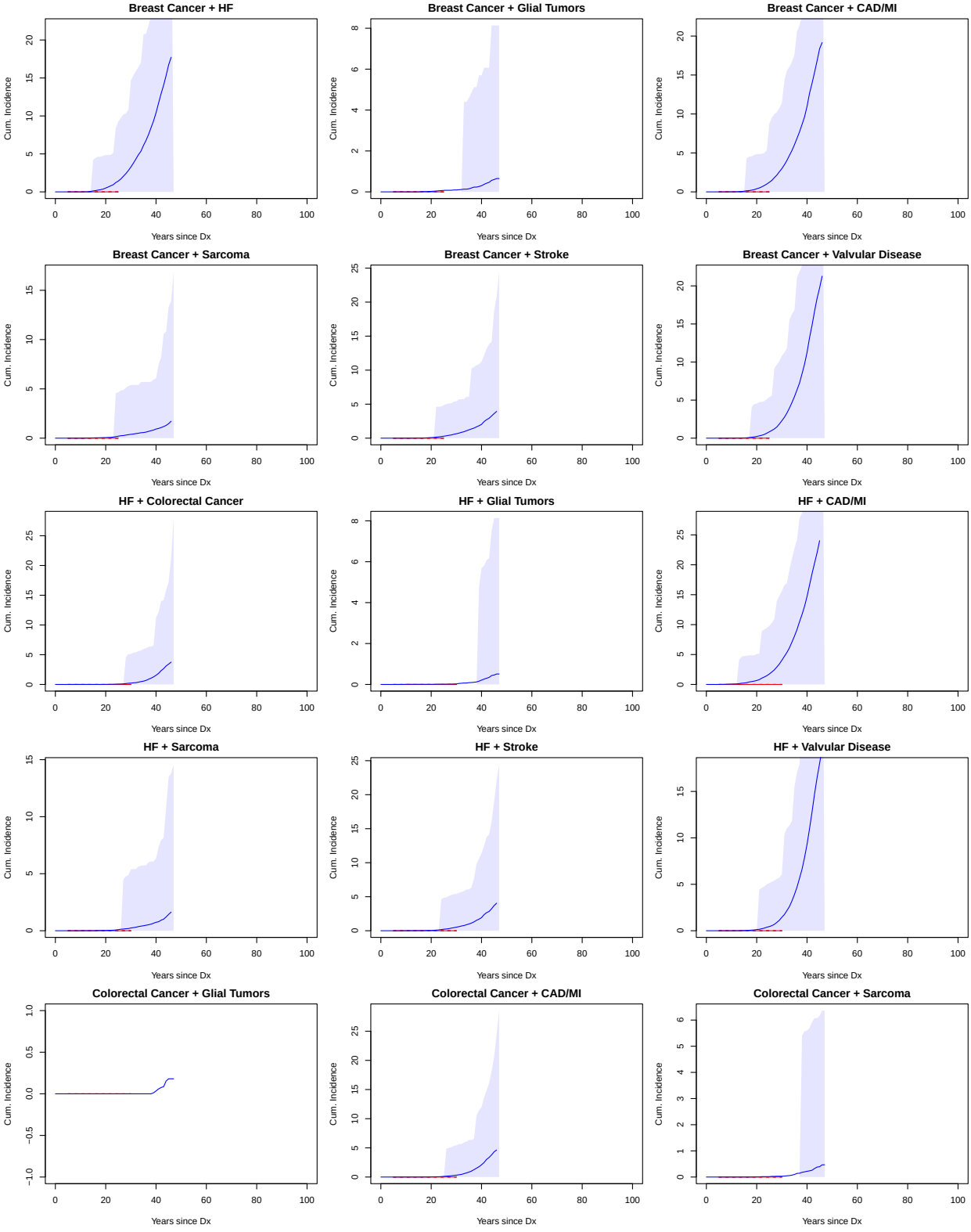

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

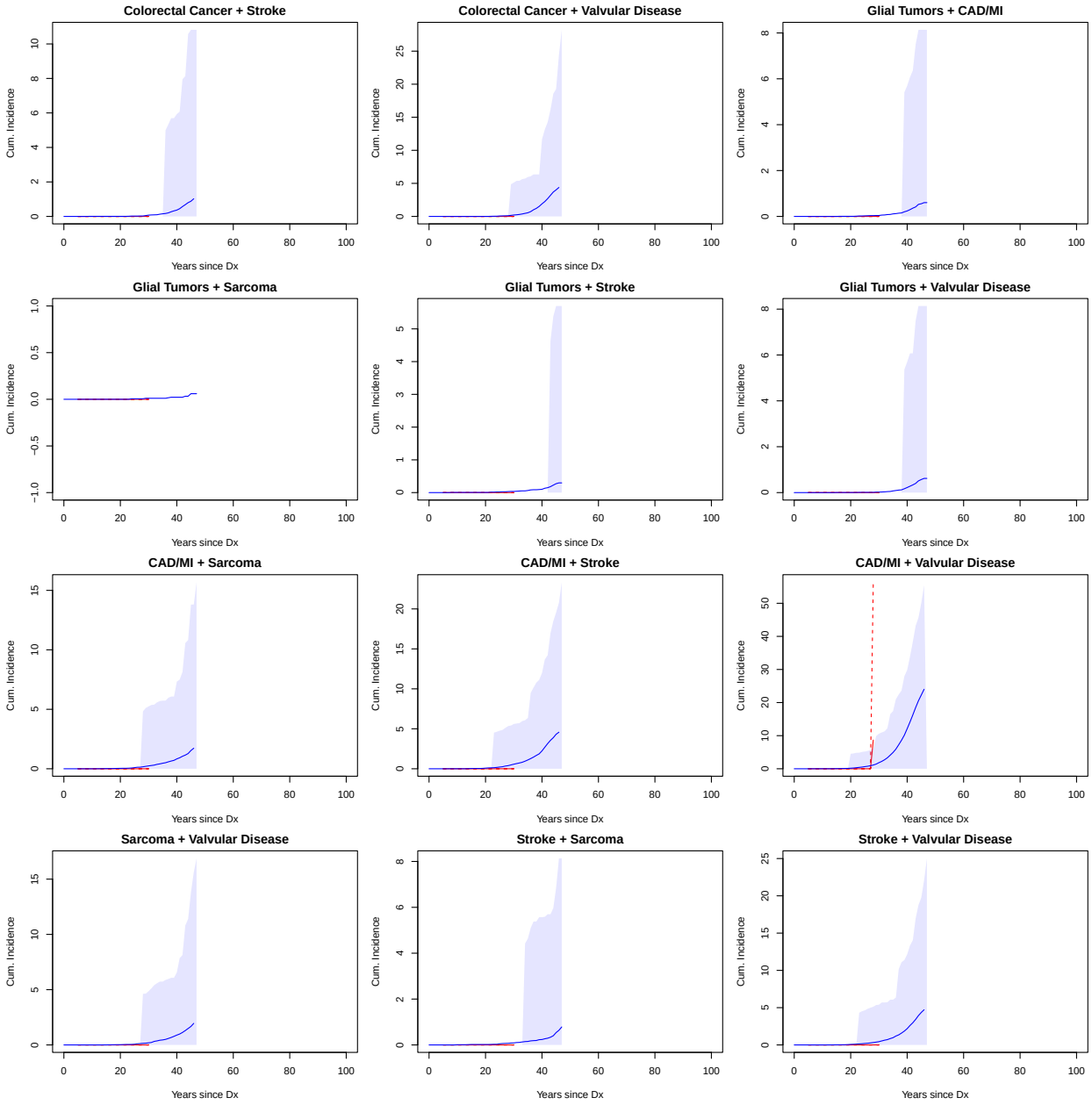
6.5.4.74 HL grp: Extended



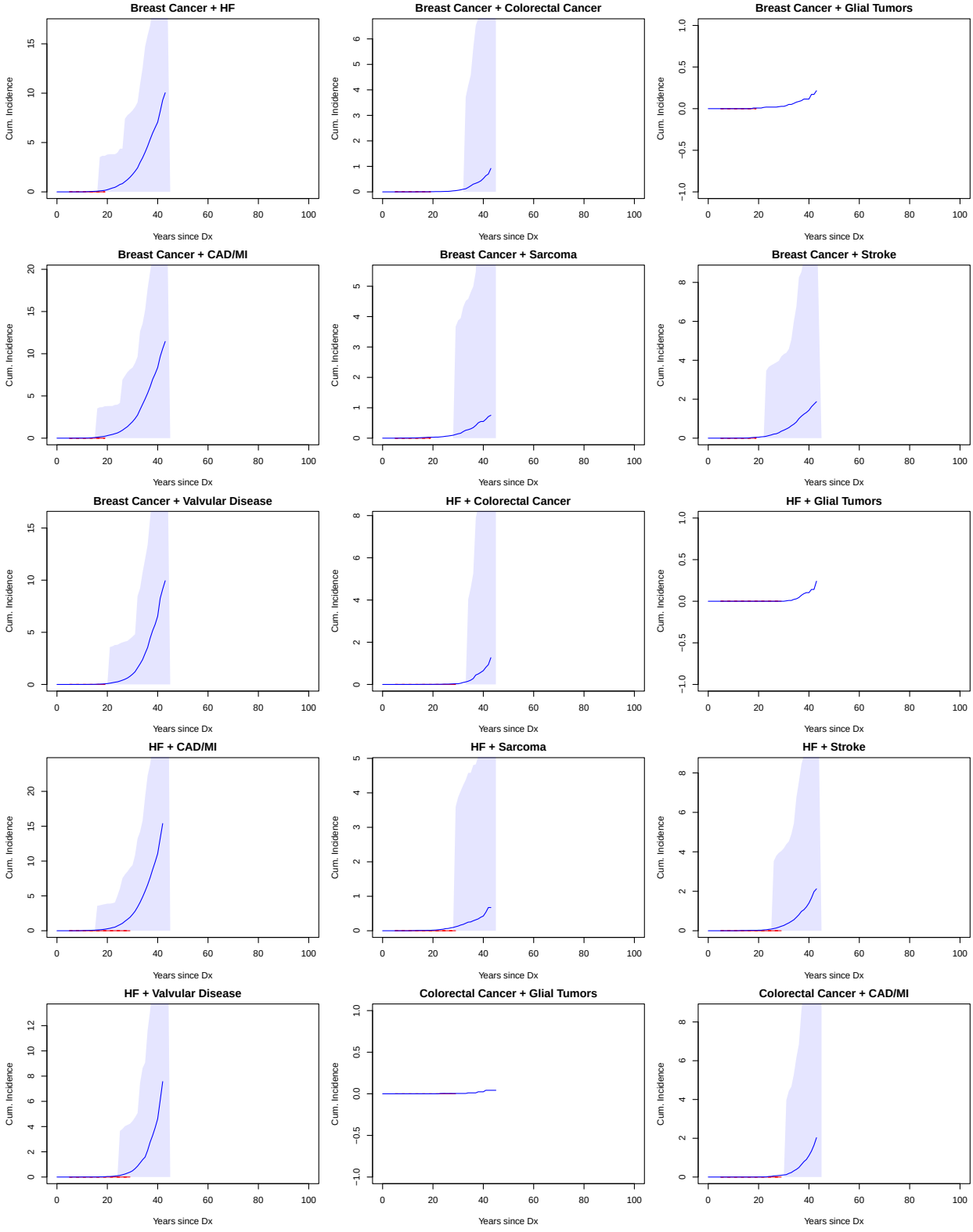

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

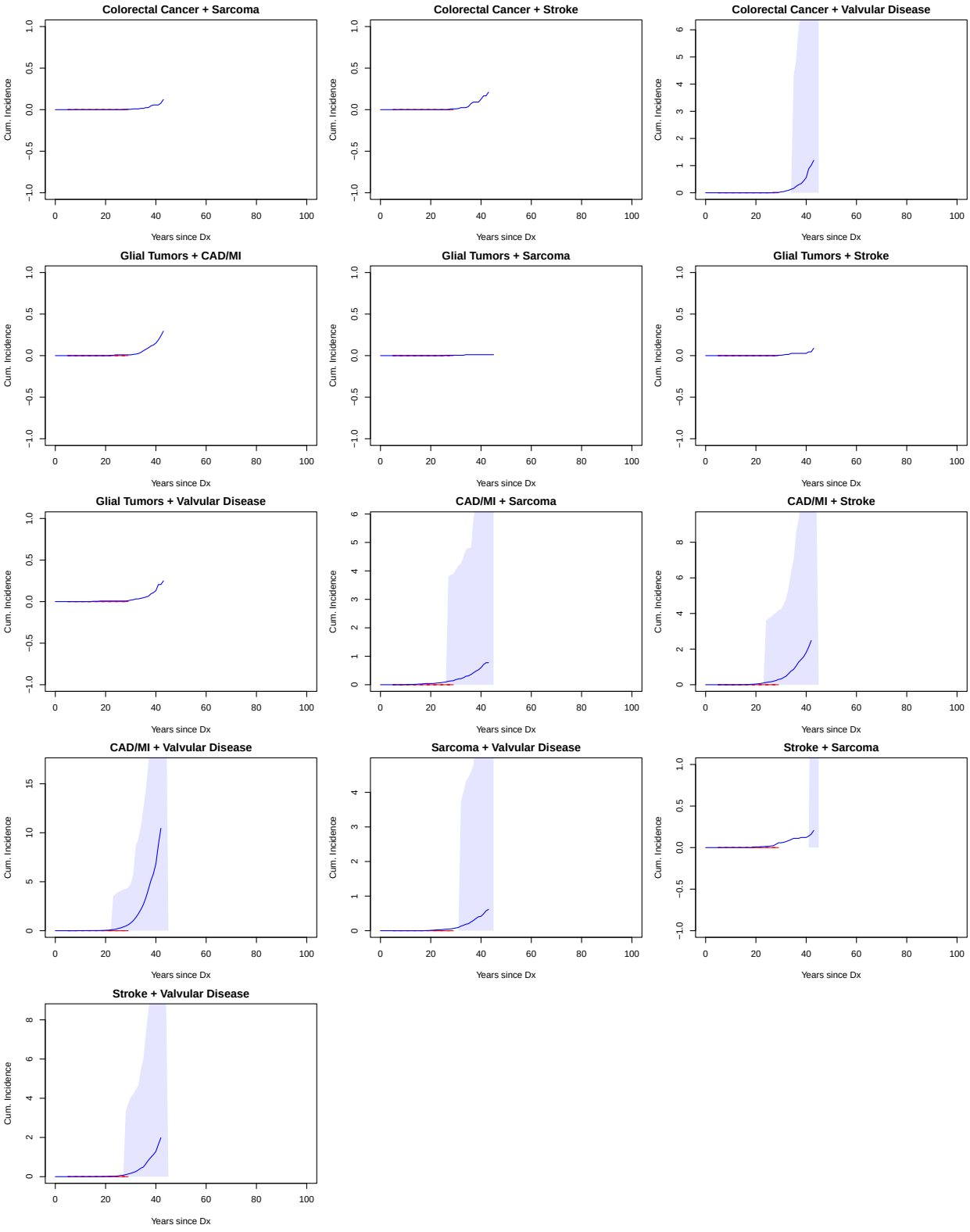
6.5.4.75 HL grp: Chest RT>=35 plus chemo



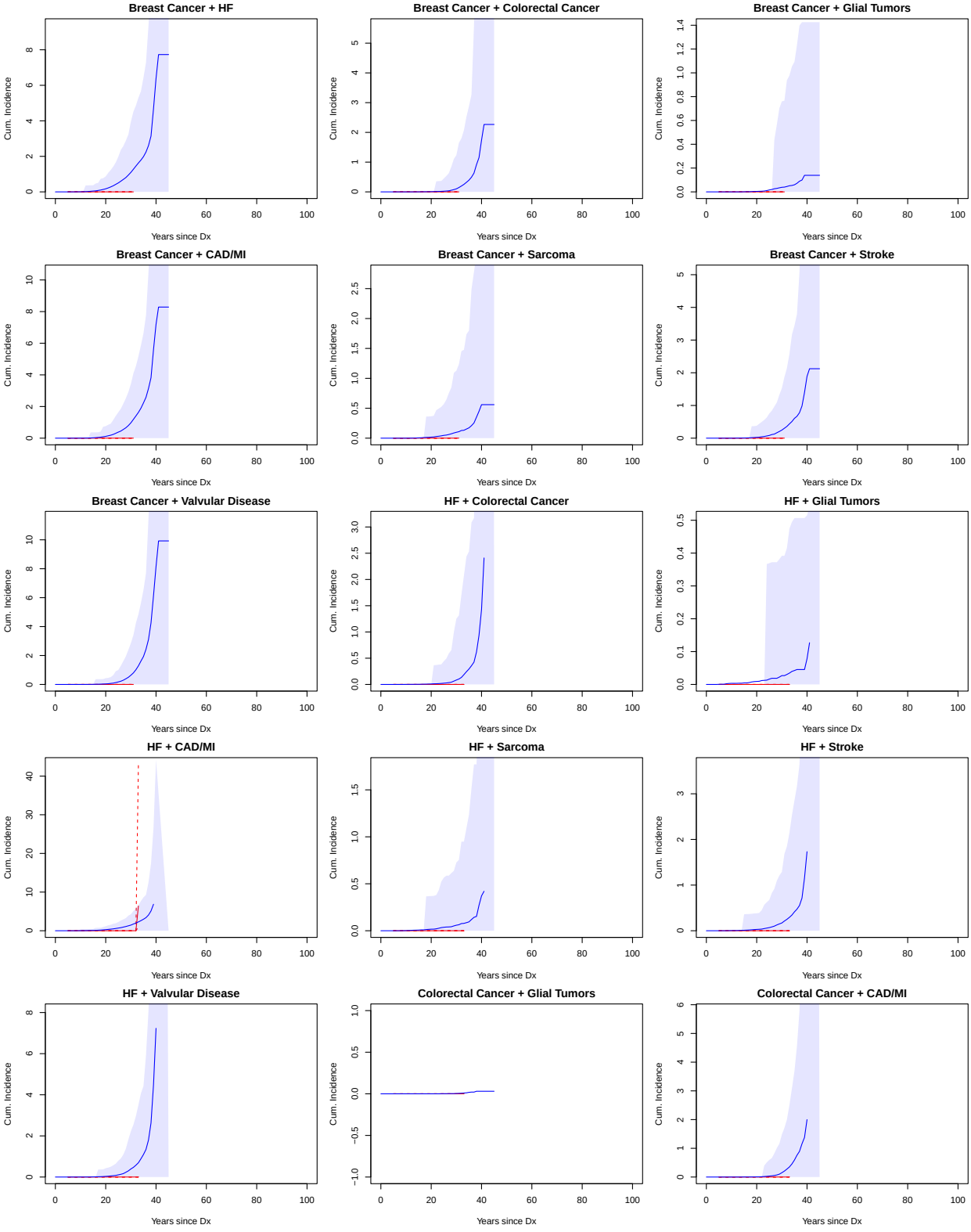

Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

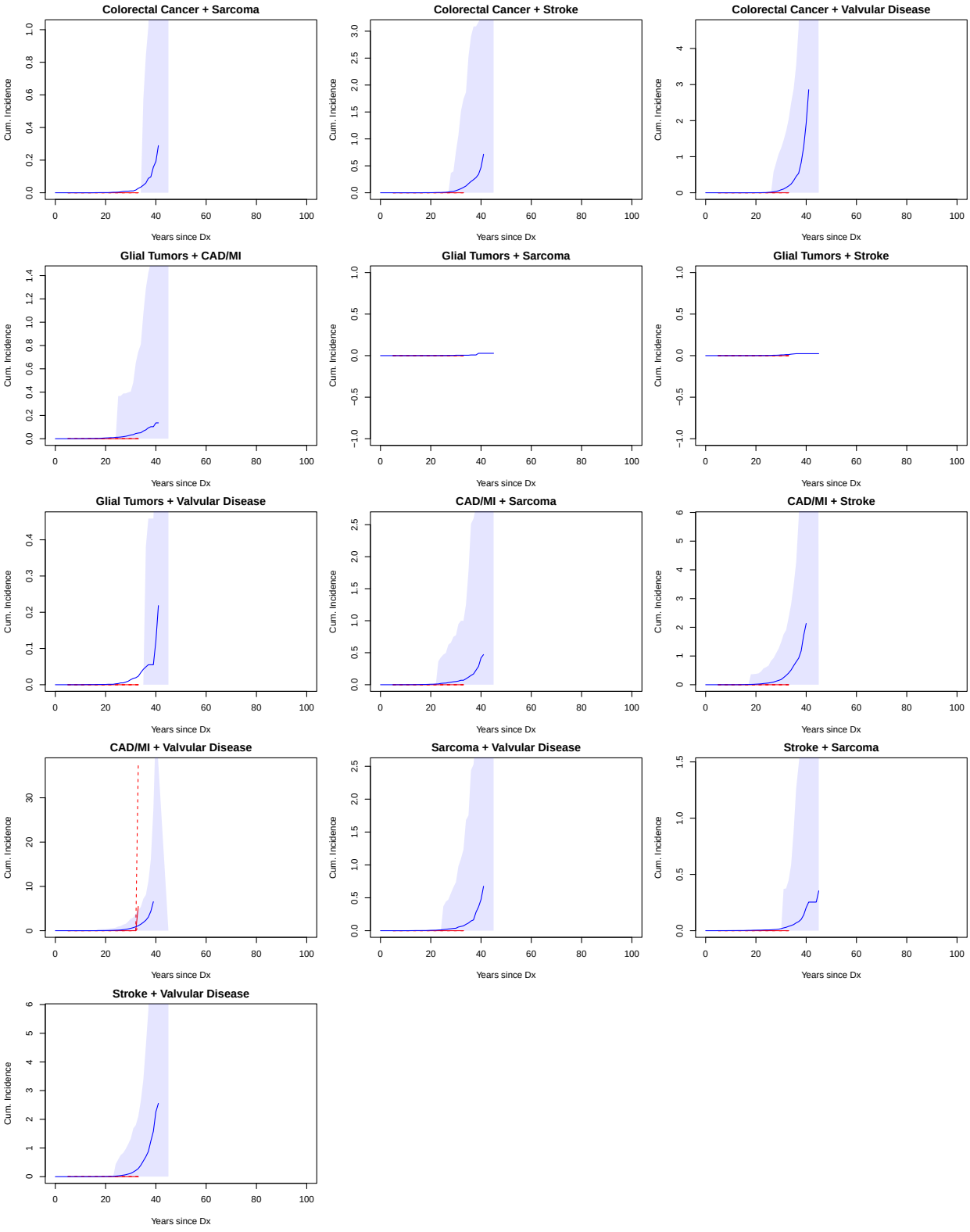
6.5.4.76 HL grp: Chest RT>=35 no chemo



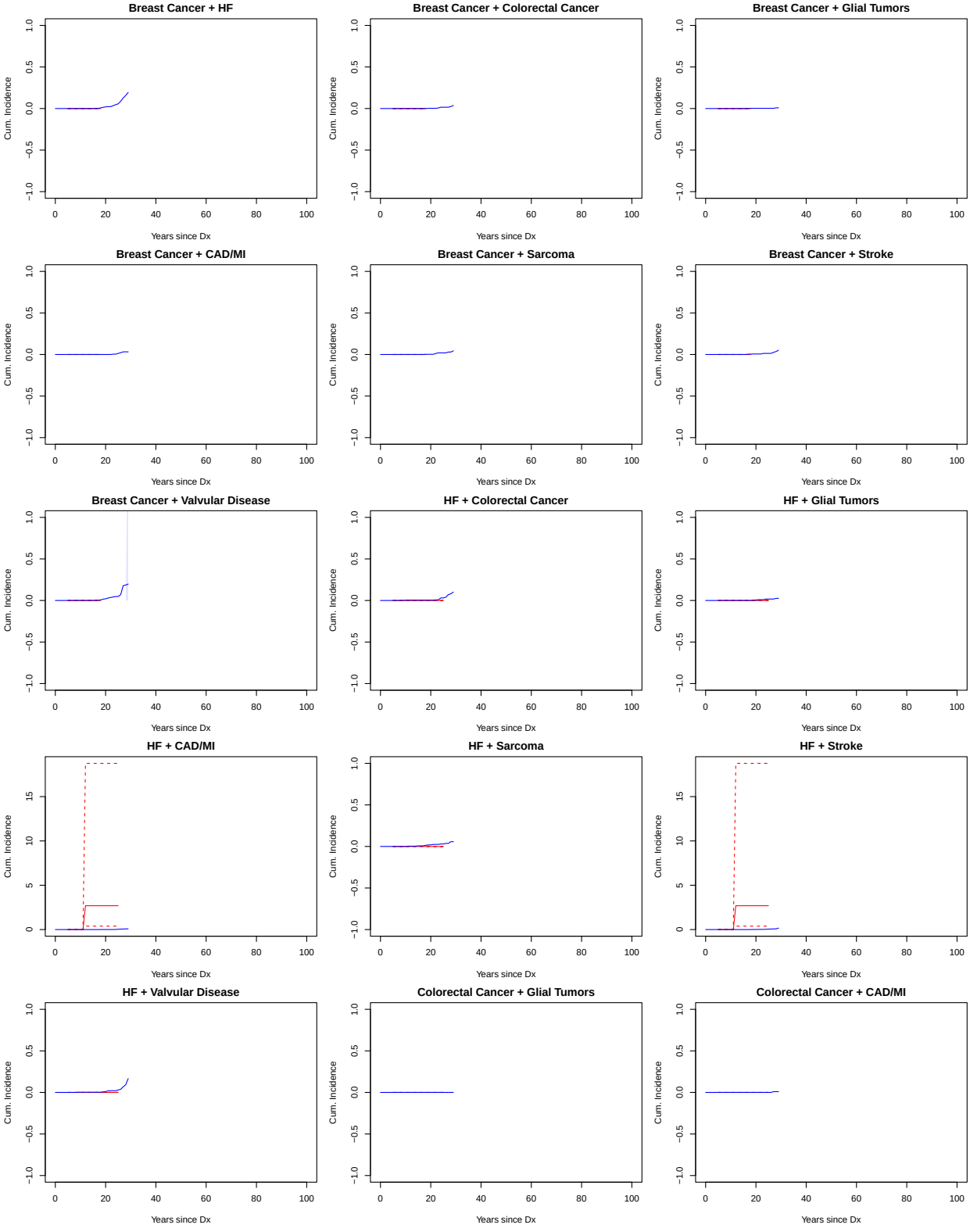

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

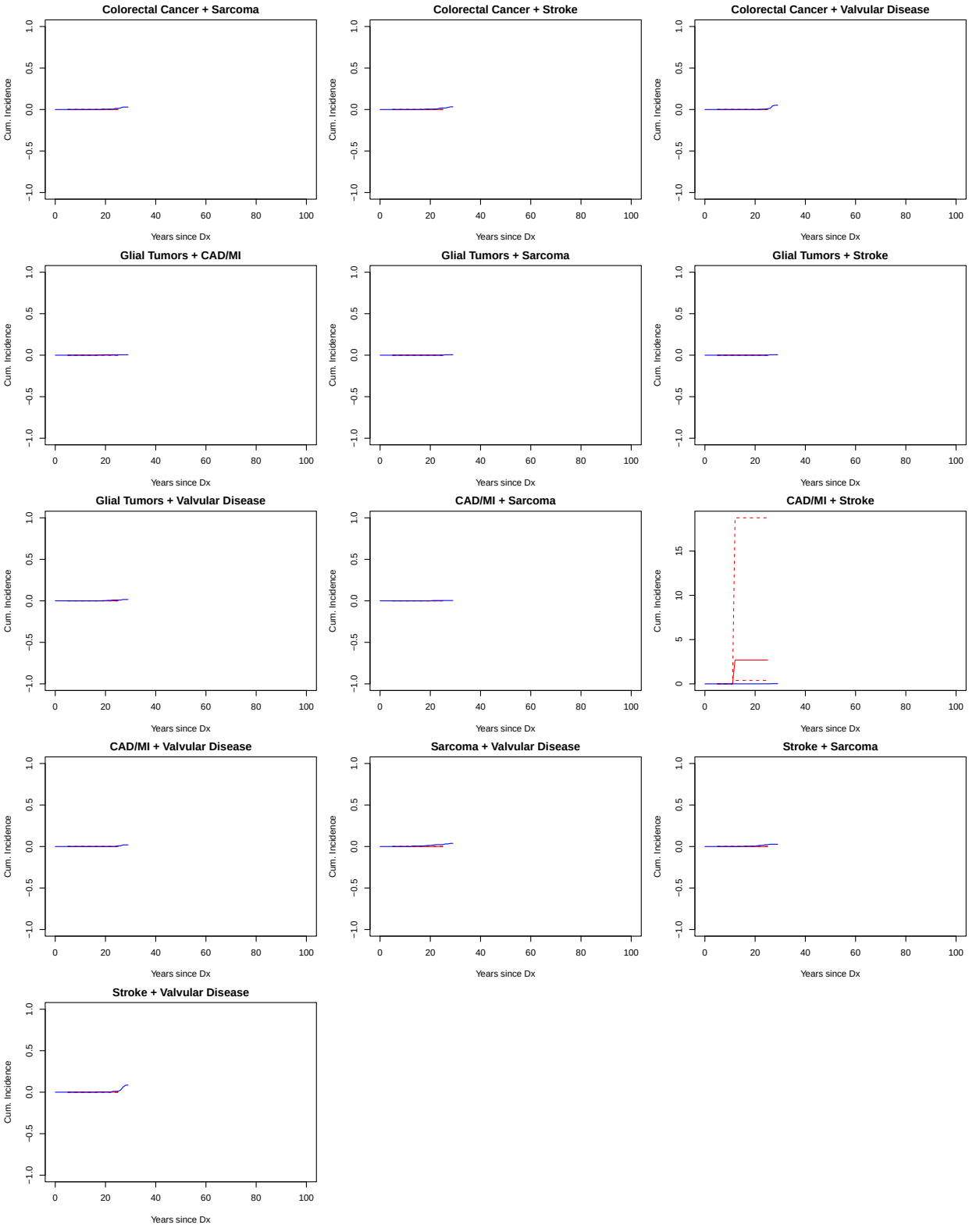
6.5.4.77 HL grp: Chest RT<35 plus chemo



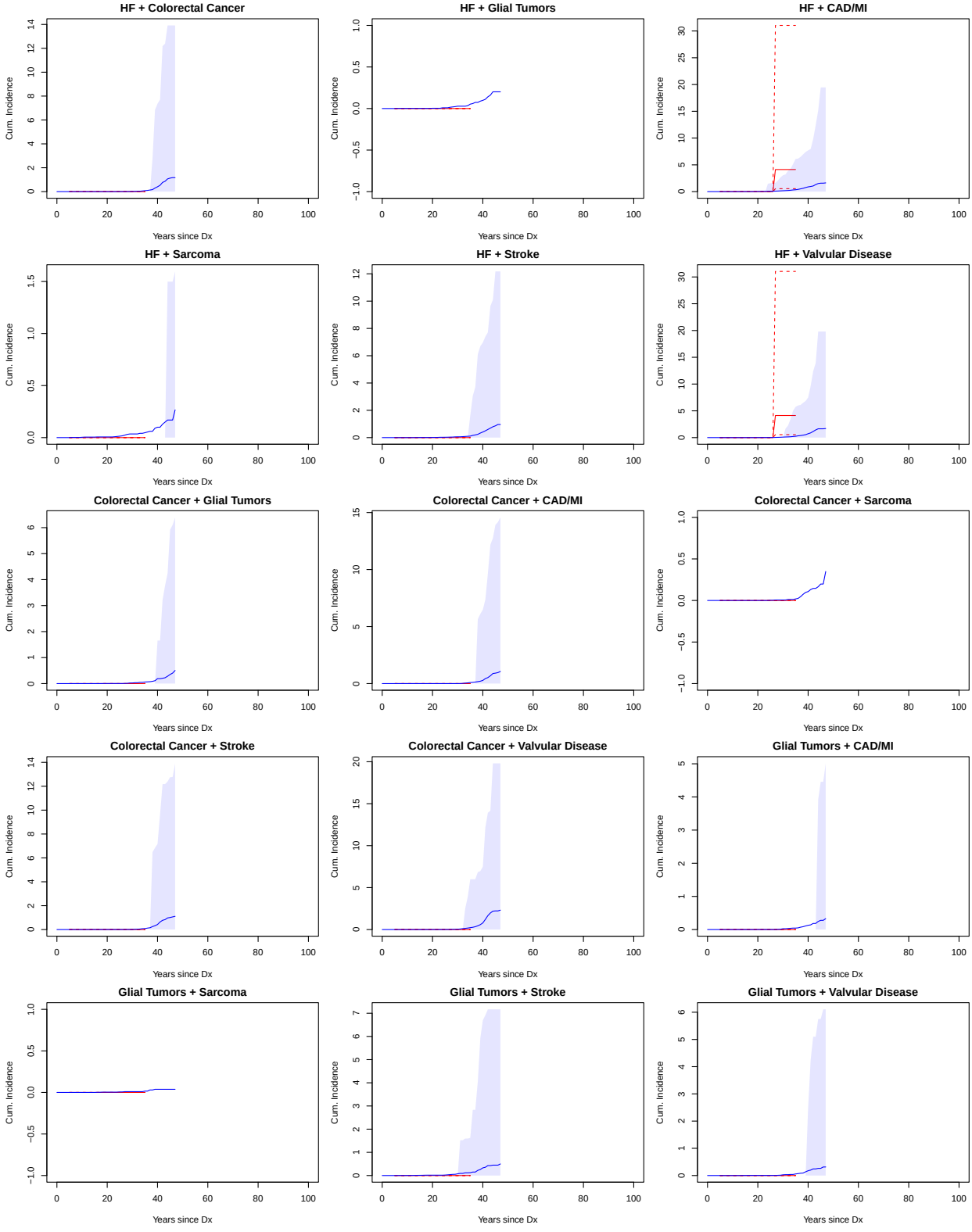

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

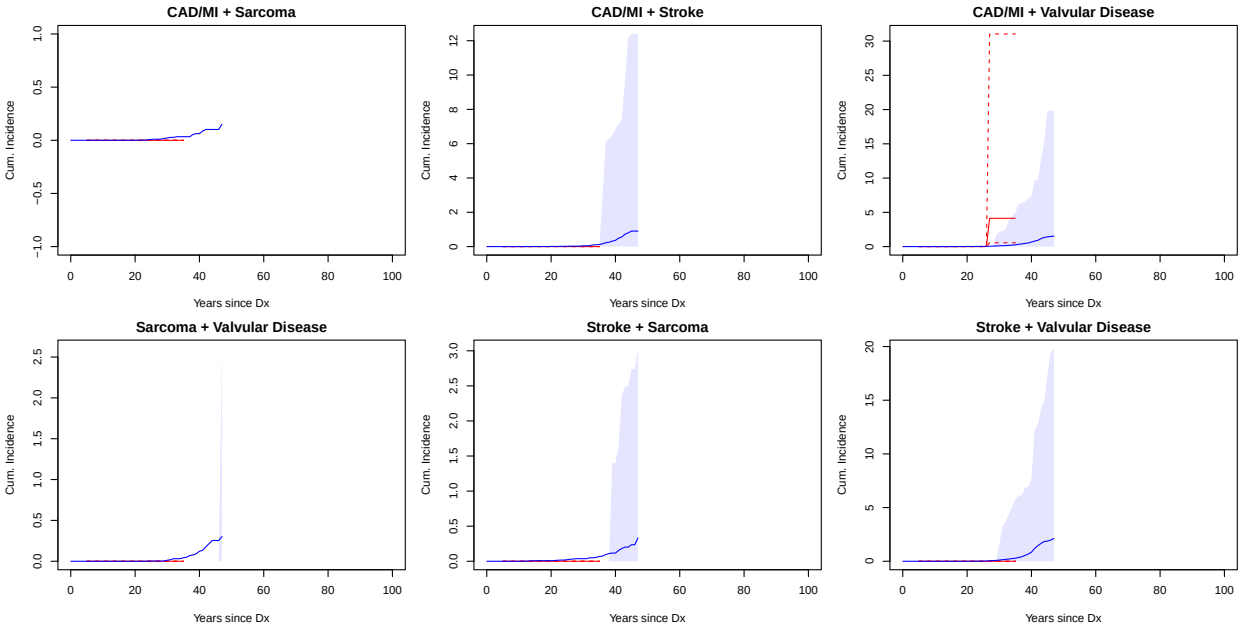
6.5.4.78 HL grp: Chemo without chest RT



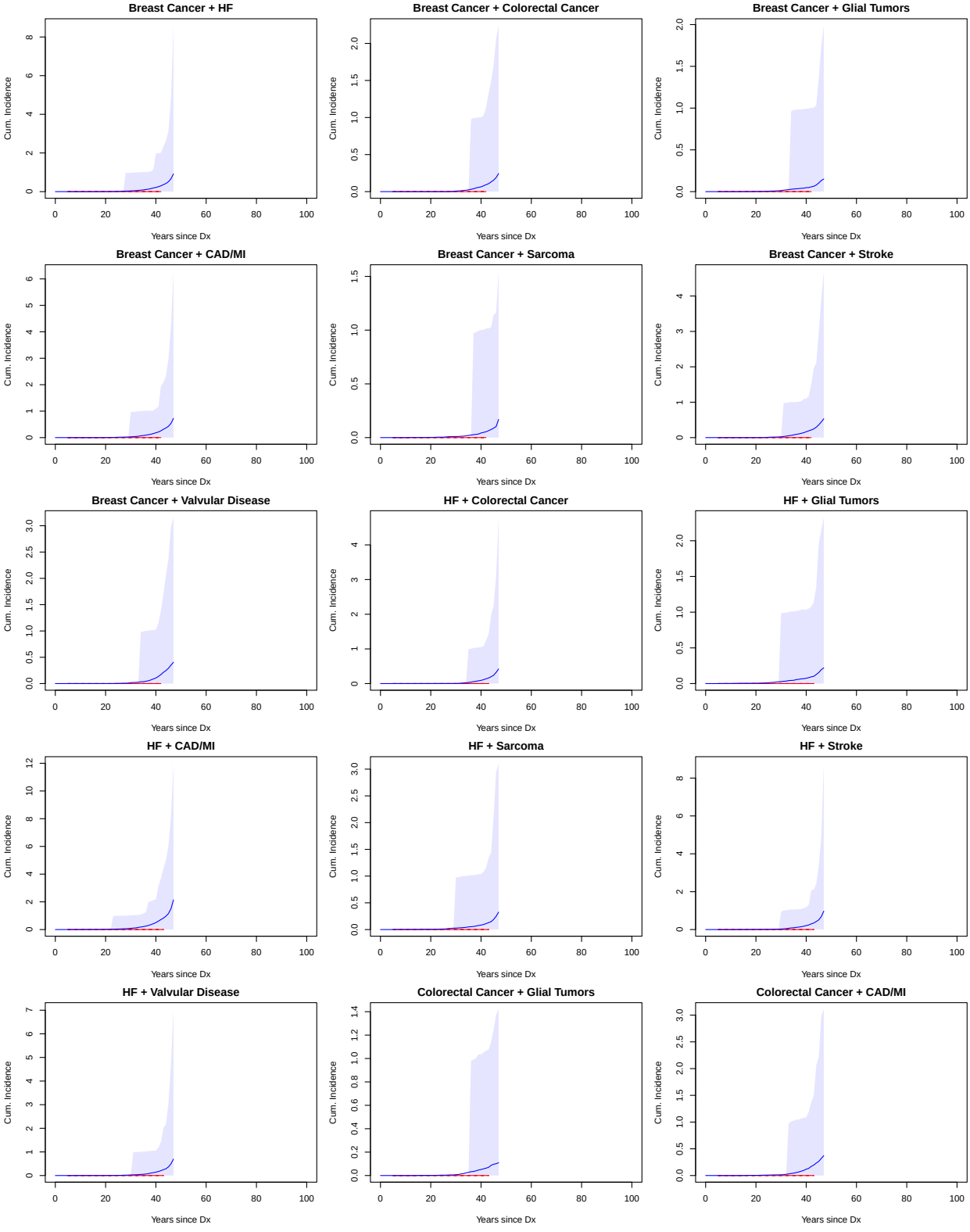

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

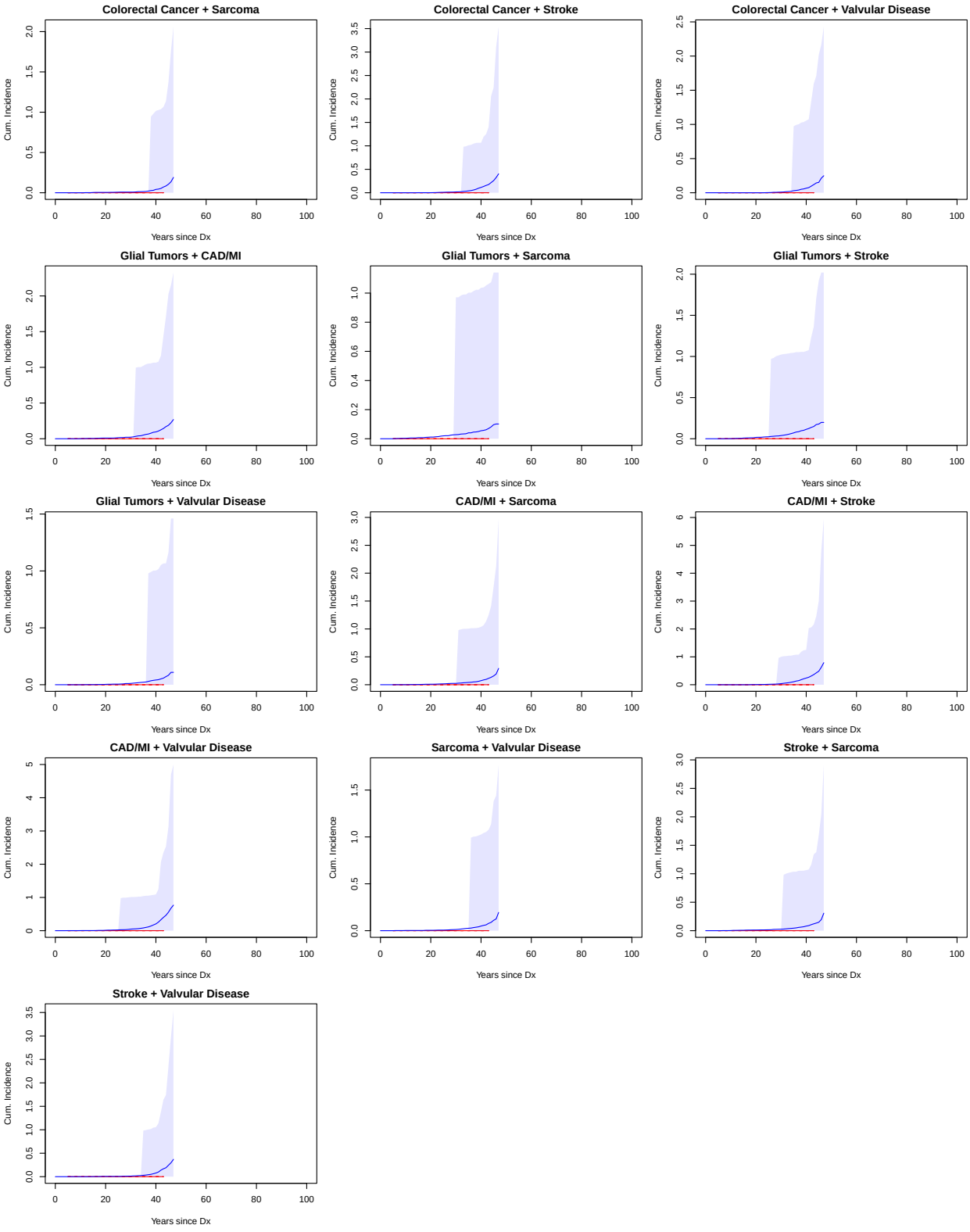
6.5.4.79 HL grp: Other



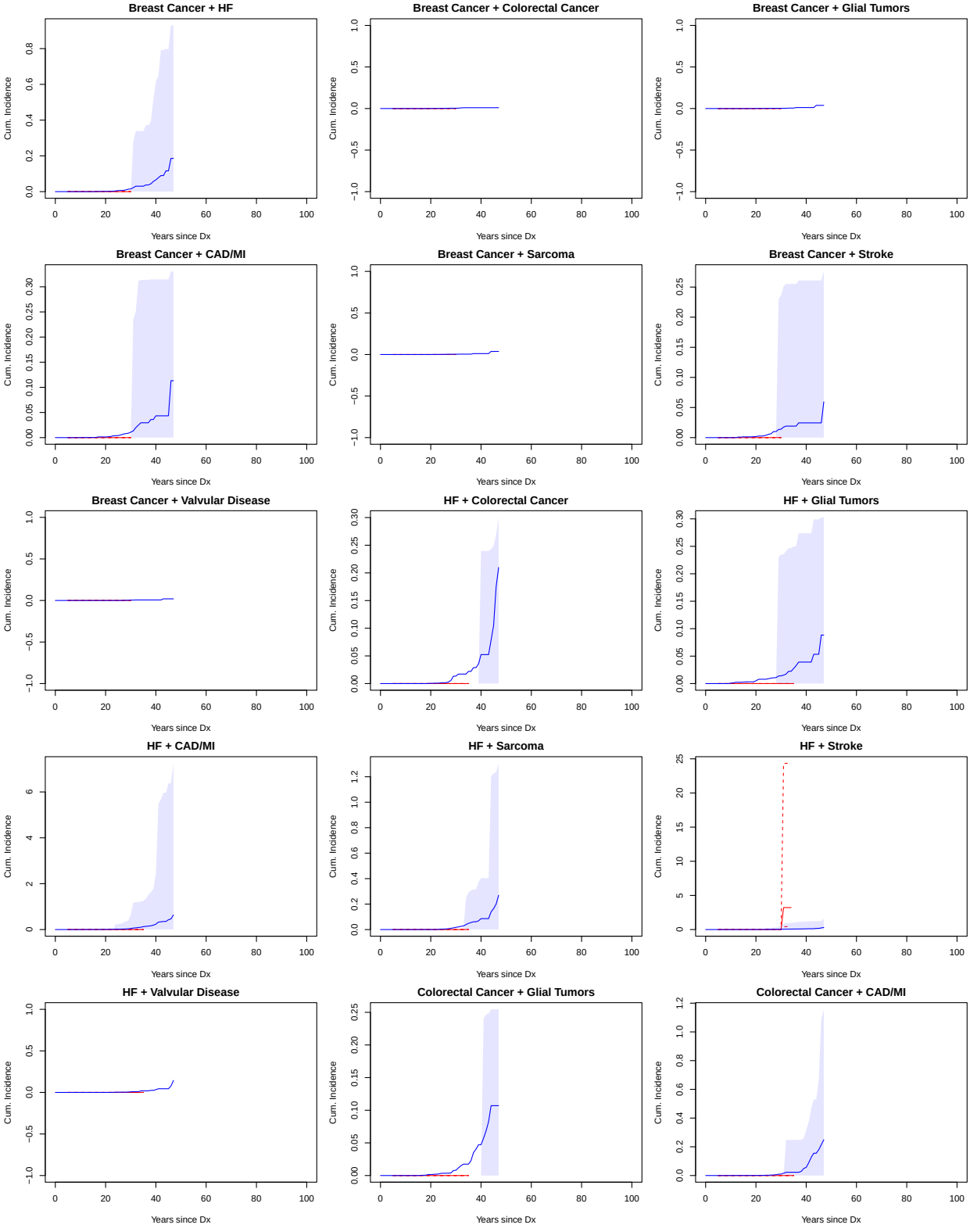

CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

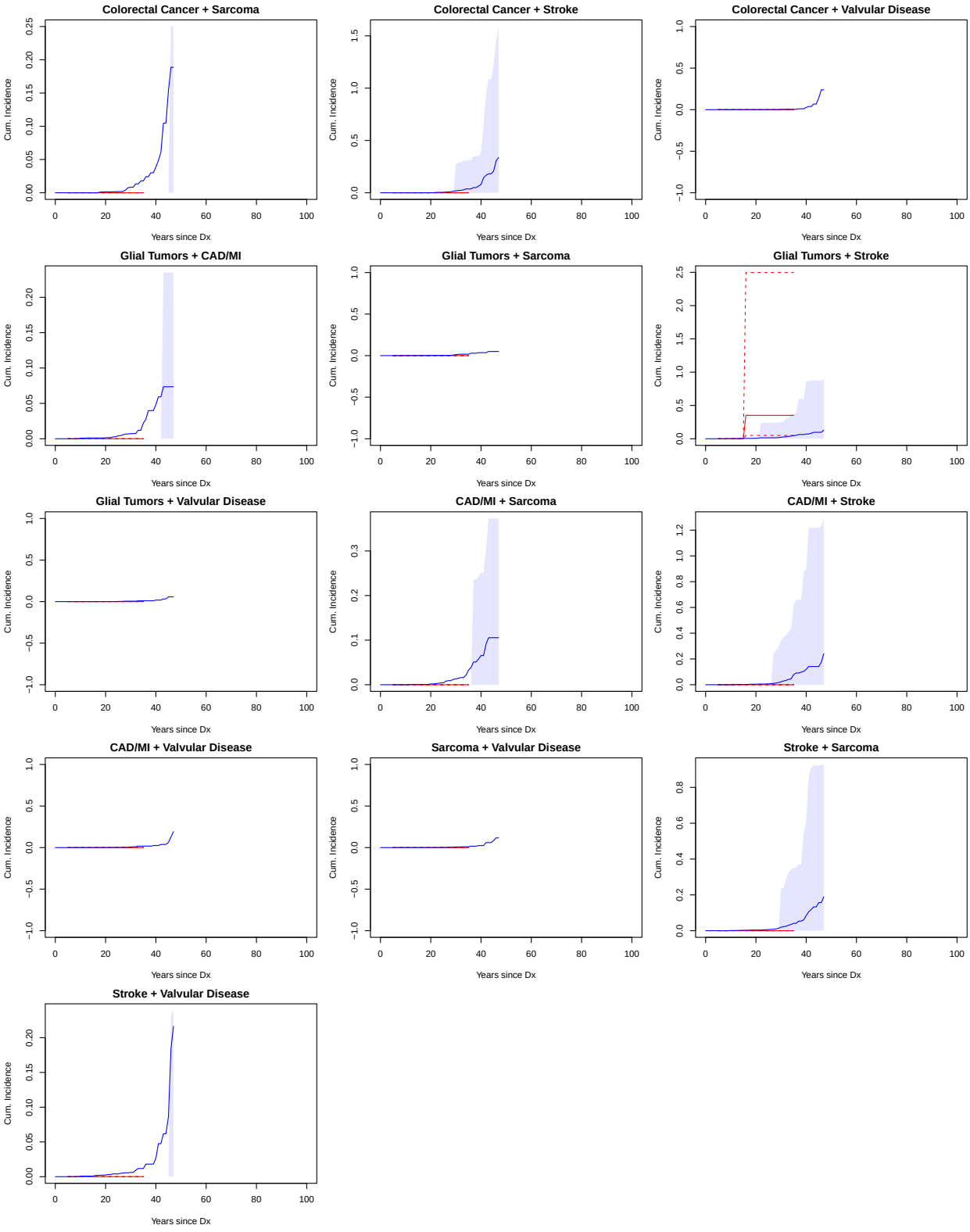
6.5.4.80 ALL grp: 1970s-like



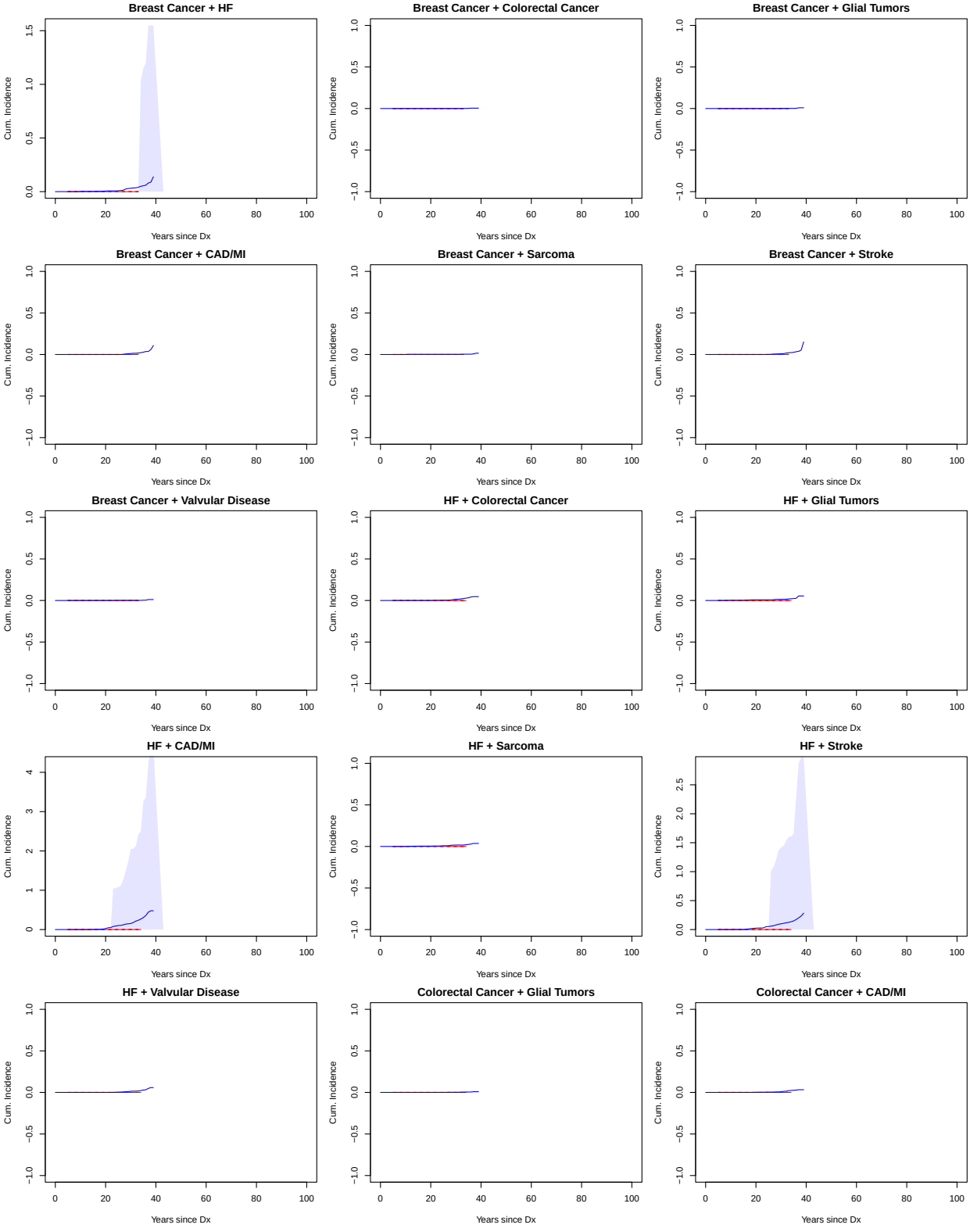

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

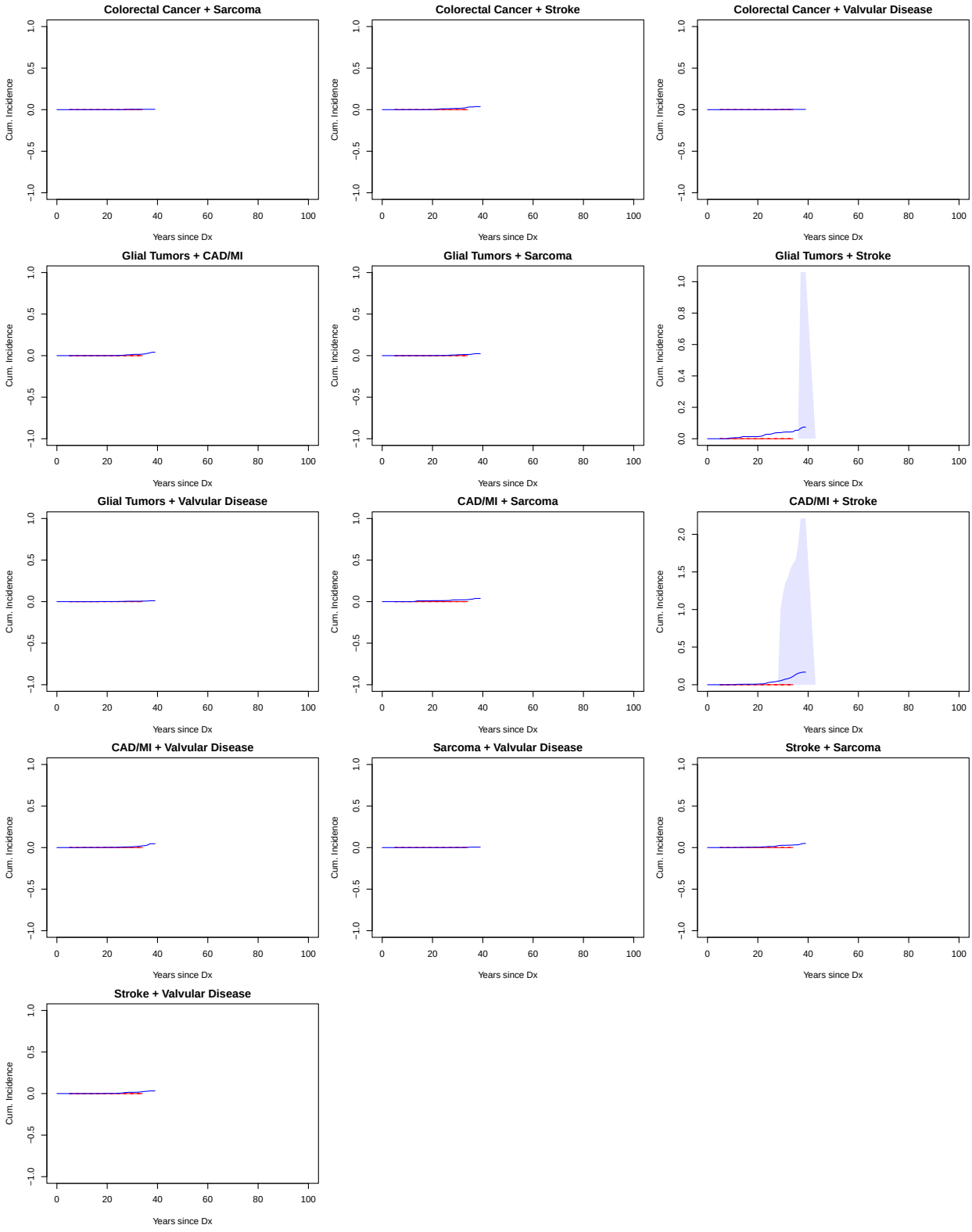
6.5.4.81 ALL grp: 1980s SR-like



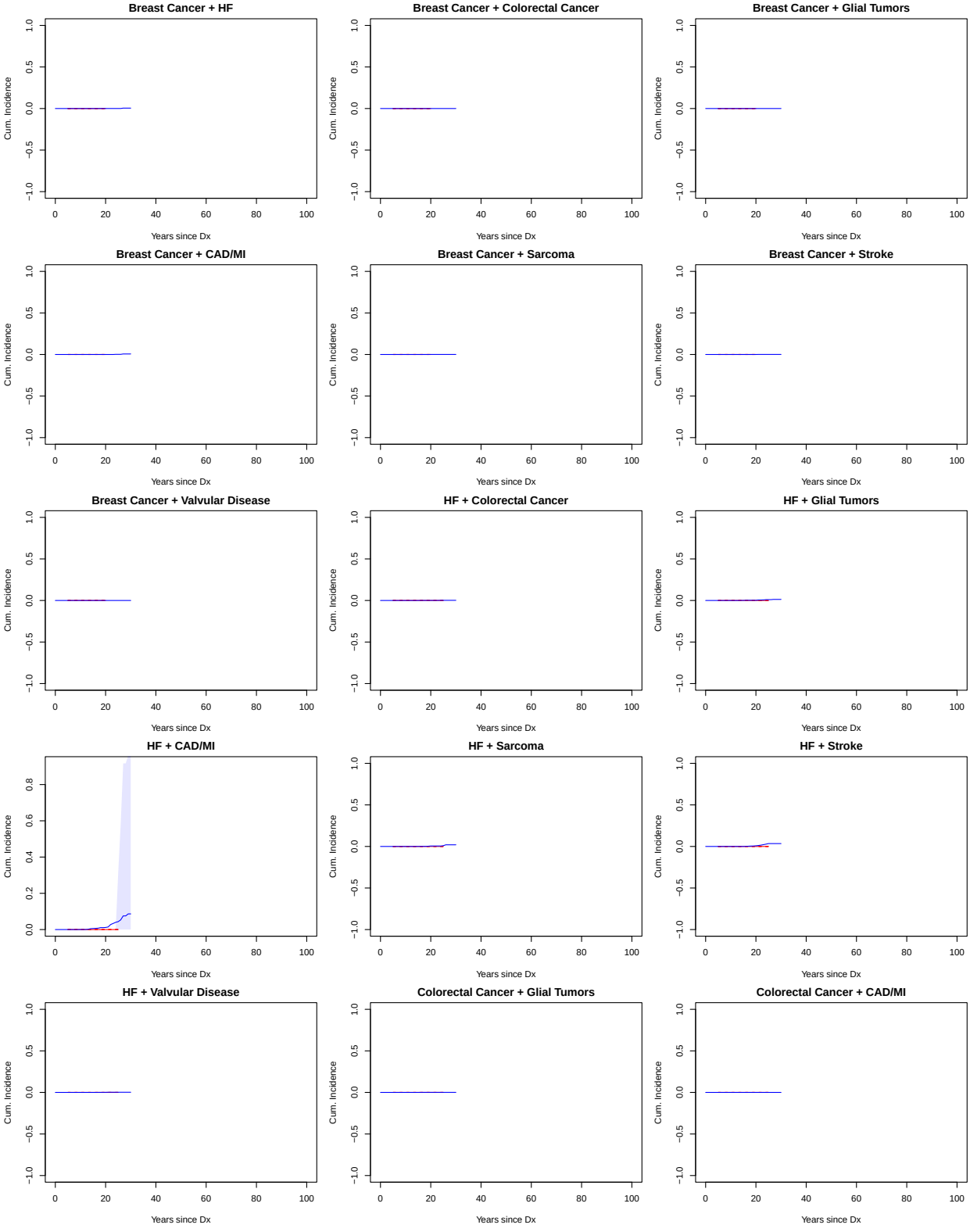

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

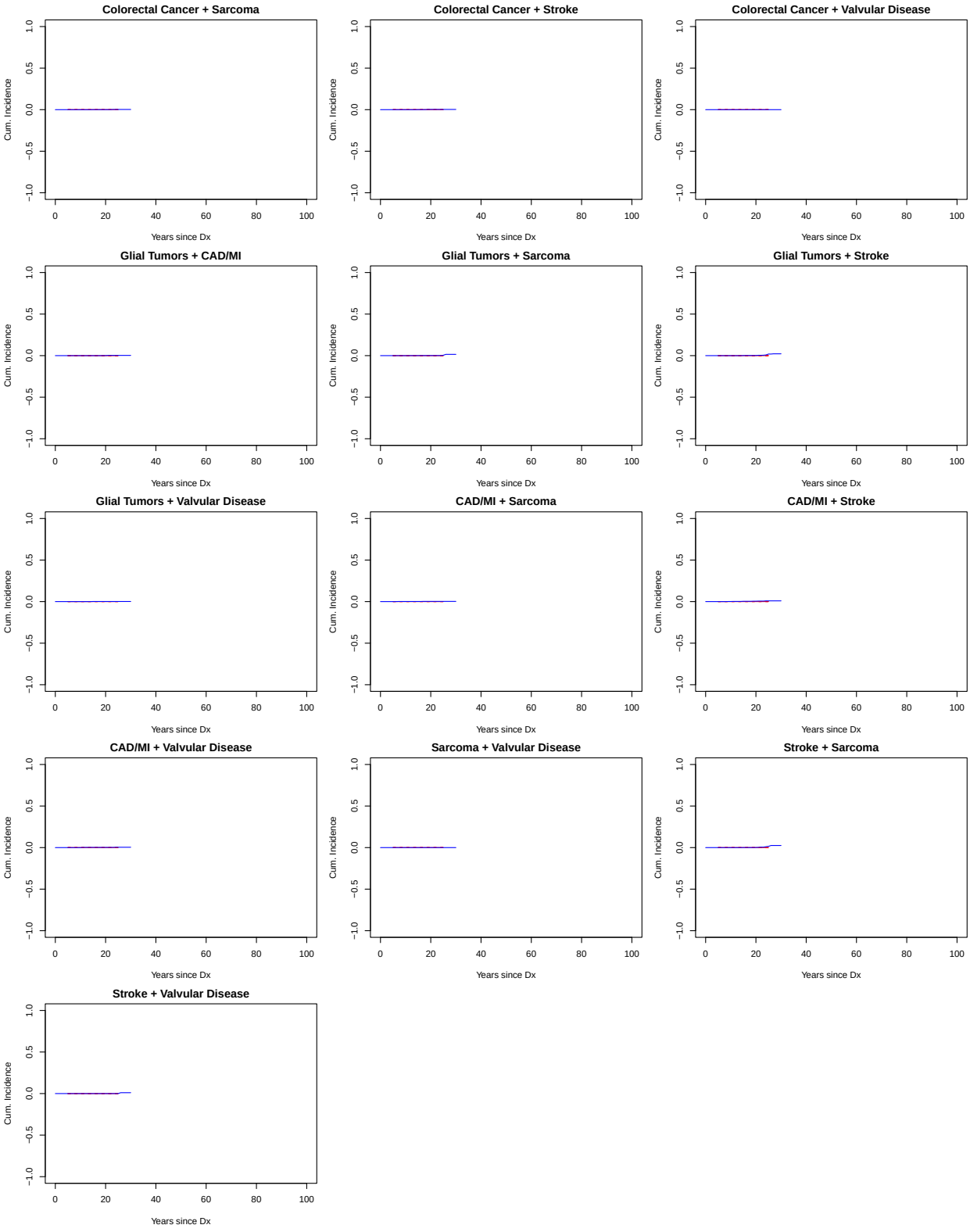
6.5.4.82 ALL grp: 1980s HR-like



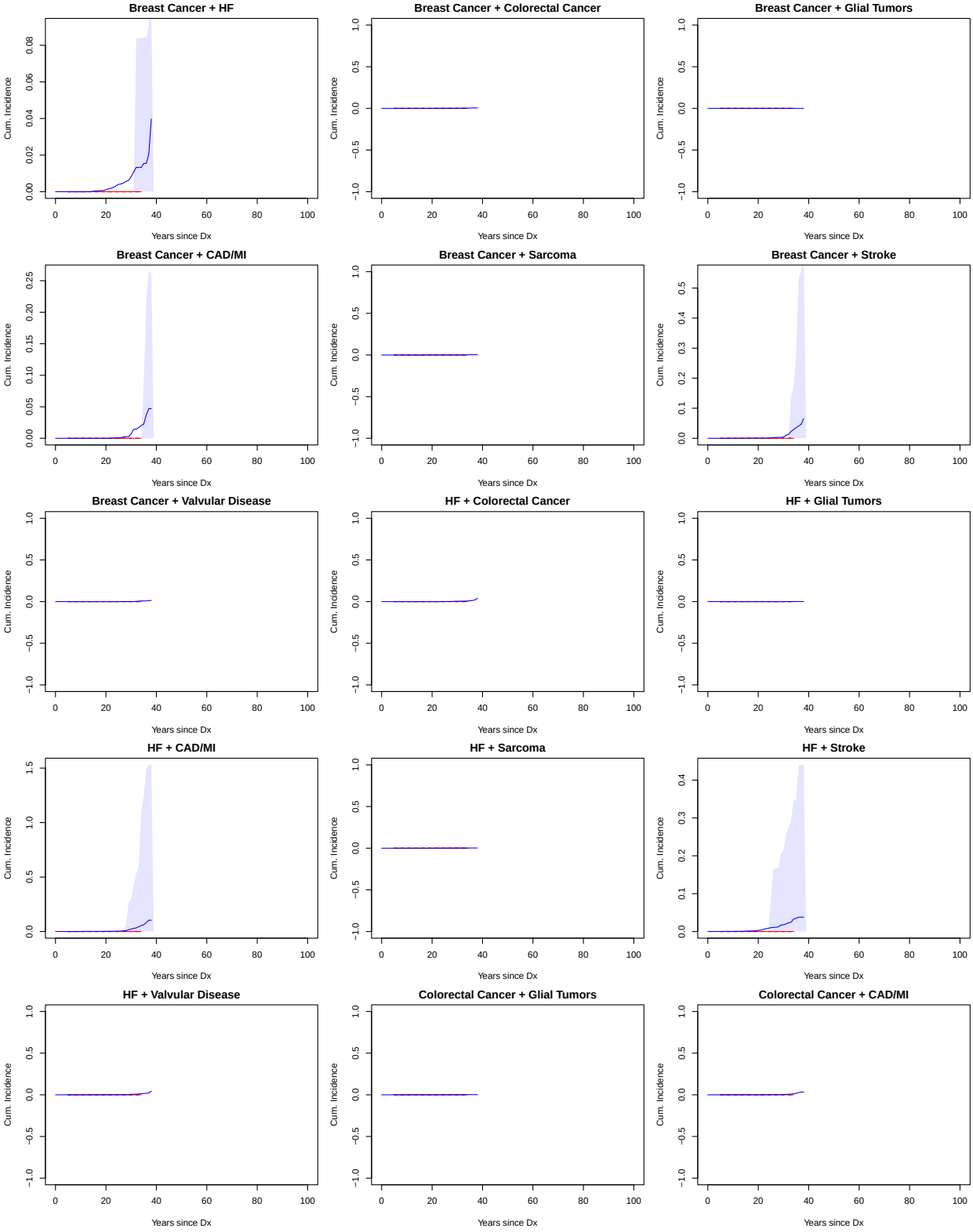

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

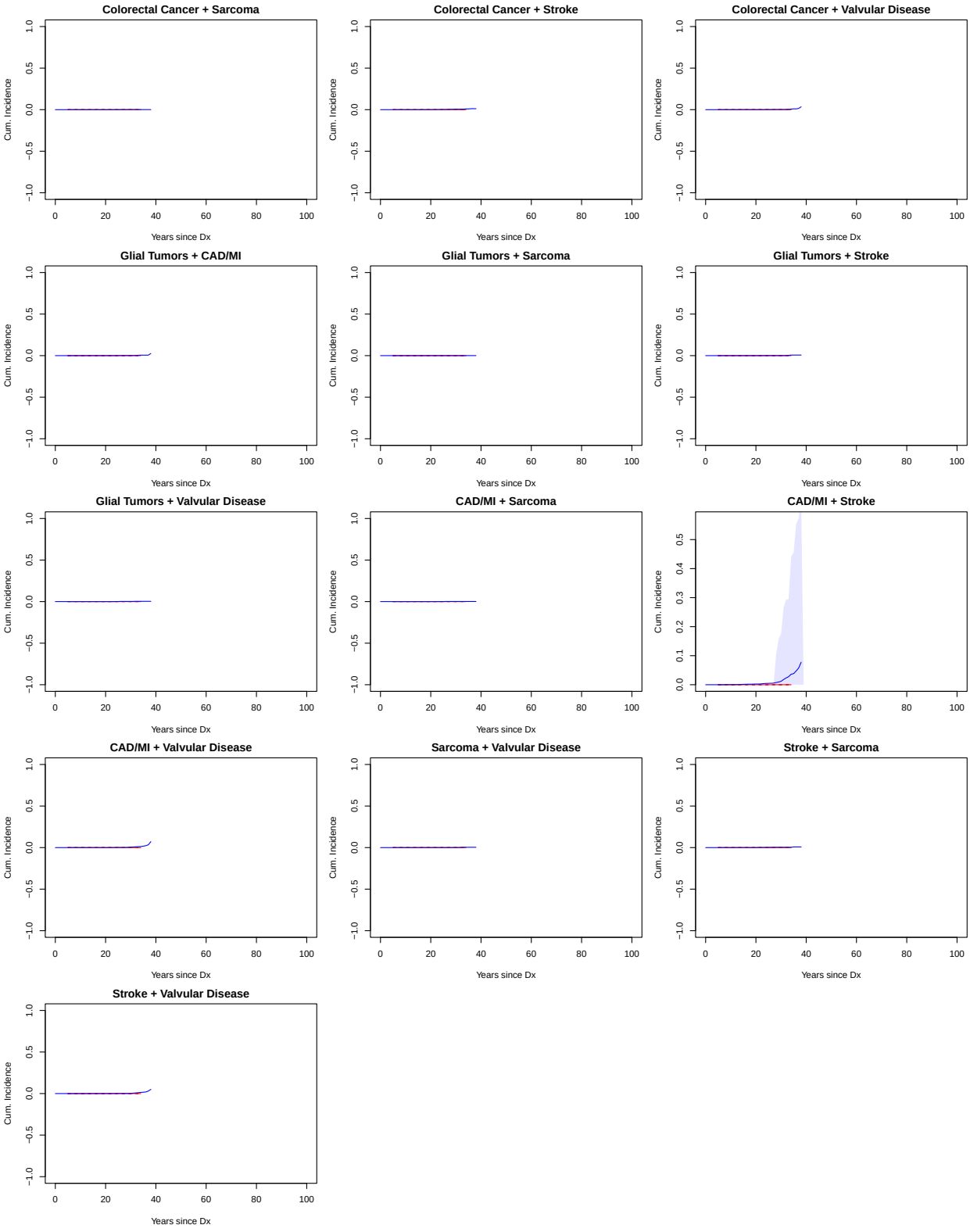
6.5.4.83 ALL grp: 1990s HR-like



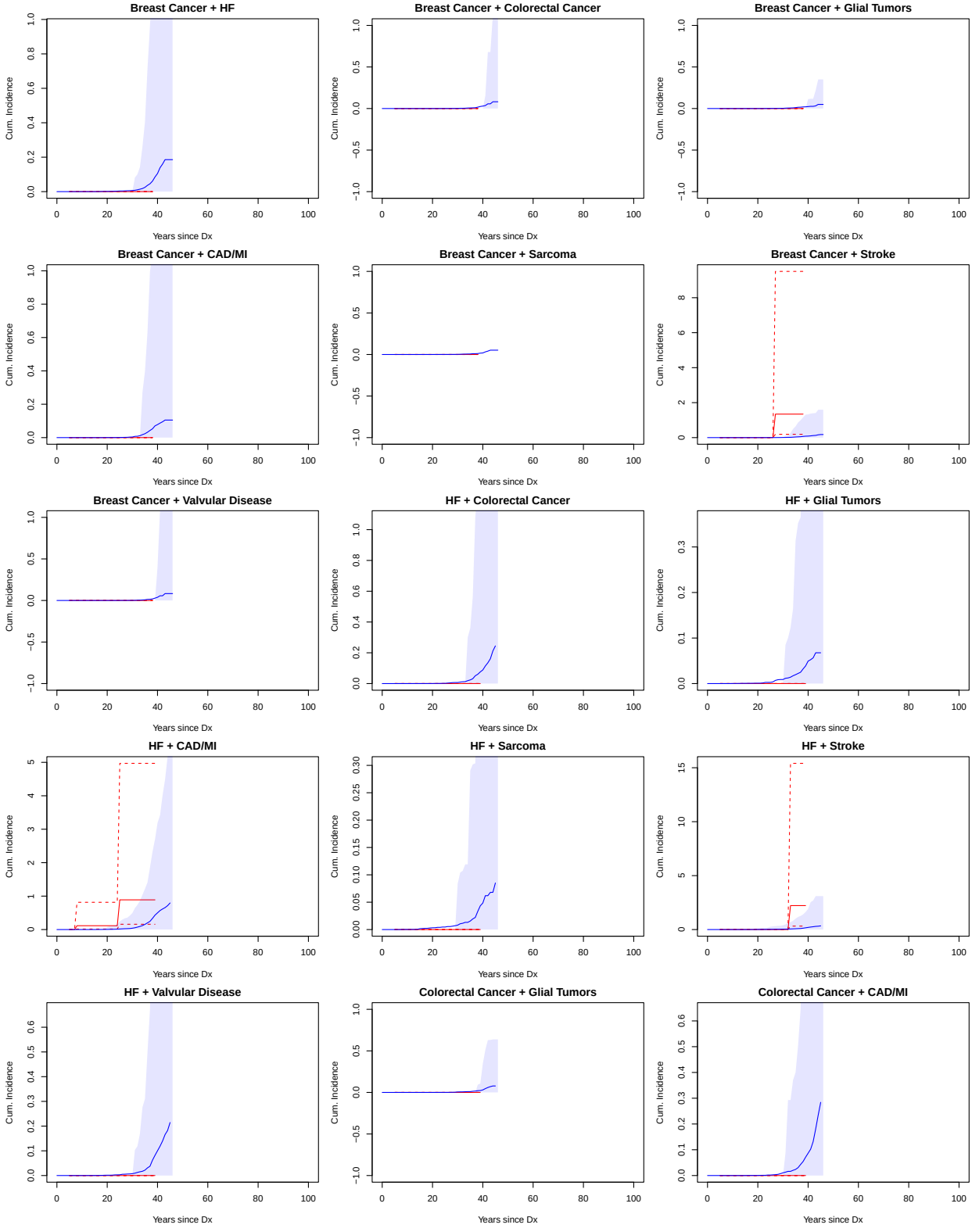

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx
−1.0
−0.5
0.0
0.5
1.0
0
20
40
60
80
100

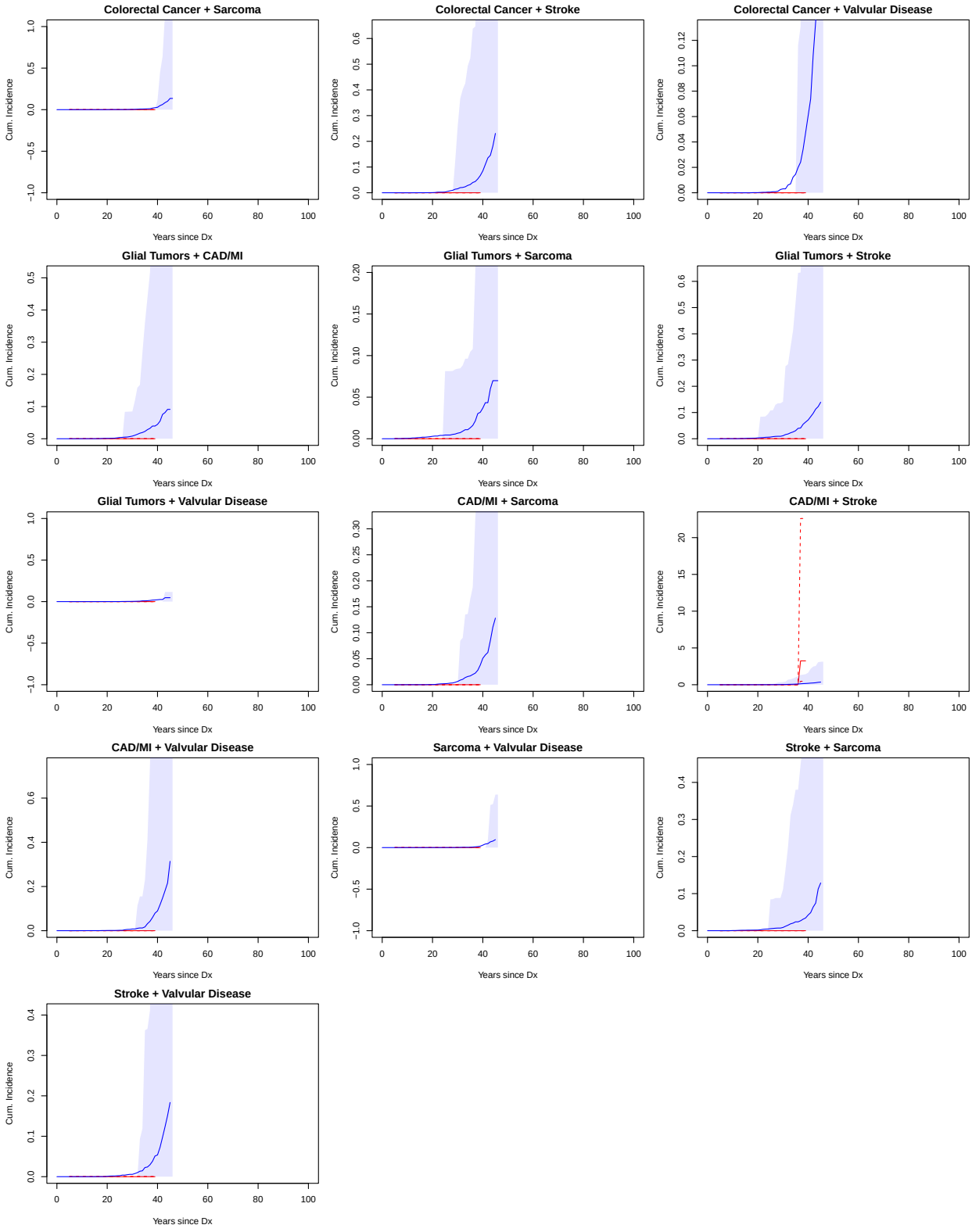
6.5.4.84 ALL grp: 1990s SR/Essig



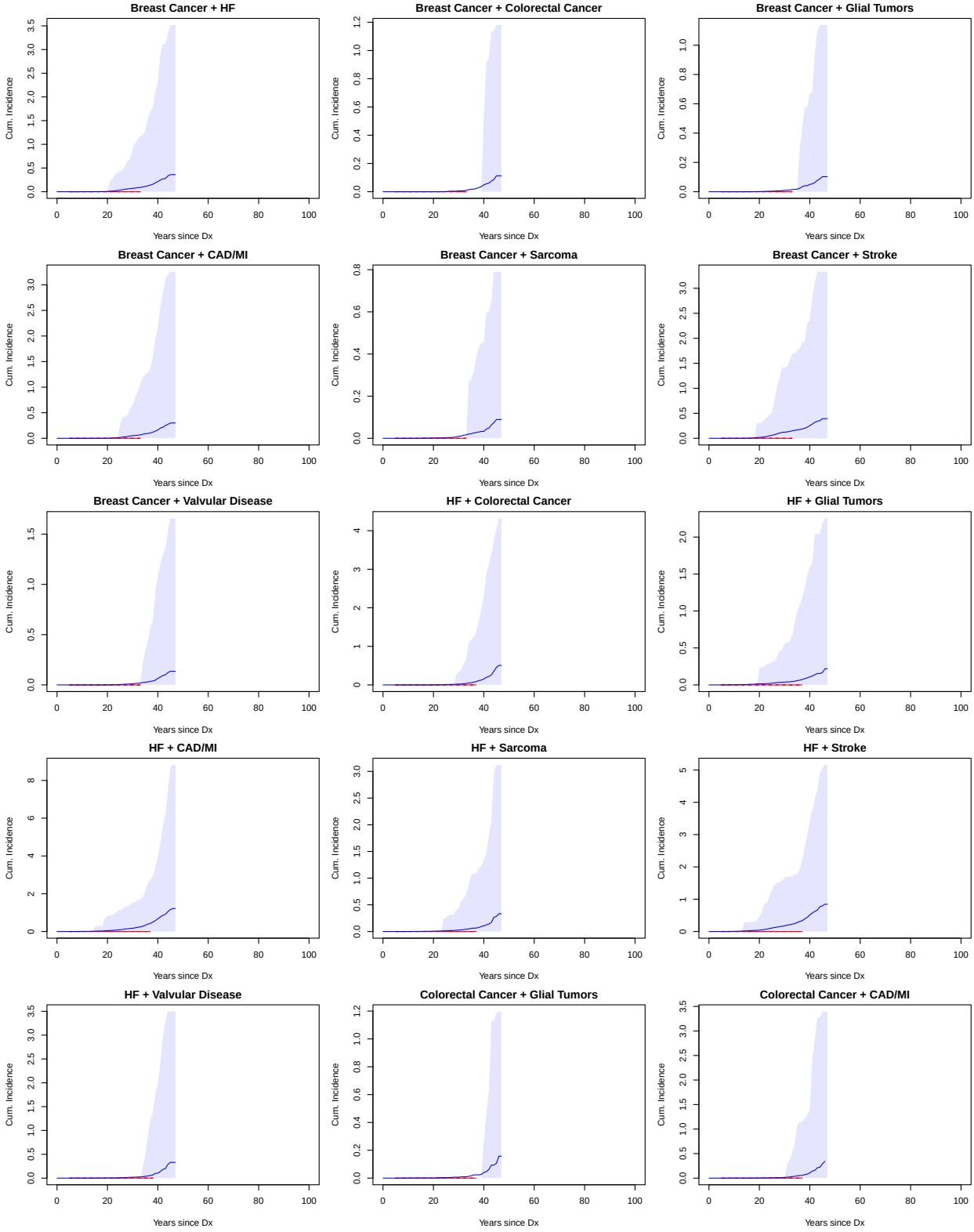

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

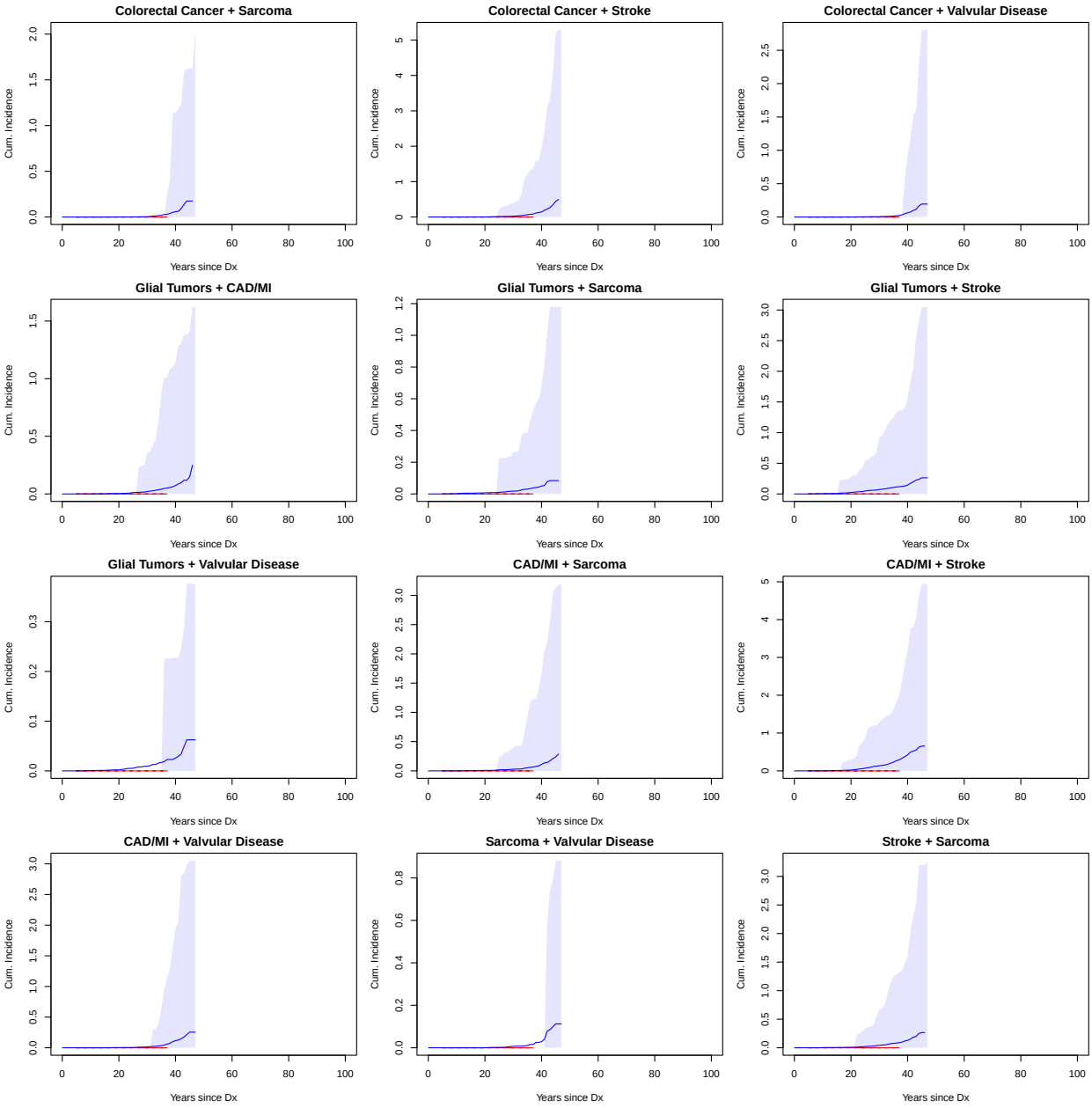
6.5.4.85 ALL grp: Other

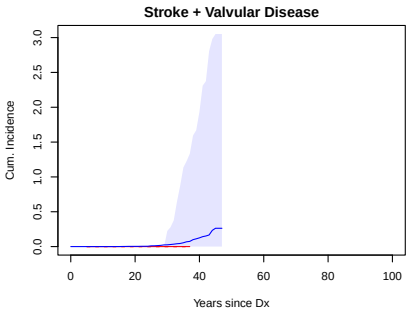



Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Stroke + Valvular Disease
Cum. Incidence
Years since Dx

6.5.4.86 ALL grp: Relapse/Transplant

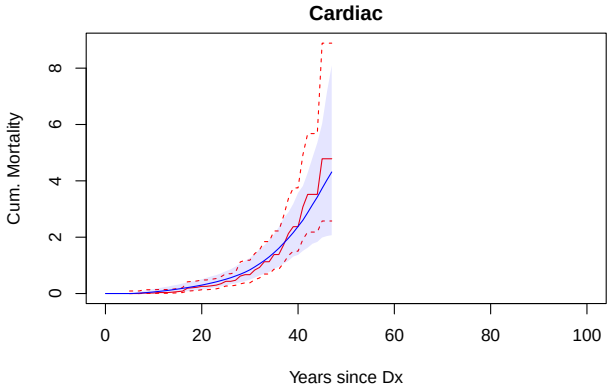


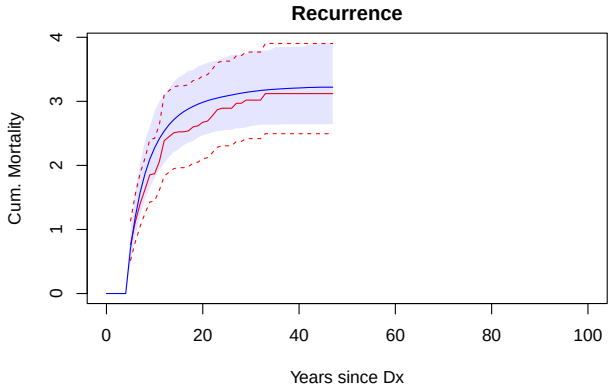

Colorectal Cancer + Sarcoma
Colorectal Cancer + Stroke
Colorectal Cancer + Valvular Disease
Glial Tumors + CAD/MI
Glial Tumors + Sarcoma
Glial Tumors + Stroke
Glial Tumors + Valvular Disease
CAD/MI + Sarcoma
CAD/MI + Stroke
CAD/MI + Valvular Disease
Sarcoma + Valvular Disease
Stroke + Sarcoma
Cum. Incidence
Years since Dx

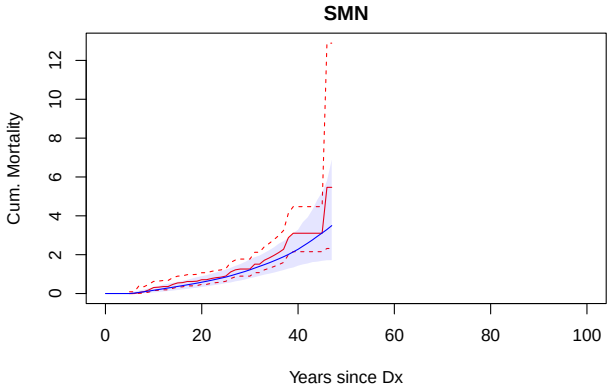

Stroke + Valvular Disease
Cum. Incidence
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0
20
40
60
80
100
Years since Dx

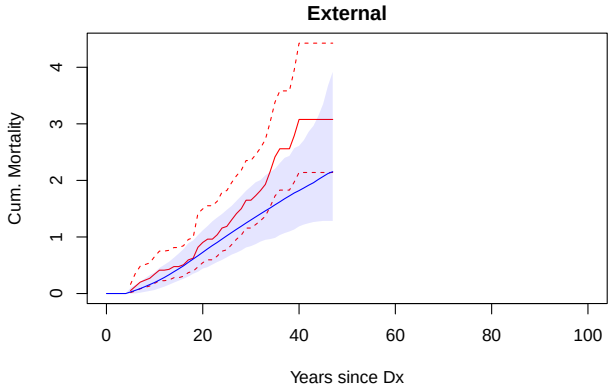
6.5.5 Cumulative Mortality

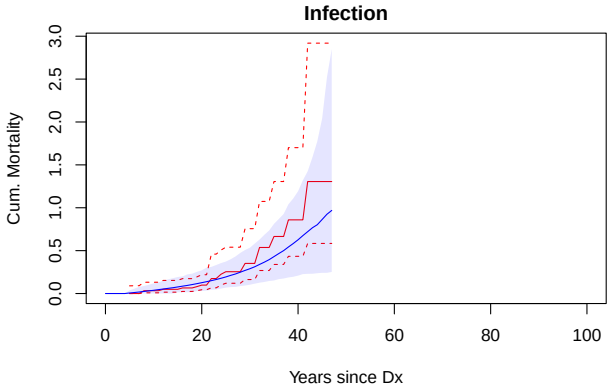
6.5.5.1 Overall

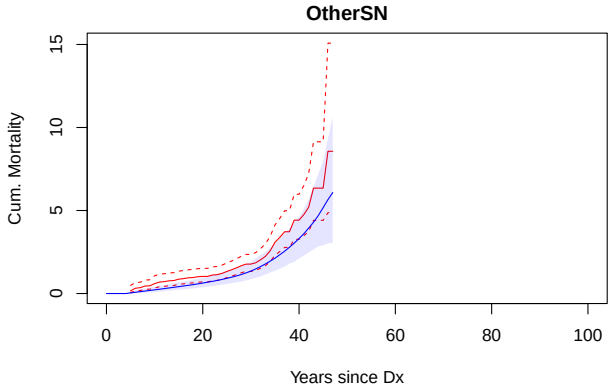


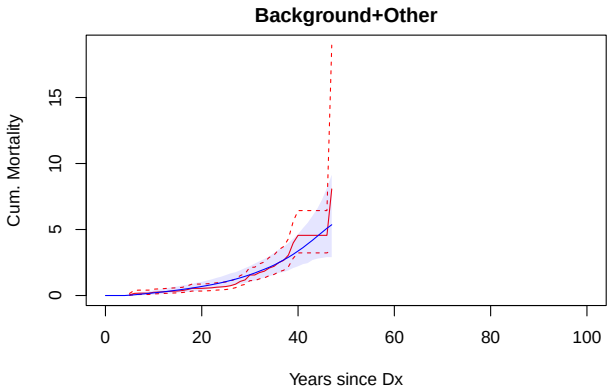




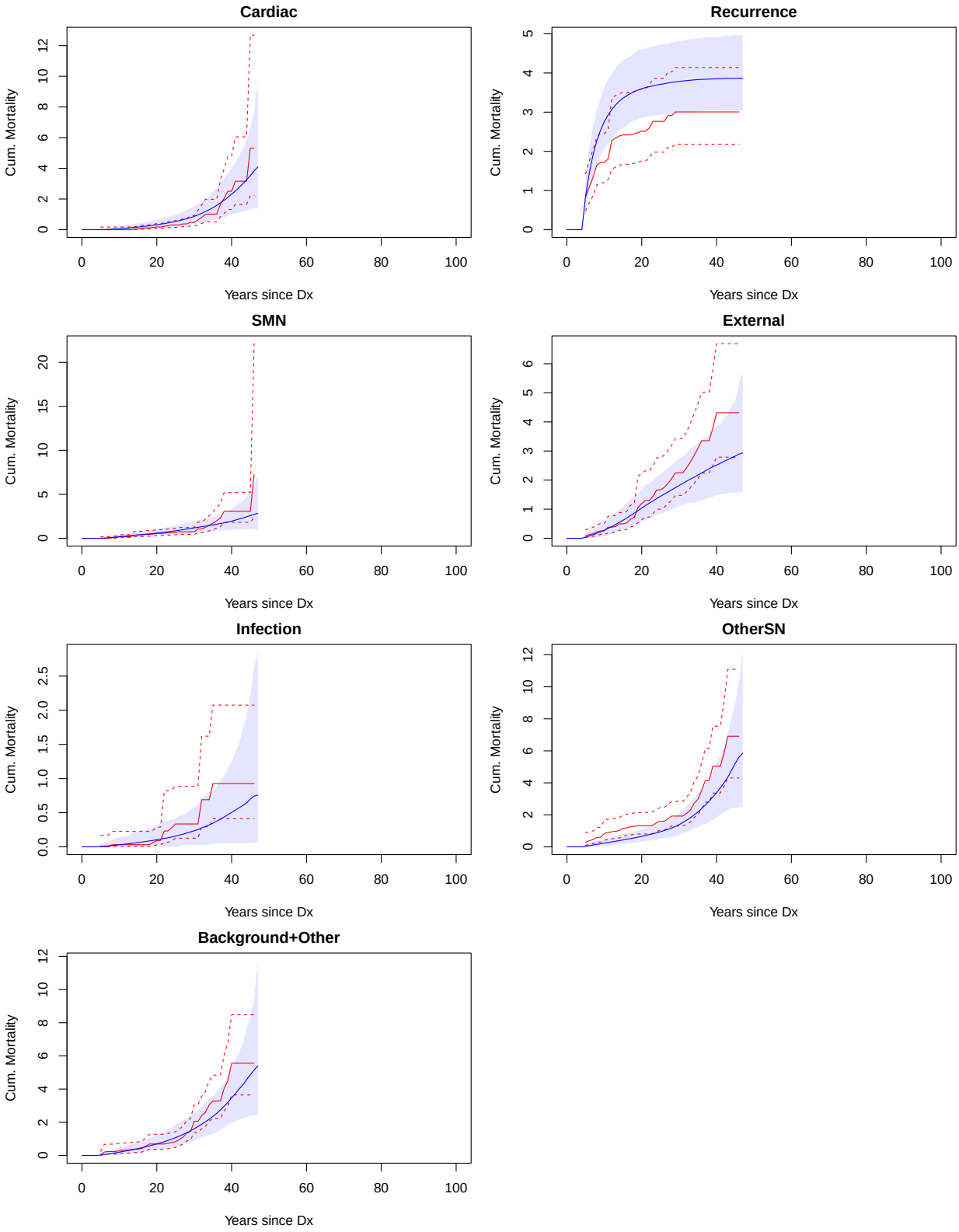




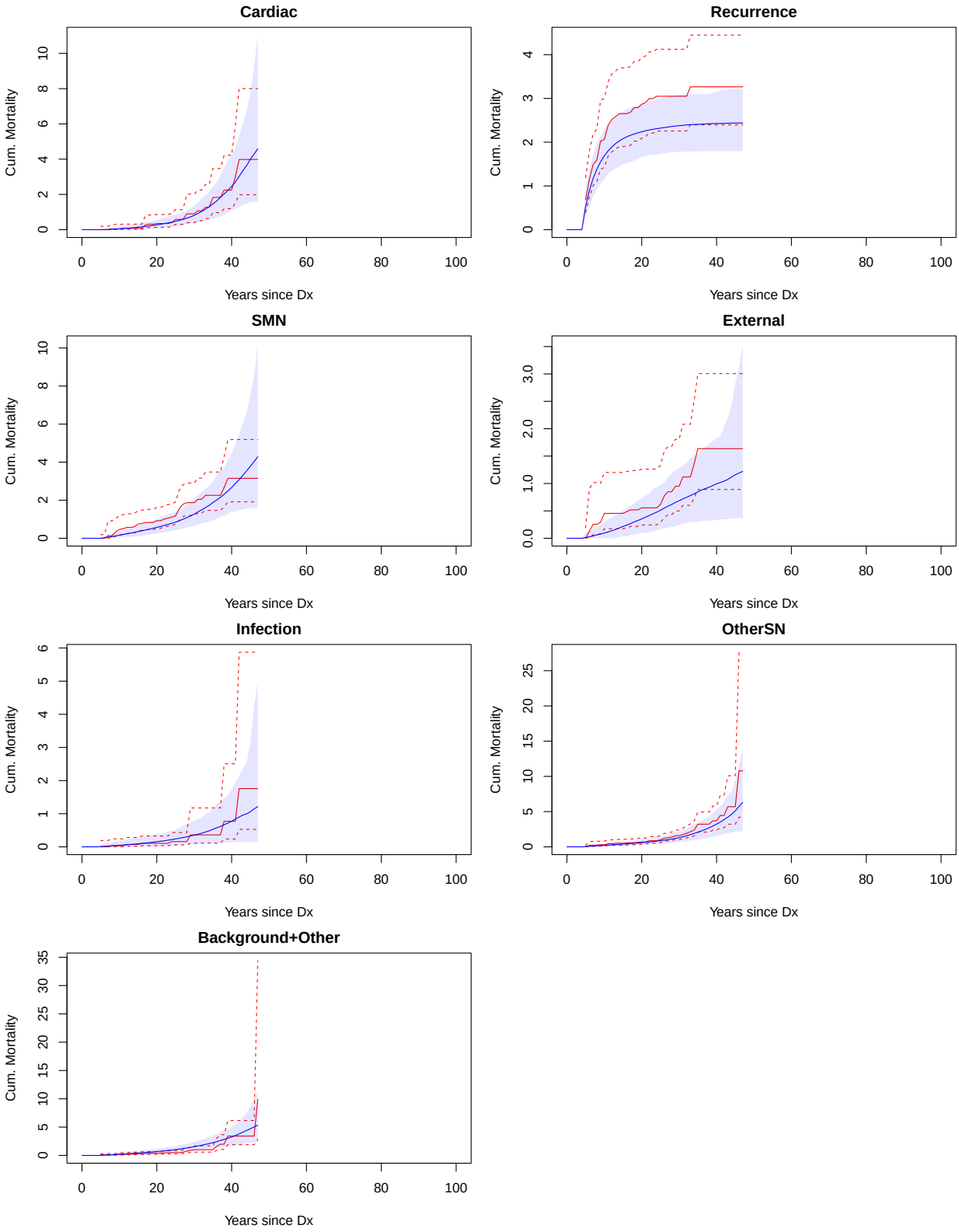




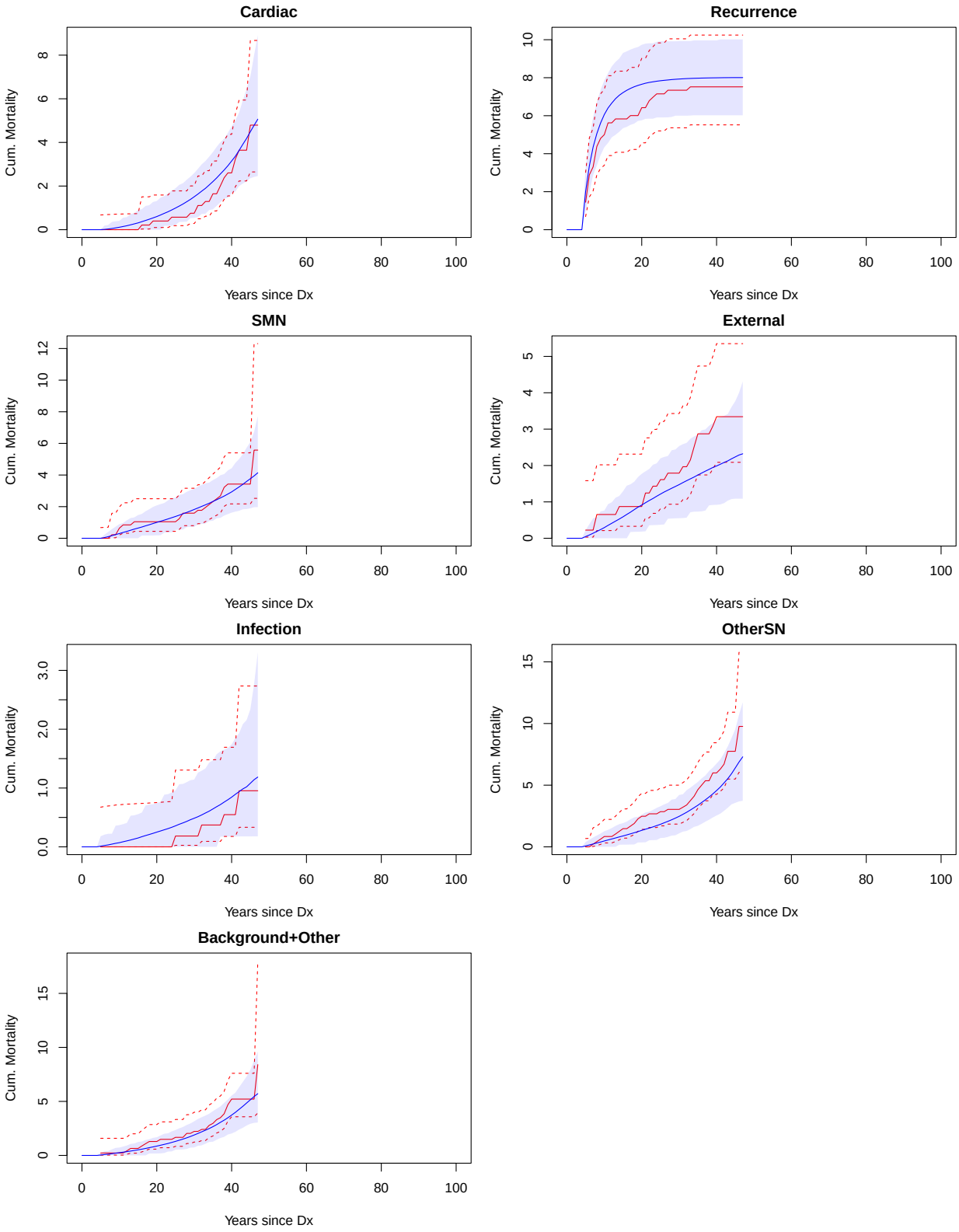
6.5.5.2 Male


Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

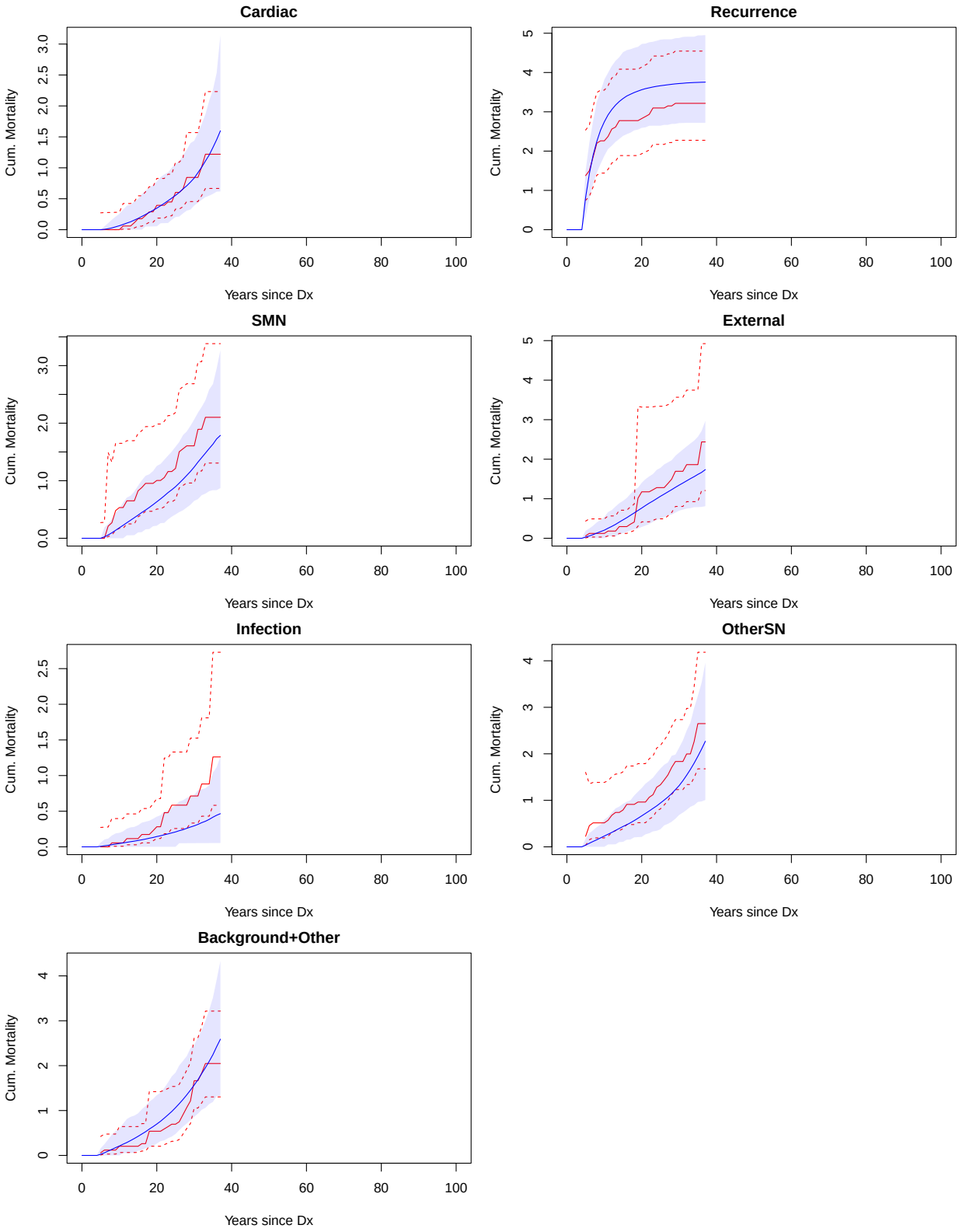
6.5.5.3 Female


Cardiac
Cum. Mortality
Years since Dx
Recurrence
Cum. Mortality
Years since Dx
SMN
Cum. Mortality
Years since Dx
External
Cum. Mortality
Years since Dx
Infection
Cum. Mortality
Years since Dx
OtherSN
Cum. Mortality
Years since Dx
Background+Other
Cum. Mortality
Years since Dx

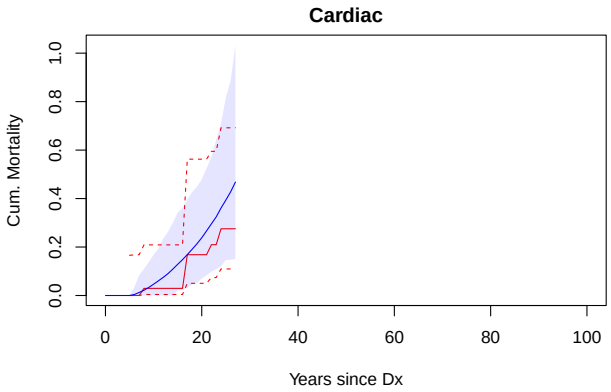
6.5.5.4 1970s

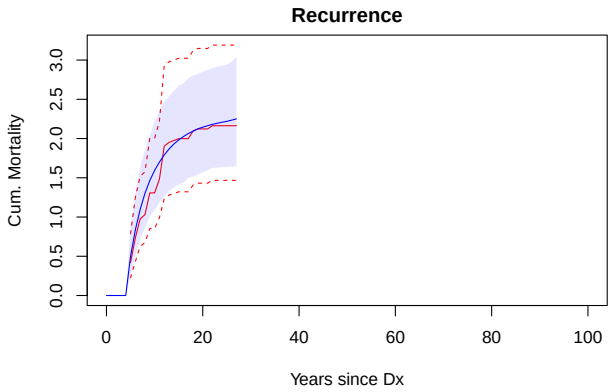

Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

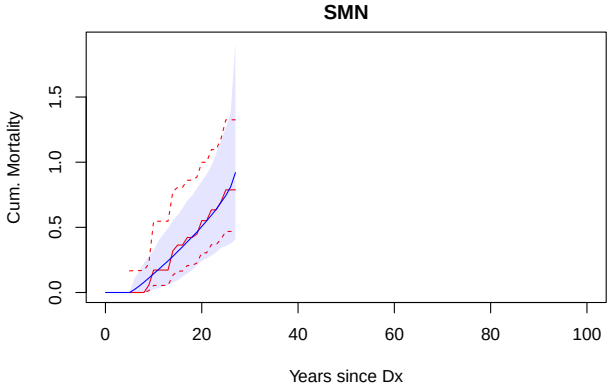
6.5.5.5 1980s

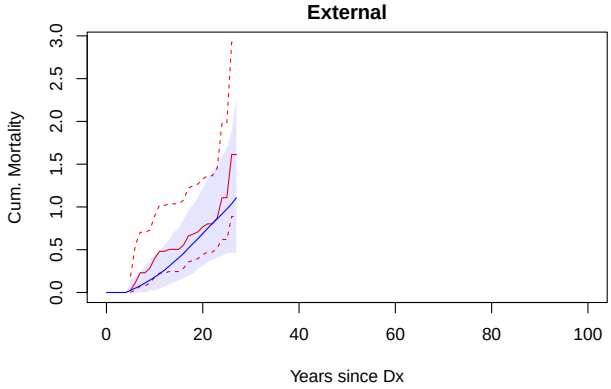

Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

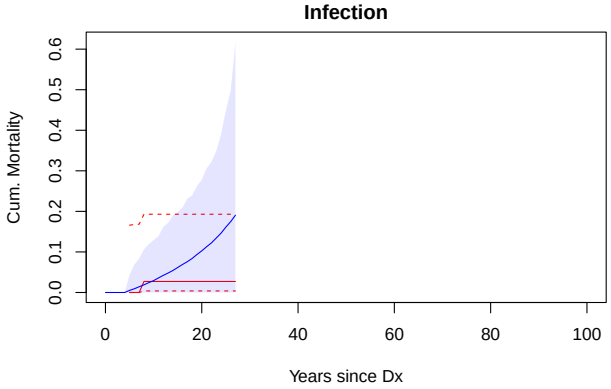
6.5.5.6 1990s

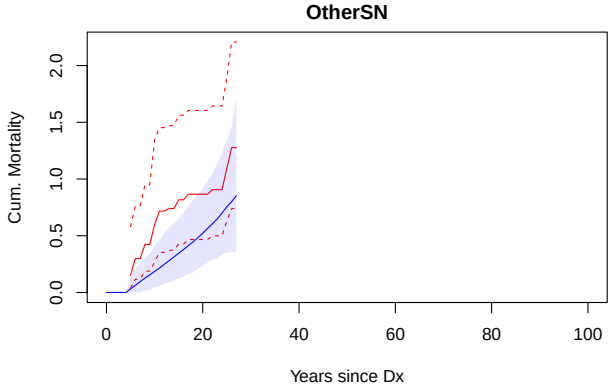

Cardiac
Cum. Mortality
0.0
0.2
0.4
0.6
0.8
1.0
0
20
40
60
80
100
Years since Dx

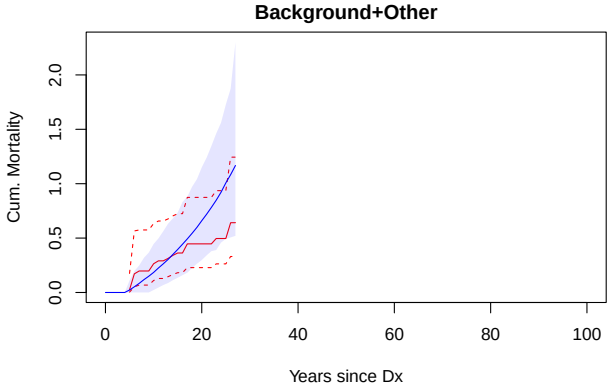

Recurrence
Cum. Mortality
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0
20
40
60
80
100
Years since Dx


SMN
Cum. Mortality
0.0
0.5
1.0
1.5
0
20
40
60
80
100
Years since Dx

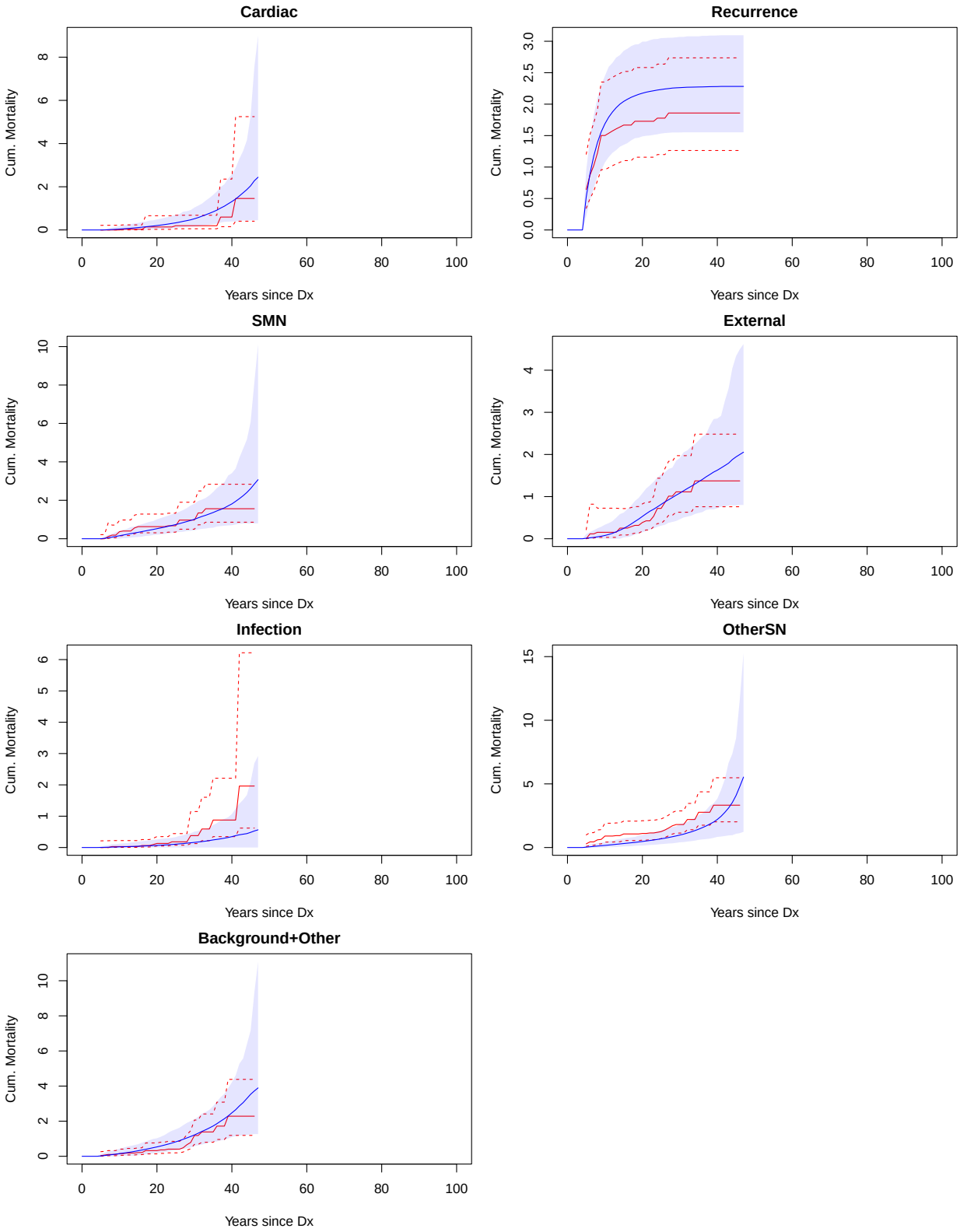

External
Cum. Mortality
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0
20
40
60
80
100
Years since Dx


Infection
Cum. Mortality
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0
20
40
60
80
100
Years since Dx

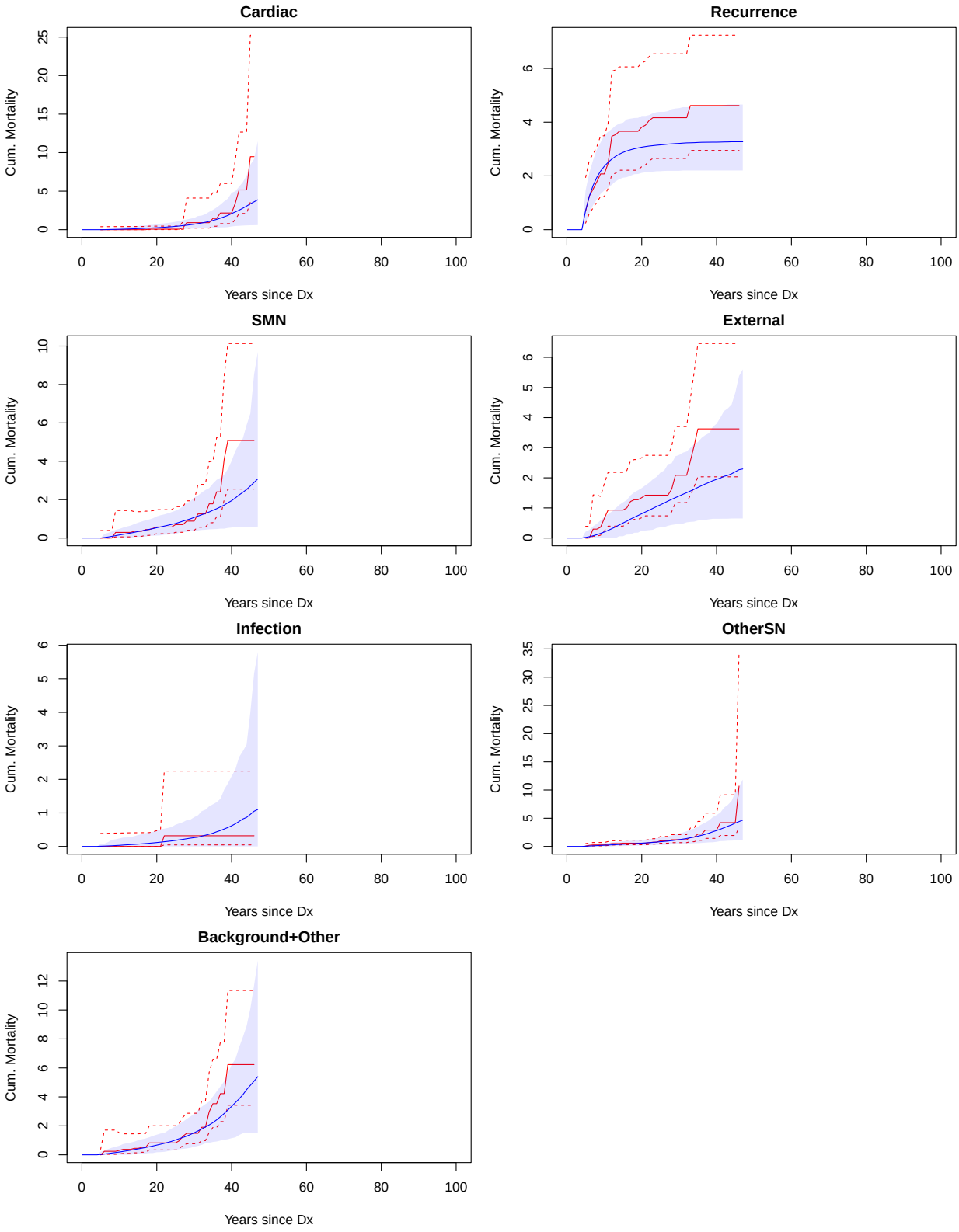

OtherSN
Cum. Mortality
0.0
0.5
1.0
1.5
2.0
0
20
40
60
80
100
Years since Dx


Background+Other
Cum. Mortality
0.0
0.5
1.0
1.5
2.0
0
20
40
60
80
100
Years since Dx

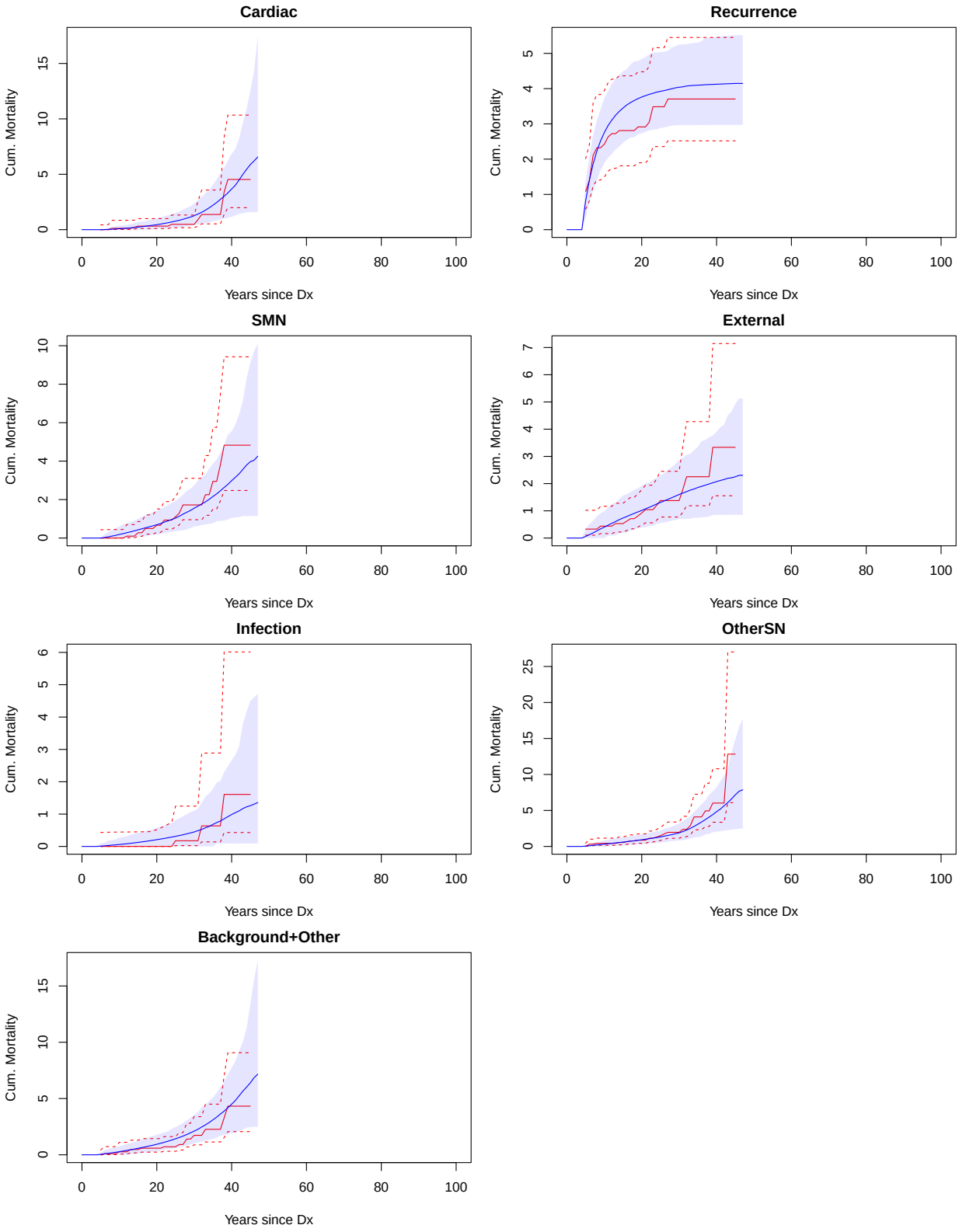
6.5.5.7 Age0-4


Cardiac
Cum. Mortality
Years since Dx
Recurrence
Cum. Mortality
Years since Dx
SMN
Cum. Mortality
Years since Dx
External
Cum. Mortality
Years since Dx
Infection
Cum. Mortality
Years since Dx
OtherSN
Cum. Mortality
Years since Dx
Background+Other
Cum. Mortality
Years since Dx

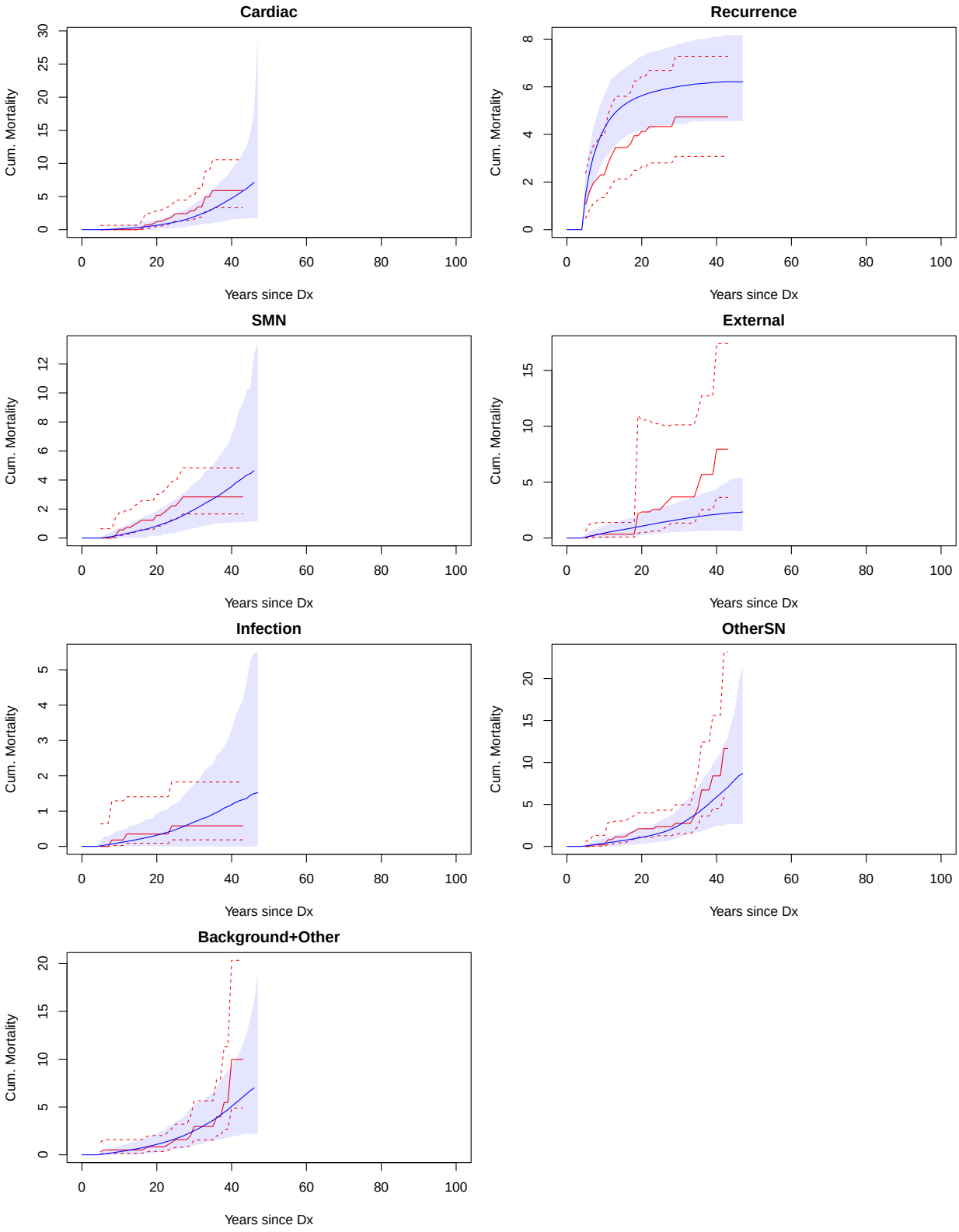
6.5.5.8 Age5-9


Cardiac
Cum. Mortality
Years since Dx
Recurrence
Cum. Mortality
Years since Dx
SMN
Cum. Mortality
Years since Dx
External
Cum. Mortality
Years since Dx
Infection
Cum. Mortality
Years since Dx
OtherSN
Cum. Mortality
Years since Dx
Background+Other
Cum. Mortality
Years since Dx

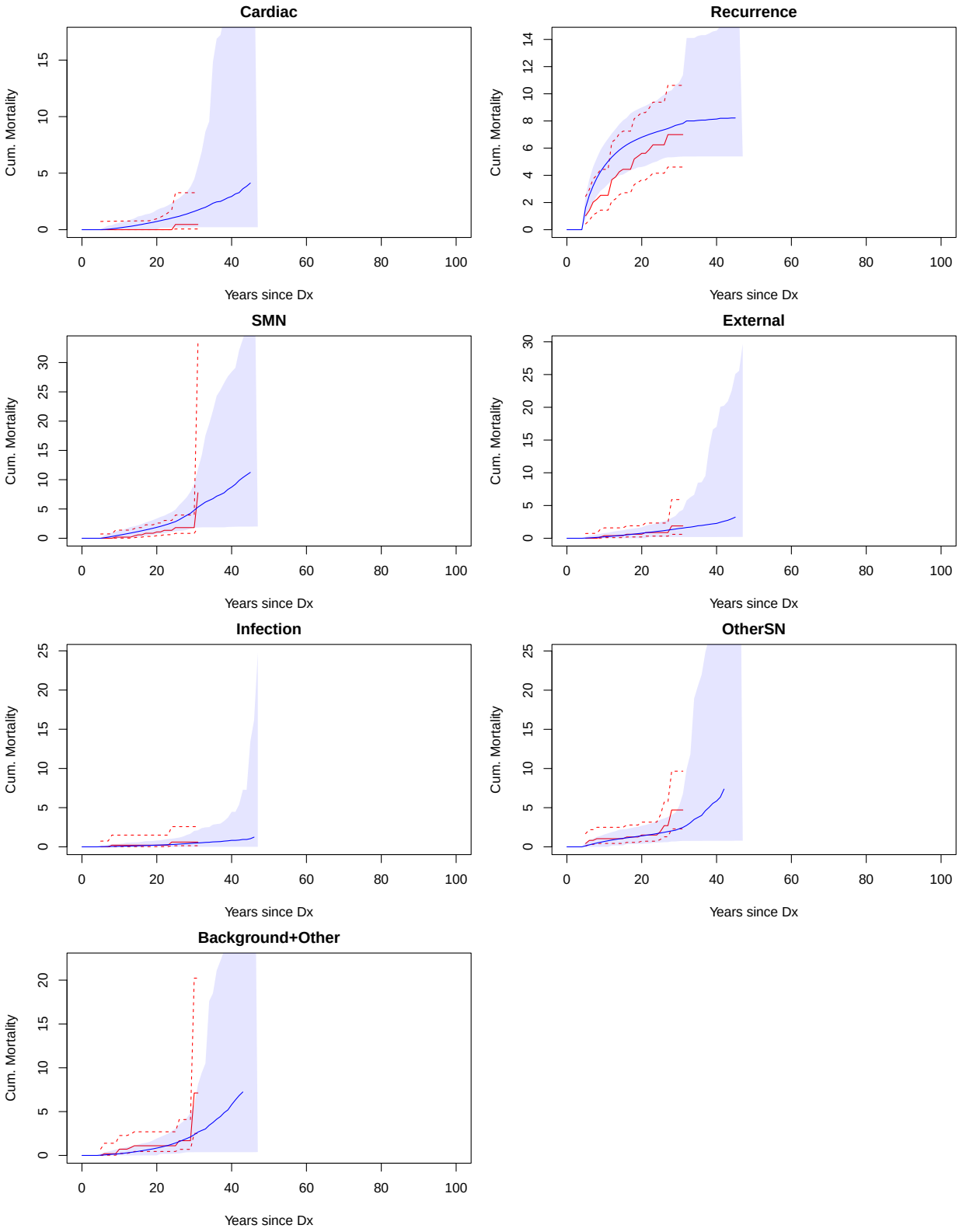
6.5.5.9 Age10-14



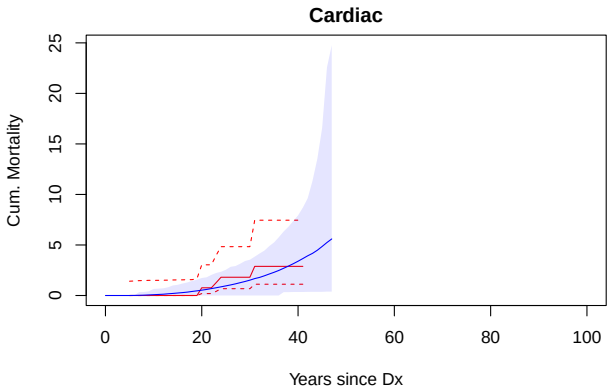
6.5.5.10 Age15-20

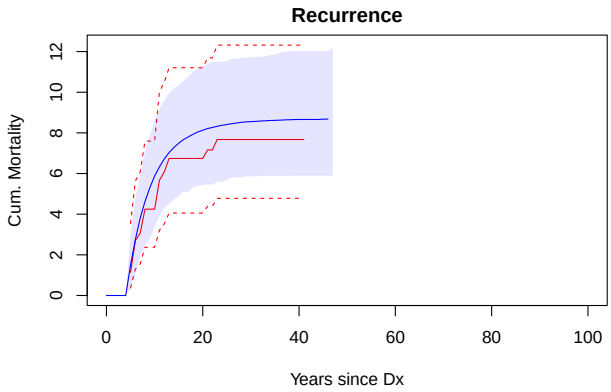


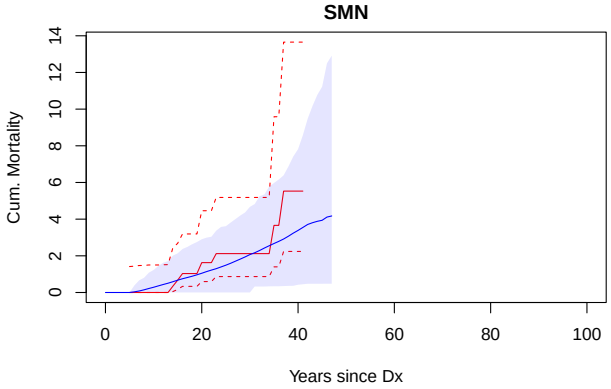
6.5.5.11 Brain

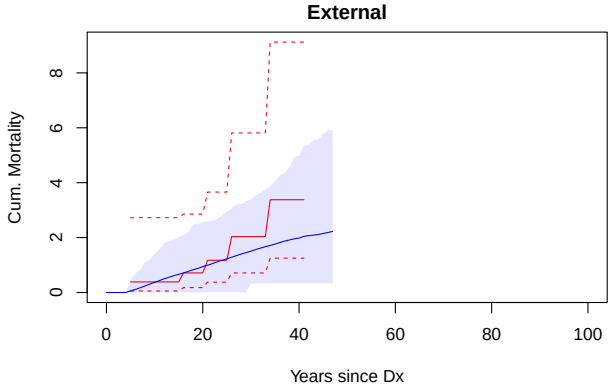

Cardiac
Cum. Mortality
Years since Dx
Recurrence
Cum. Mortality
Years since Dx
SMN
Cum. Mortality
Years since Dx
External
Cum. Mortality
Years since Dx
Infection
Cum. Mortality
Years since Dx
OtherSN
Cum. Mortality
Years since Dx
Background+Other
Cum. Mortality
Years since Dx

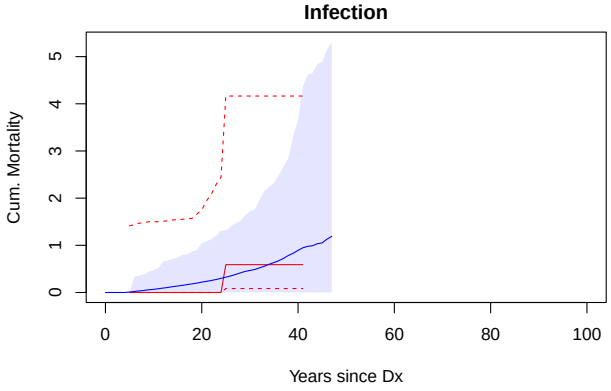
6.5.5.12 Bone

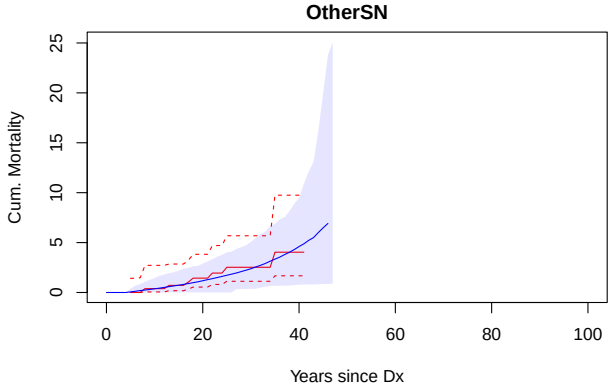

Cardiac
Cum. Mortality
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx

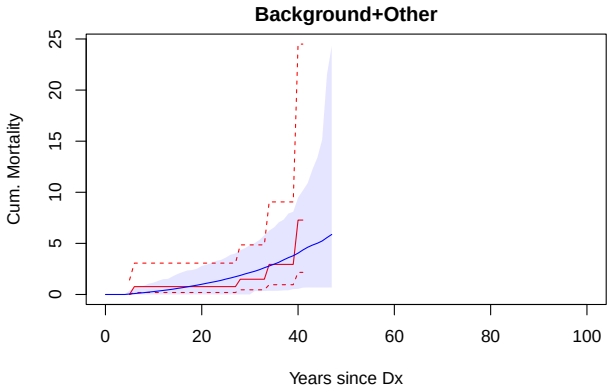

Recurrence
Cum. Mortality
0
2
4
6
8
10
12
0
20
40
60
80
100
Years since Dx


SMN
Cum. Mortality
0
2
4
6
8
10
12
14
0
20
40
60
80
100
Years since Dx

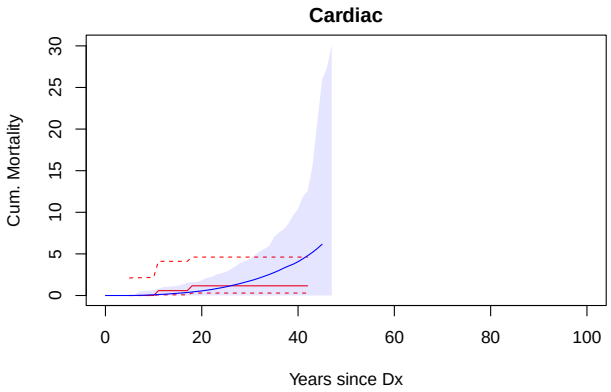

External
Cum. Mortality
0
2
4
6
8
0
20
40
60
80
100
Years since Dx

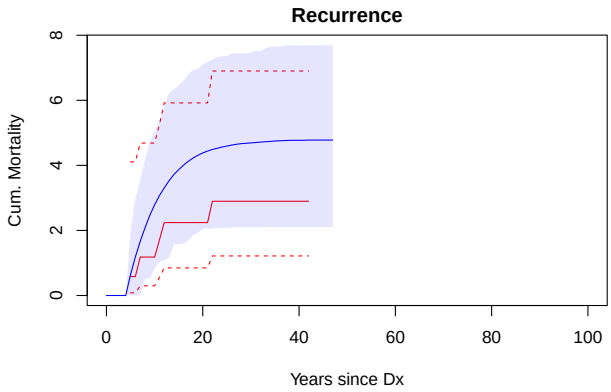

Infection
Cum. Mortality
0
1
2
3
4
5
0
20
40
60
80
100
Years since Dx

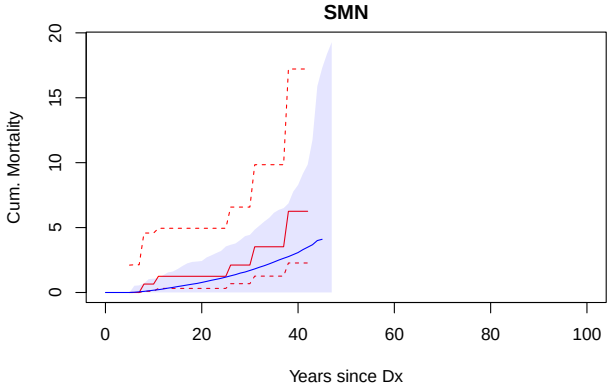

OtherSN
Cum. Mortality
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx

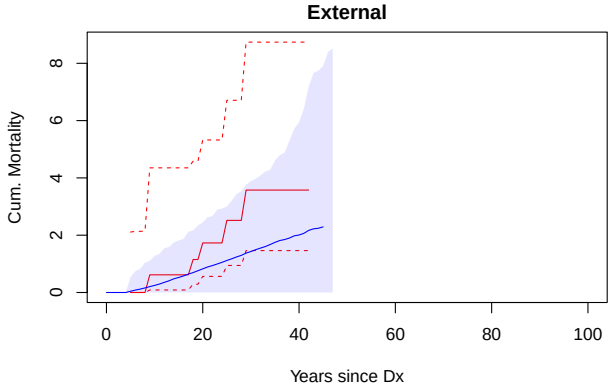

Background+Other
Cum. Mortality
0
5
10
15
20
25
0
20
40
60
80
100
Years since Dx

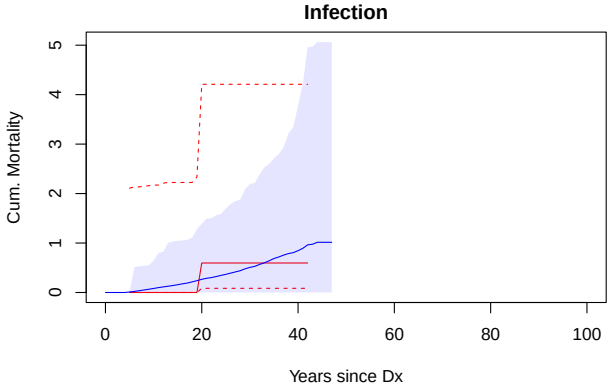
6.5.5.13 Soft Tissue Sarcoma

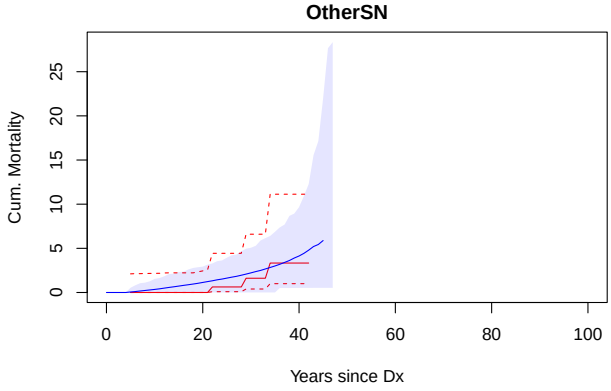


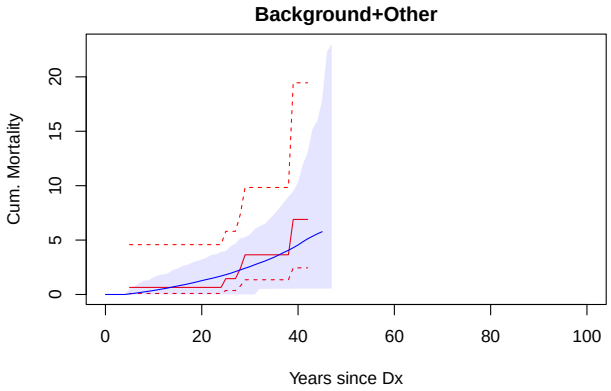




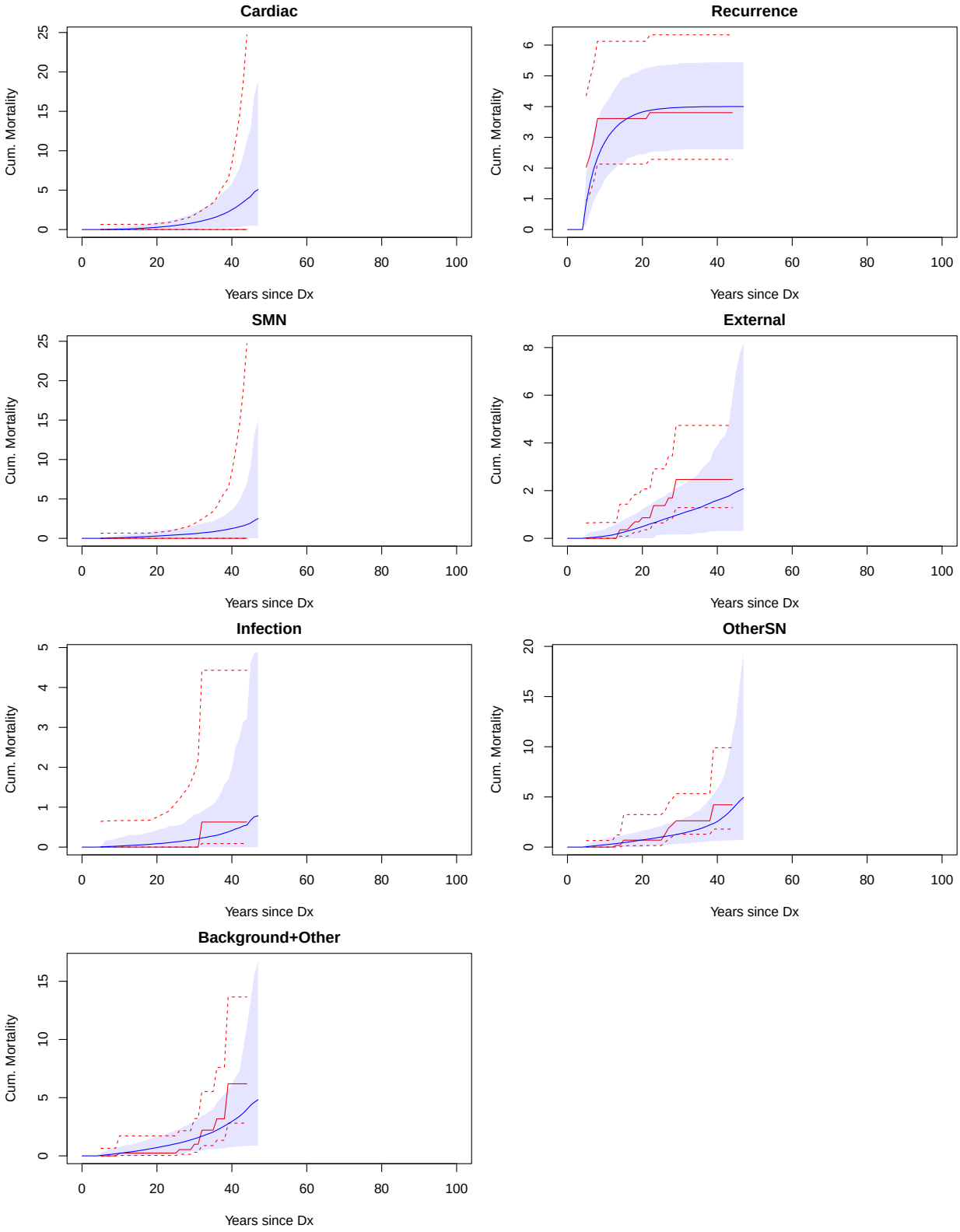




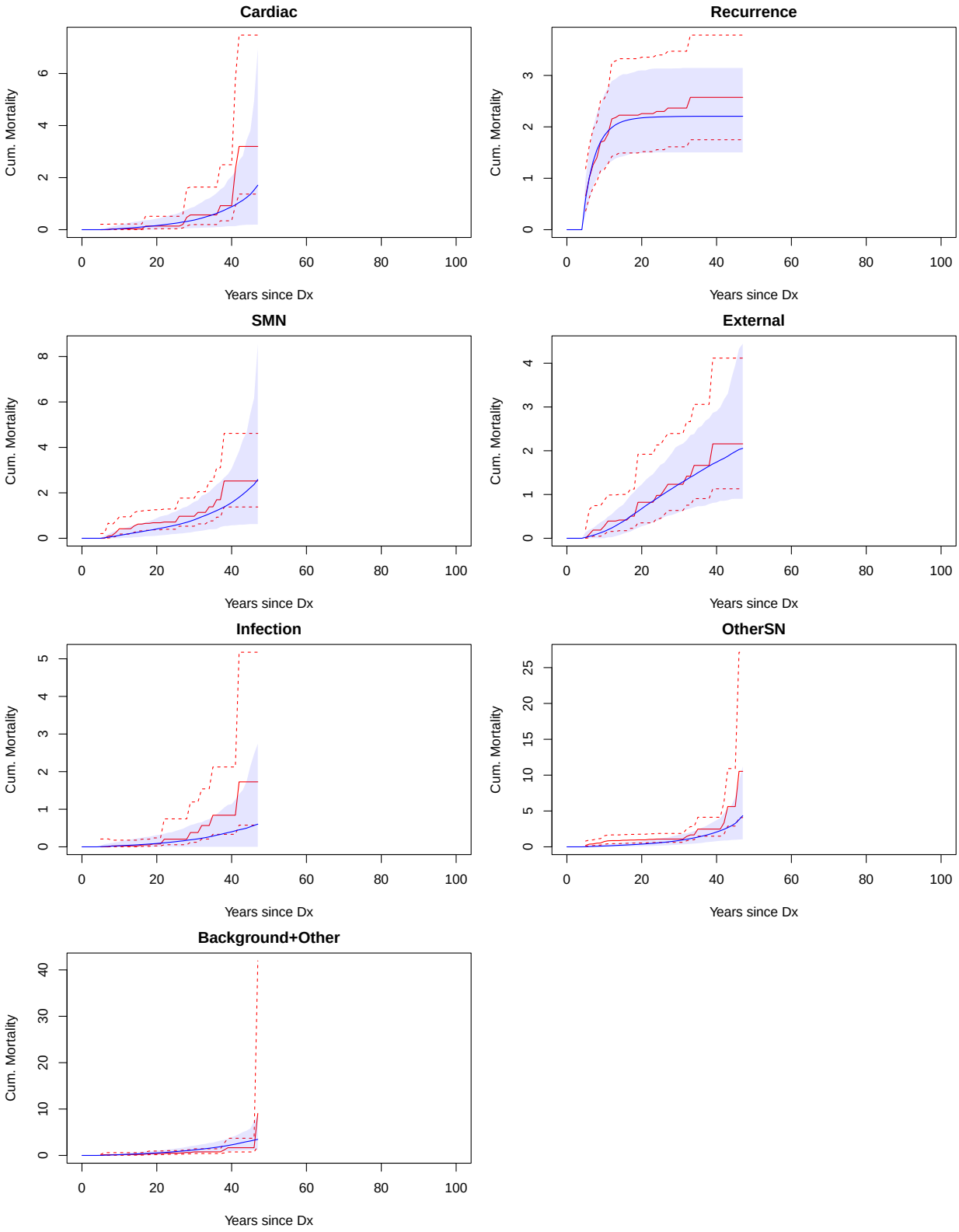




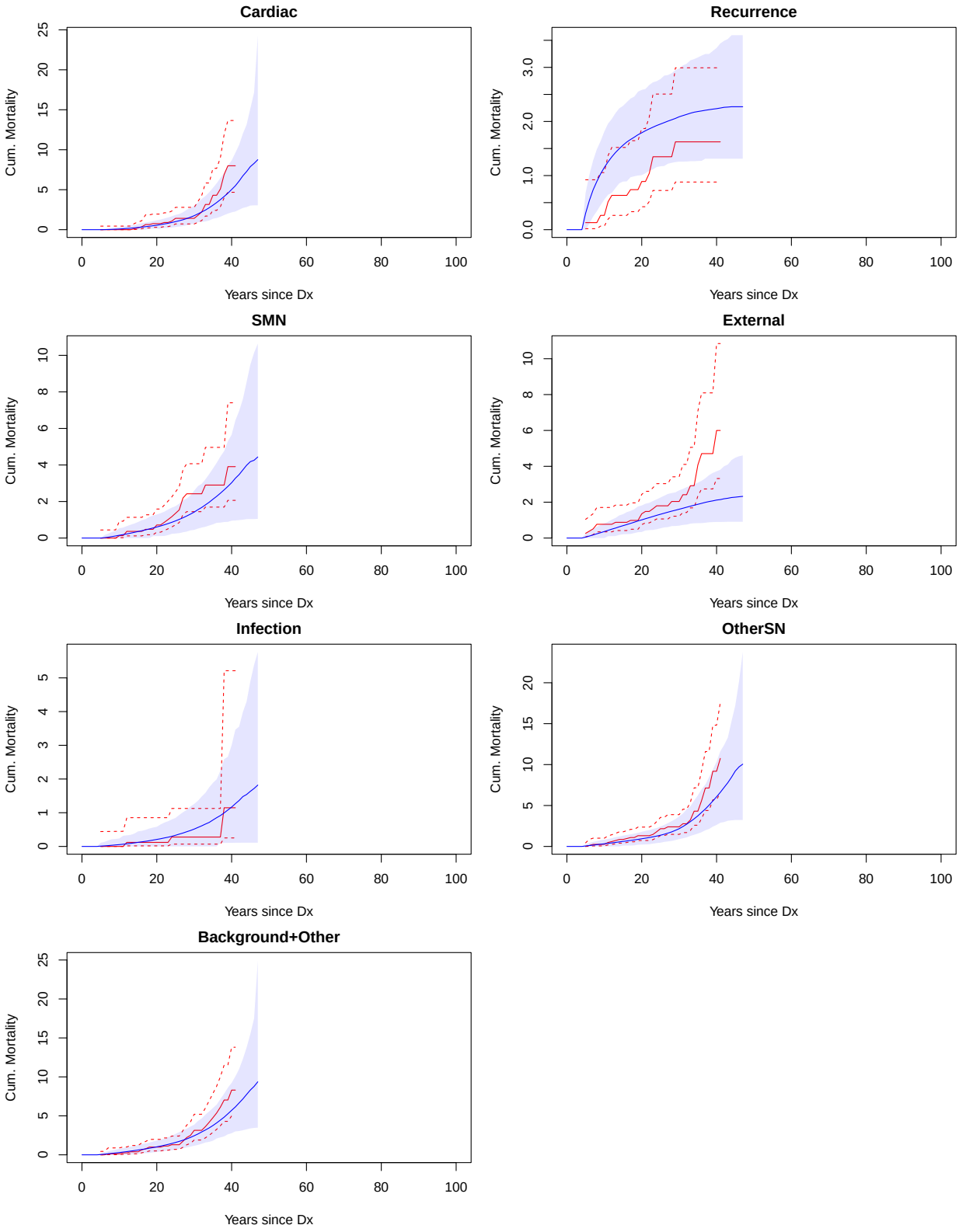
6.5.5.14 WT/NBL


Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

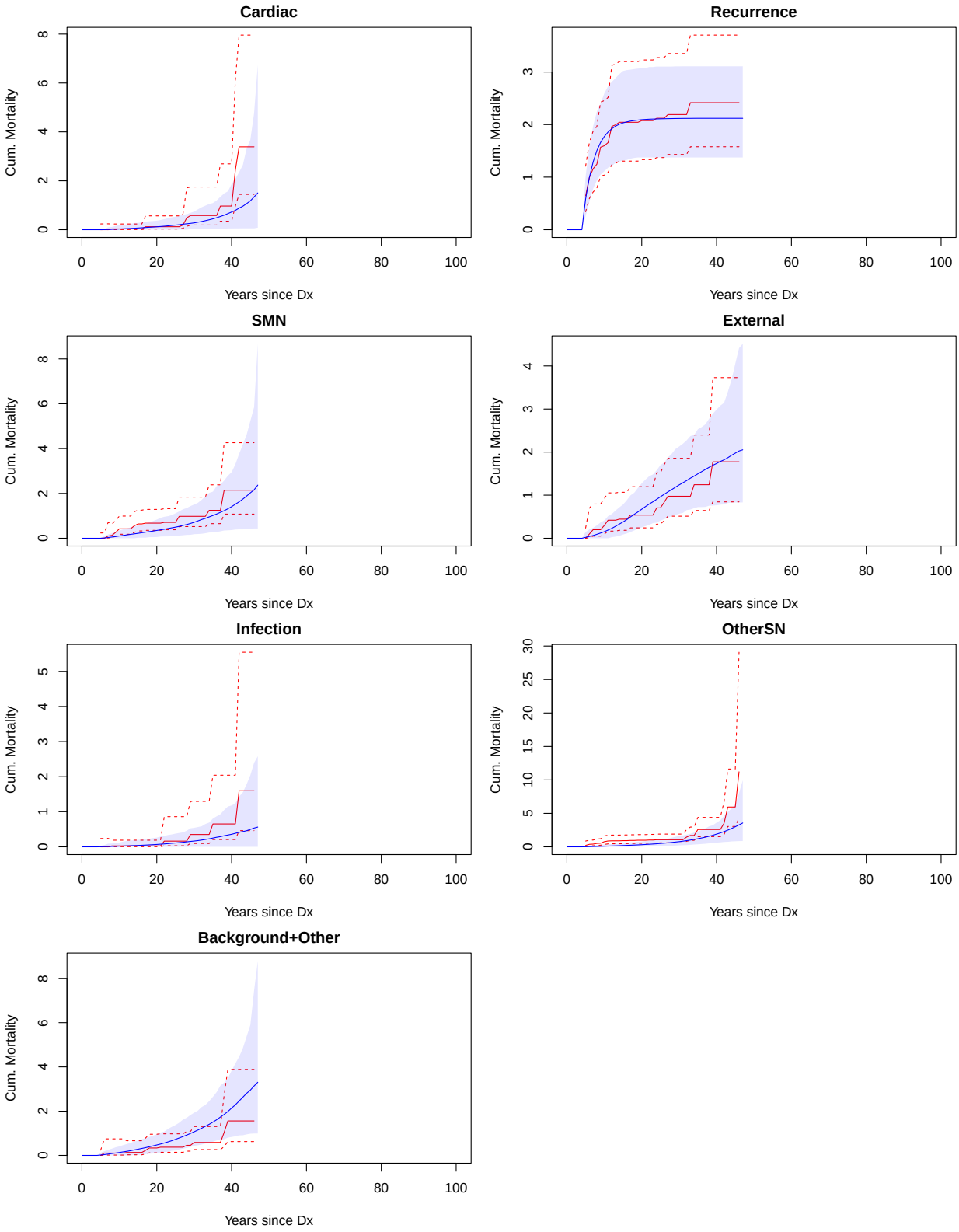
6.5.5.15 Leukemia



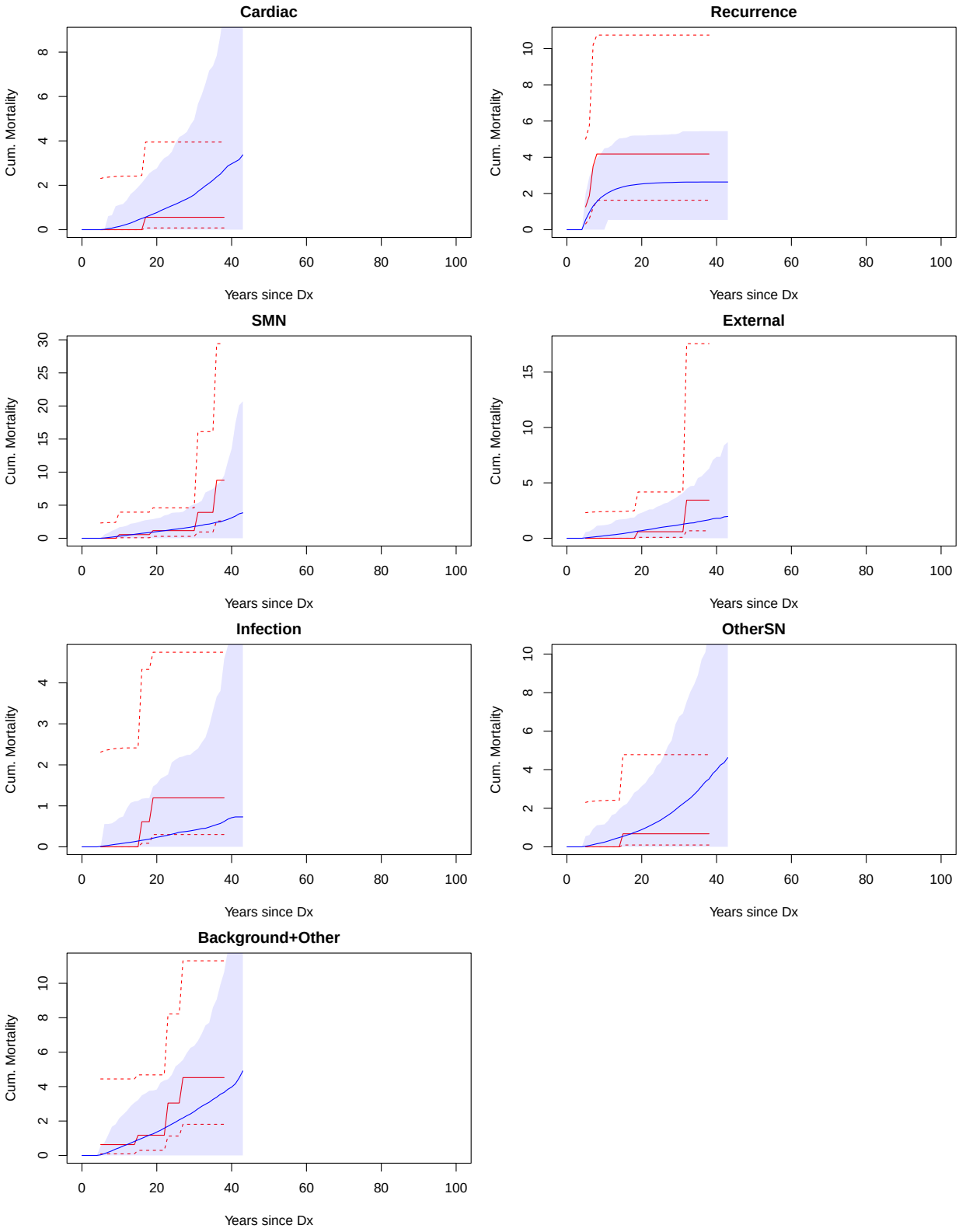
6.5.5.16 Lymphoma



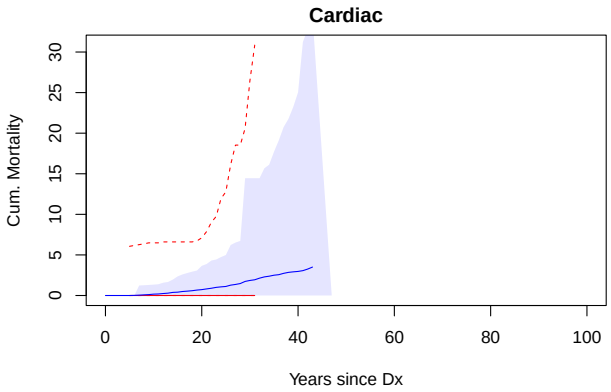
6.5.5.17 ALL

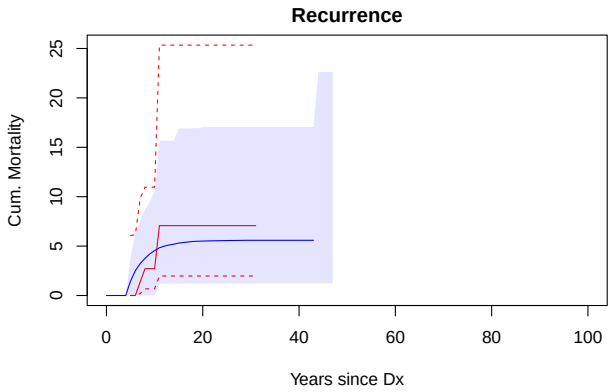

Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

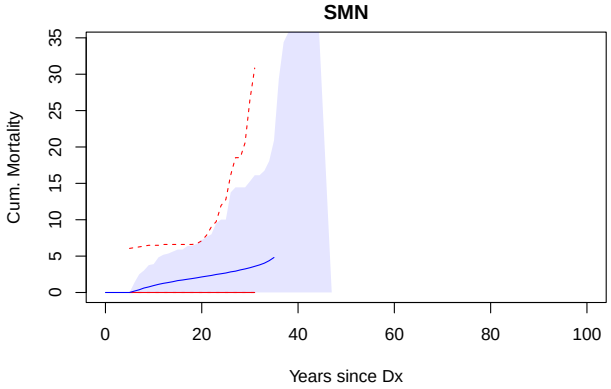
6.5.5.18 AML

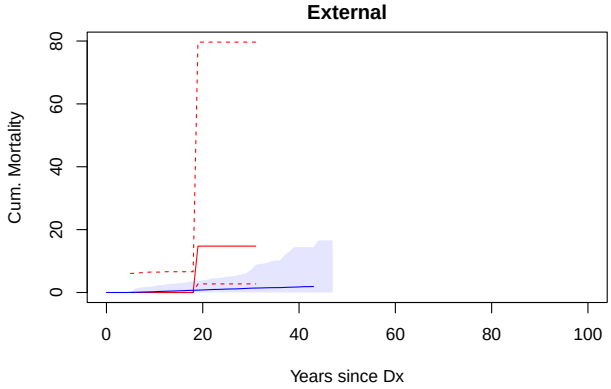

Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

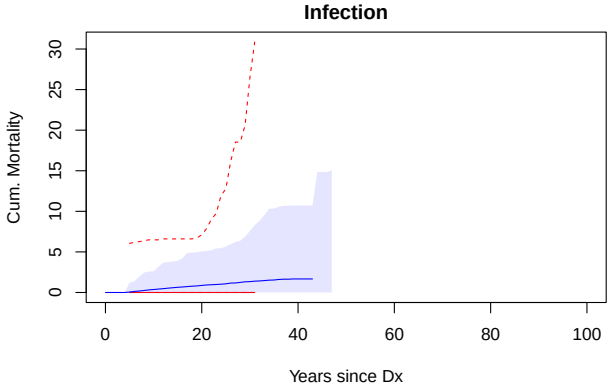
6.5.5.19 OtherLeukemia

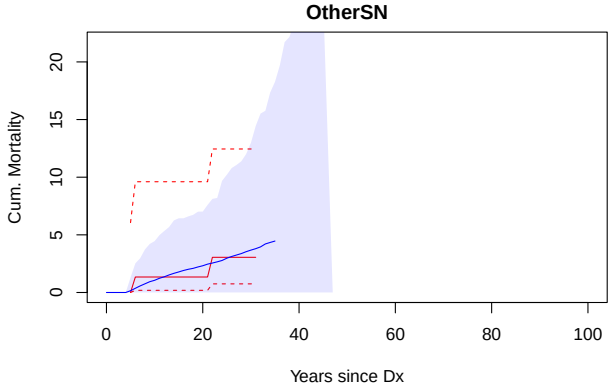


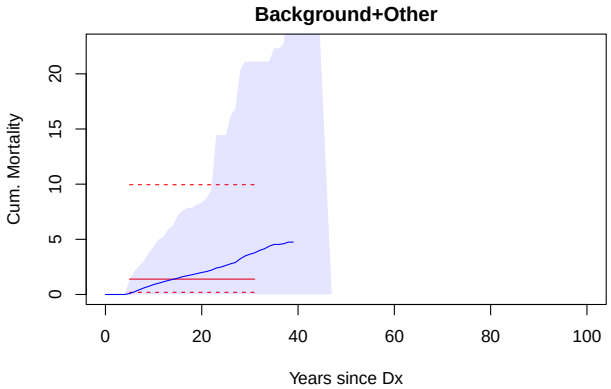




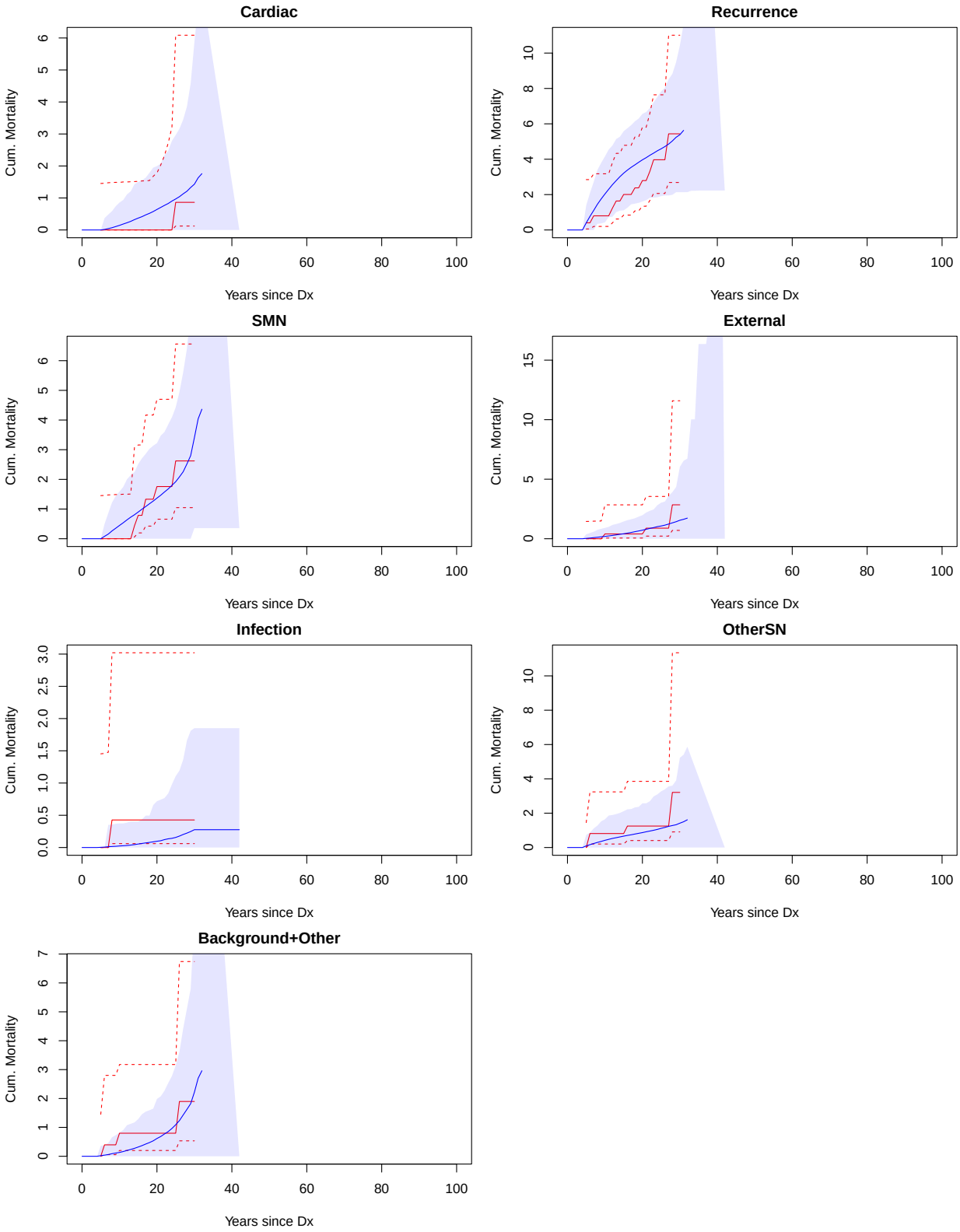




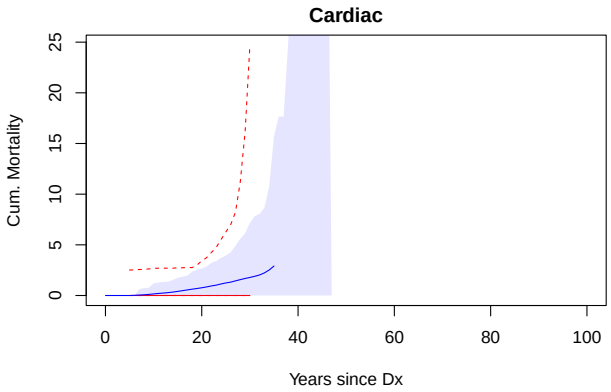


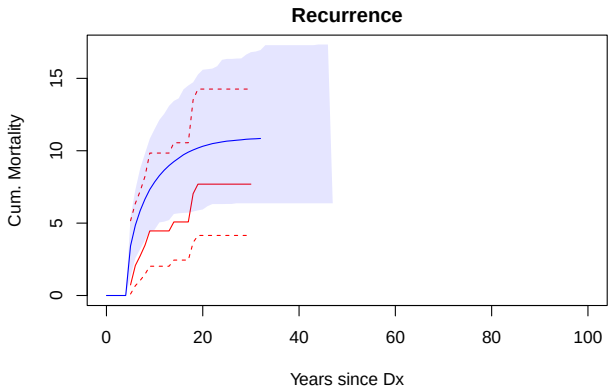


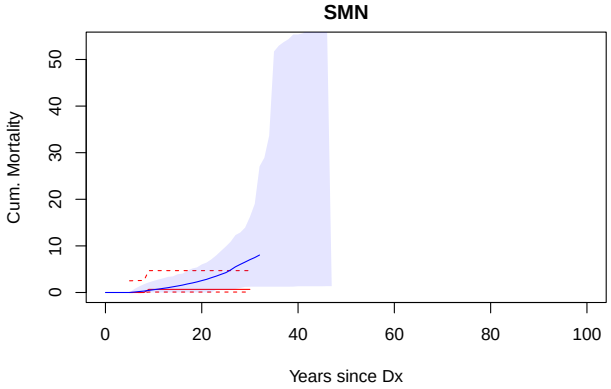
6.5.5.20 Astrocytoma

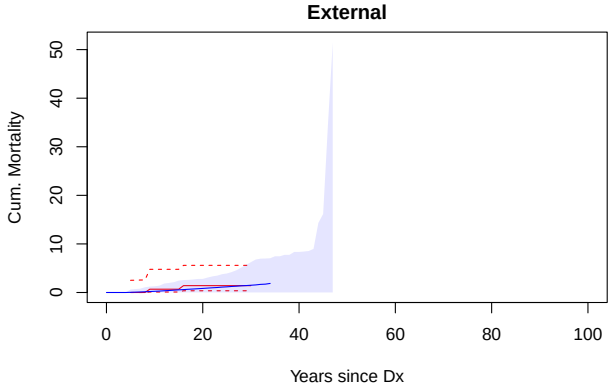


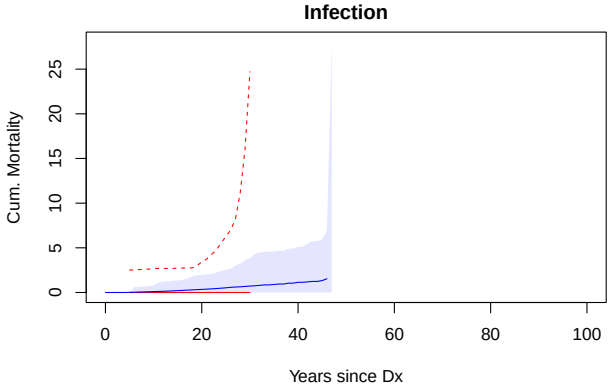
6.5.5.21 Medulloblastoma

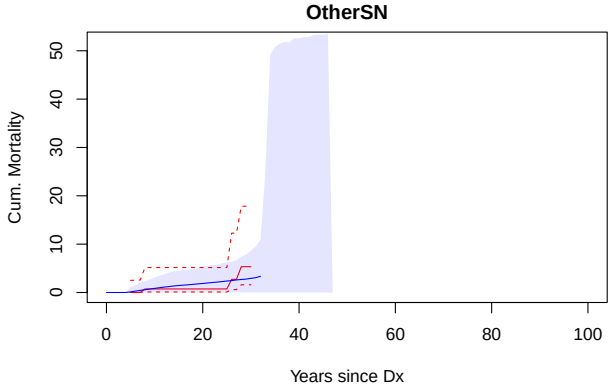


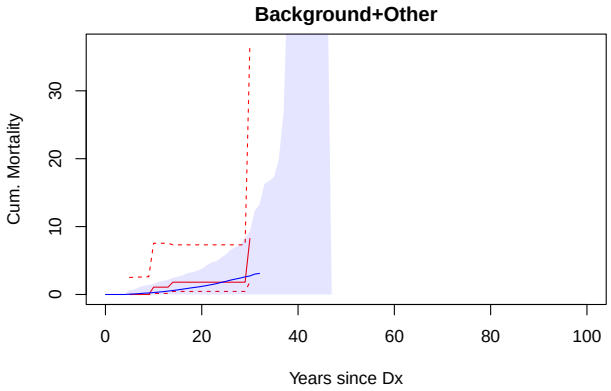




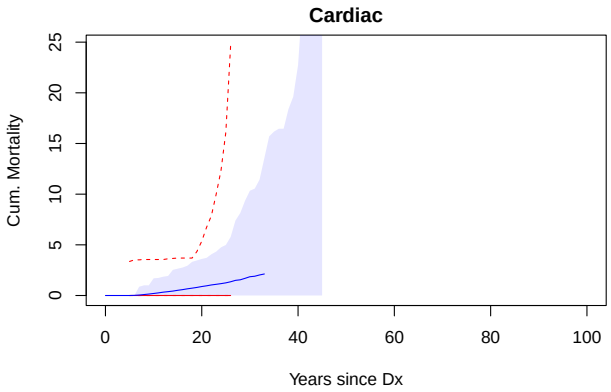


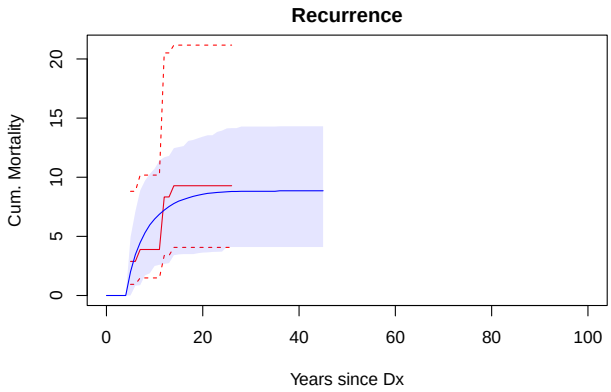


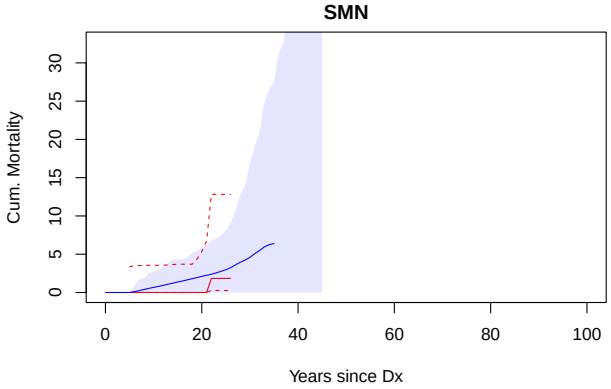


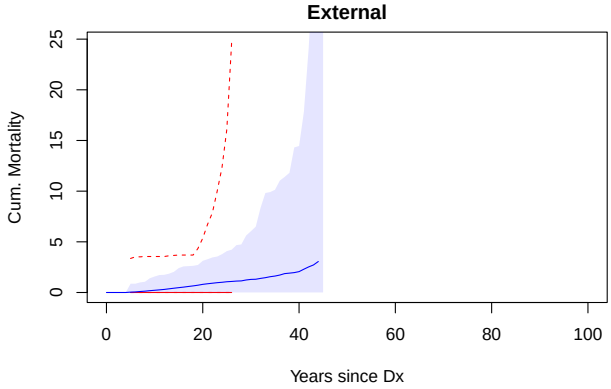


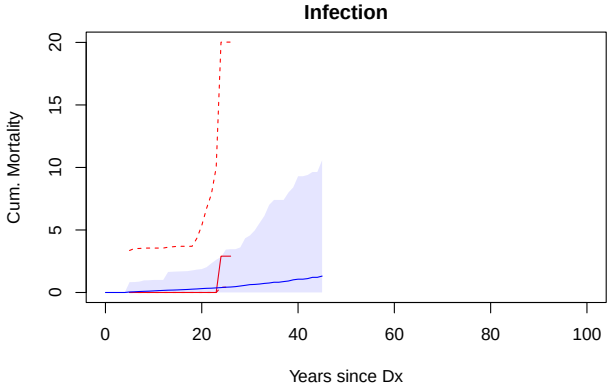
6.5.5.22 Other CNS

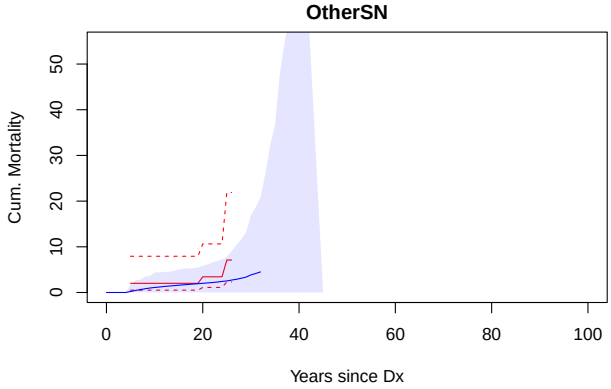


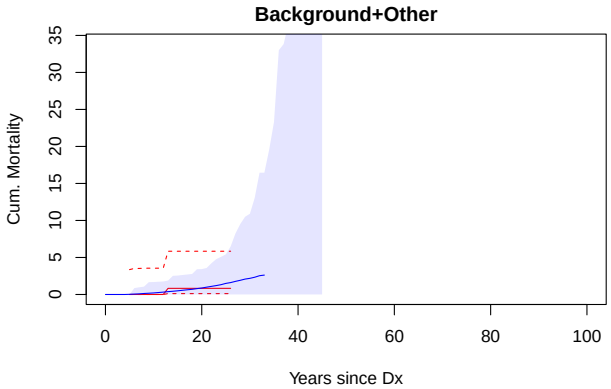




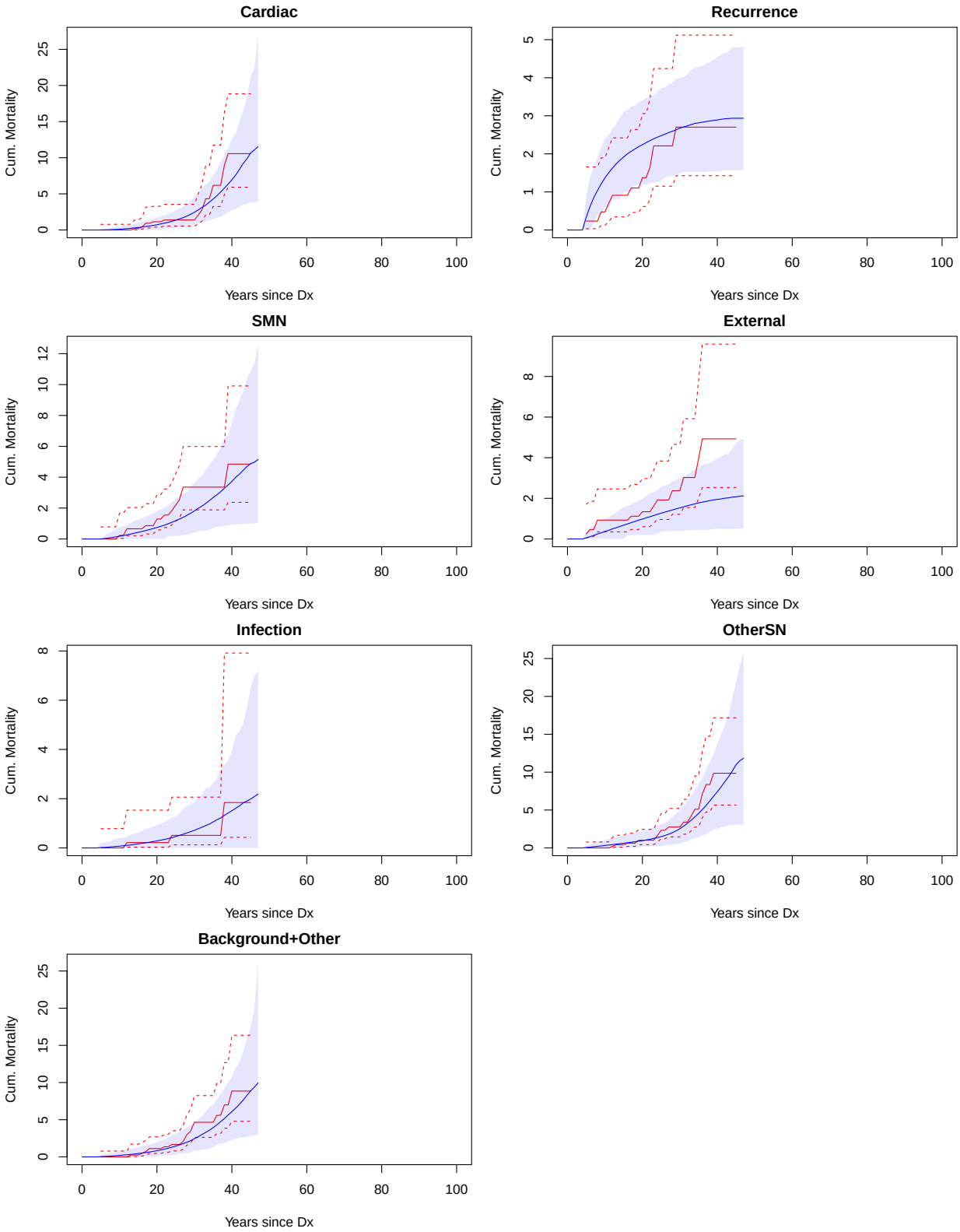




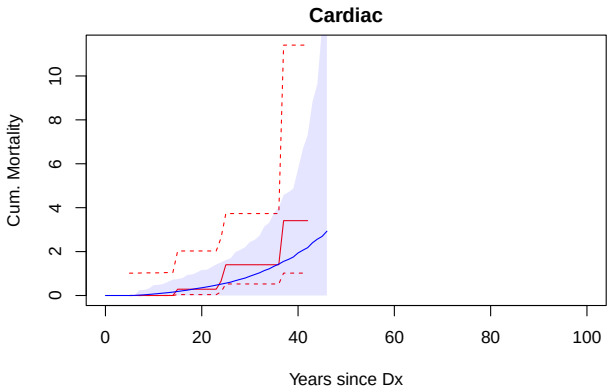


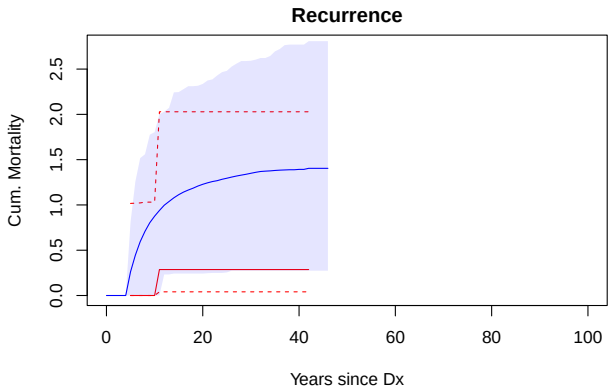


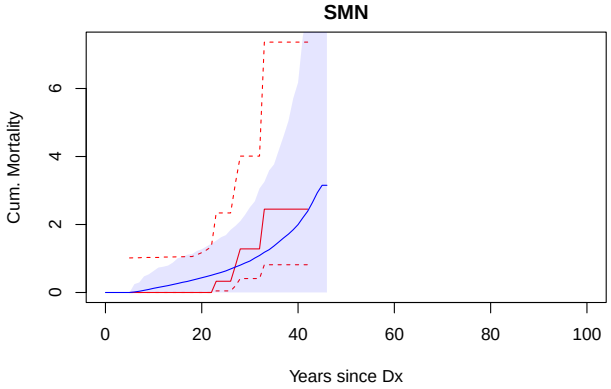
6.5.5.23 HL

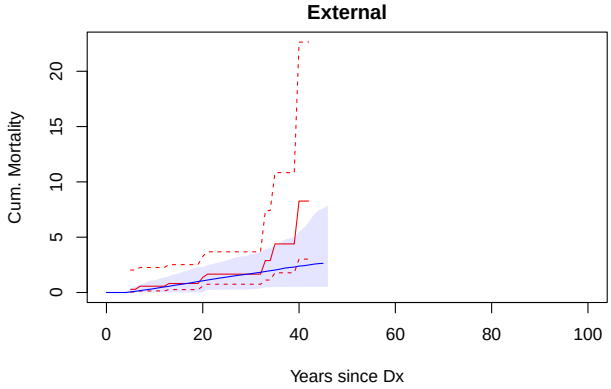

Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

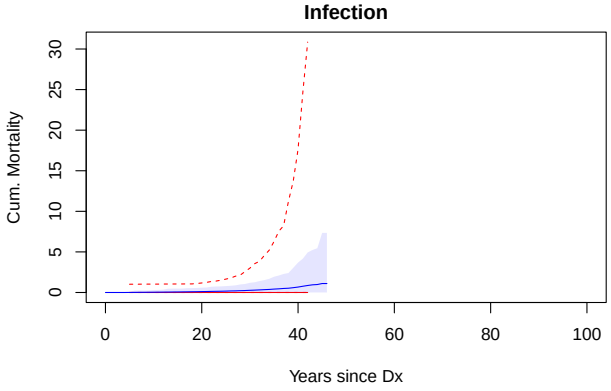
6.5.5.24 NHL

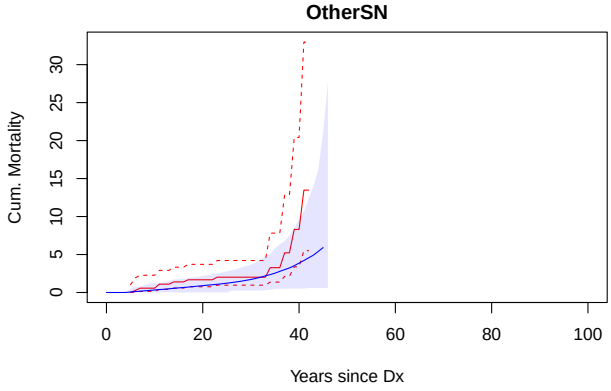

Cardiac
Cum. Mortality
0
2
4
6
8
10
0
20
40
60
80
100
Years since Dx

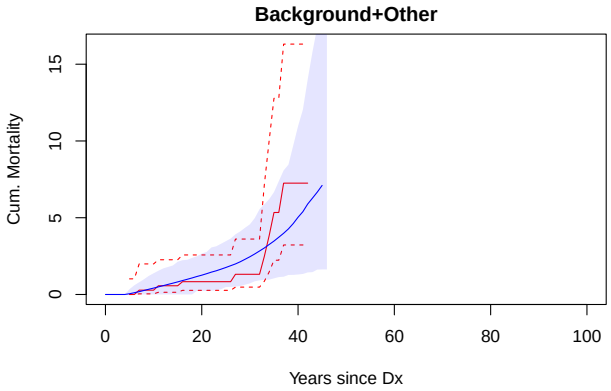

Recurrence
Cum. Mortality
0.0
0.5
1.0
1.5
2.0
2.5
0
20
40
60
80
100
Years since Dx


SMN
Cum. Mortality
0
2
4
6
0
20
40
60
80
100
Years since Dx

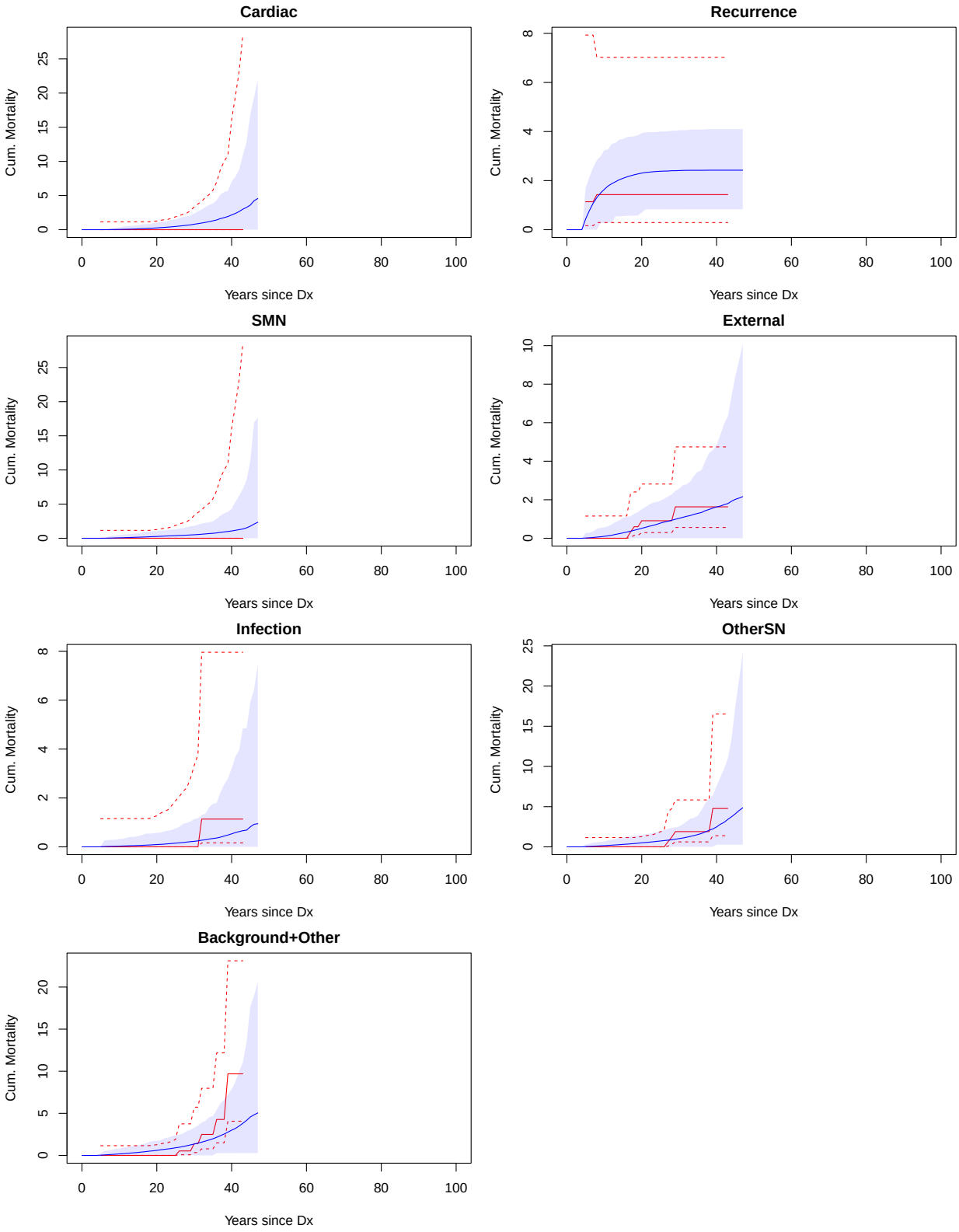

External
Cum. Mortality
0
5
10
15
20
0
20
40
60
80
100
Years since Dx


Infection
Cum. Mortality
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx

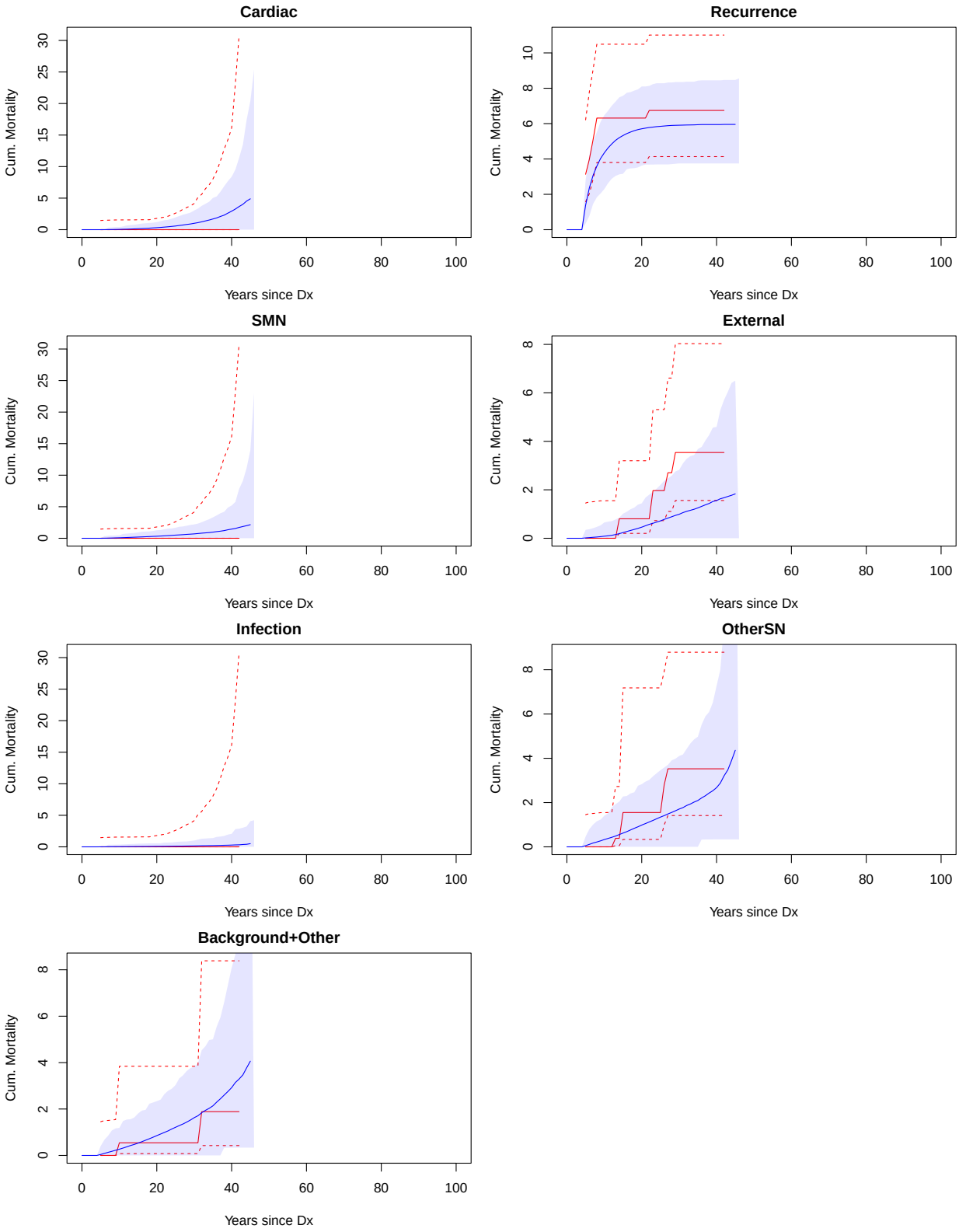

OtherSN
Cum. Mortality
0
5
10
15
20
25
30
0
20
40
60
80
100
Years since Dx


Background+Other
Cum. Mortality
0
5
10
15
0
20
40
60
80
100
Years since Dx

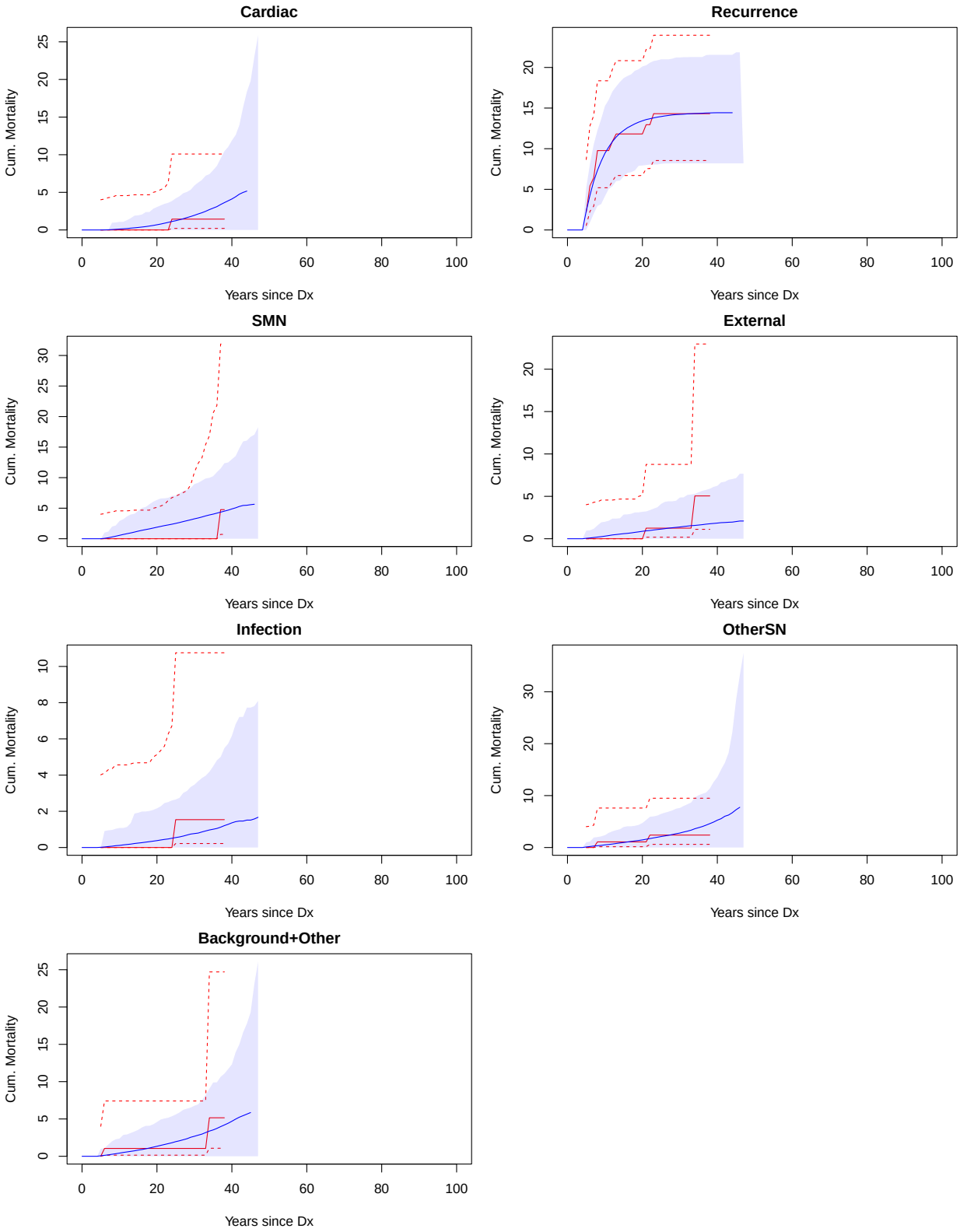
6.5.5.25 WT


Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

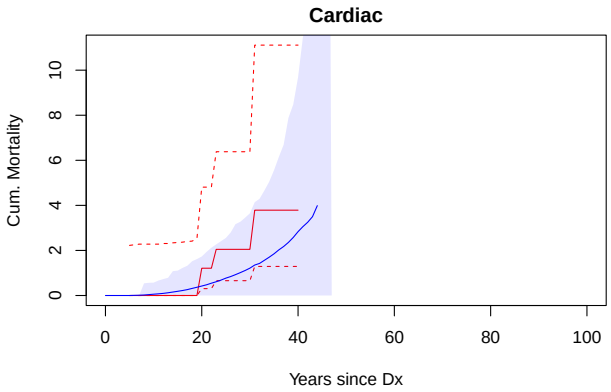
6.5.5.26 NBL

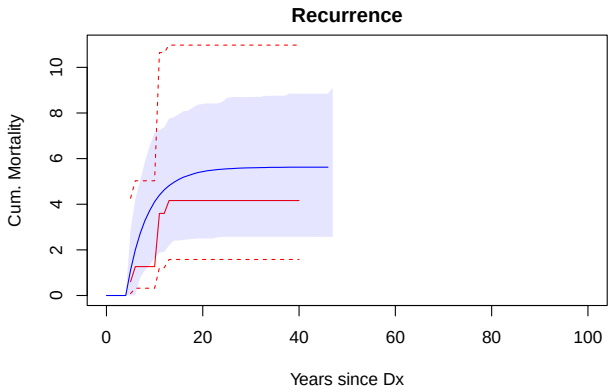

Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

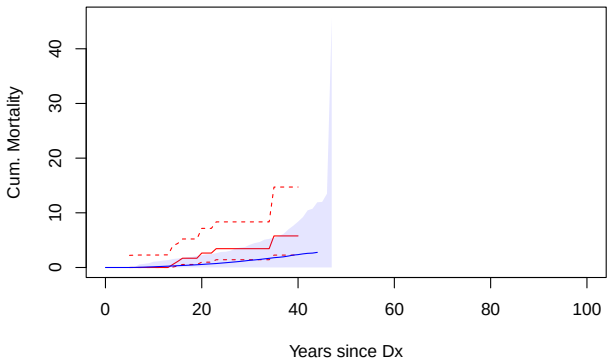
6.5.5.27 Ewings

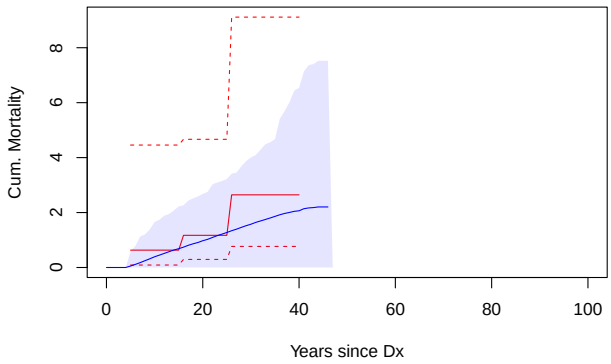


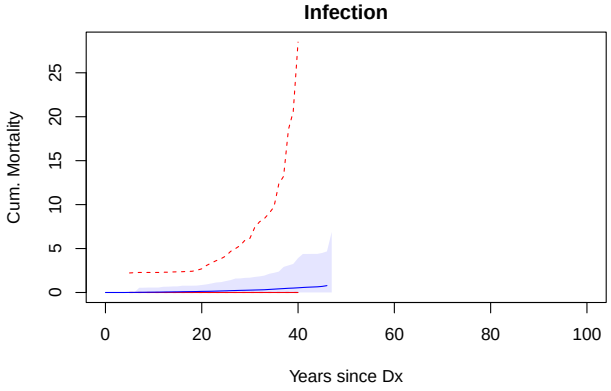
6.5.5.28 Osteosarcoma

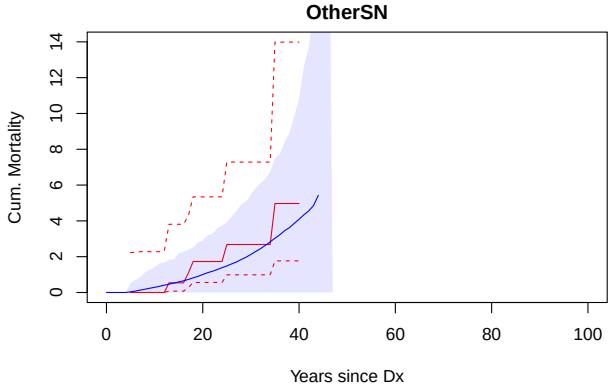


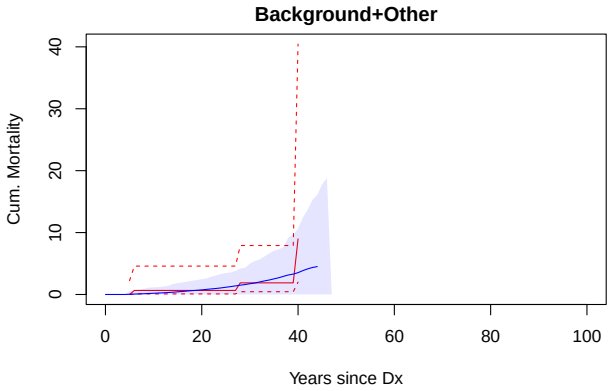




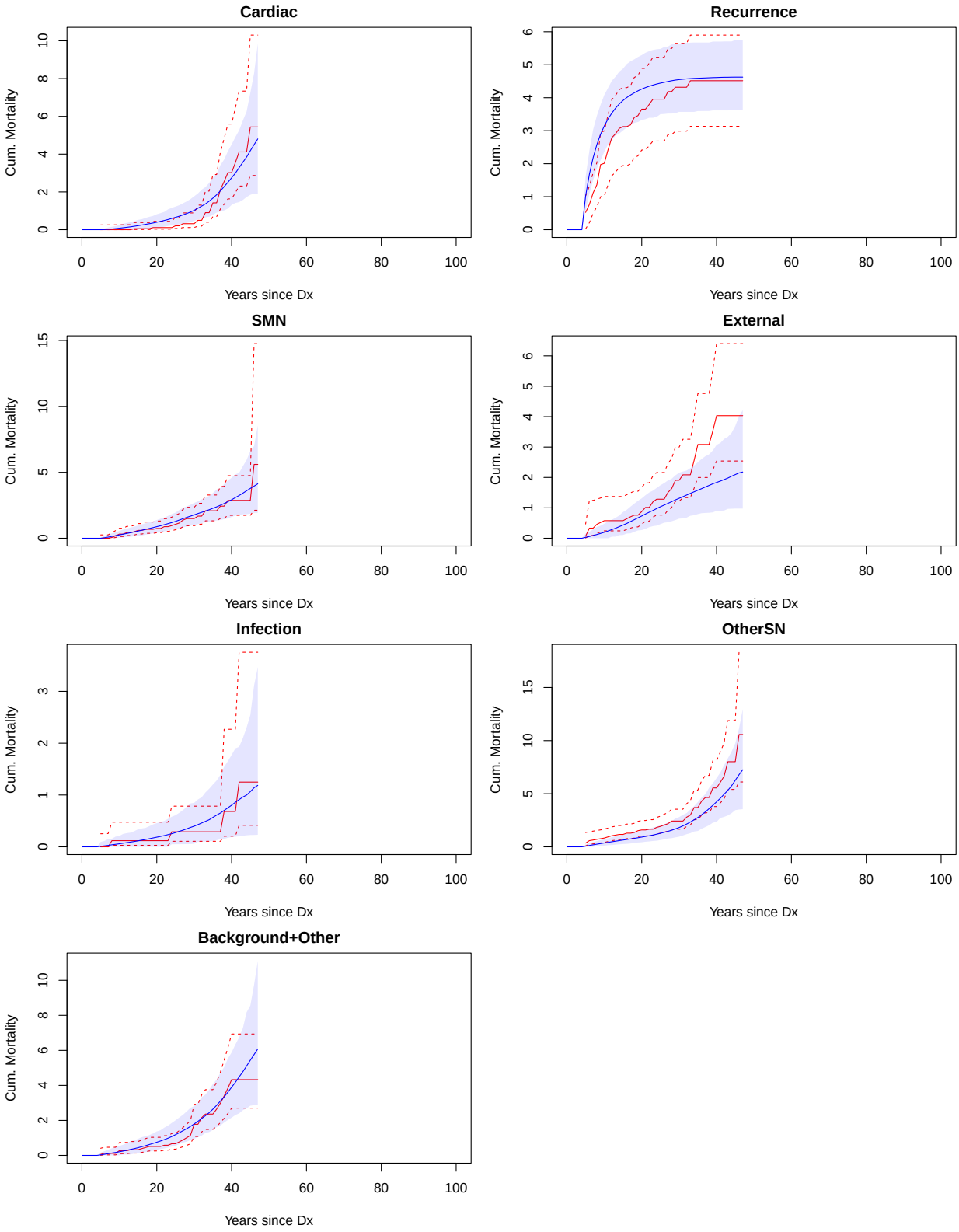




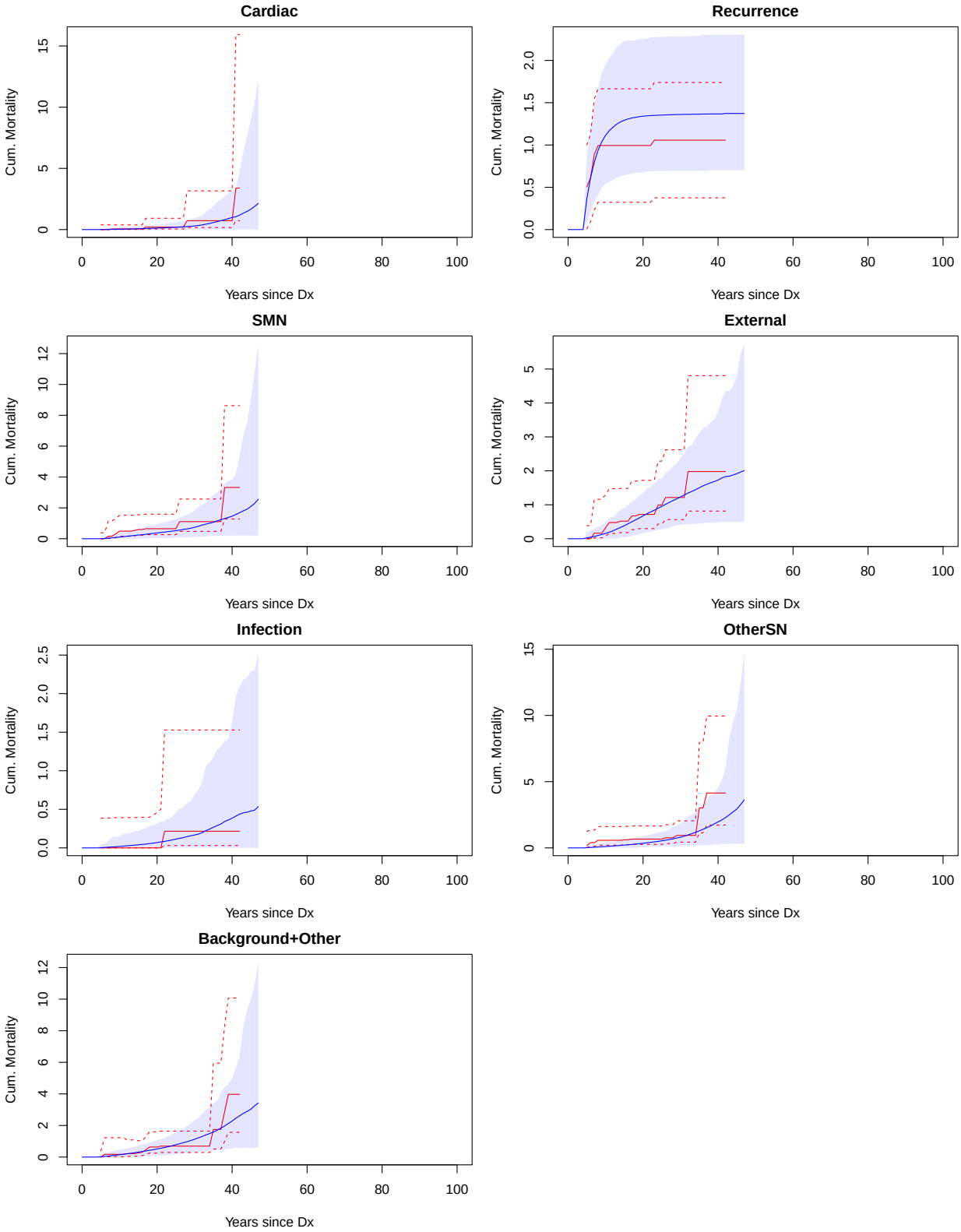




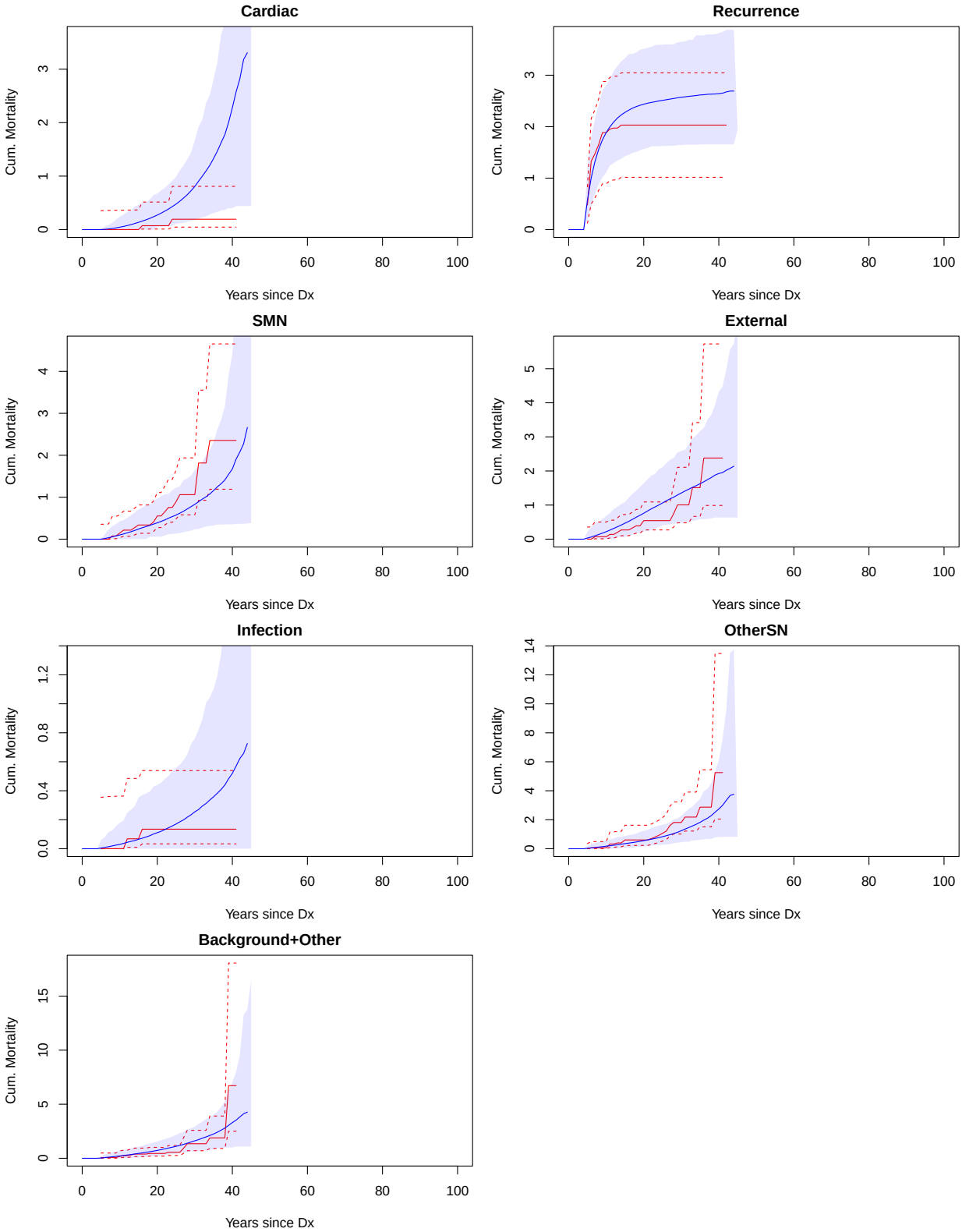
6.5.5.29 AnthNone



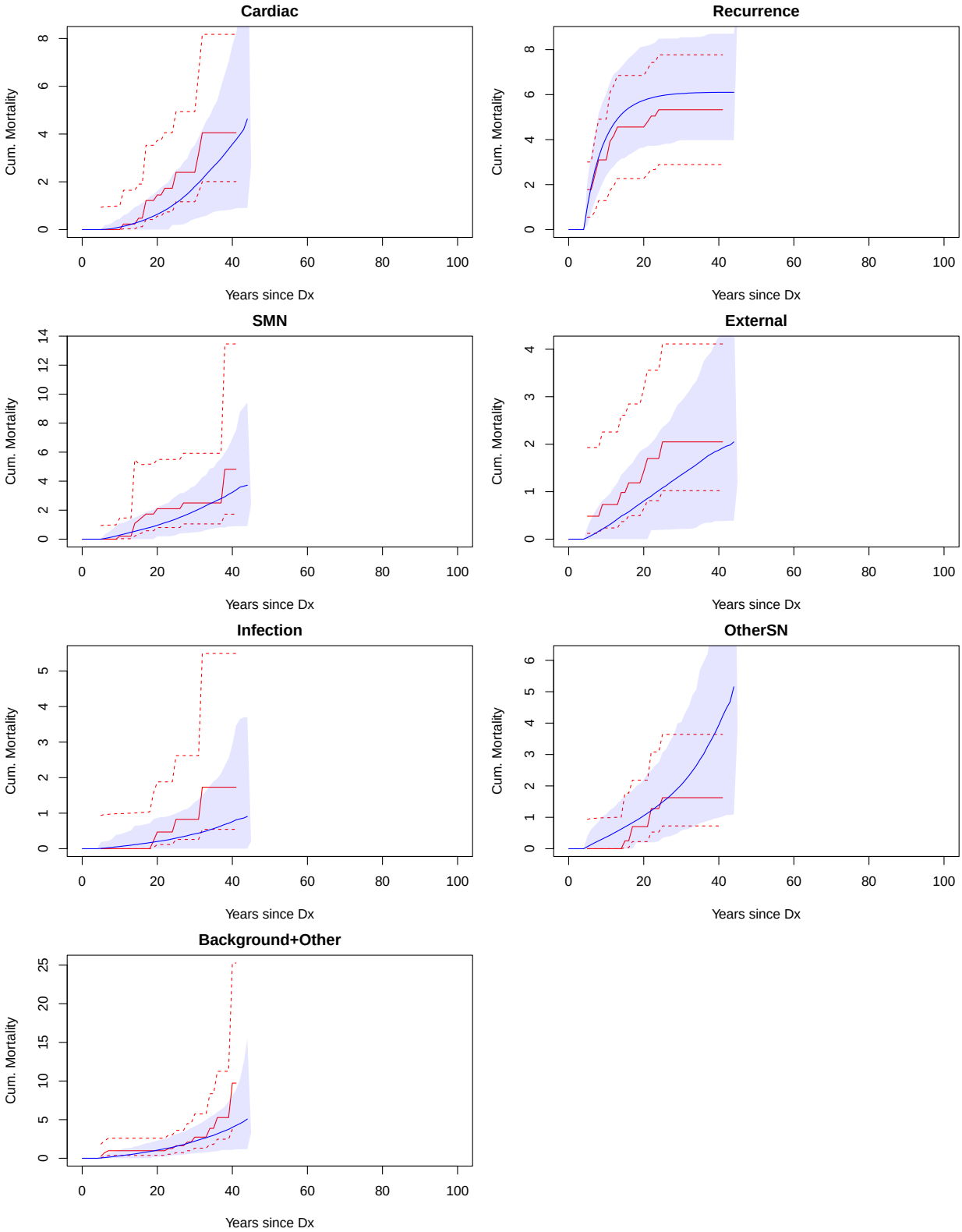
6.5.5.30 Anth<100



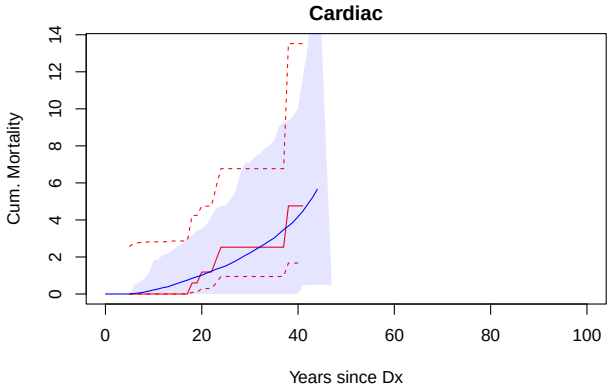
6.5.5.31 Anth100_249

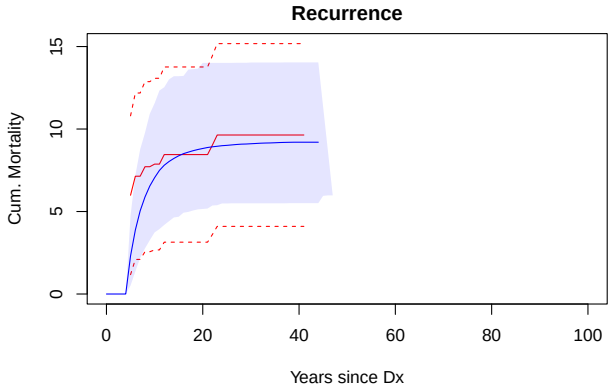


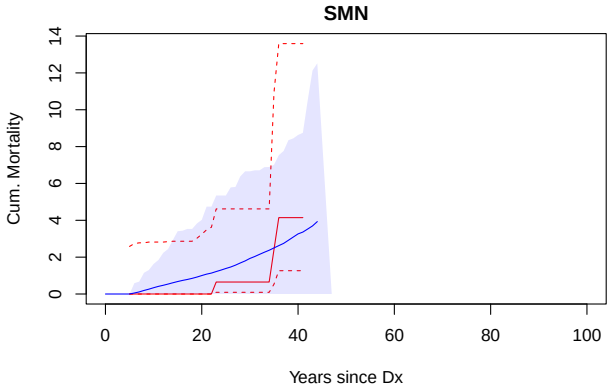
6.5.5.32 Anth250_399

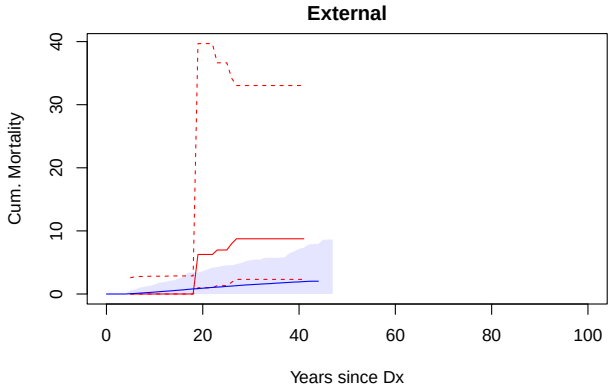


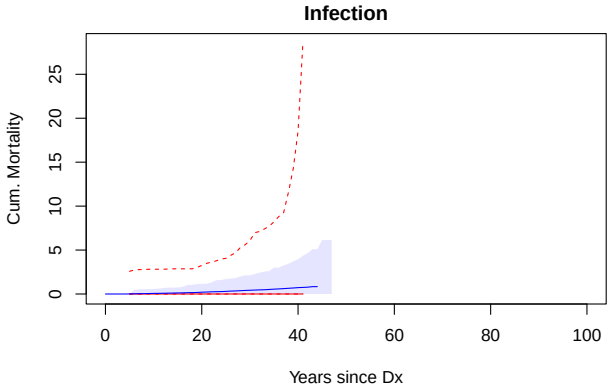
6.5.5.33 Anth400+

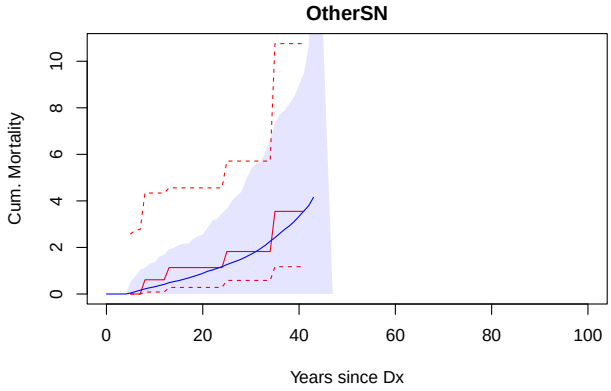


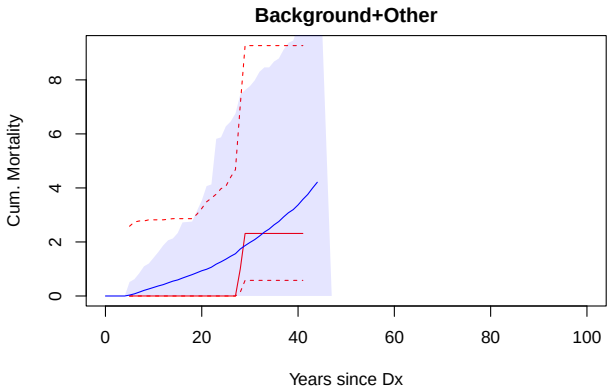




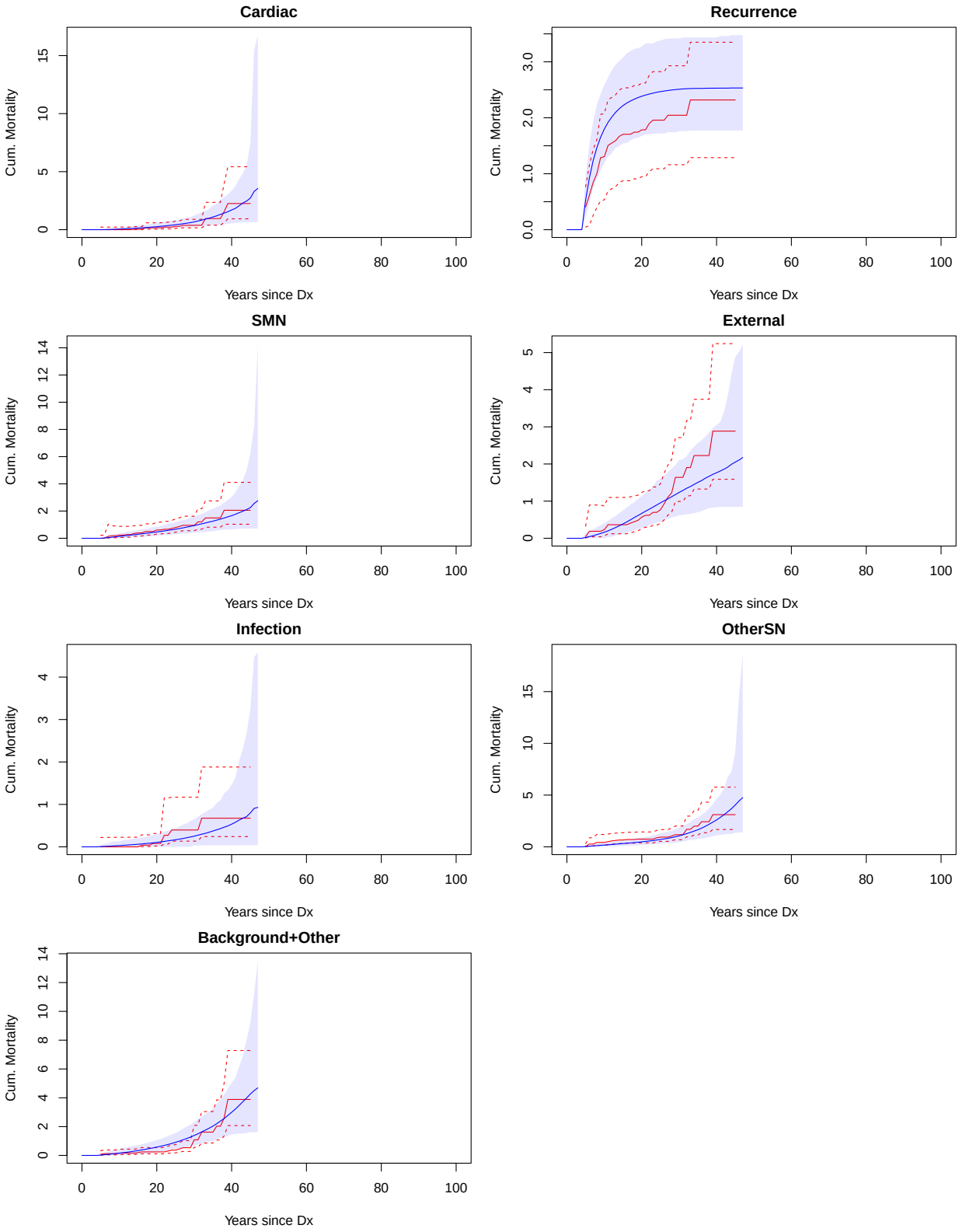




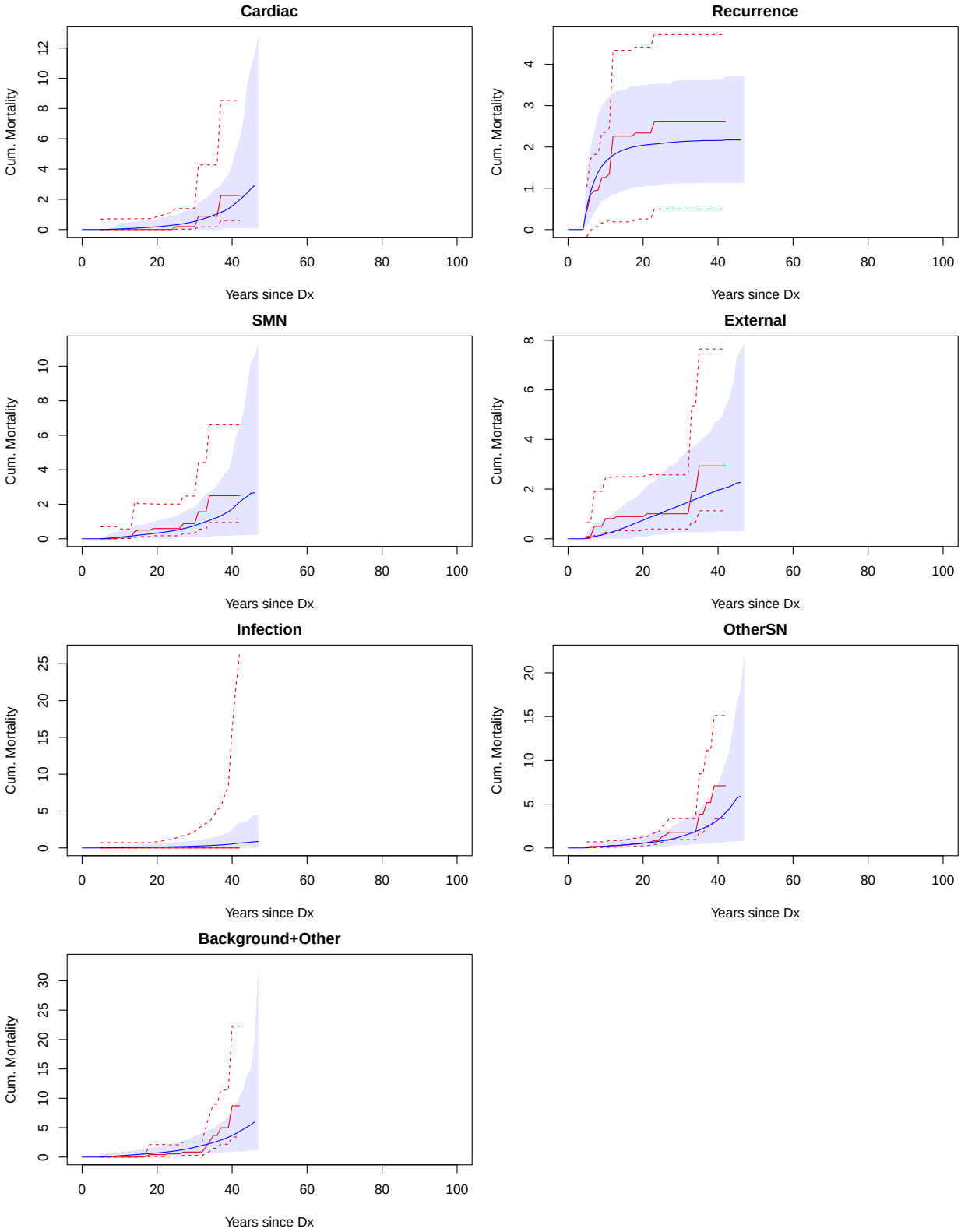




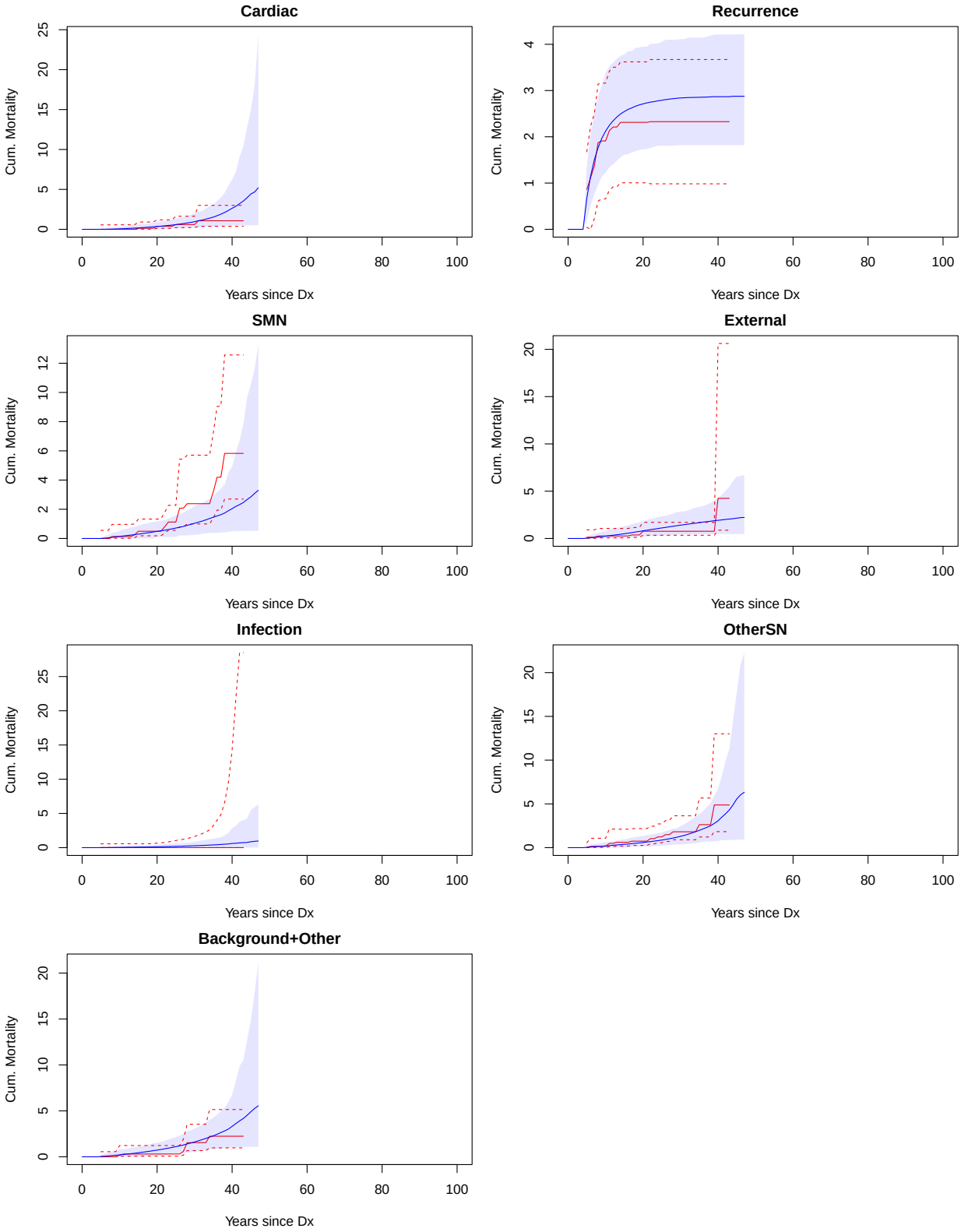
6.5.5.34 AlkNone



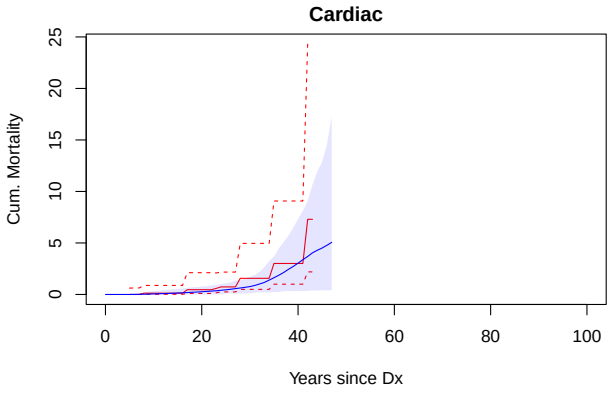
6.5.5.35 Alk<4000

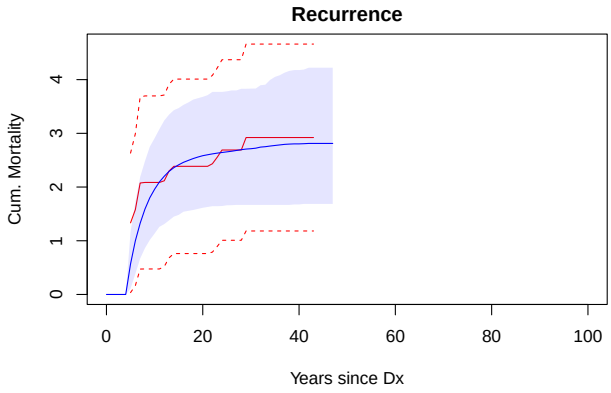


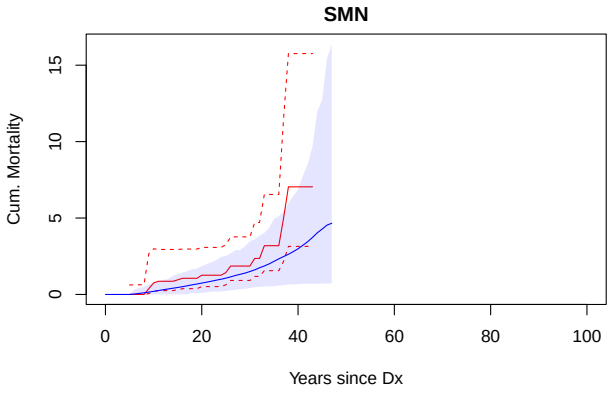
6.5.5.36 Alk4000_7999

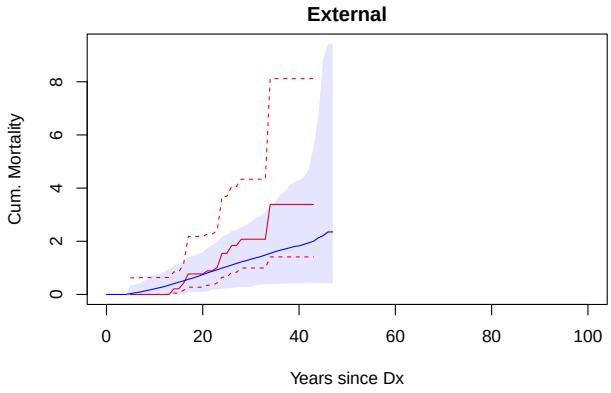


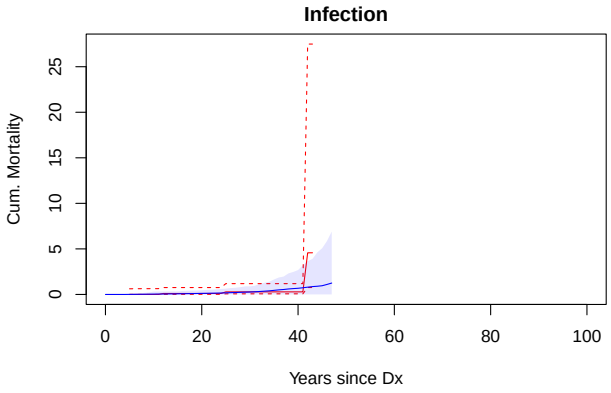
6.5.5.37 Alk8000_11999

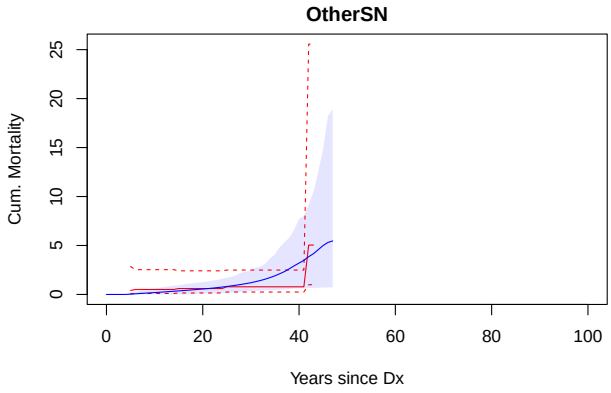


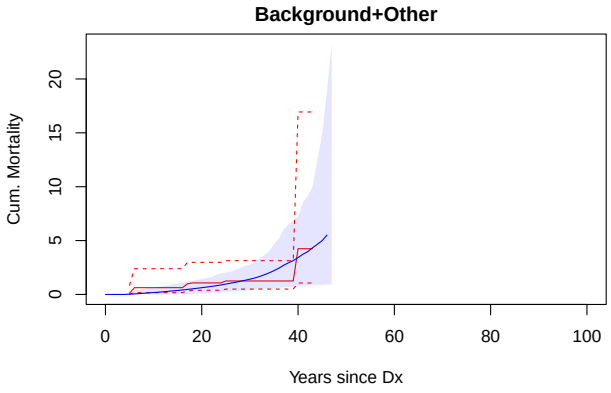




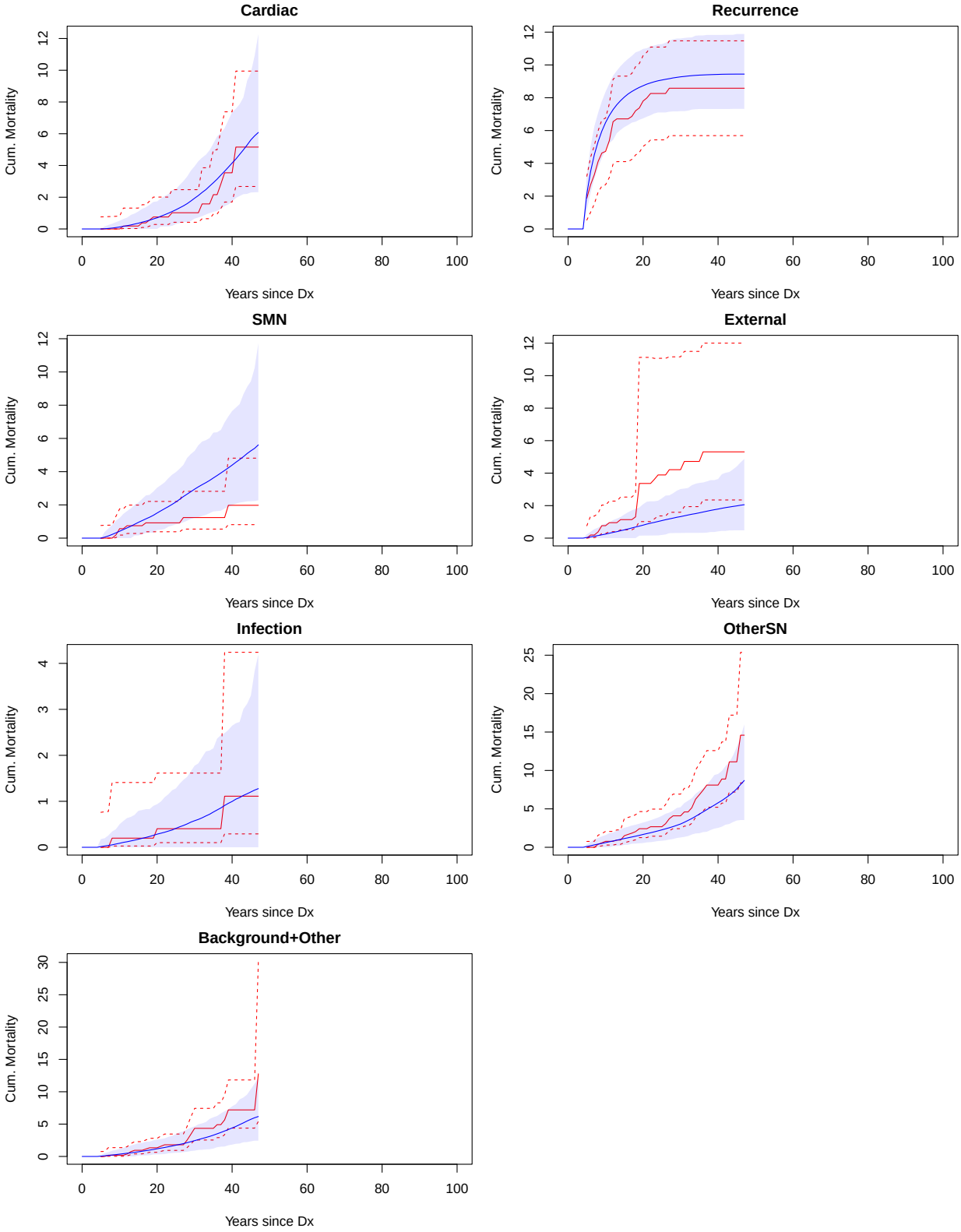




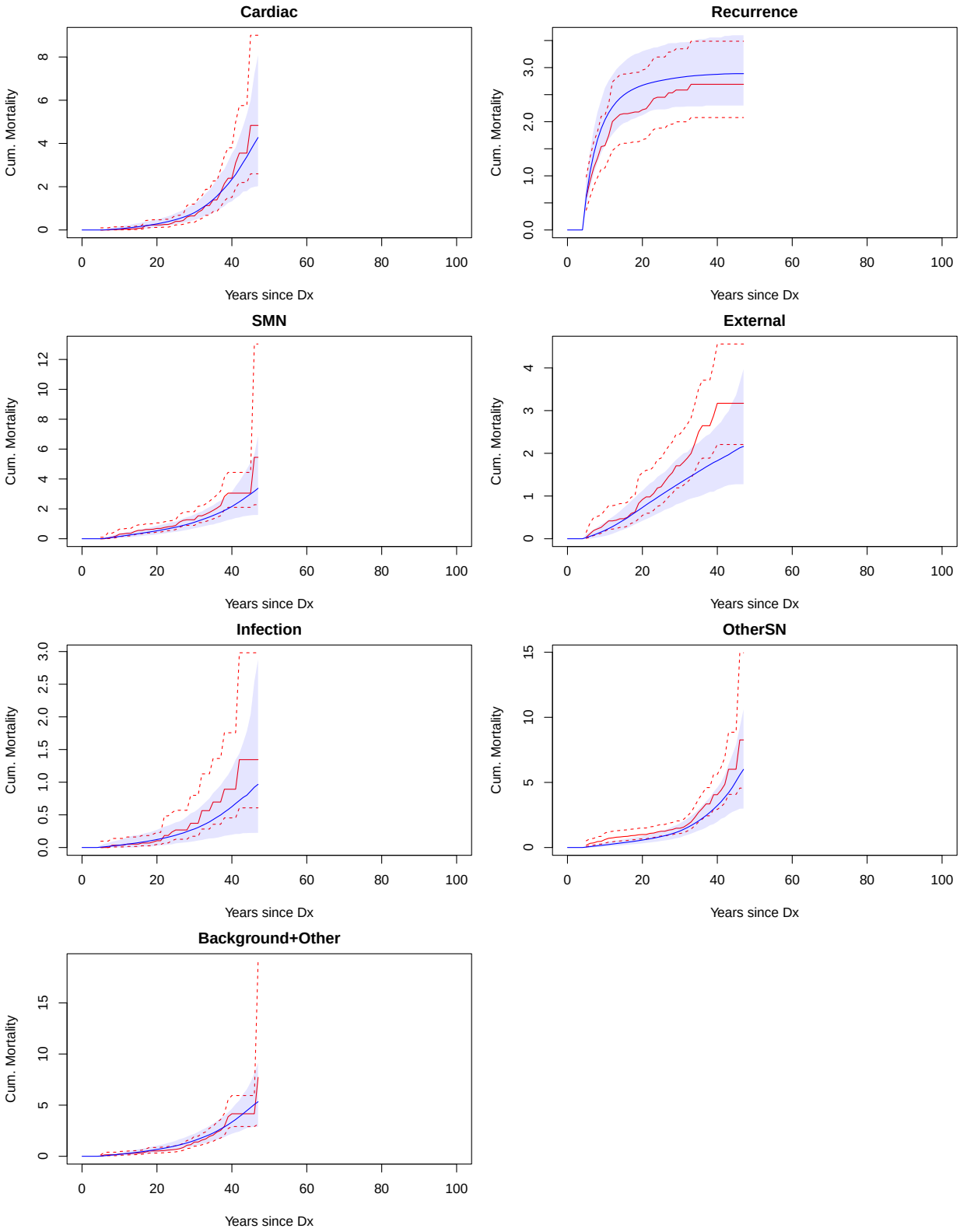




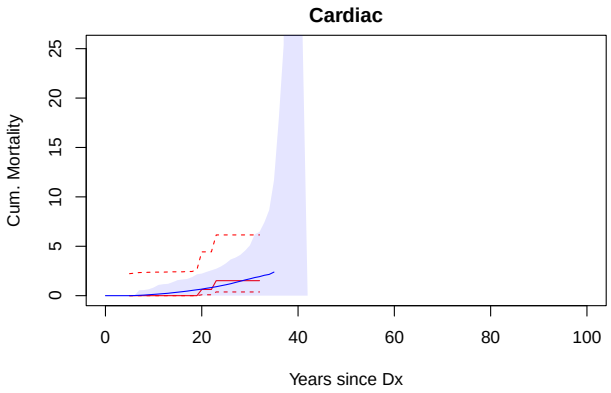
6.5.5.38 Alk12000+

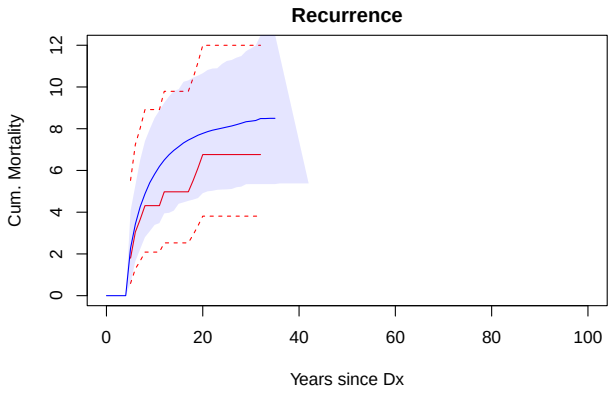


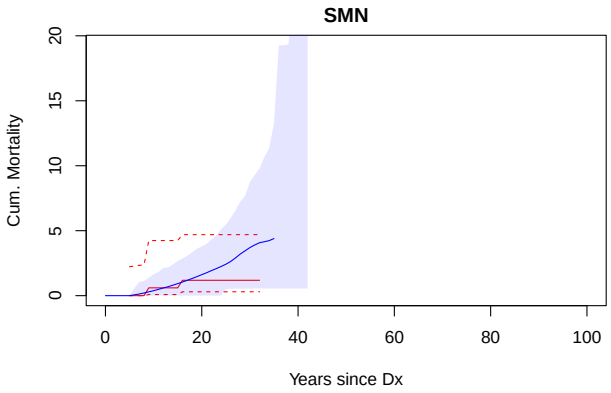
6.5.5.39 CispNone

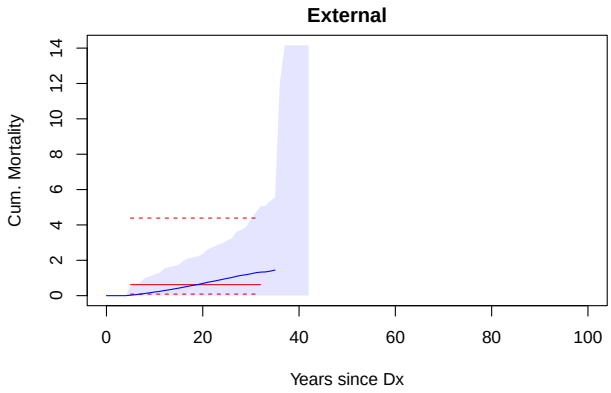


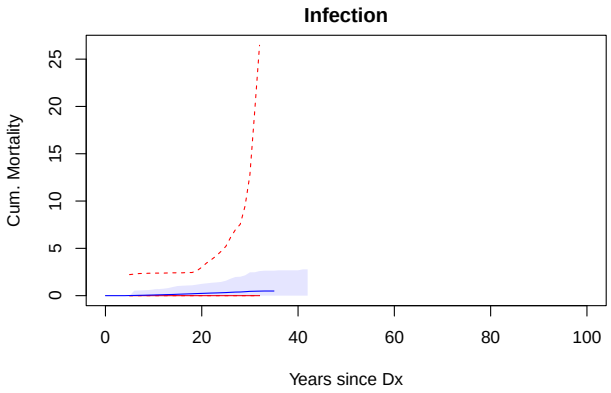
6.5.5.40 Cisp<400

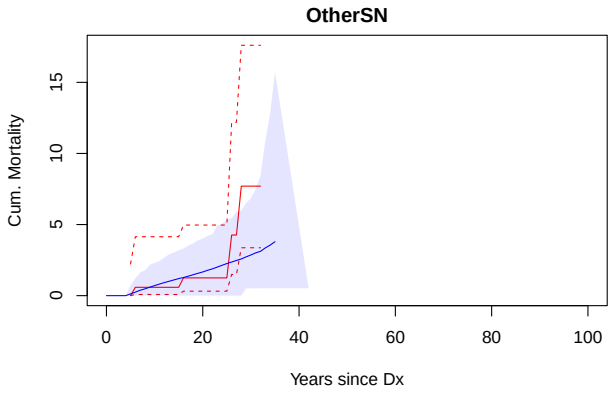


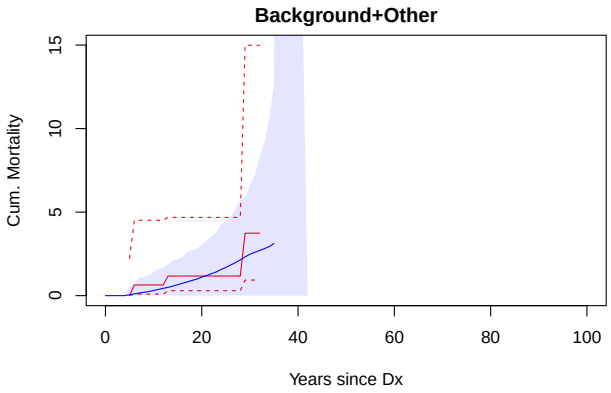




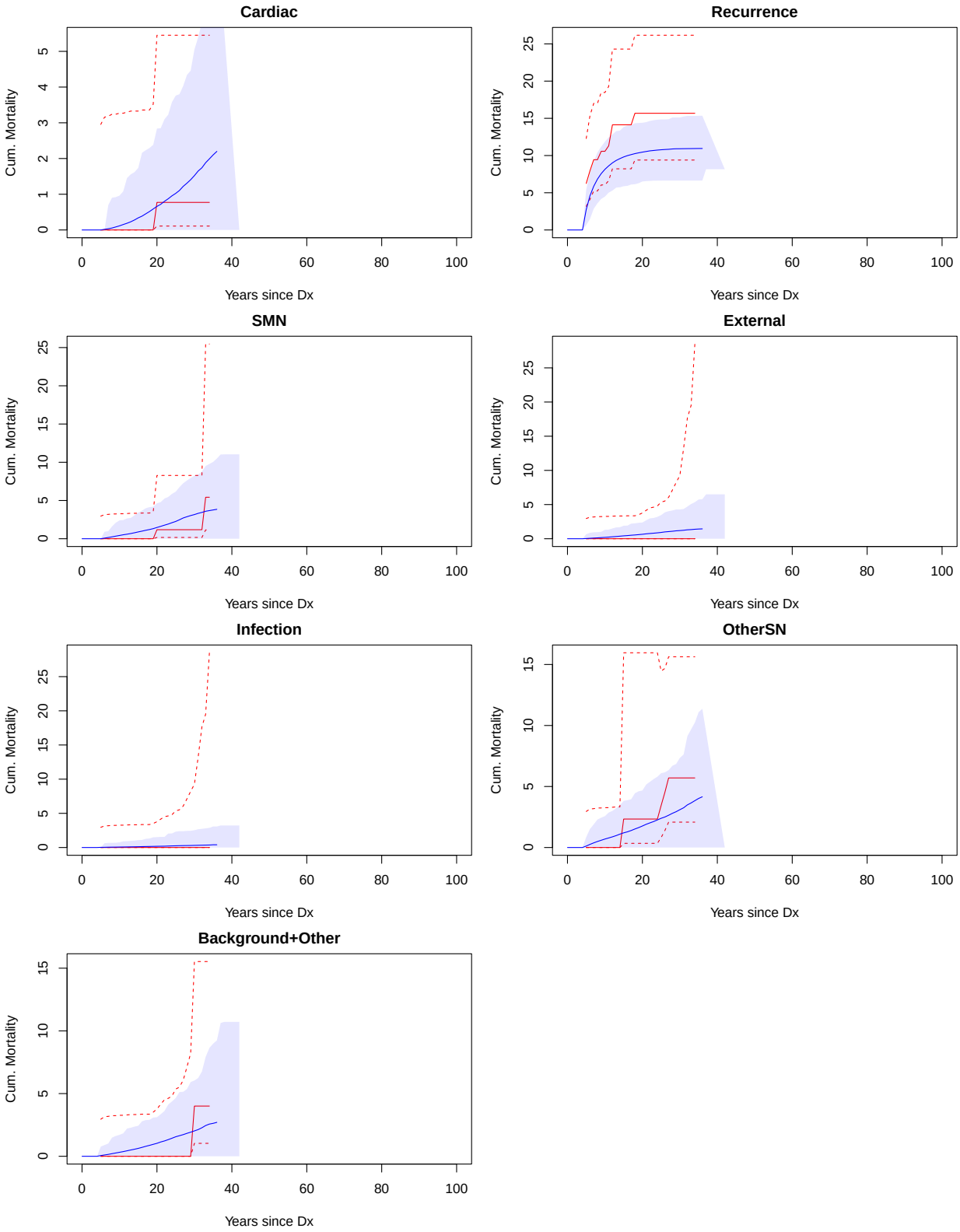




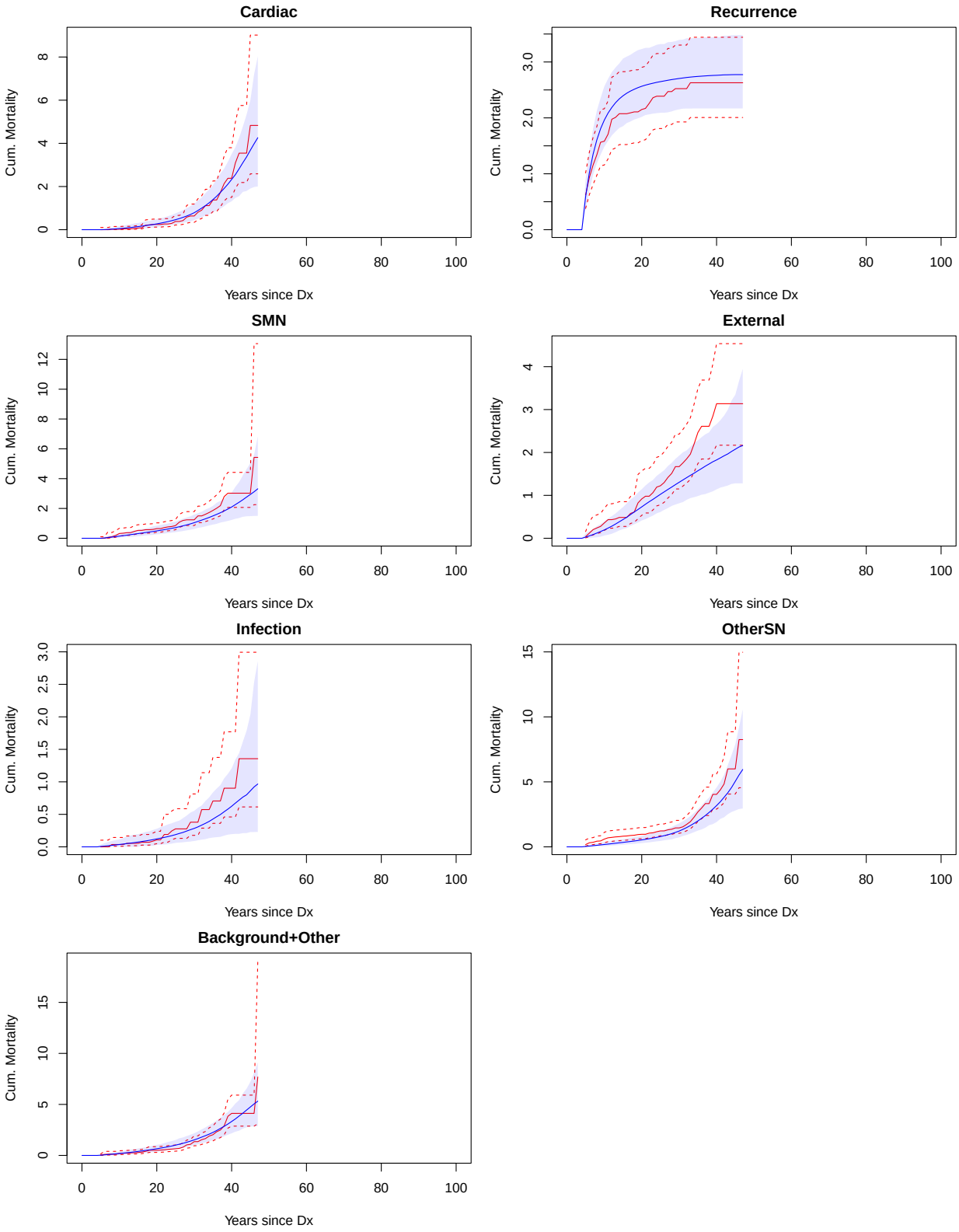




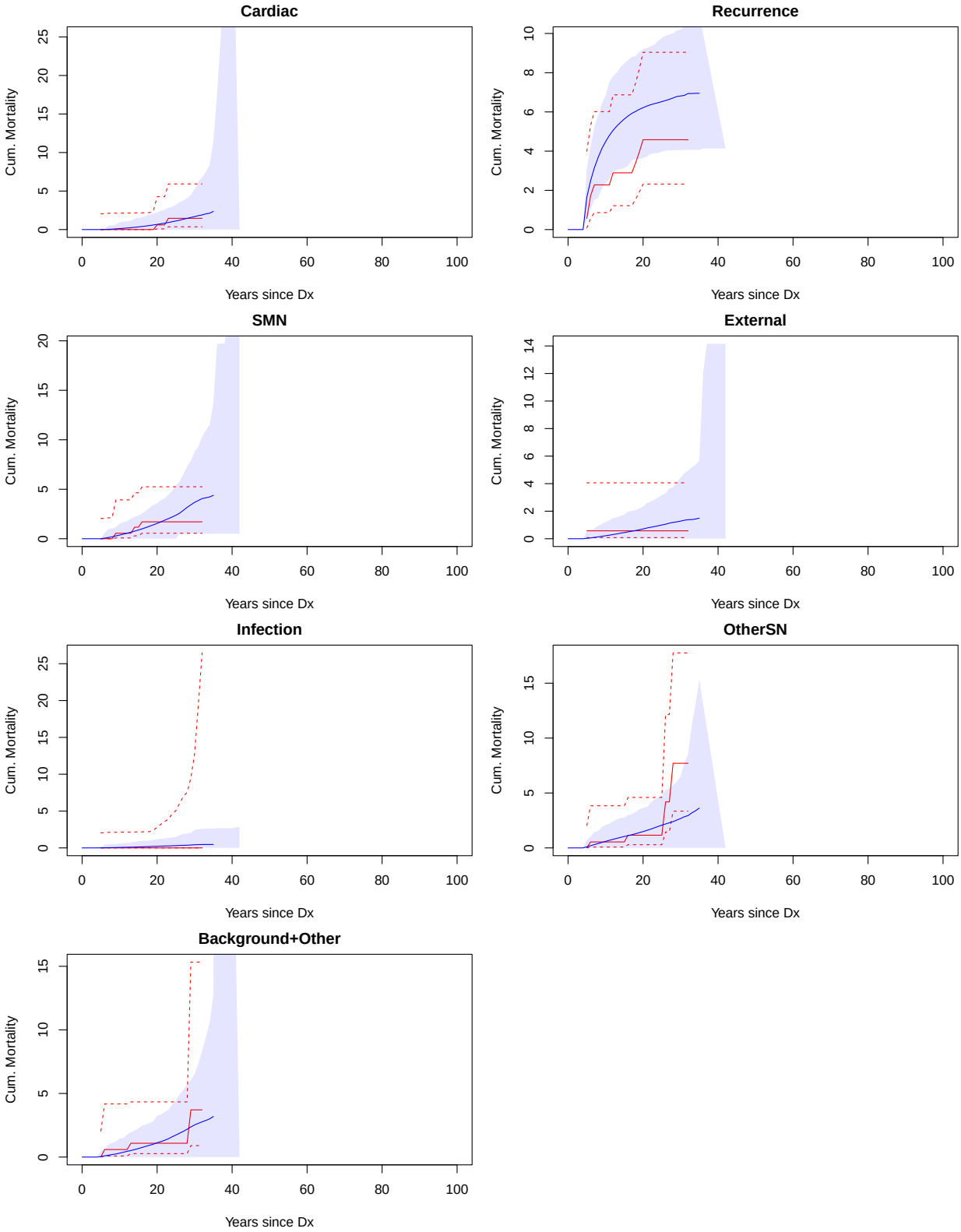
6.5.5.41 Cisp400+



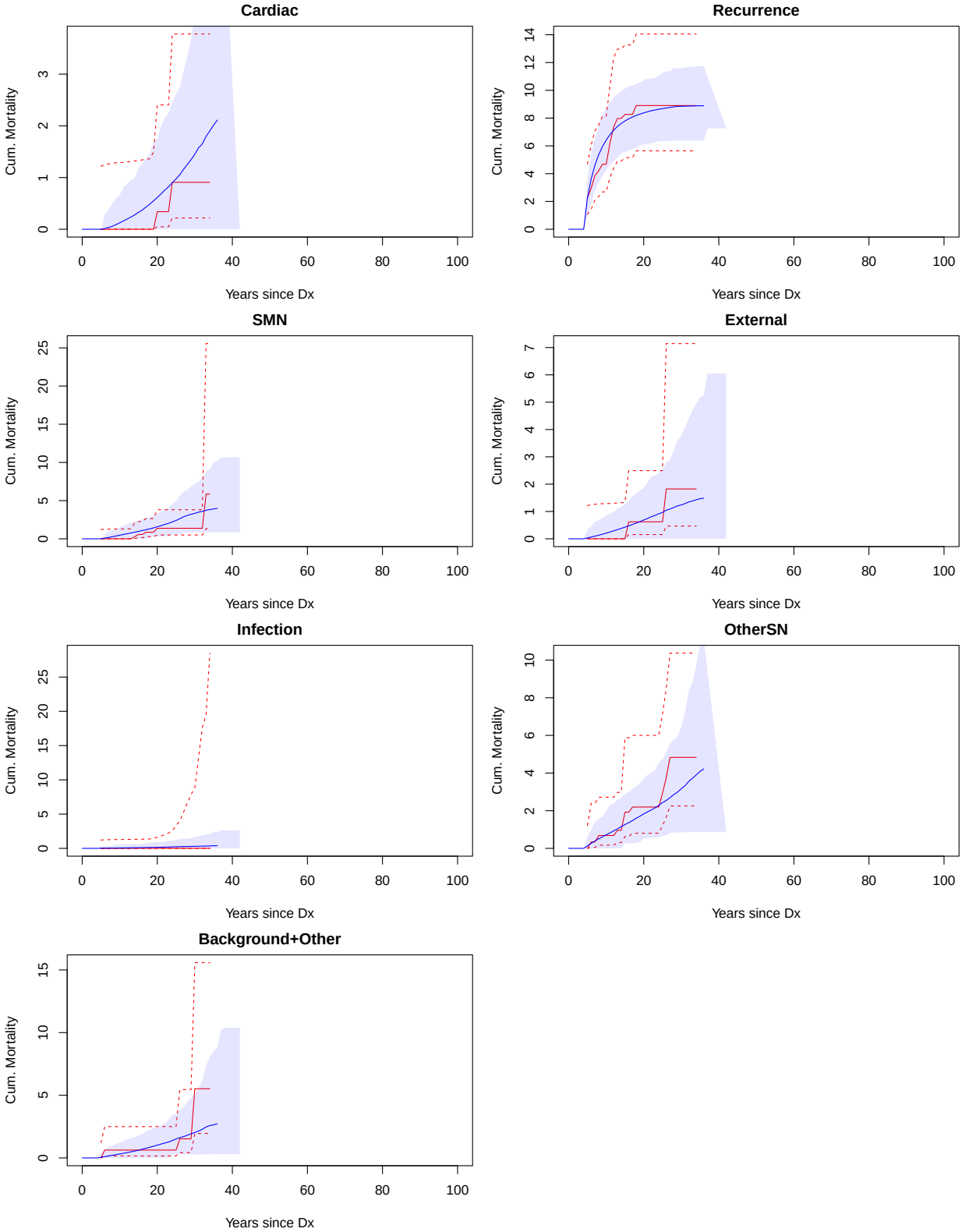
6.5.5.42 PlatNone



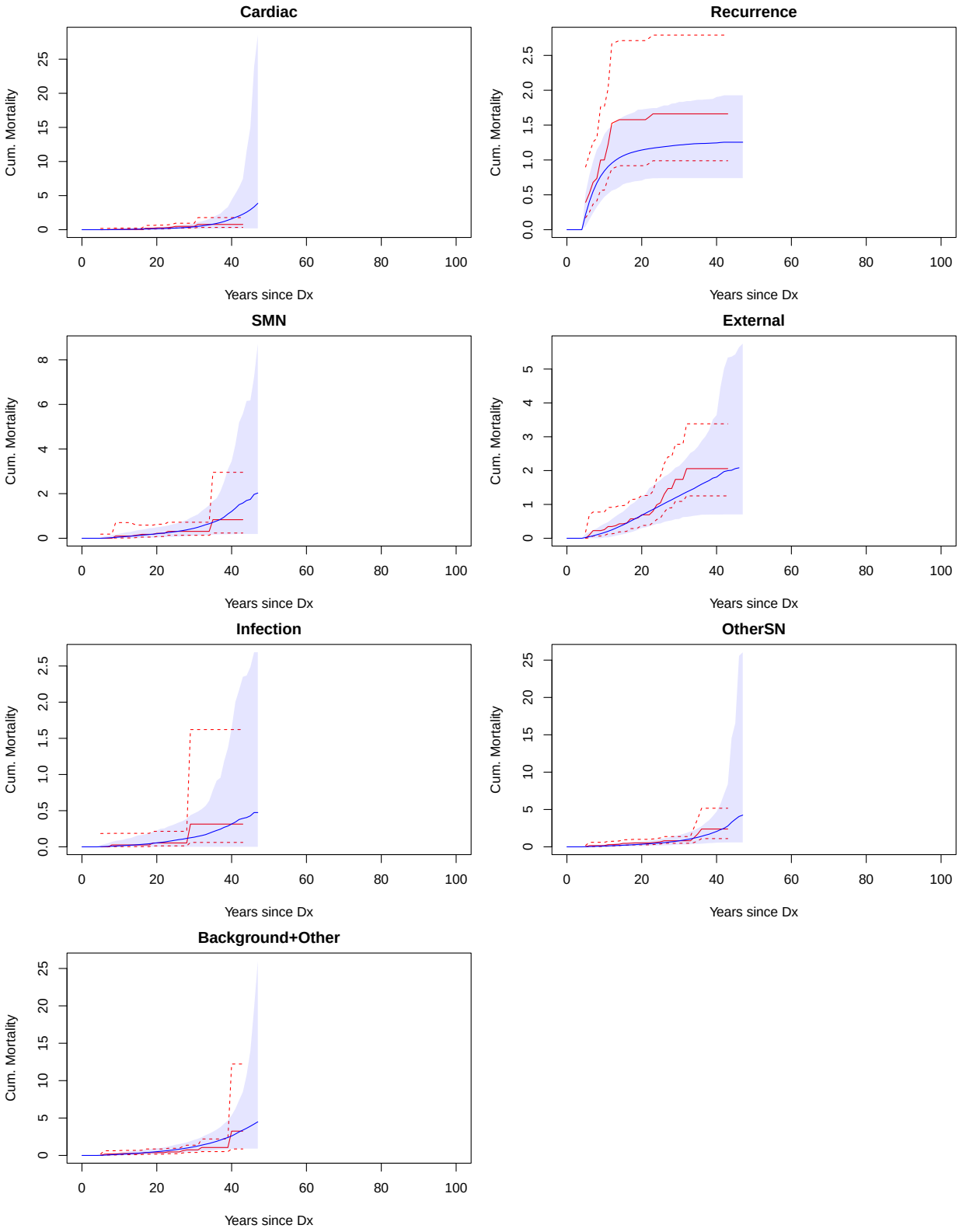
6.5.5.43 Plat<400



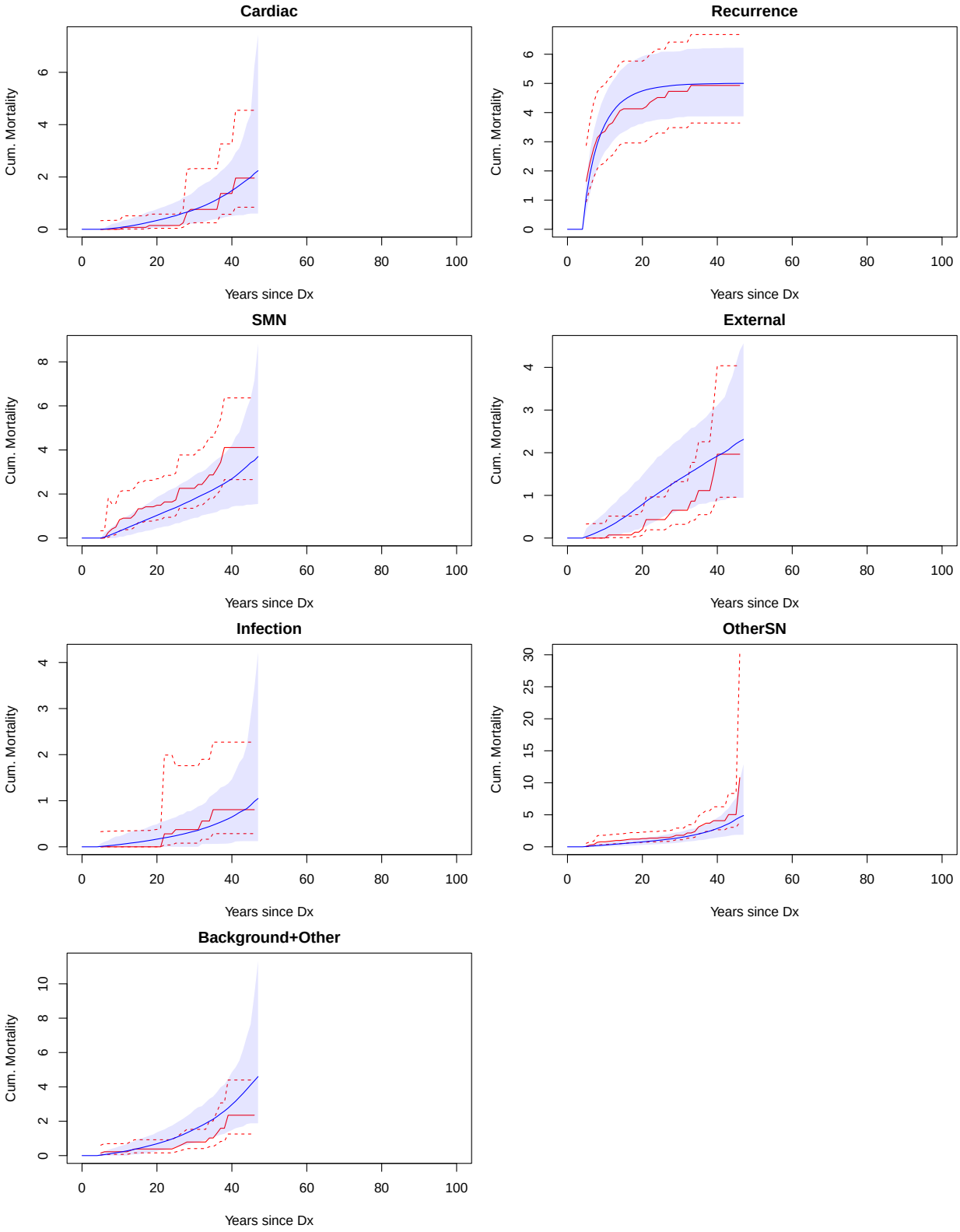
6.5.5.44 Plat400+



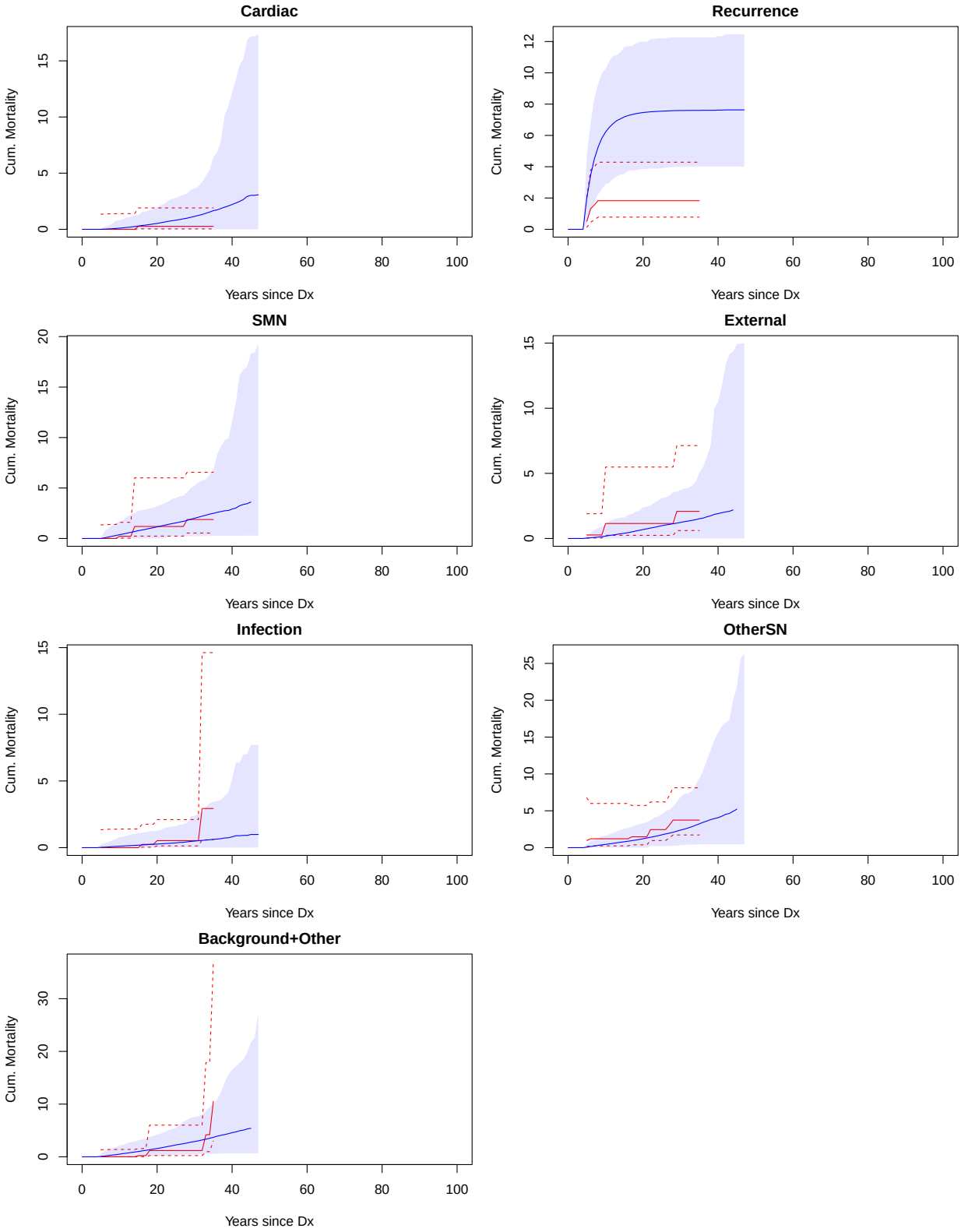
6.5.5.45 ChestNone



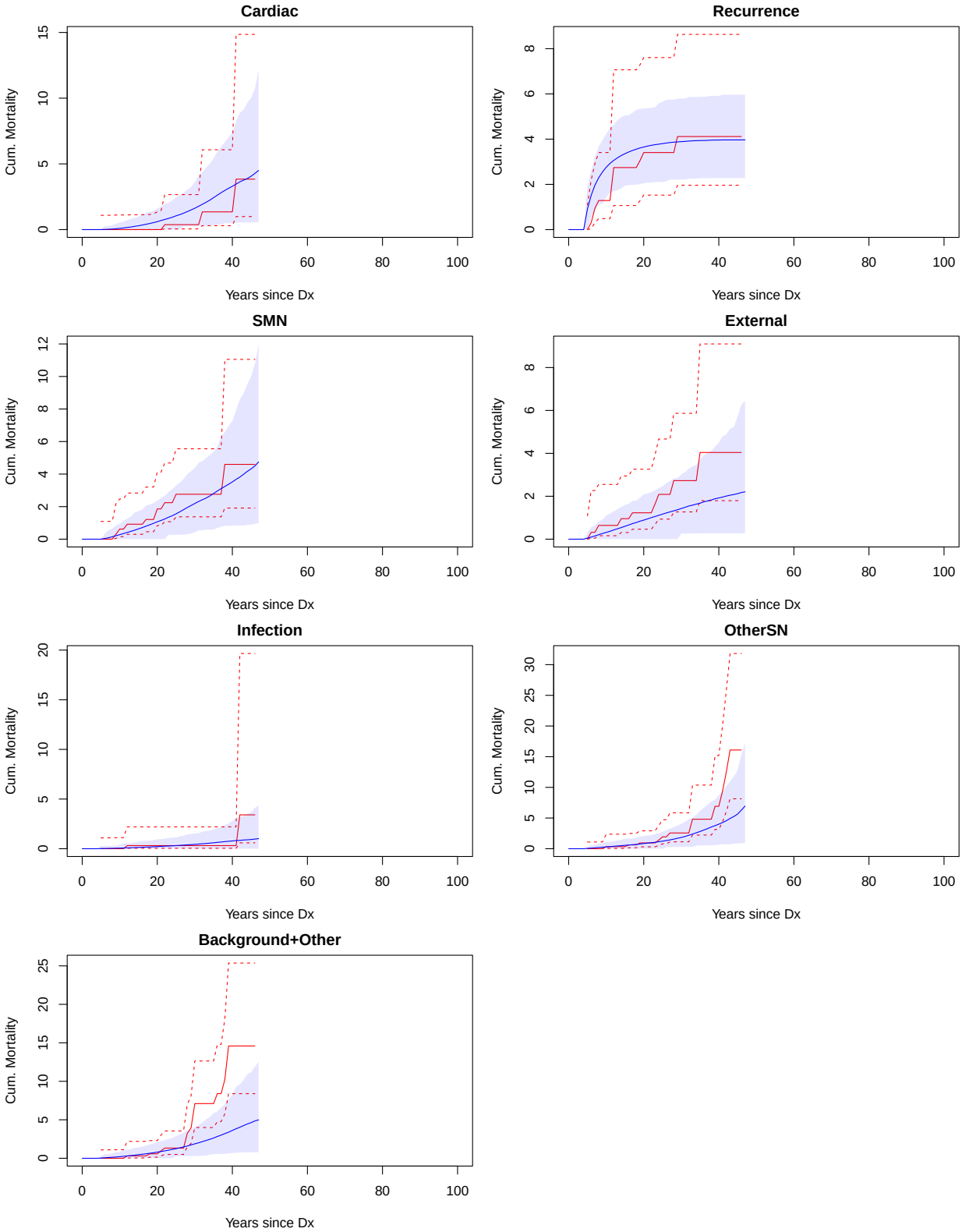
6.5.5.46 Chest<10



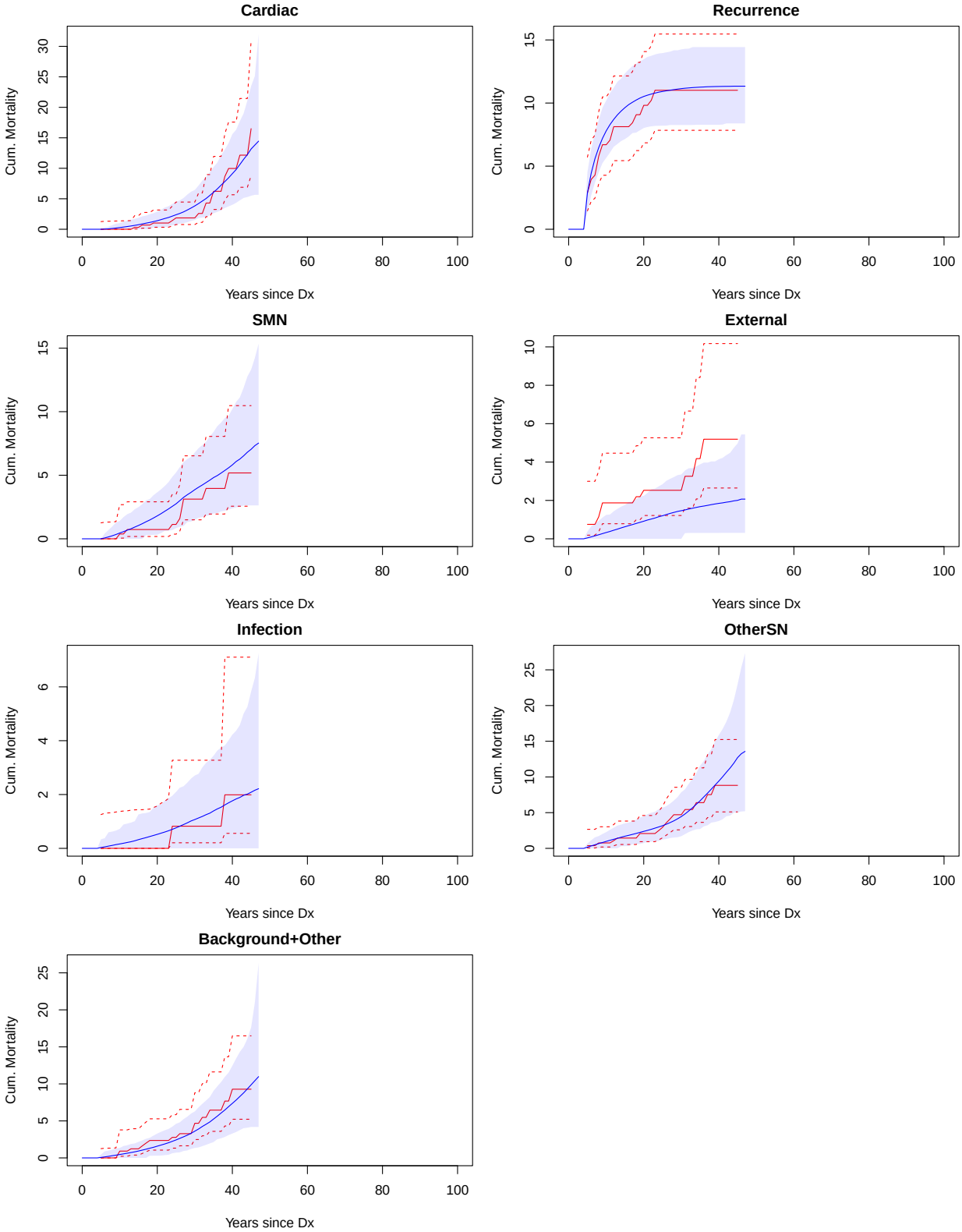
6.5.5.47 Chest10_19



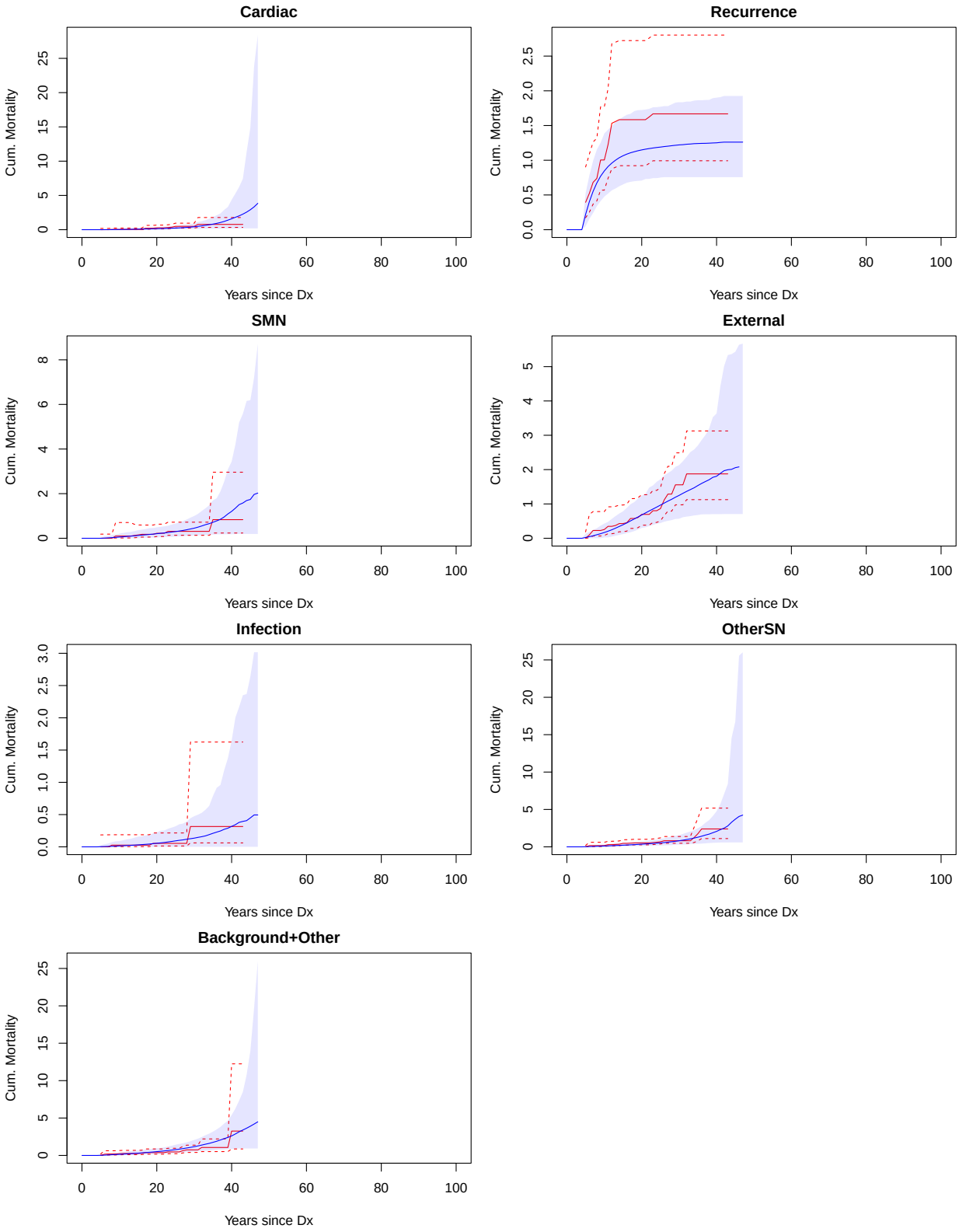
6.5.5.48 Chest20_29



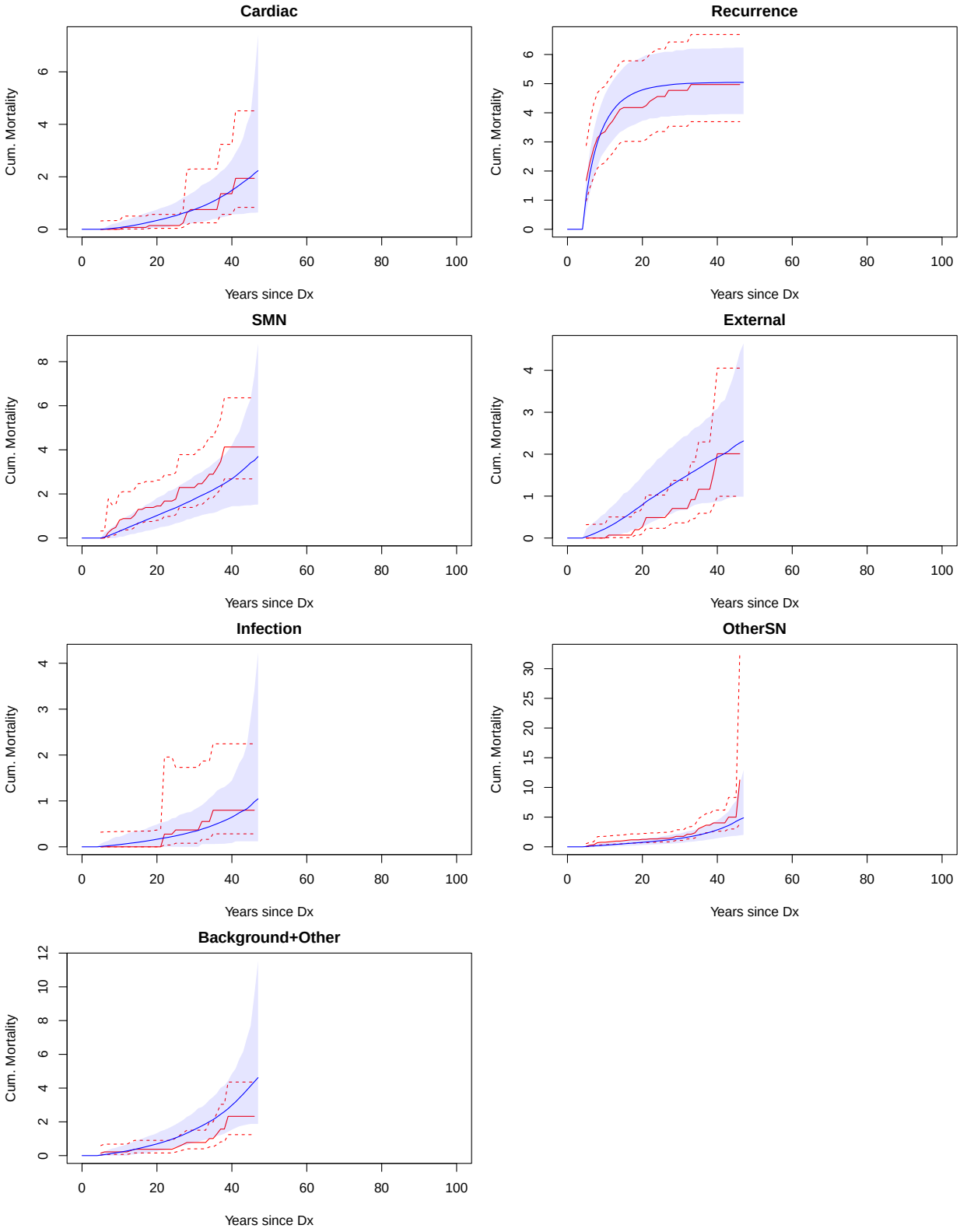
6.5.5.49 Chest30+



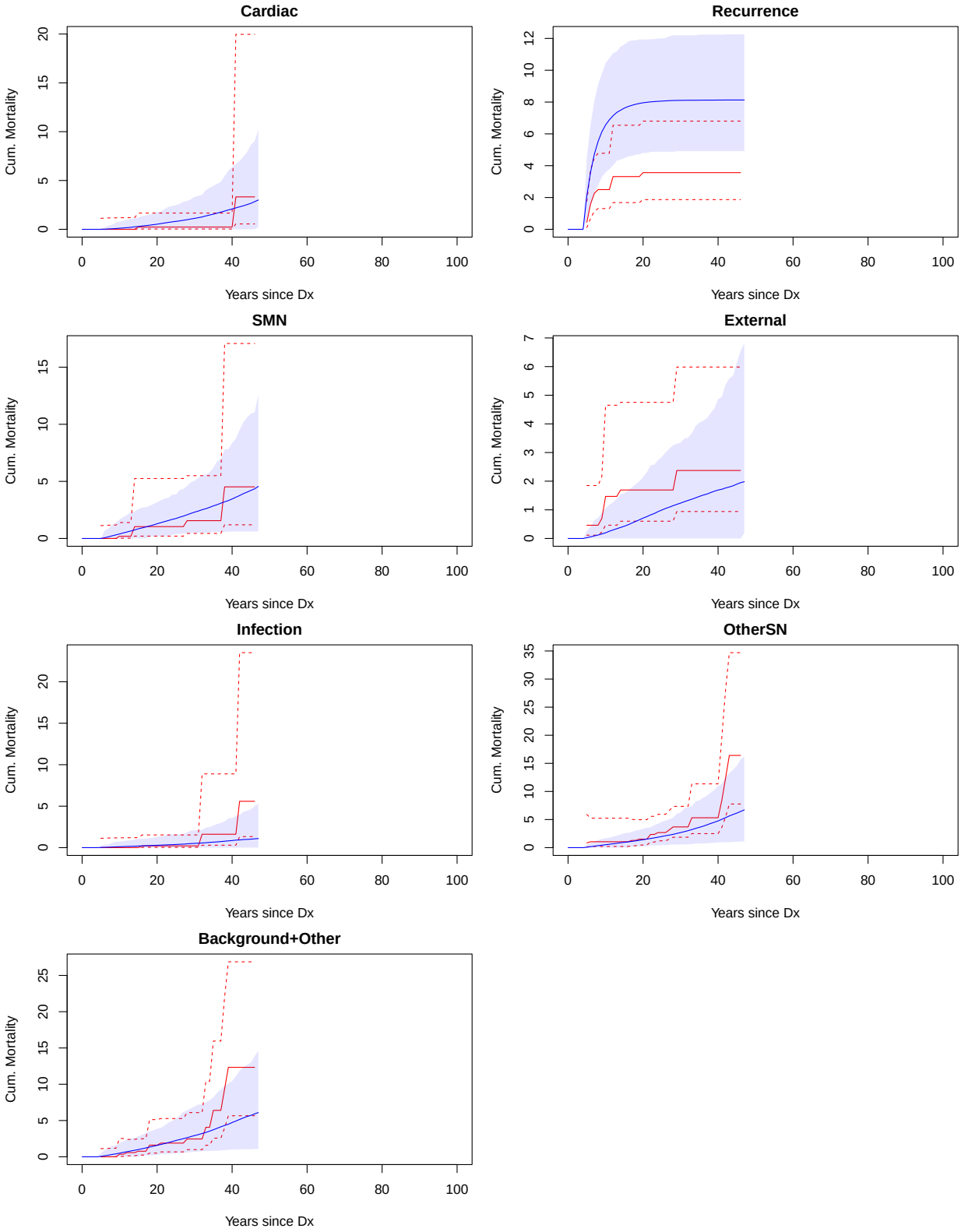
6.5.5.50 HeartNone



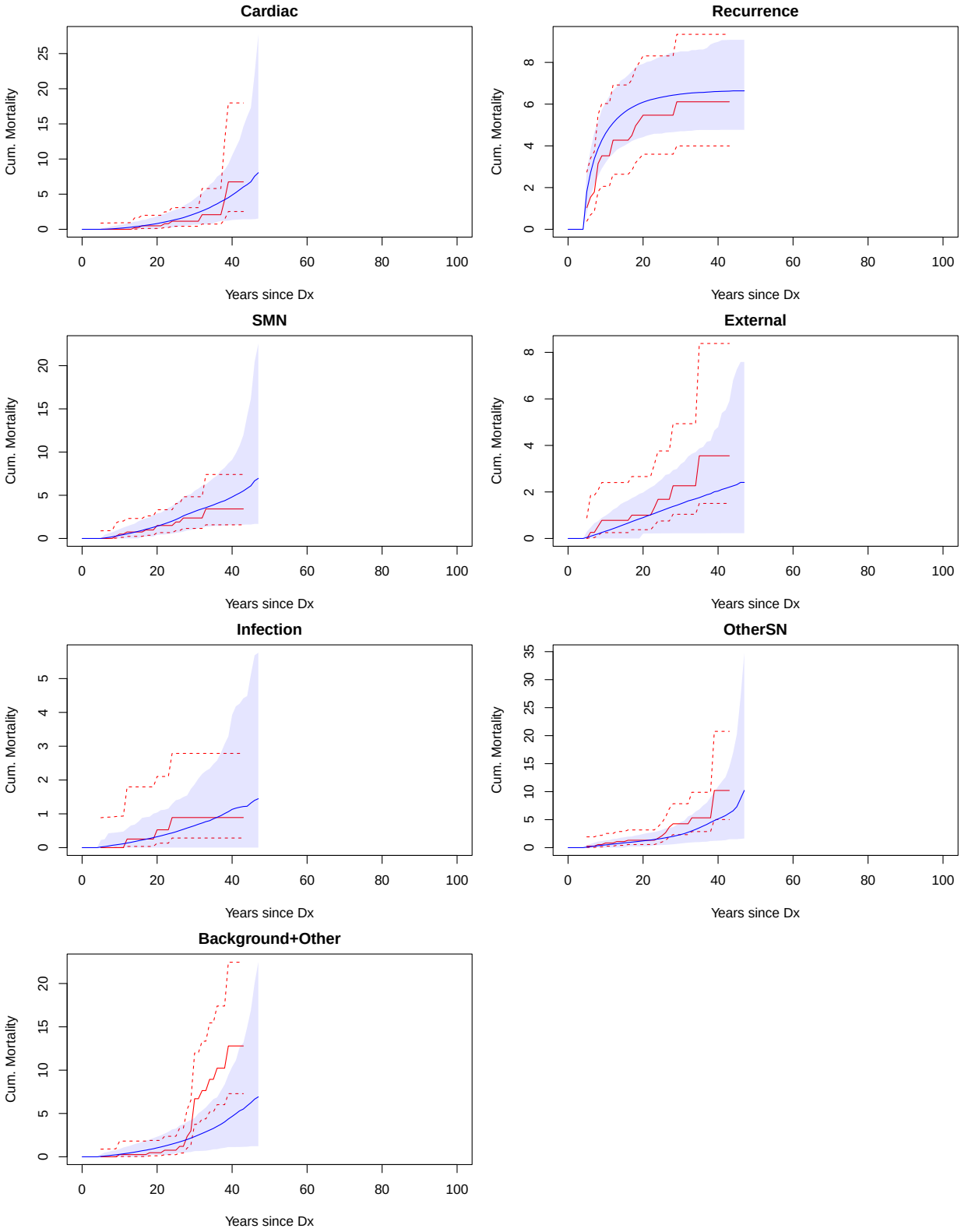
6.5.5.51 Heart<5



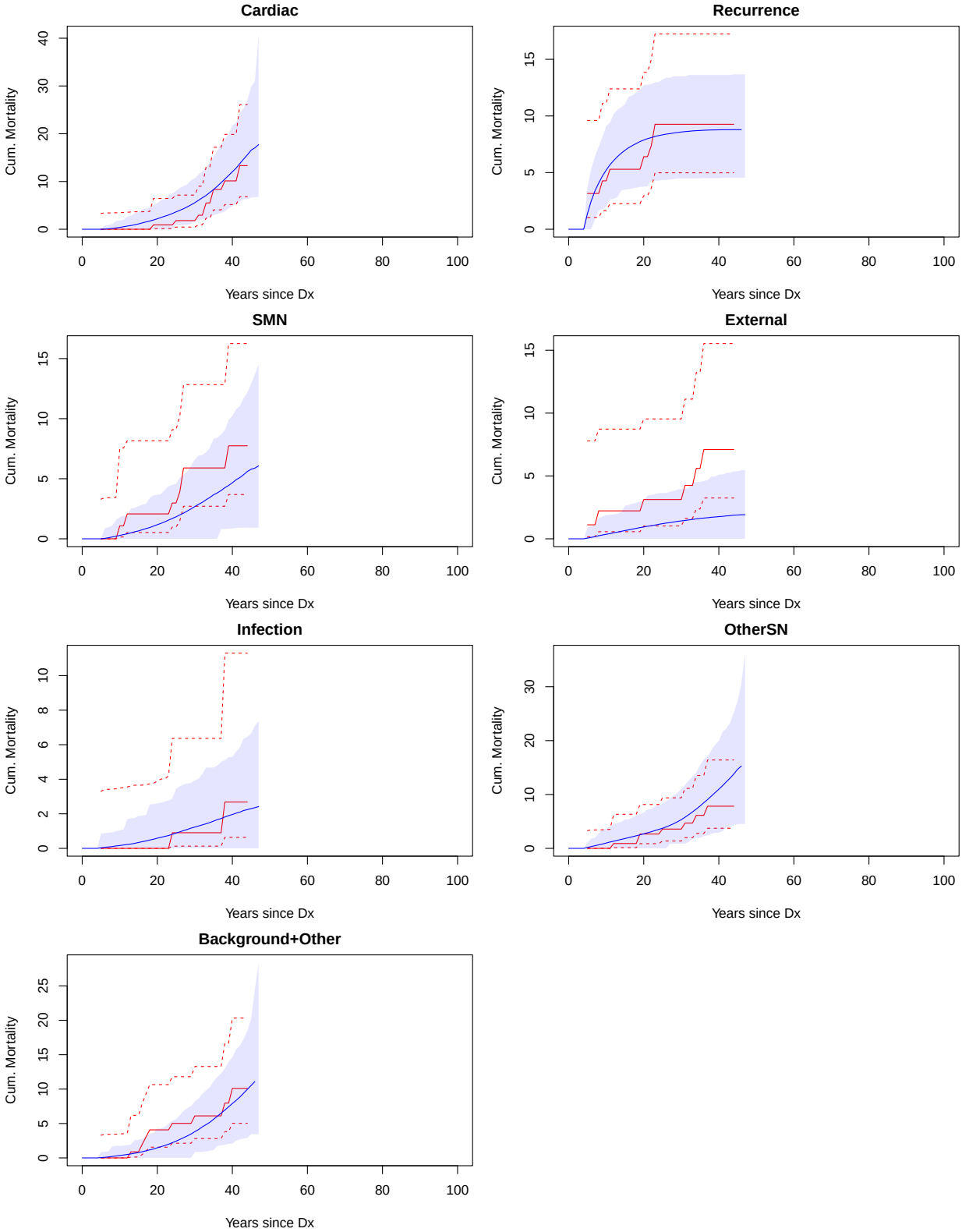
6.5.5.52 Heart5_14



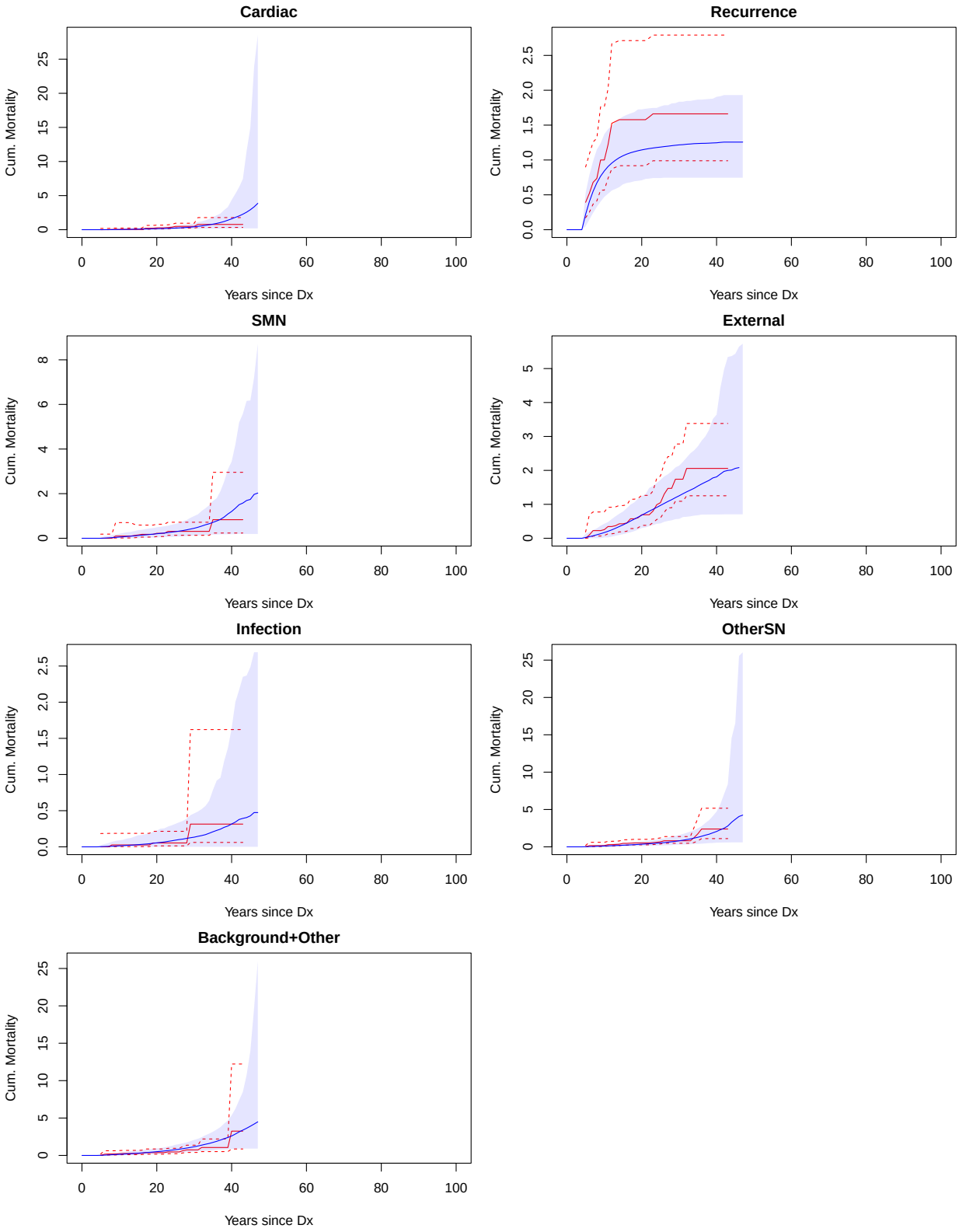
6.5.5.53 Heart15_34



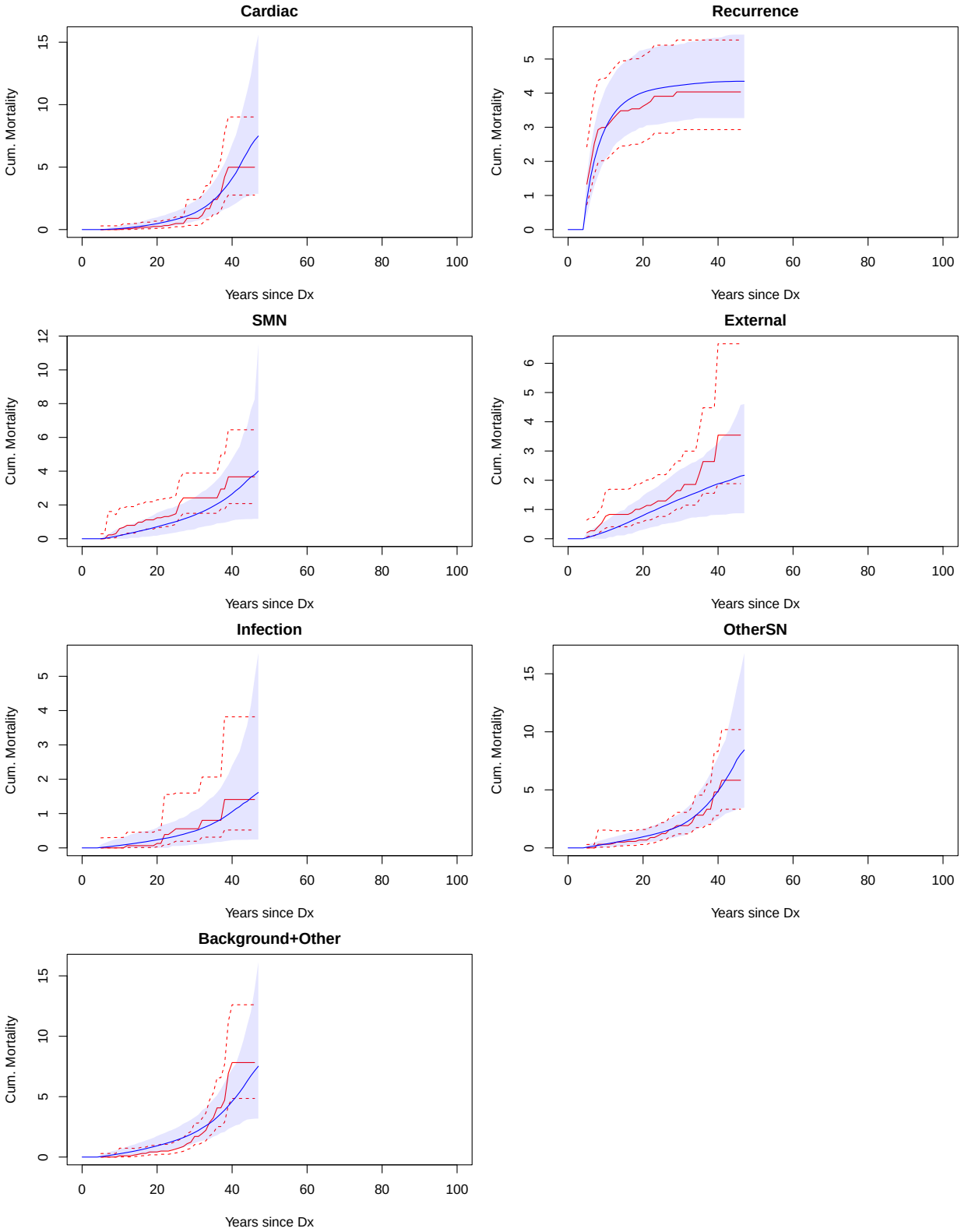
6.5.5.54 Heart35+



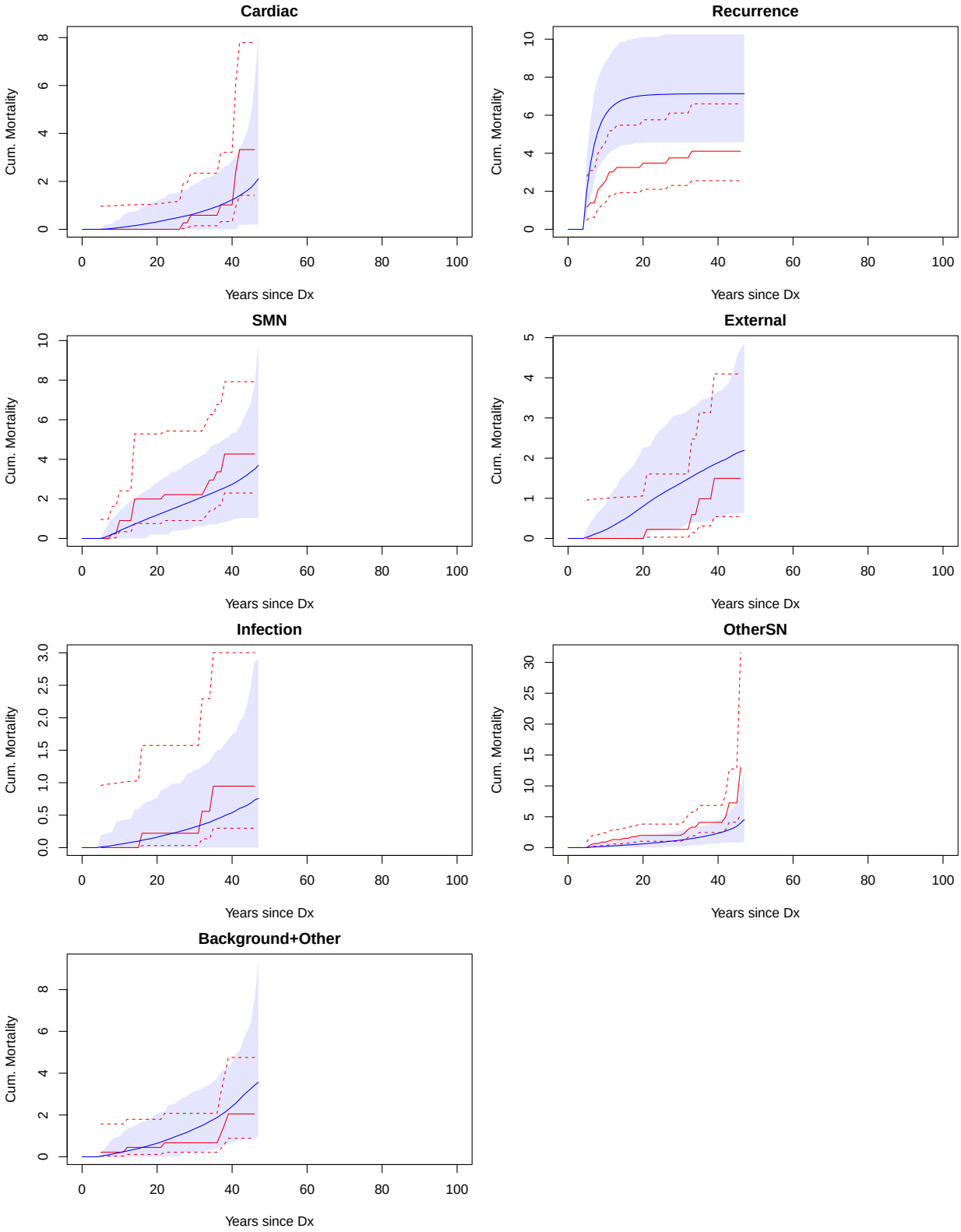
6.5.5.55 CRTNone



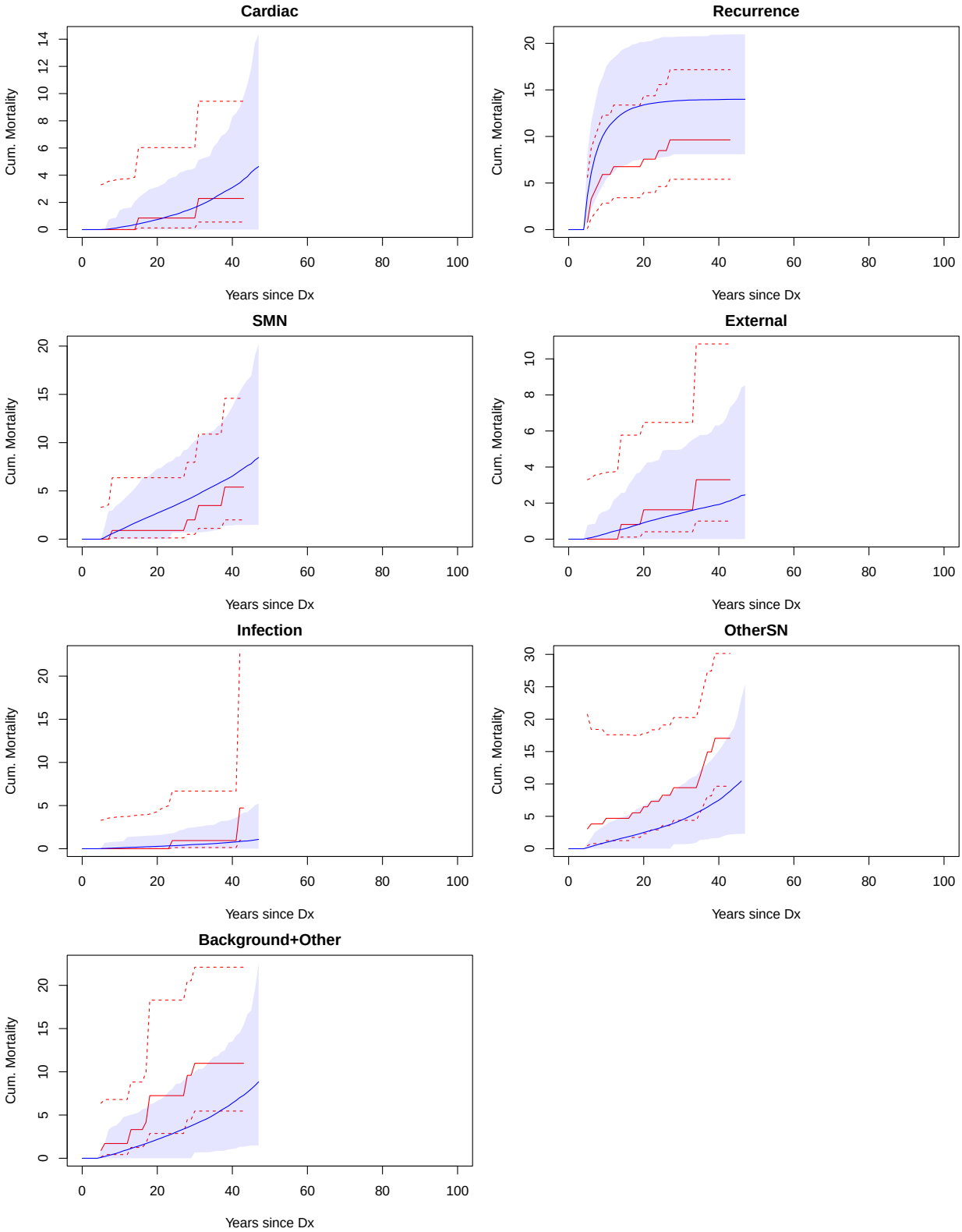
6.5.5.56 CRT<20


Cardiac
Cum. Mortality
Years since Dx
Recurrence
Cum. Mortality
Years since Dx
SMN
Cum. Mortality
Years since Dx
External
Cum. Mortality
Years since Dx
Infection
Cum. Mortality
Years since Dx
OtherSN
Cum. Mortality
Years since Dx
Background+Other
Cum. Mortality
Years since Dx

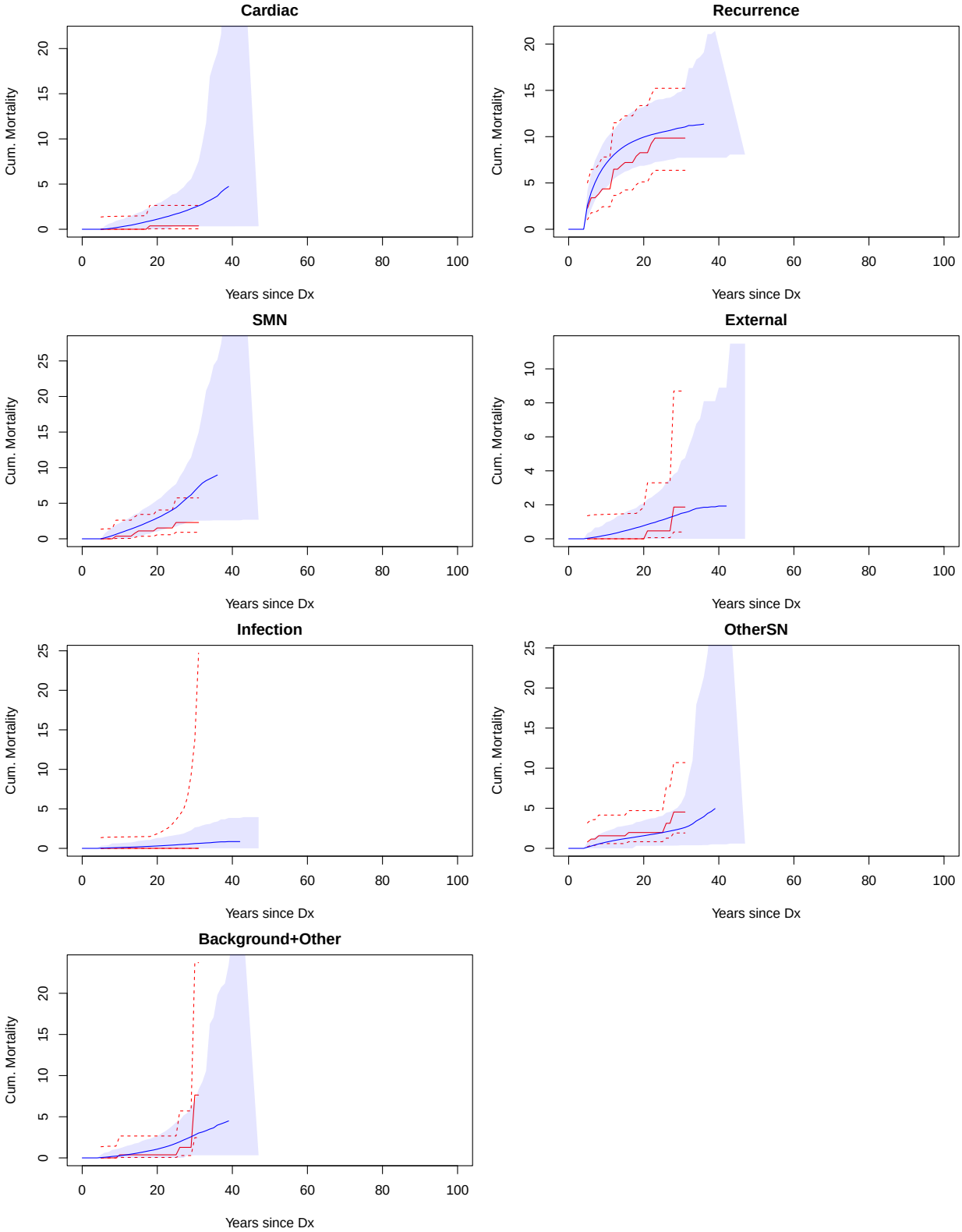
6.5.5.57 CRT20_29



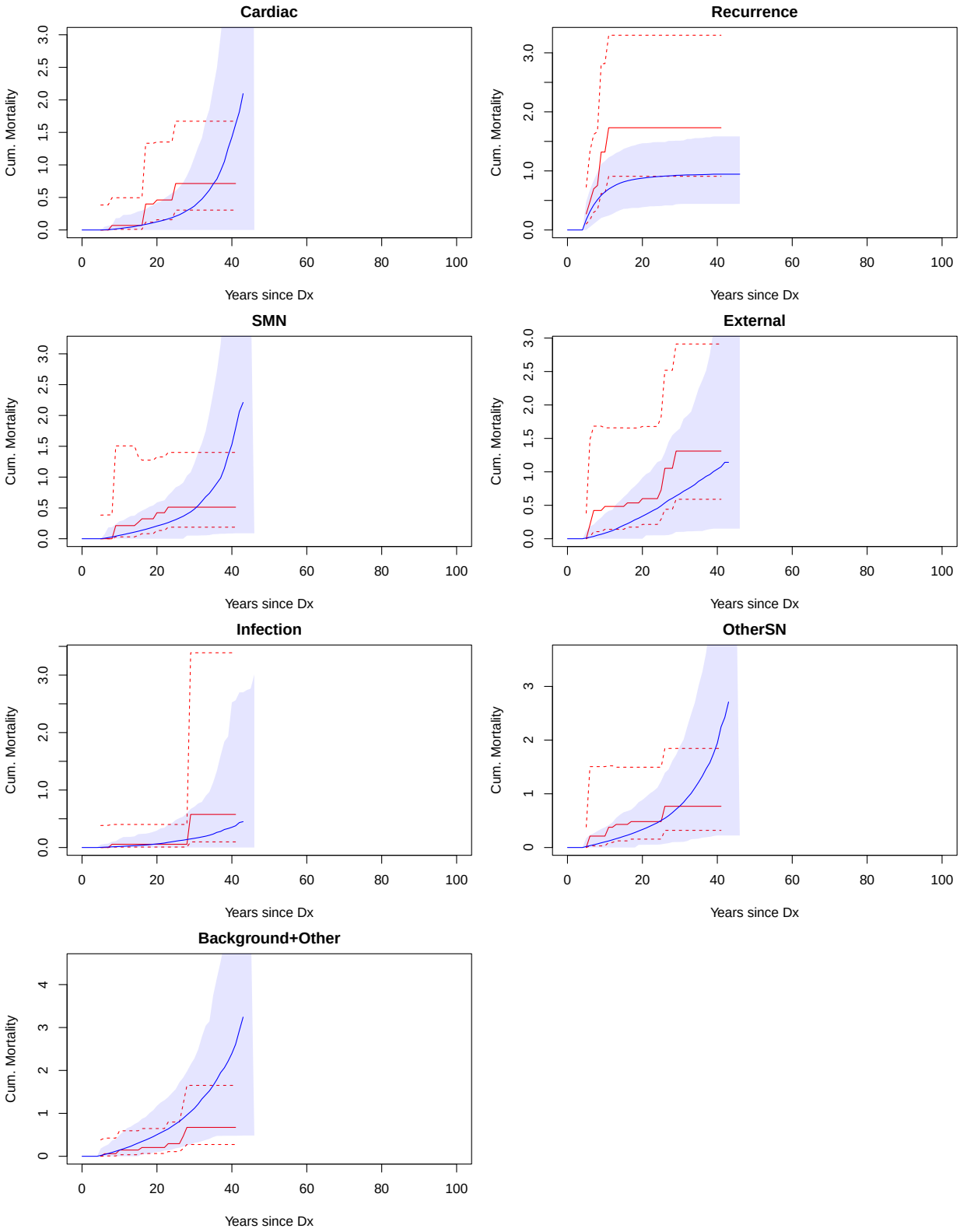
6.5.5.58 CRT30_49



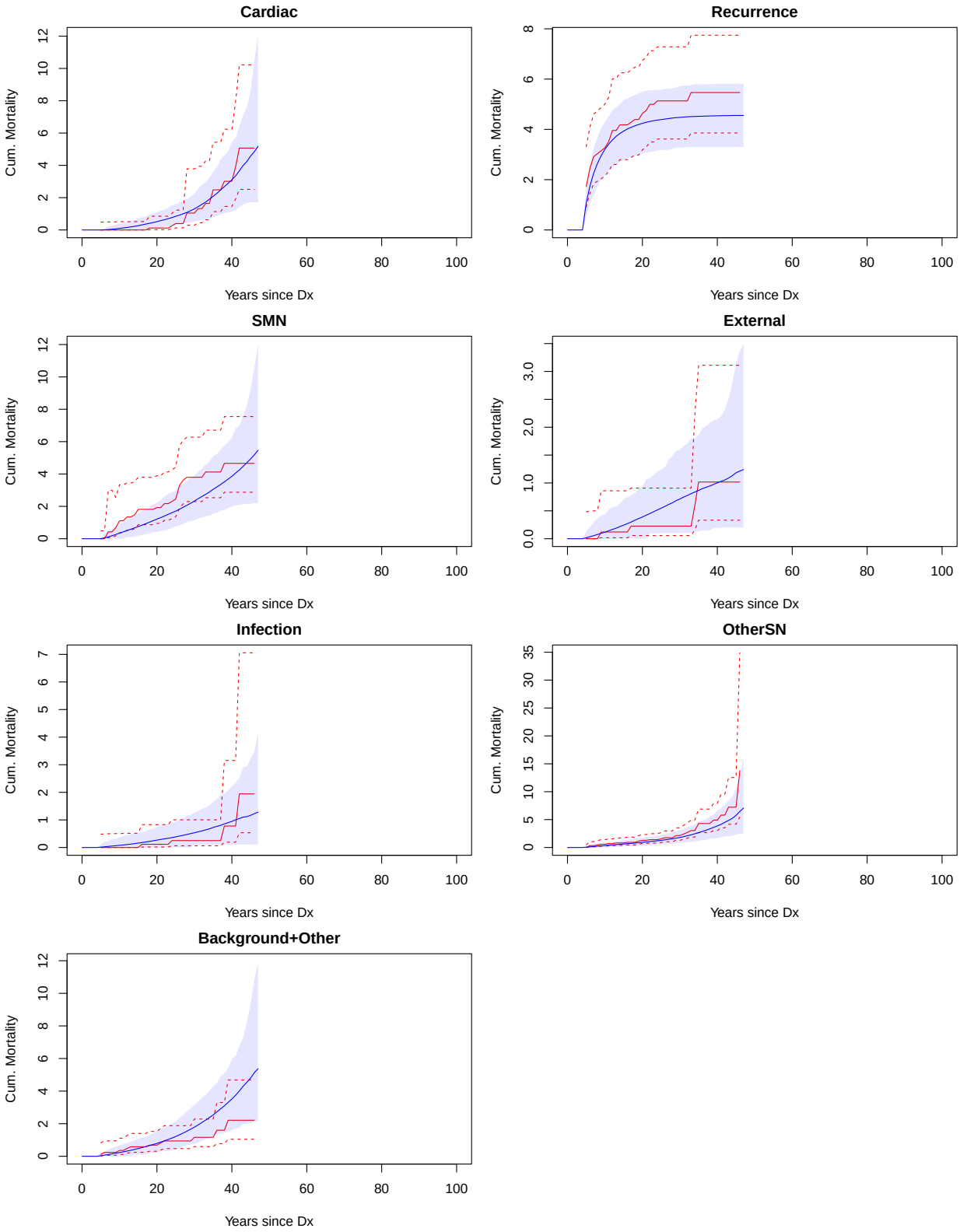
6.5.5.59 CRT50+


Cardiac
Recurrence
SMN
External
Infection
OtherSN
Background+Other
Cum. Mortality
Years since Dx

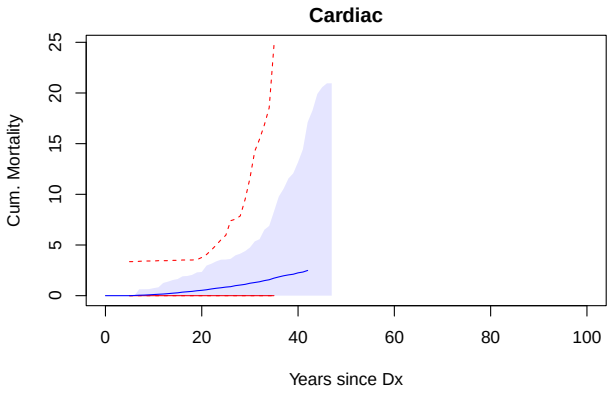
6.5.5.60 OvaryNone

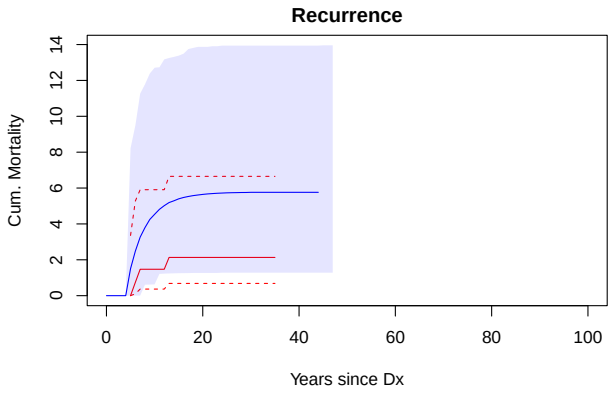


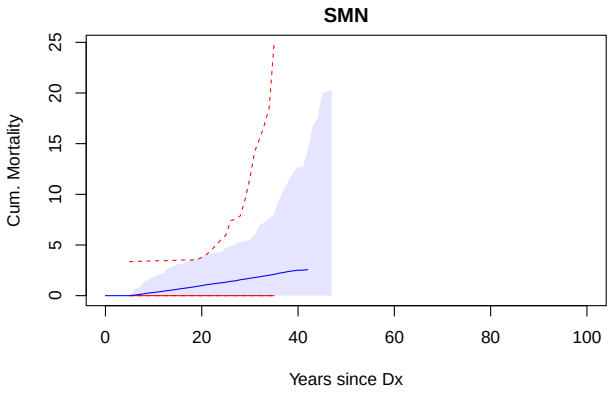
6.5.5.61 Ovary<10

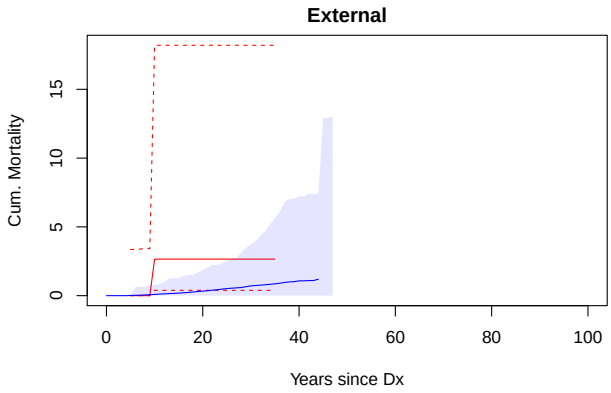


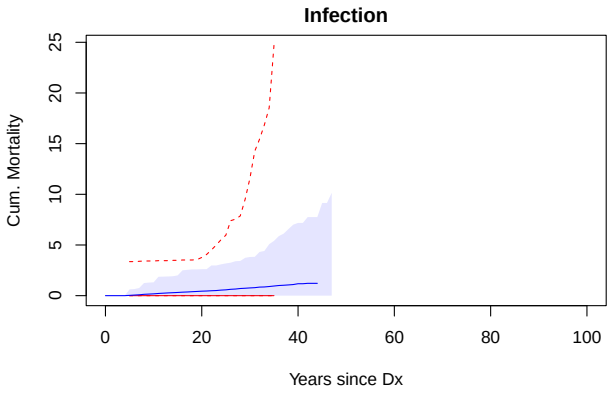
6.5.5.62 Ovary10-19

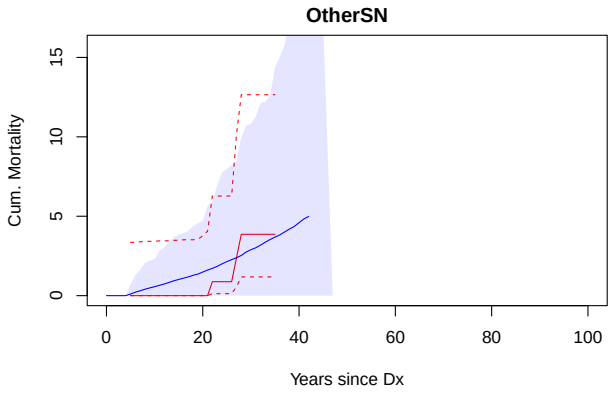


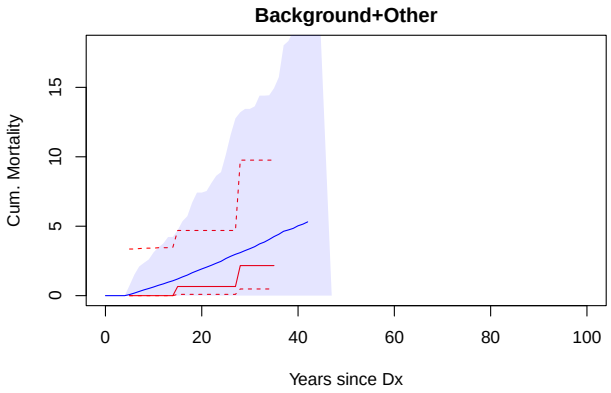




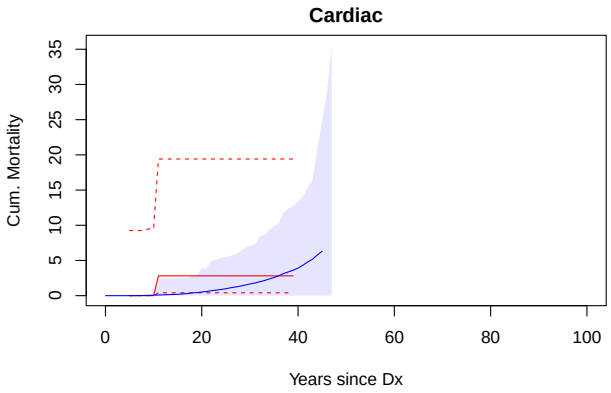


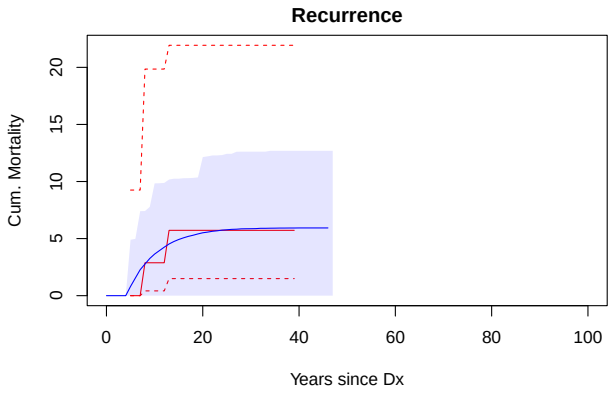


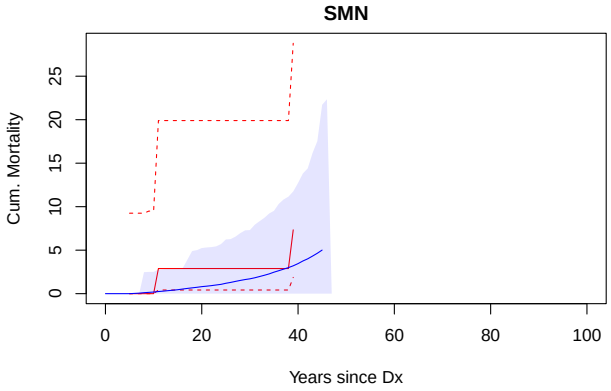


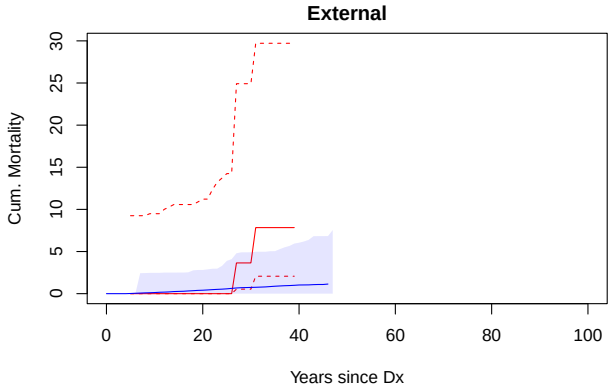


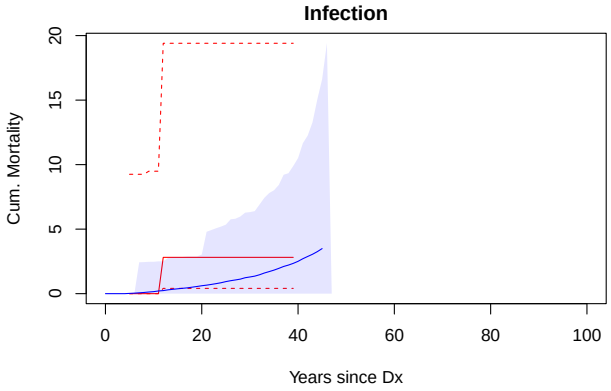
6.5.5.63 Ovary20+

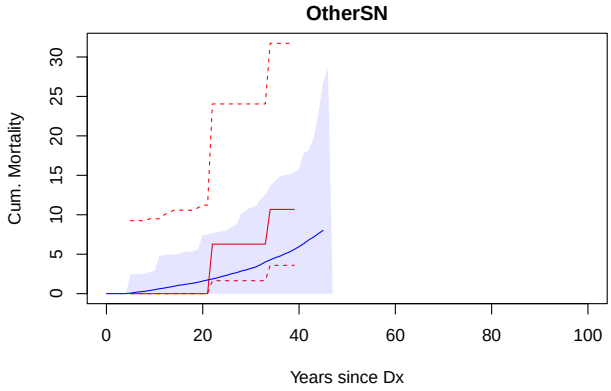


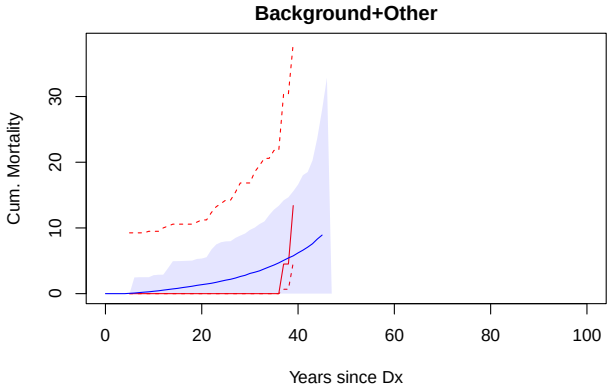




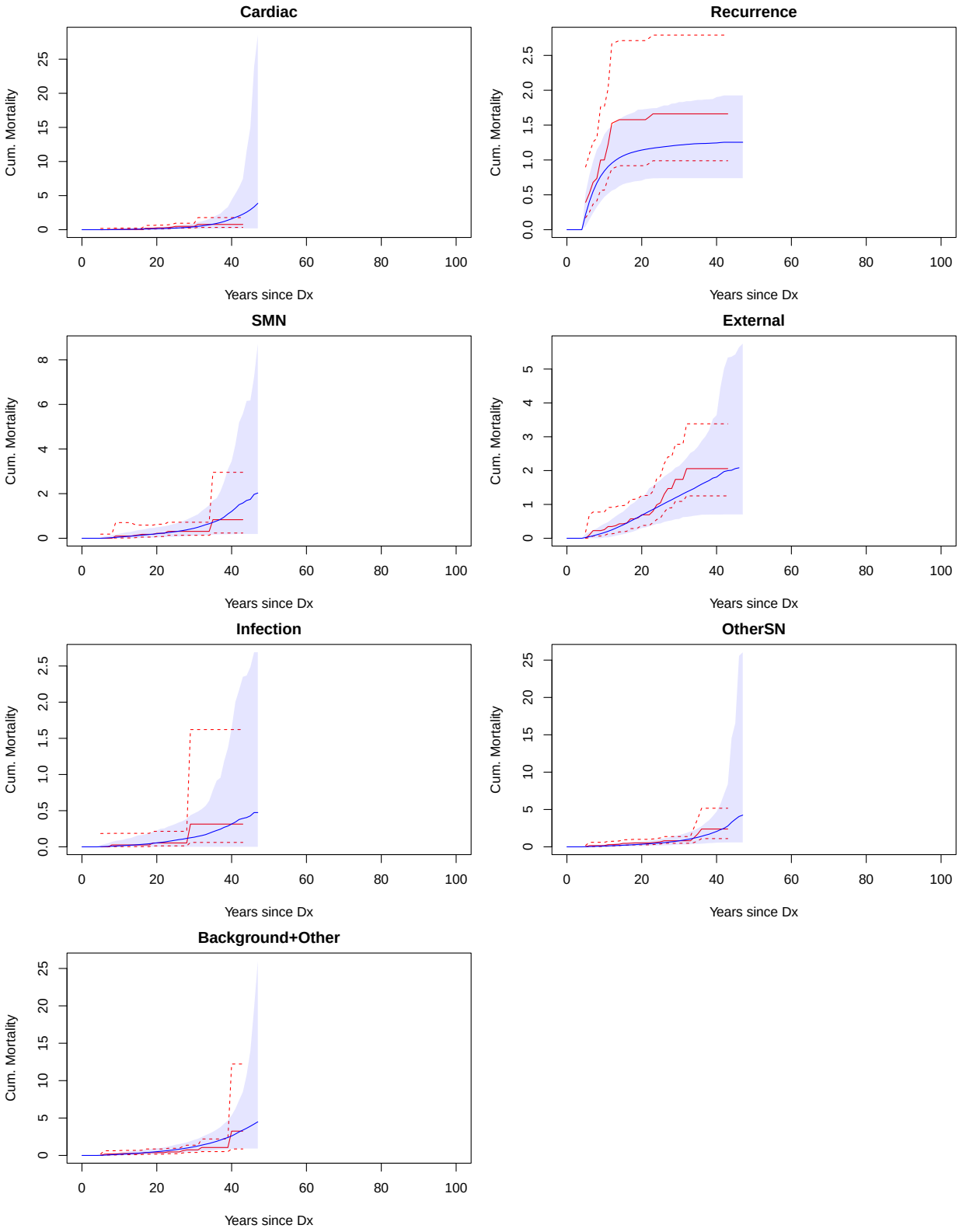




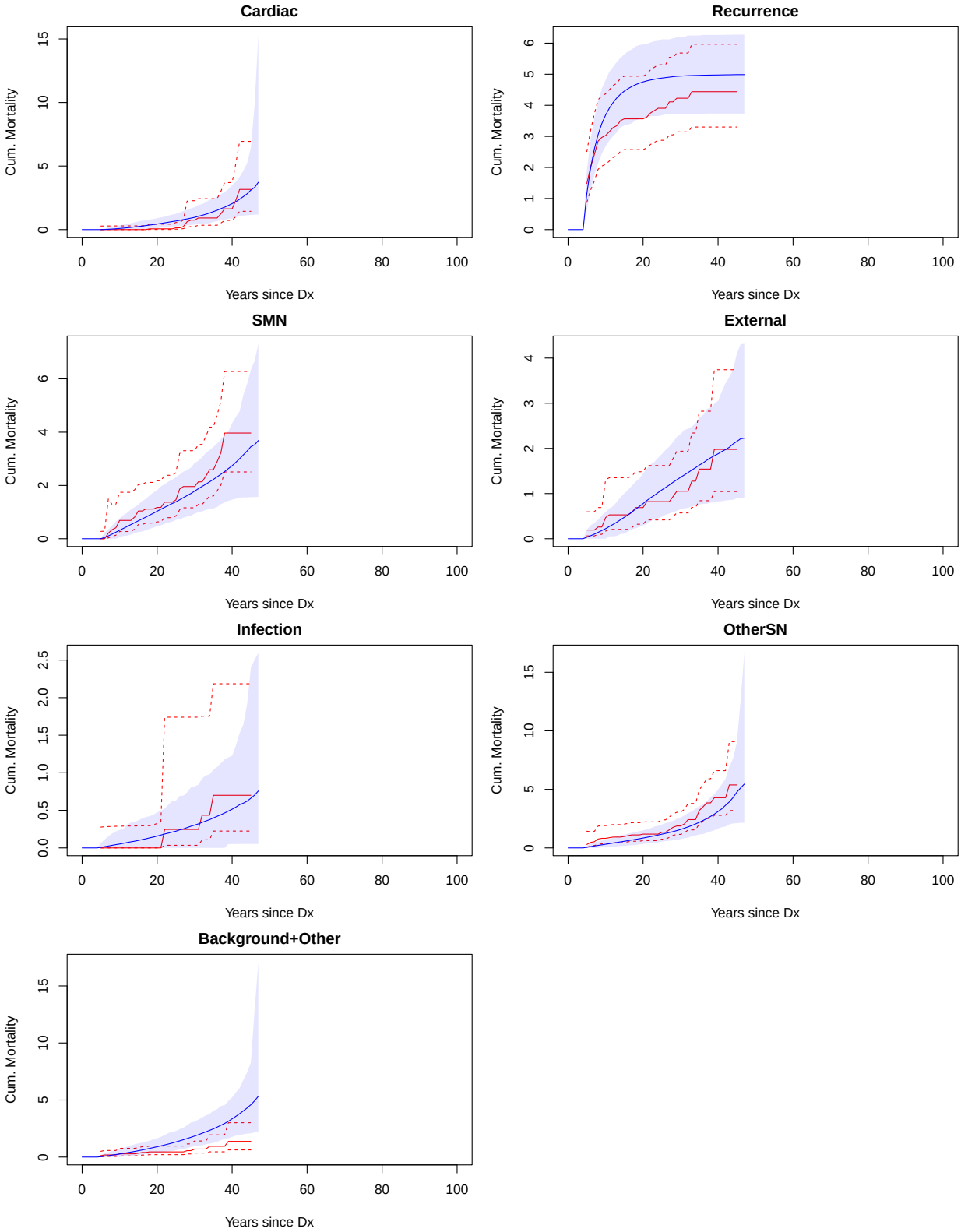




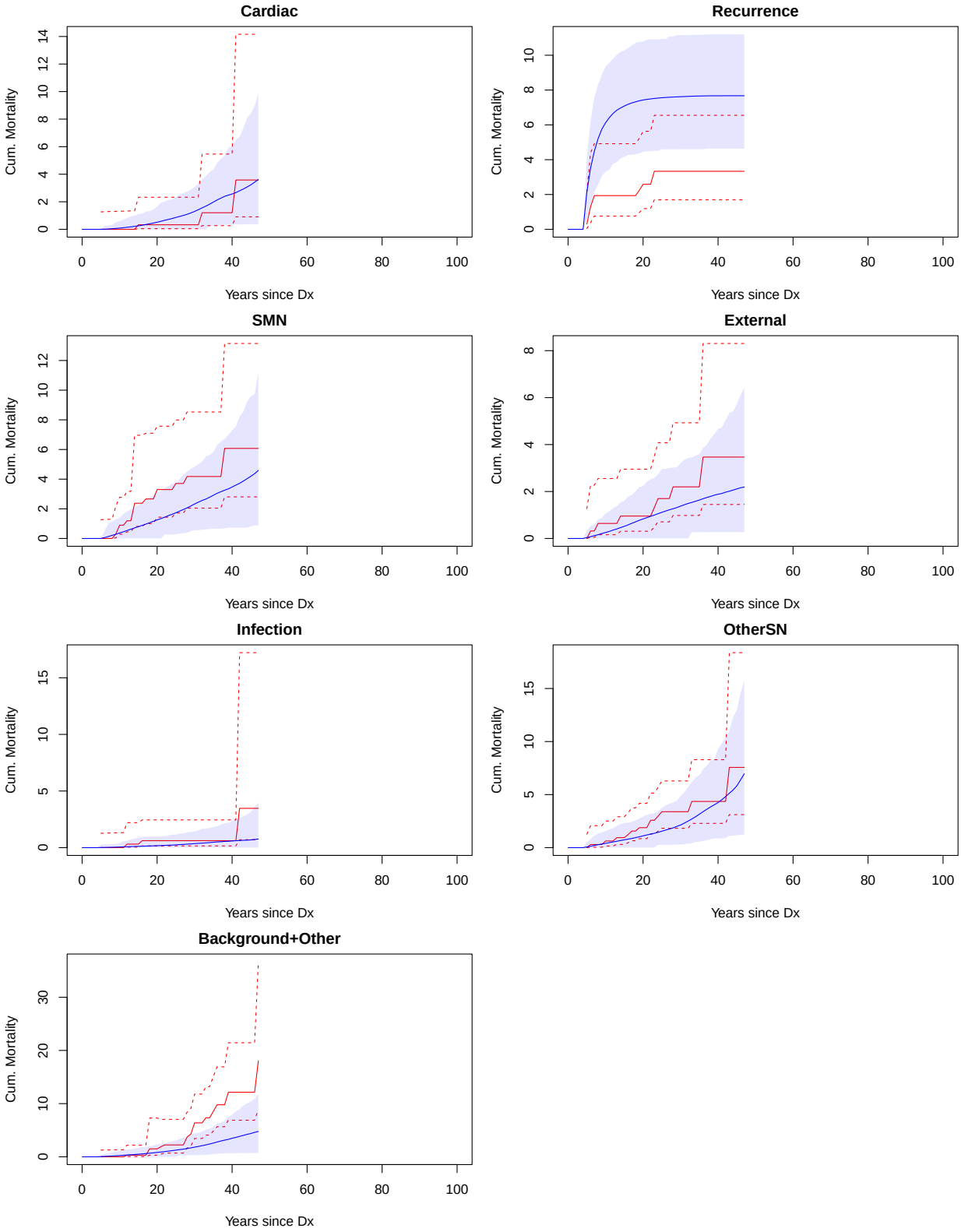
6.5.5.64 AbdPelNone



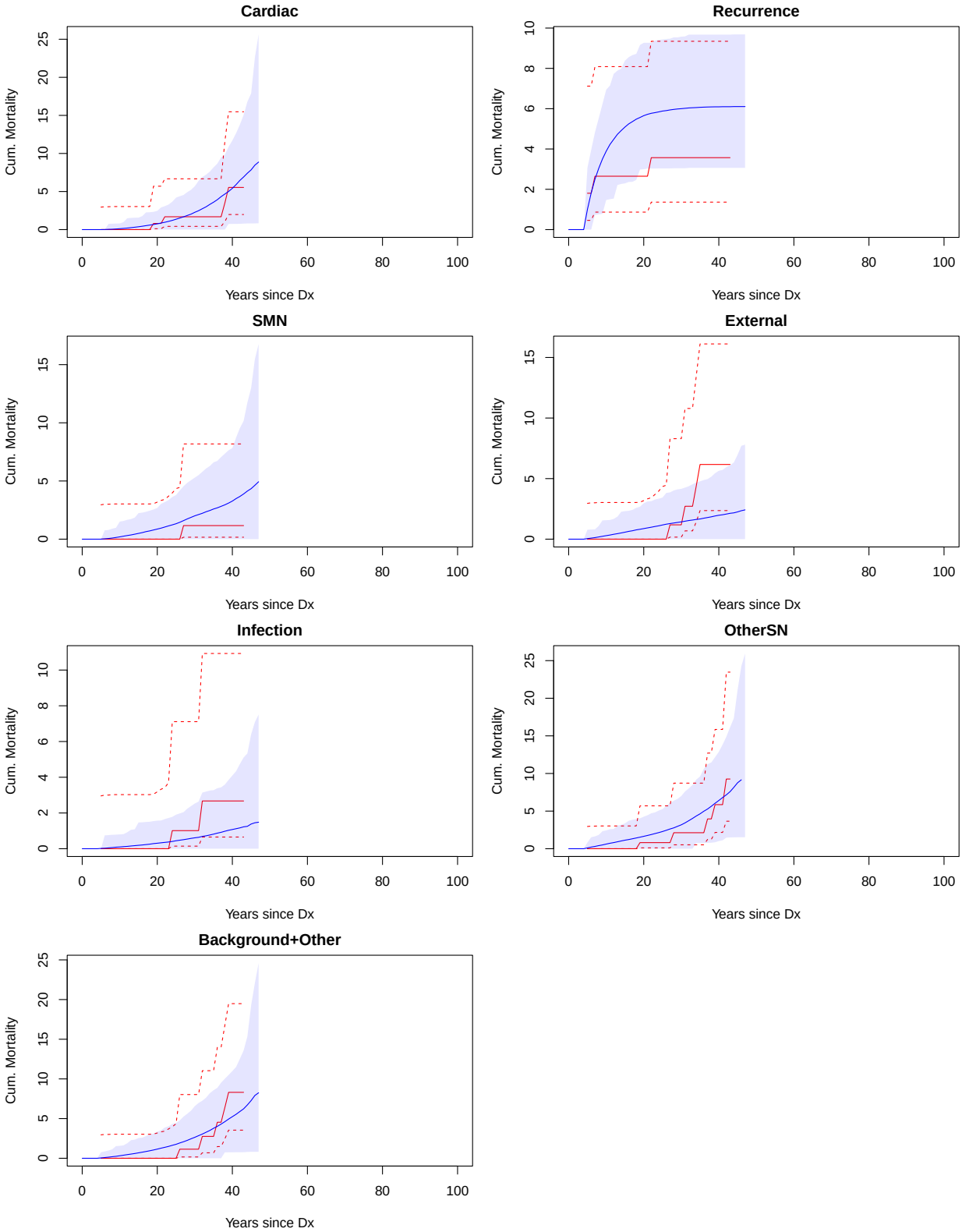
6.5.5.65 AbdPel<15



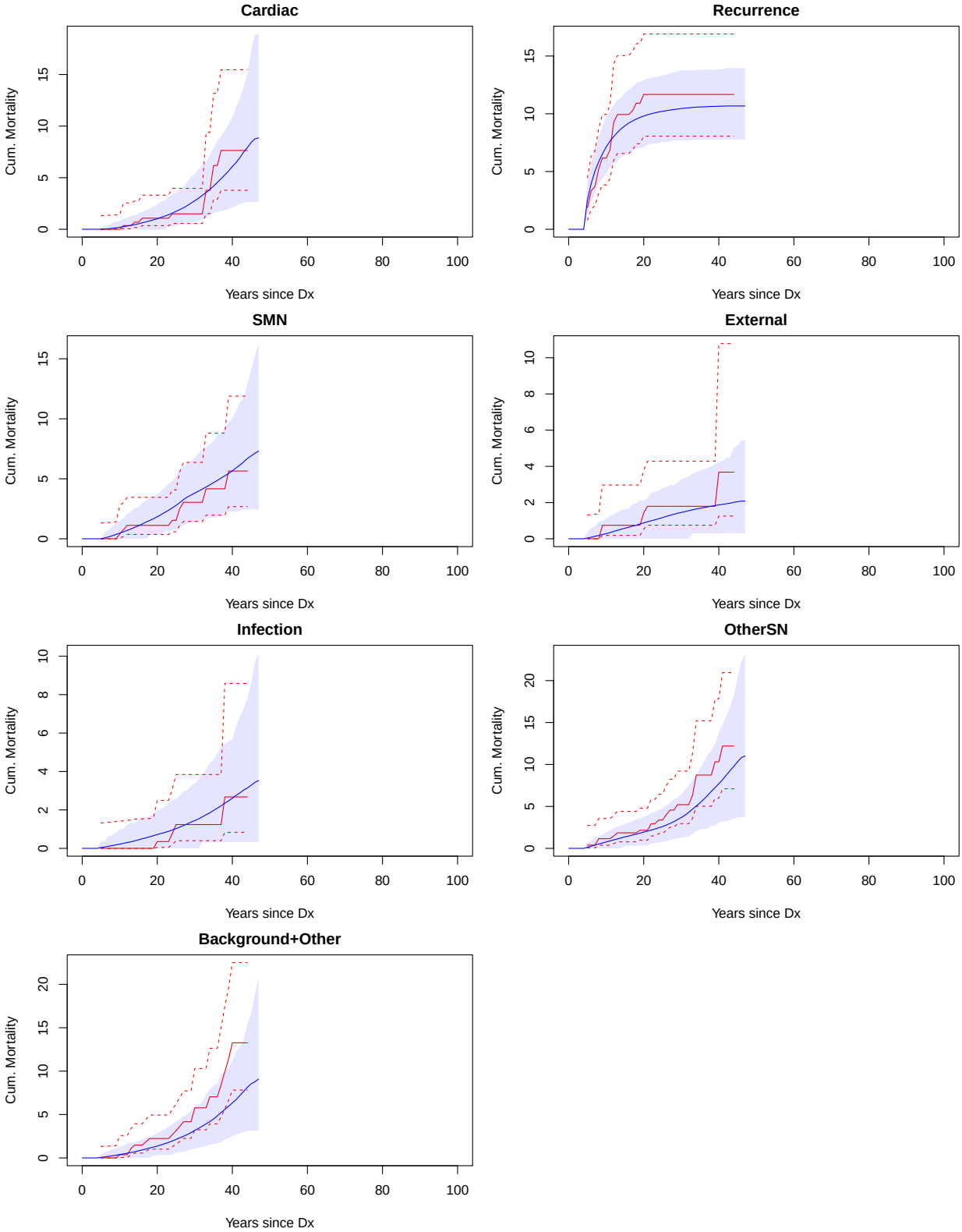
6.5.5.66 AbdPel15_24



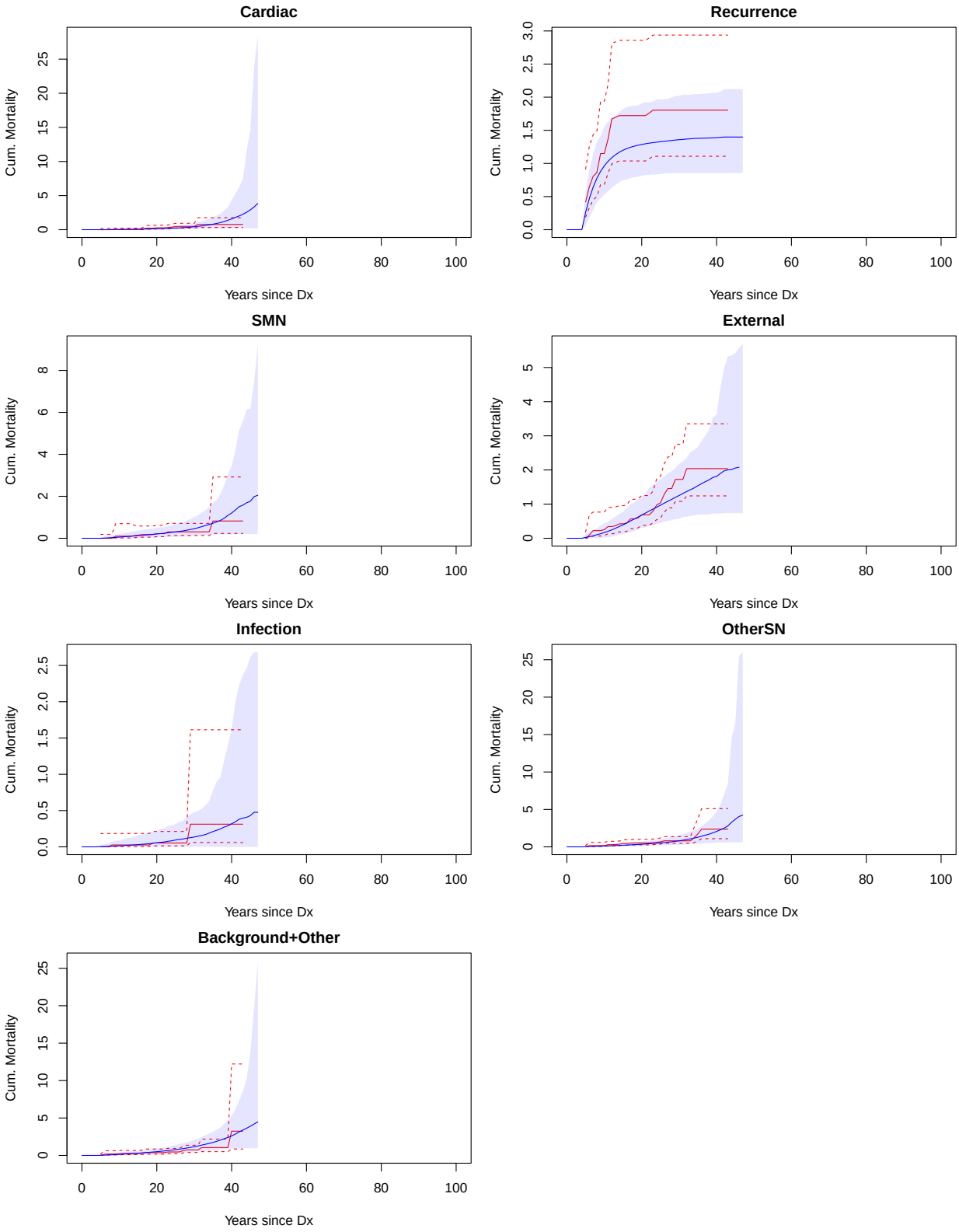
6.5.5.67 AbdPel25_34



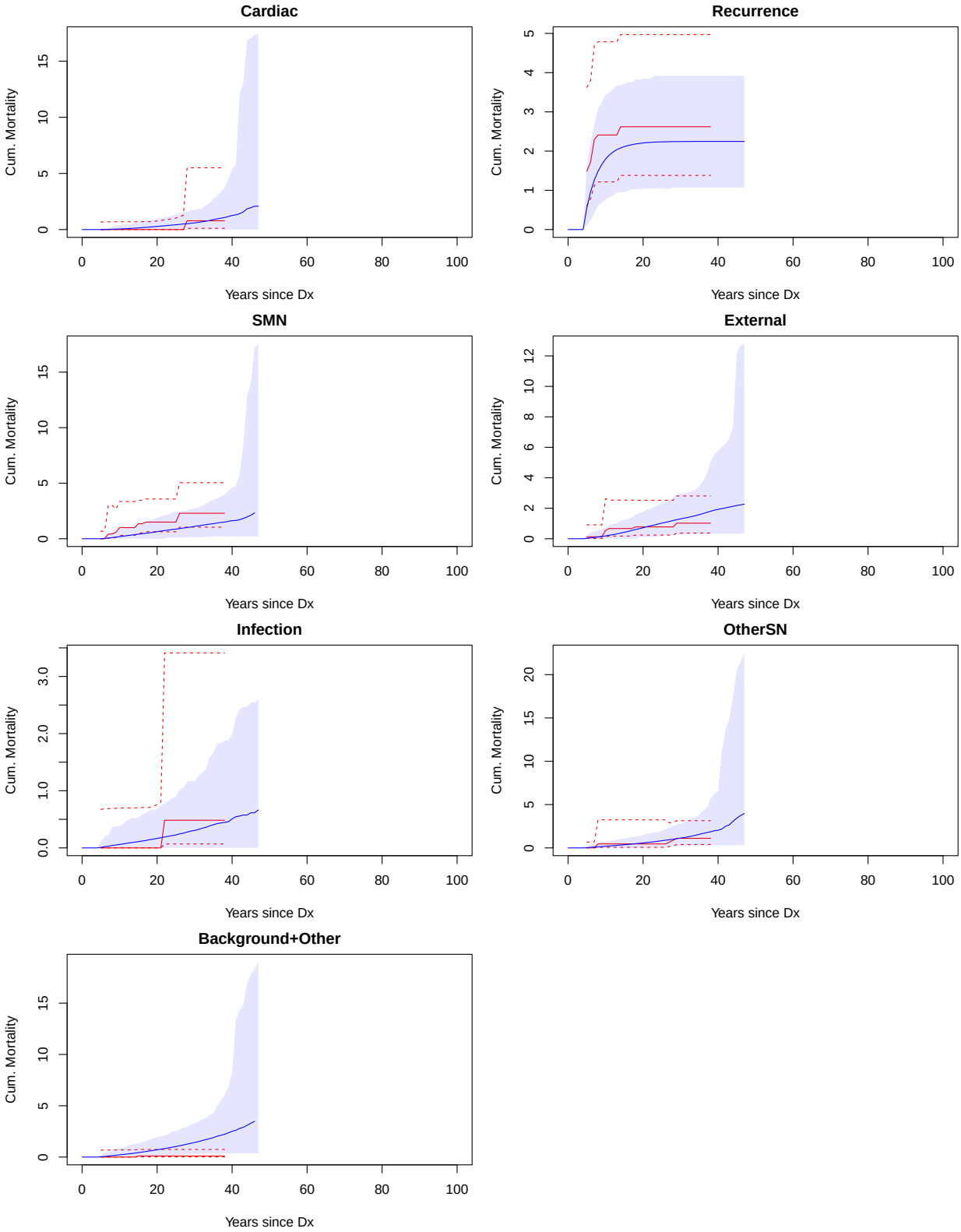
6.5.5.68 AbdPel35+



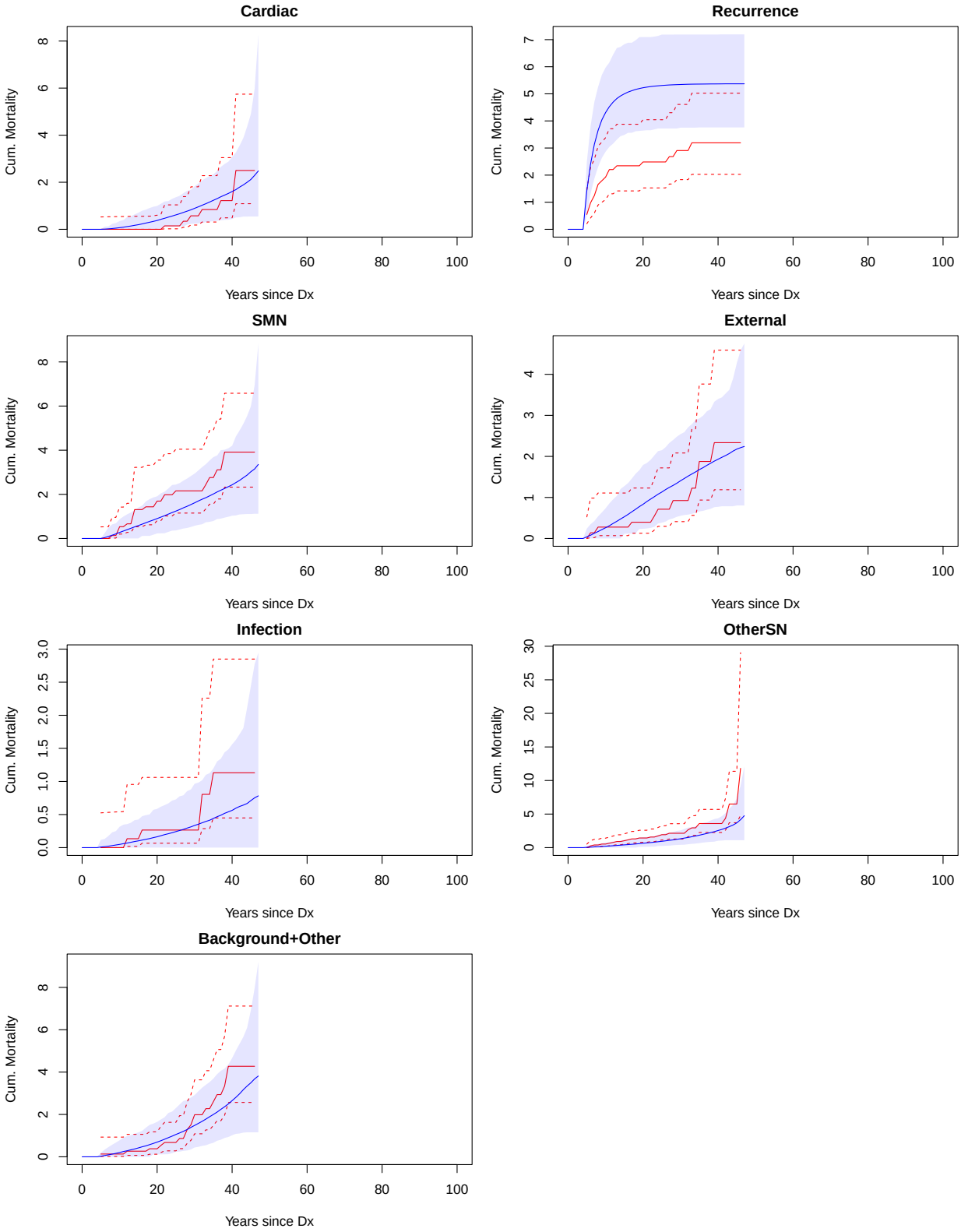
6.5.5.69 MaxRTNone



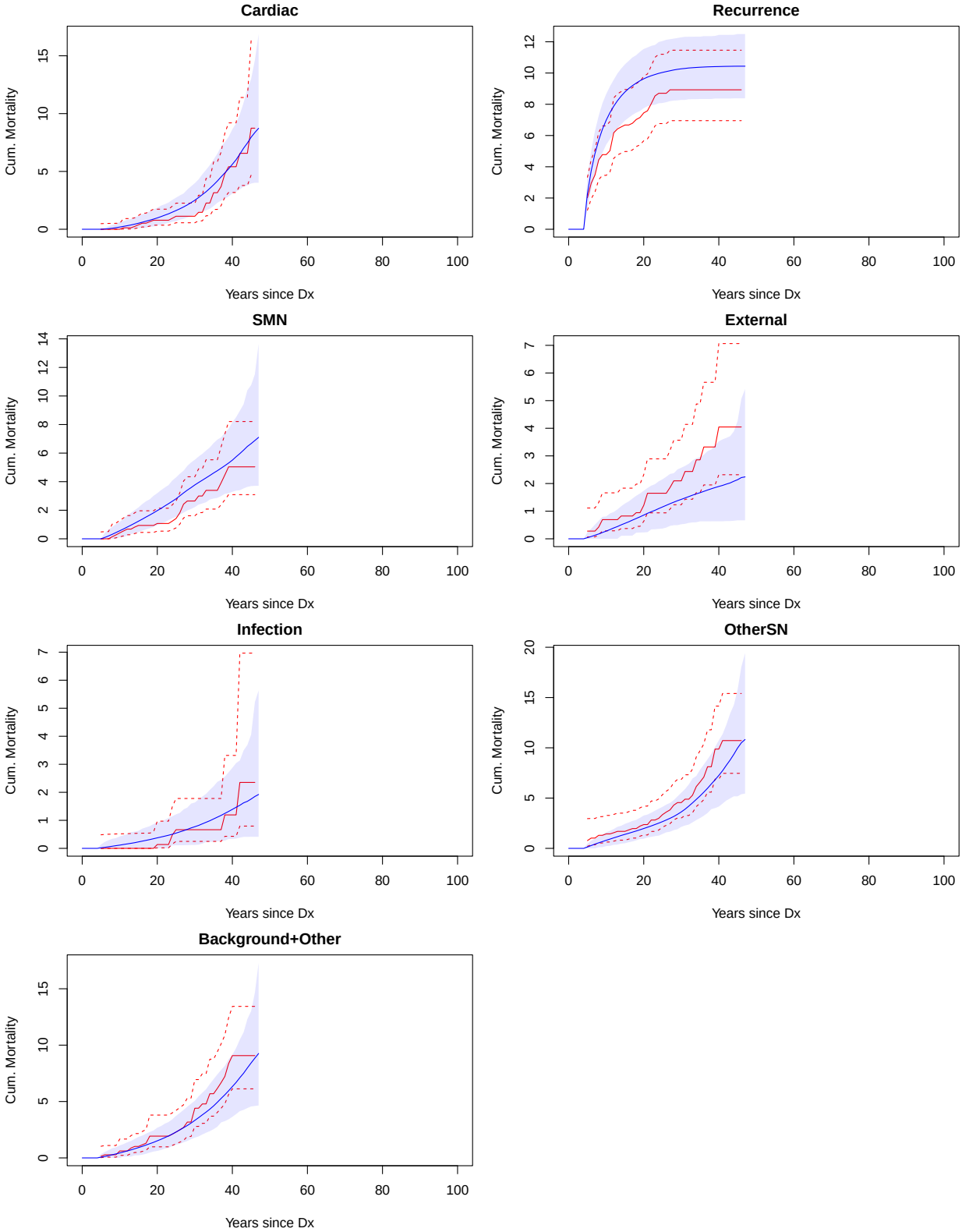
6.5.5.70 MaxRT<20



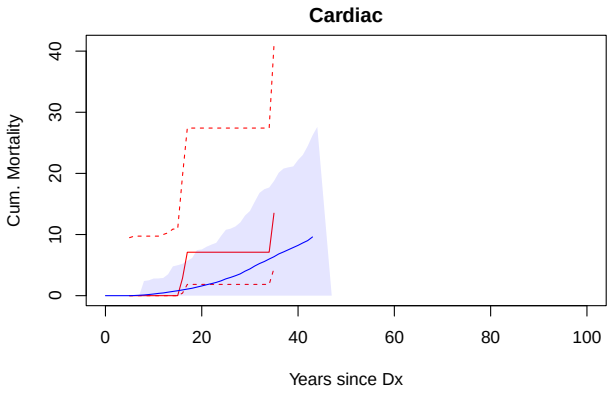
6.5.5.71 MaxRT20_29

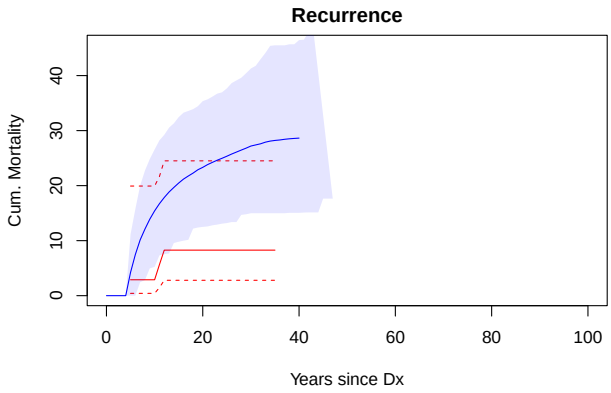


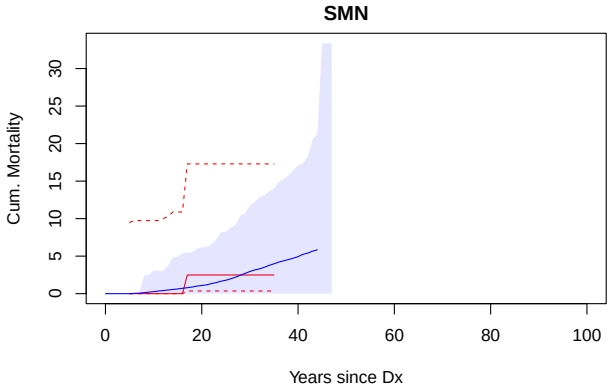
6.5.5.72 MaxRT30+

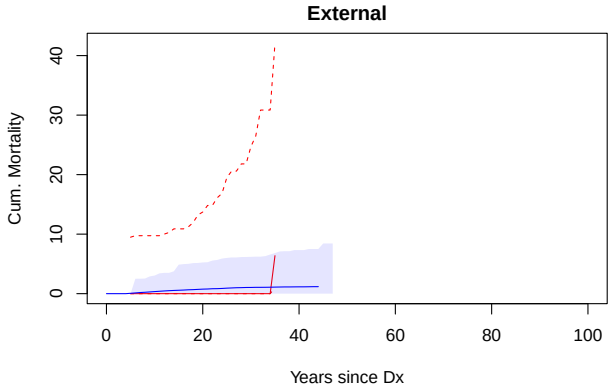


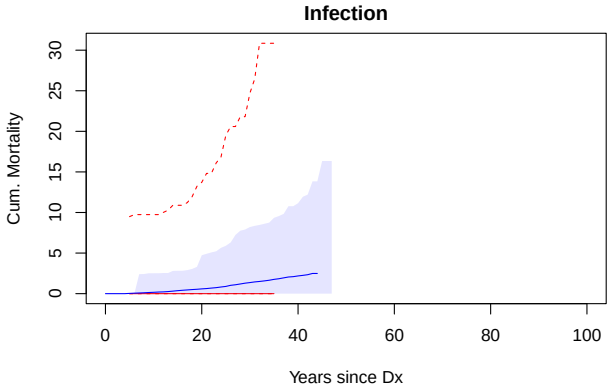
6.5.5.73 HL grp: Salvage

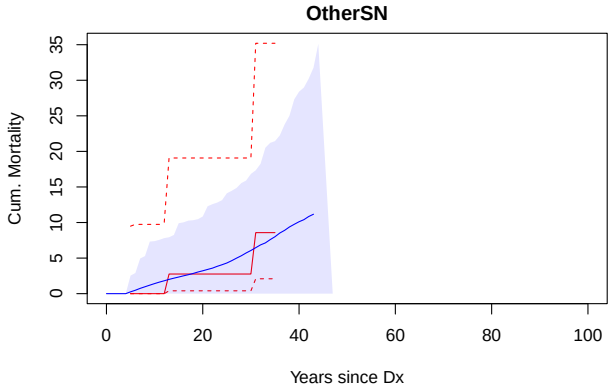


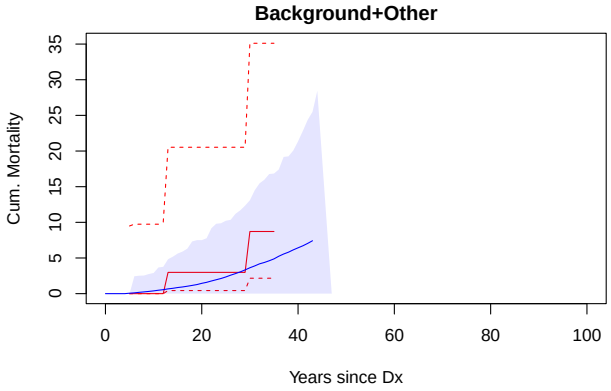




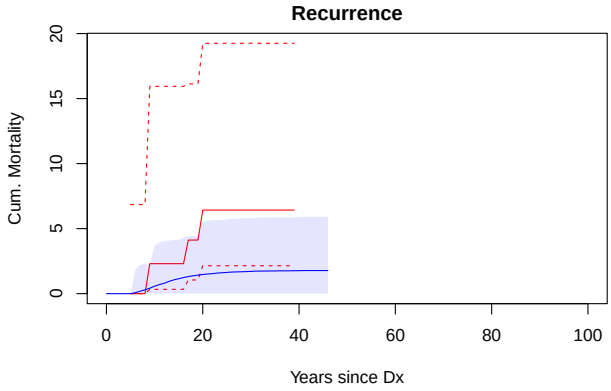


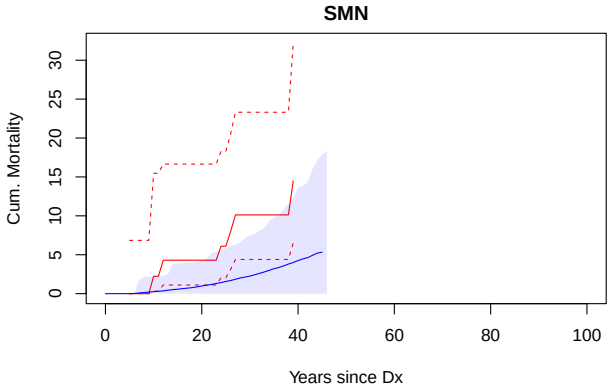


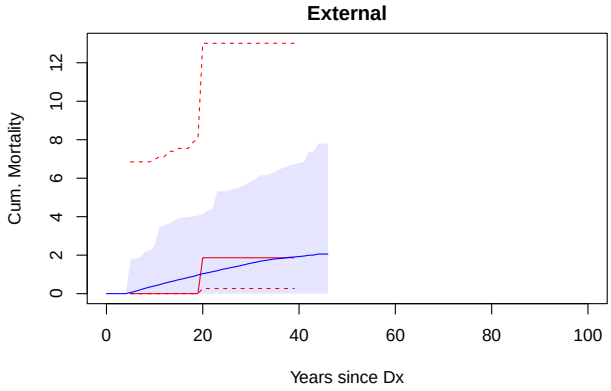


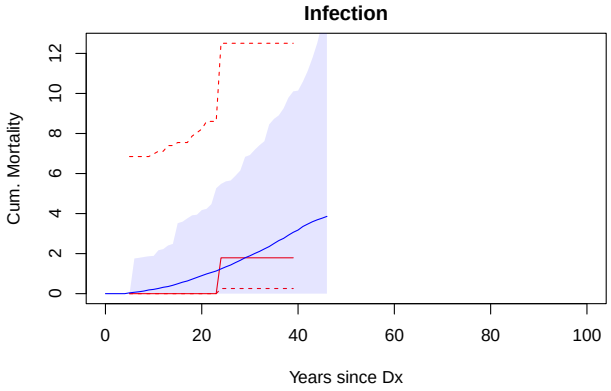


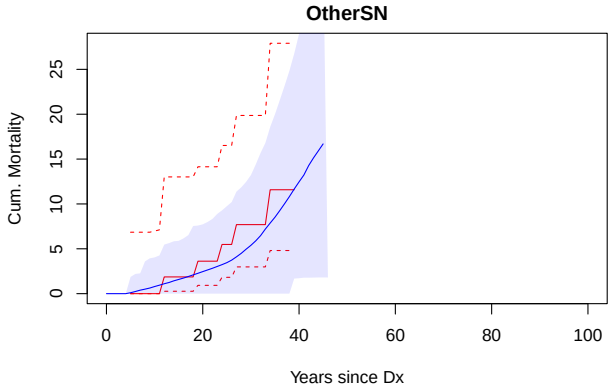
6.5.5.74 HL grp: Extended

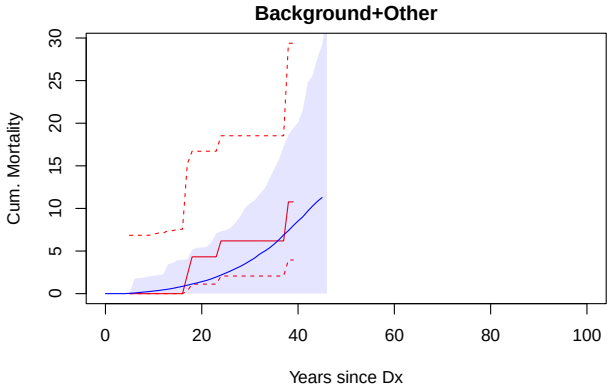




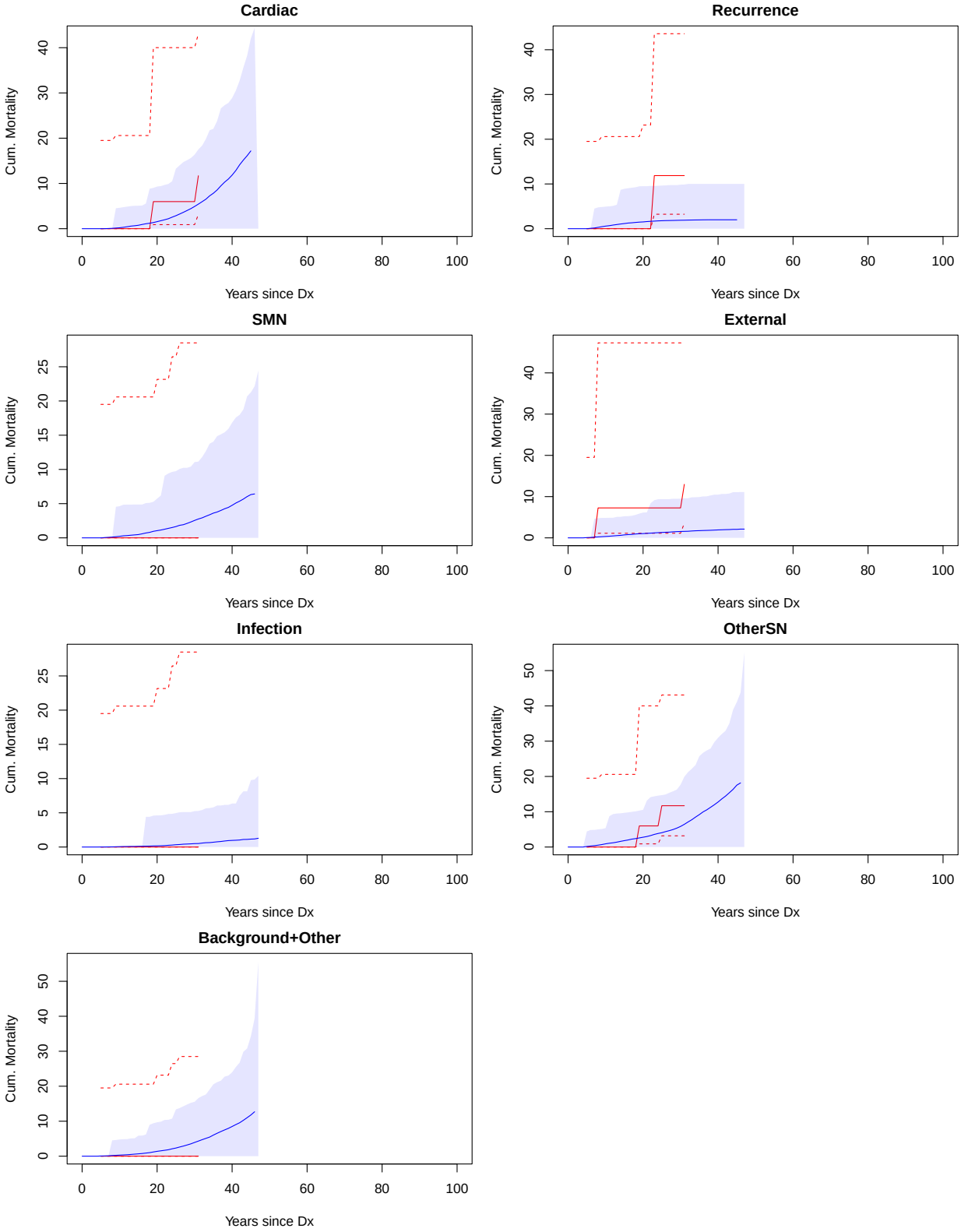




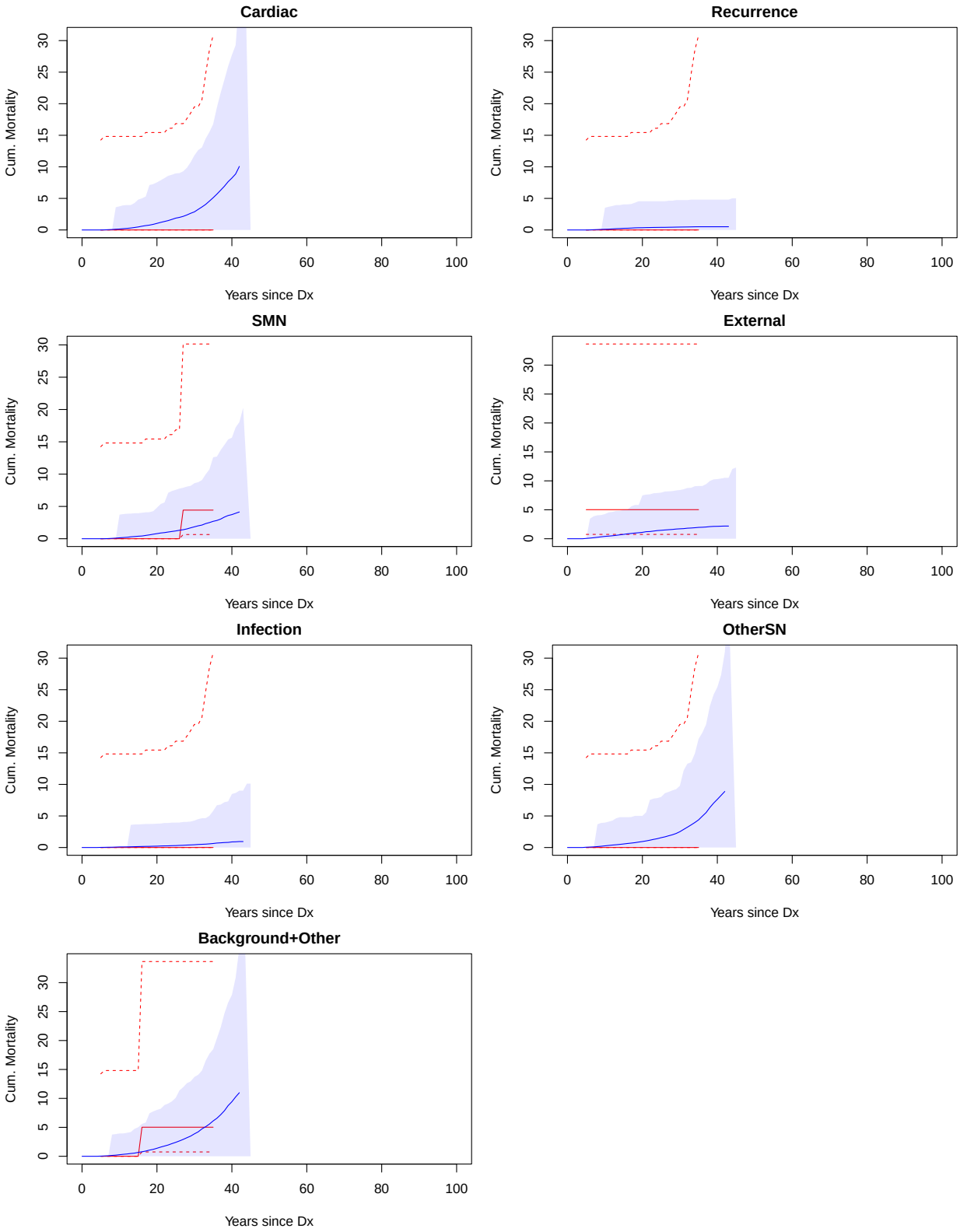




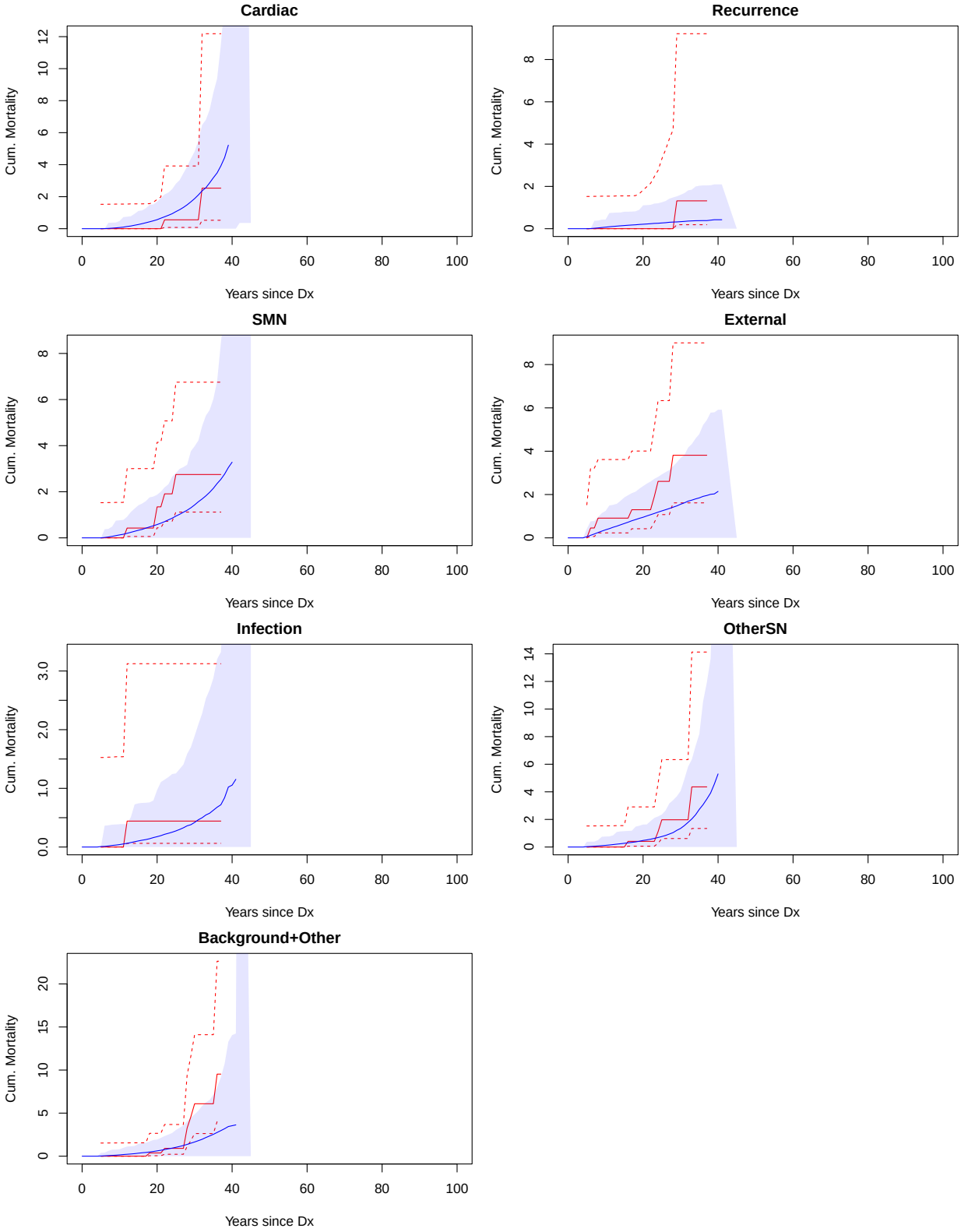
6.5.5.75 HL grp: Chest RT>=35 plus chemo



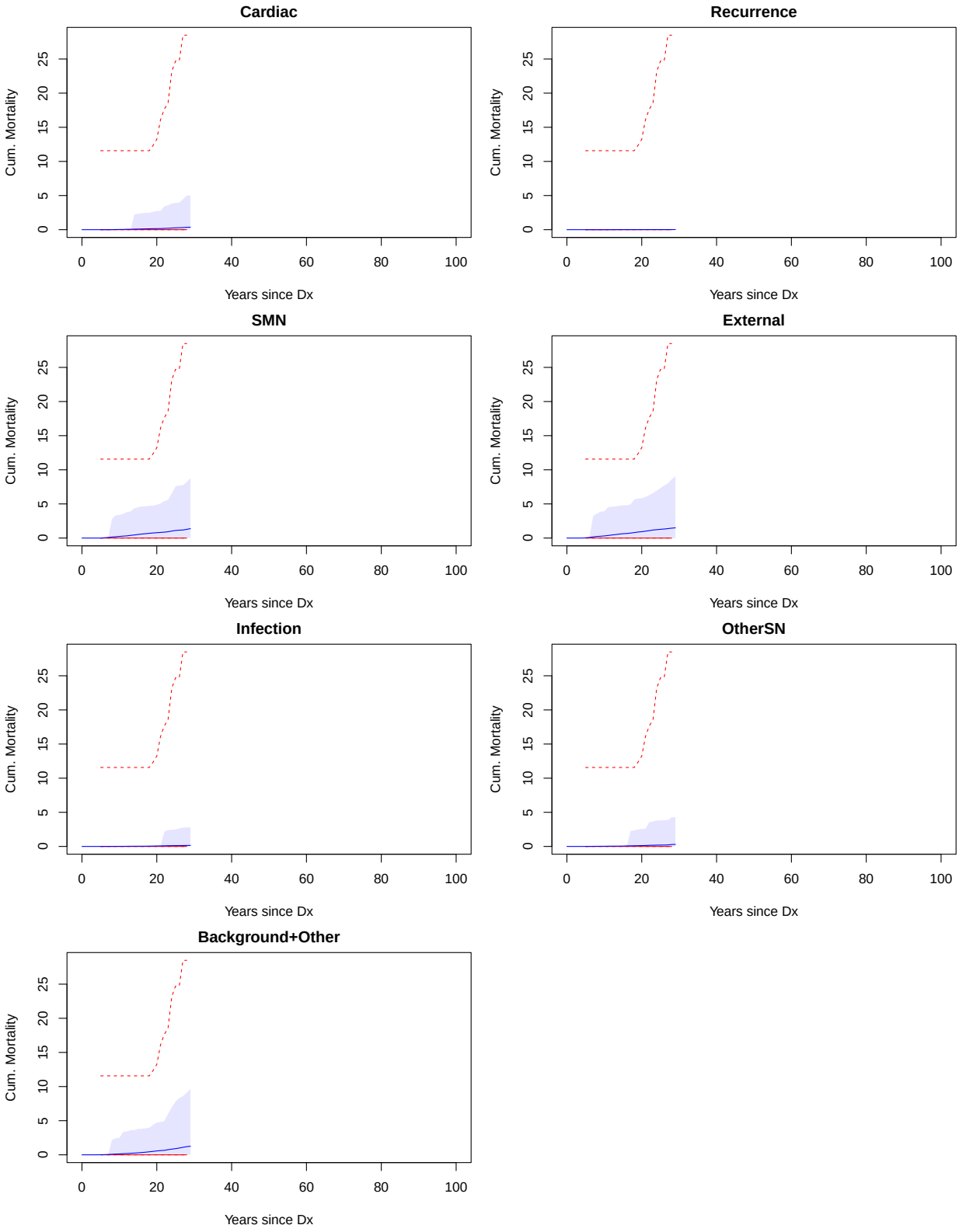
6.5.5.76 HL grp: Chest RT>=35 no chemo



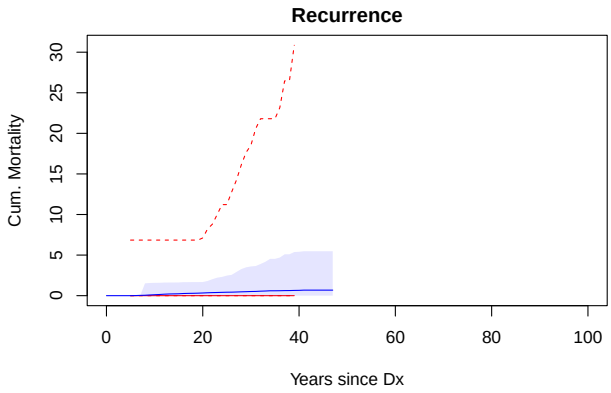
6.5.5.77 HL grp: Chest RT<35 plus chemo

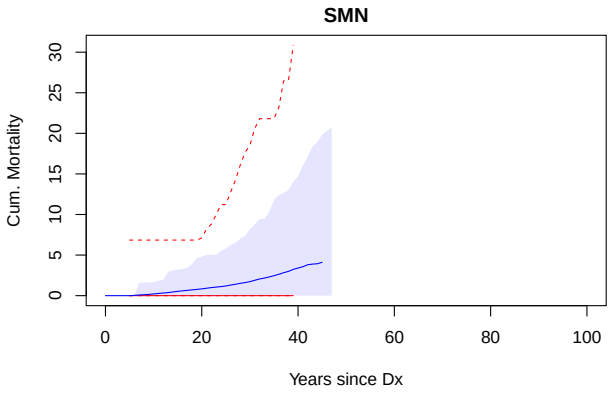


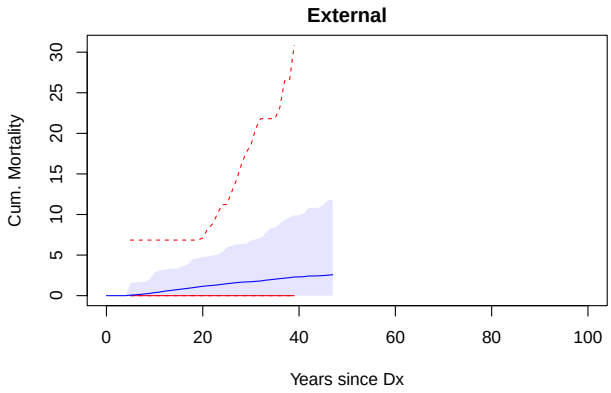
6.5.5.78 HL grp: Chemo without chest RT

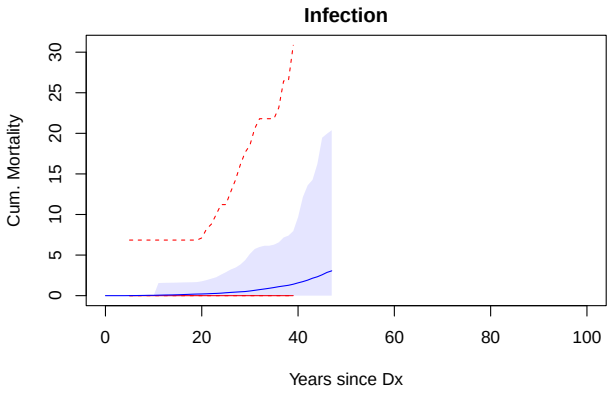


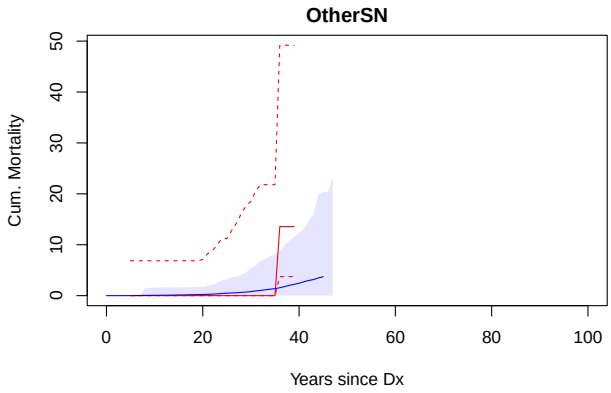
6.5.5.79 HL grp: Other

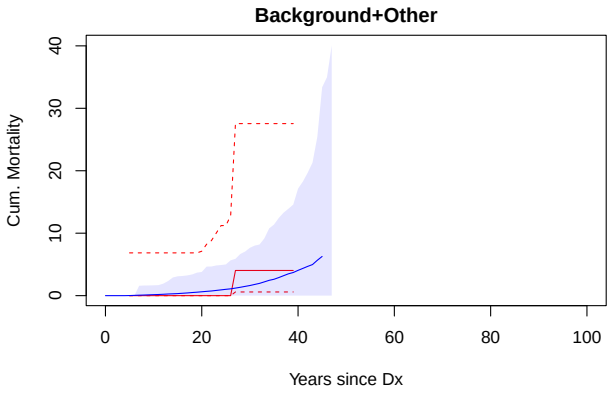




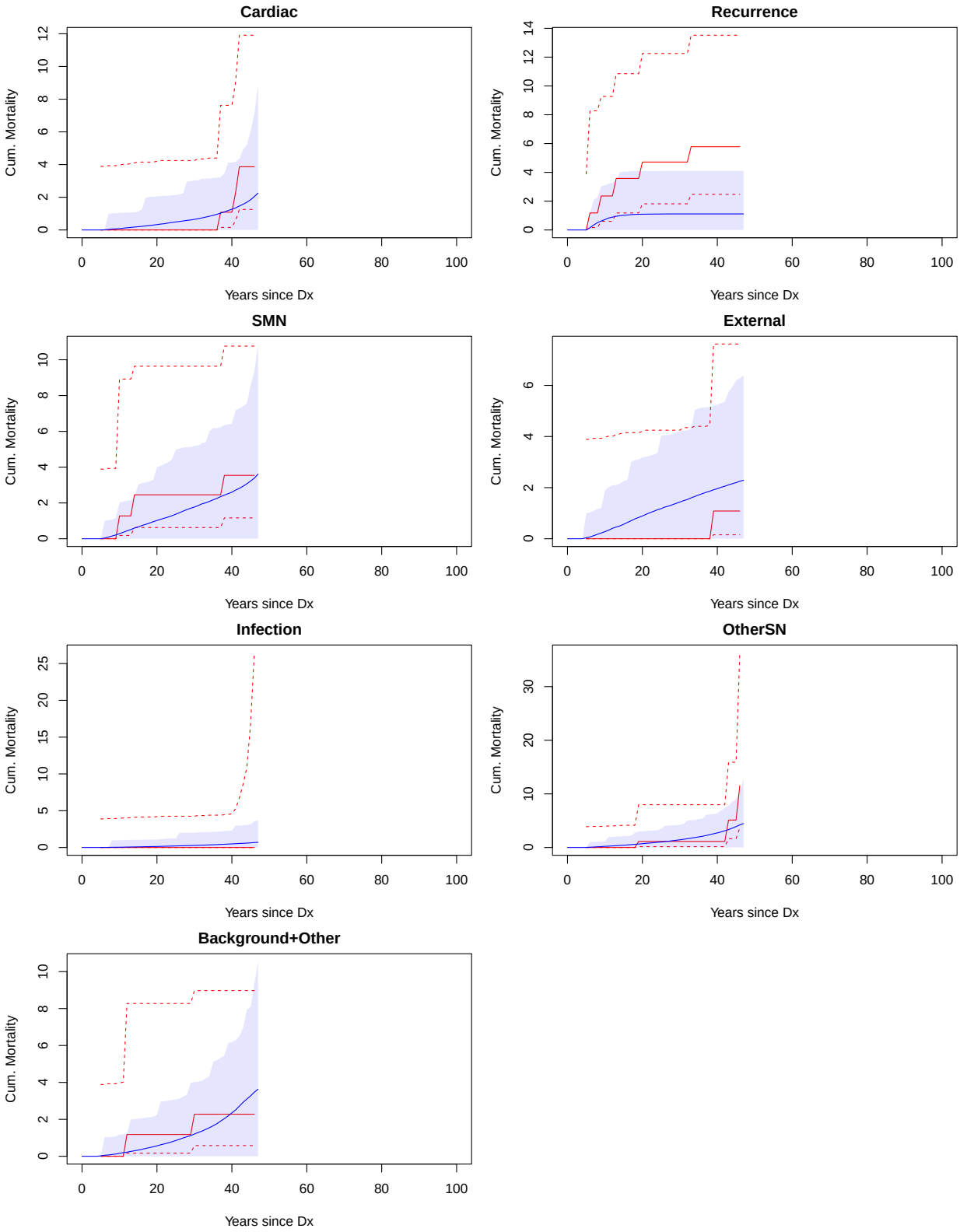




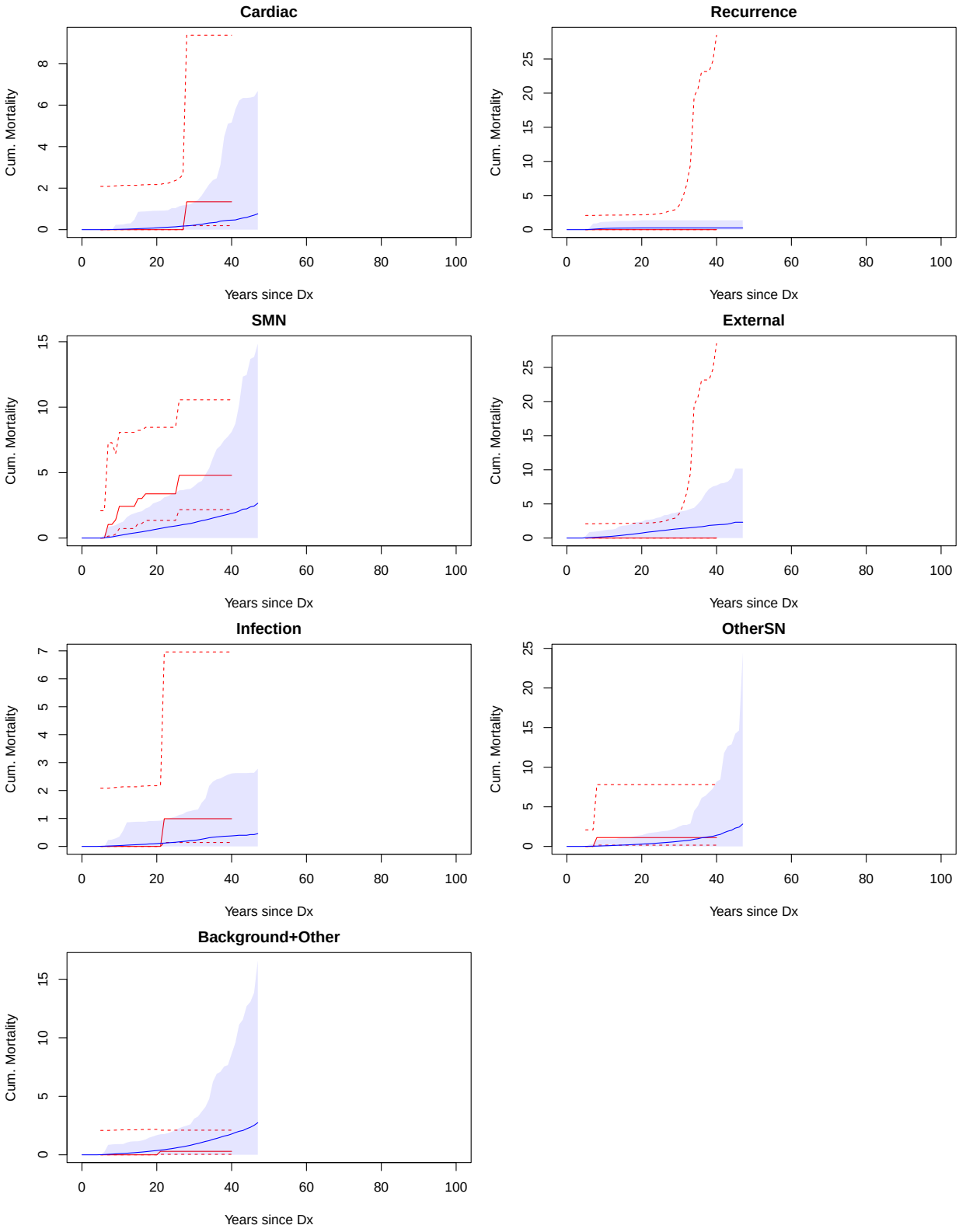




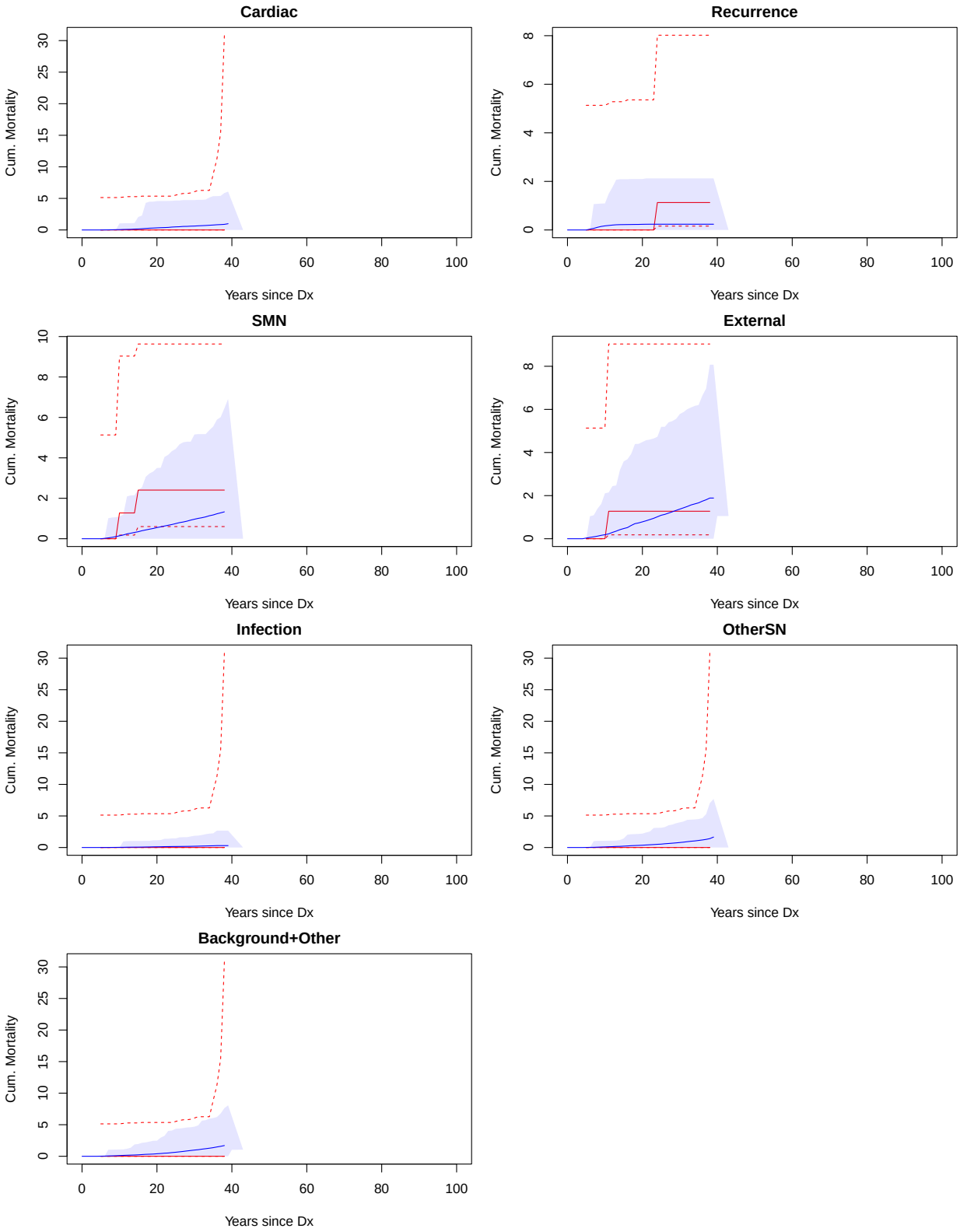
6.5.5.80 ALL grp: 1970s-like



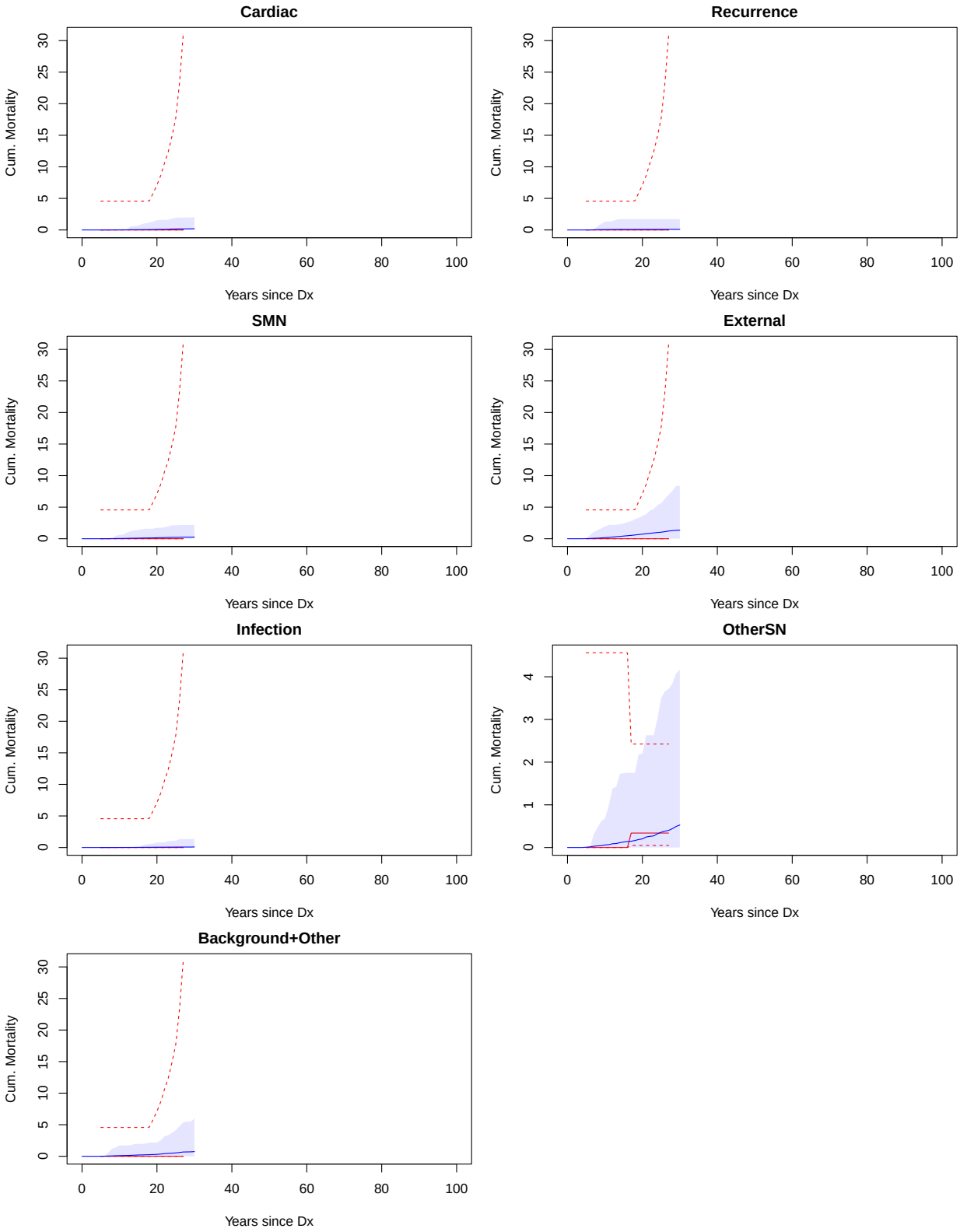
6.5.5.81 ALL grp: 1980s SR-like



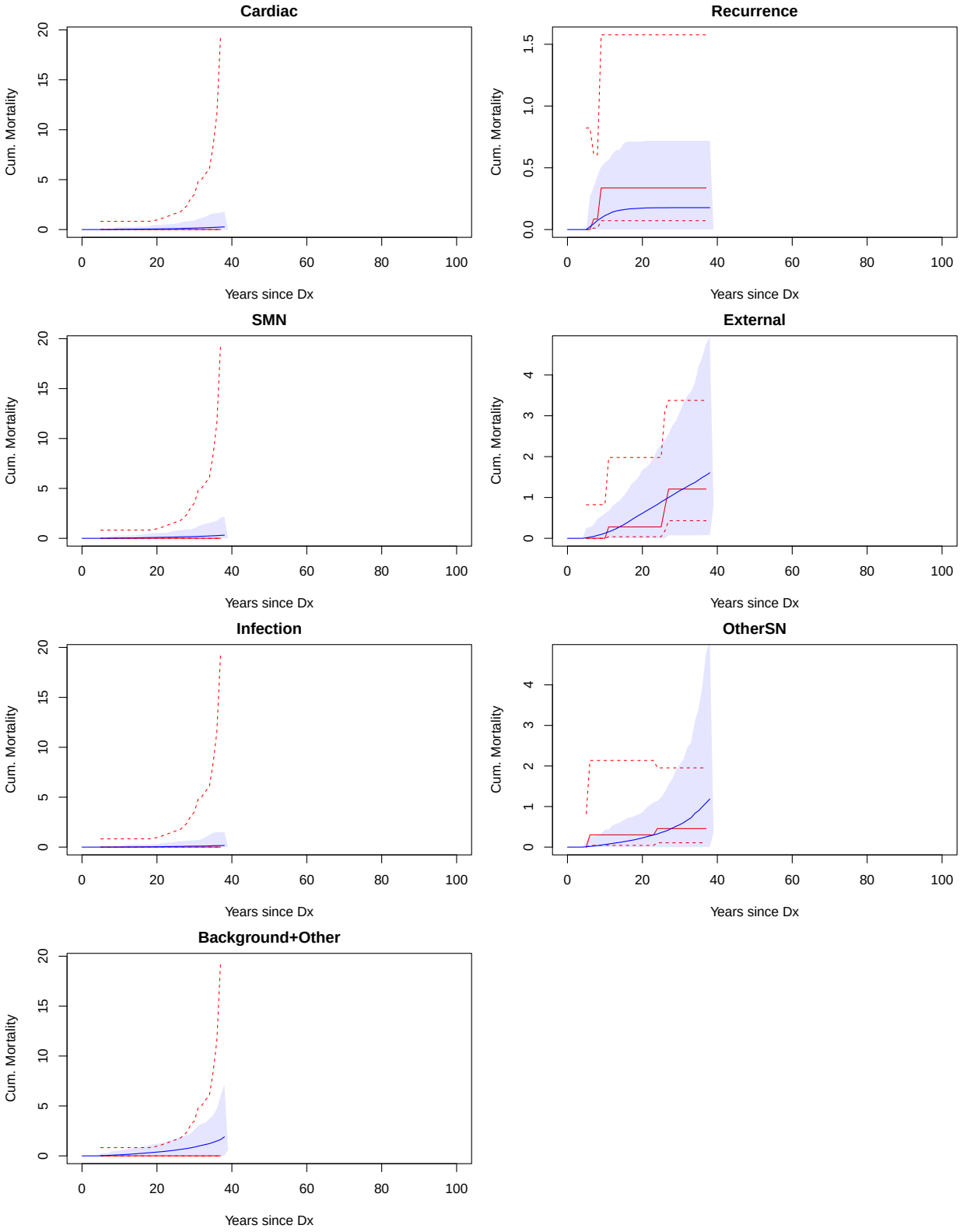
6.5.5.82 ALL grp: 1980s HR-like



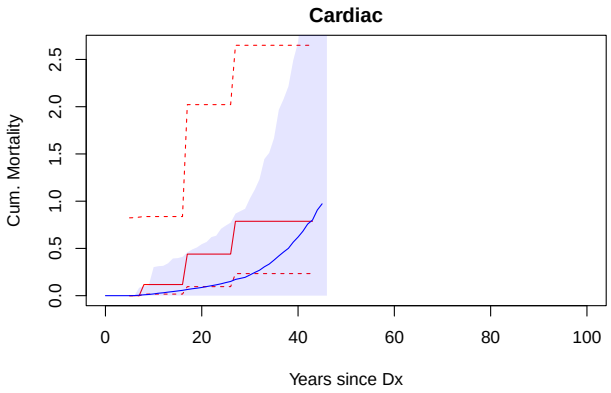
6.5.5.83 ALL grp: 1990s HR-like

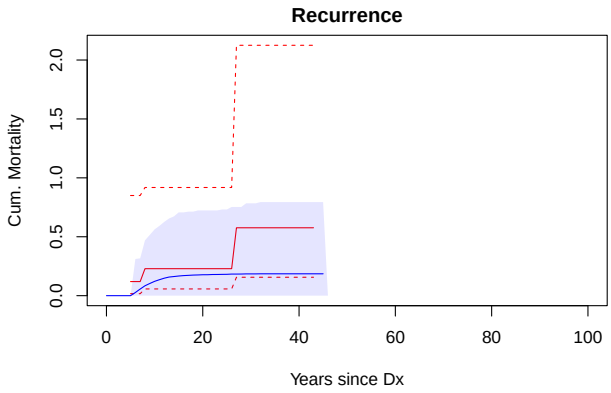


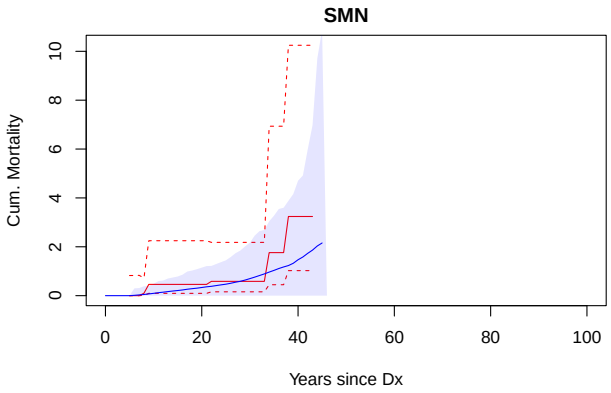
6.5.5.84 ALL grp: 1990s SR/Essig

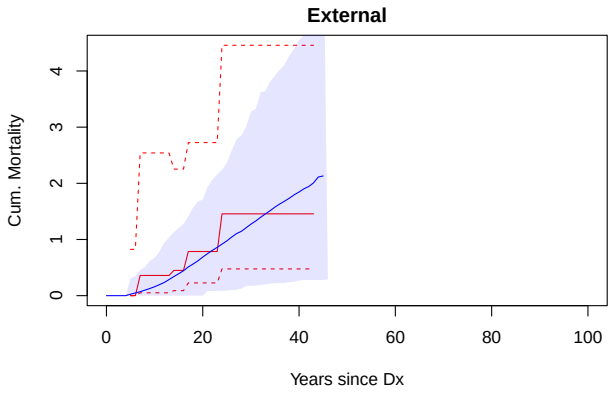


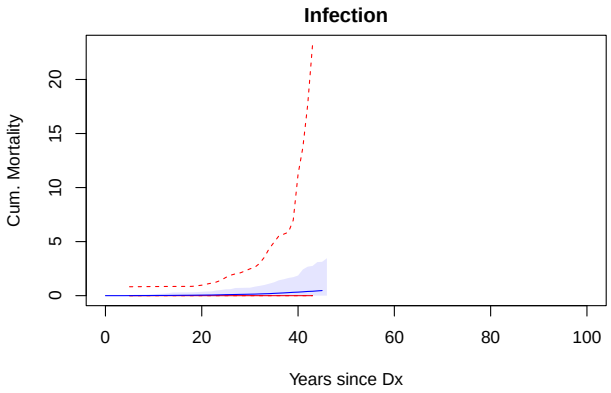
6.5.5.85 ALL grp: Other

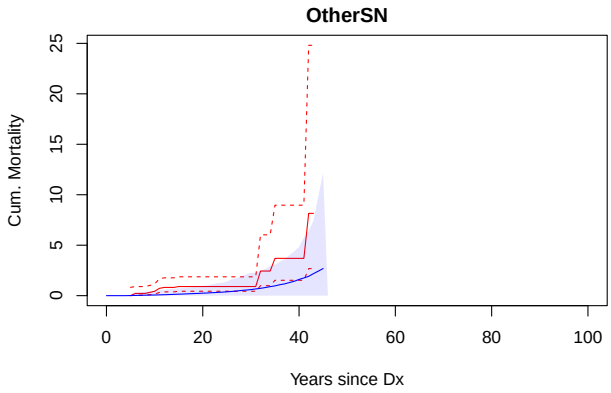


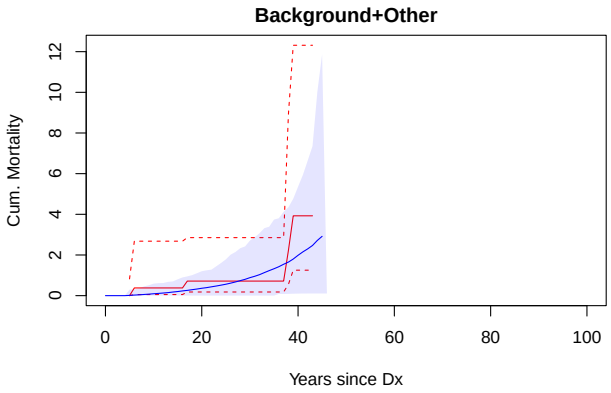




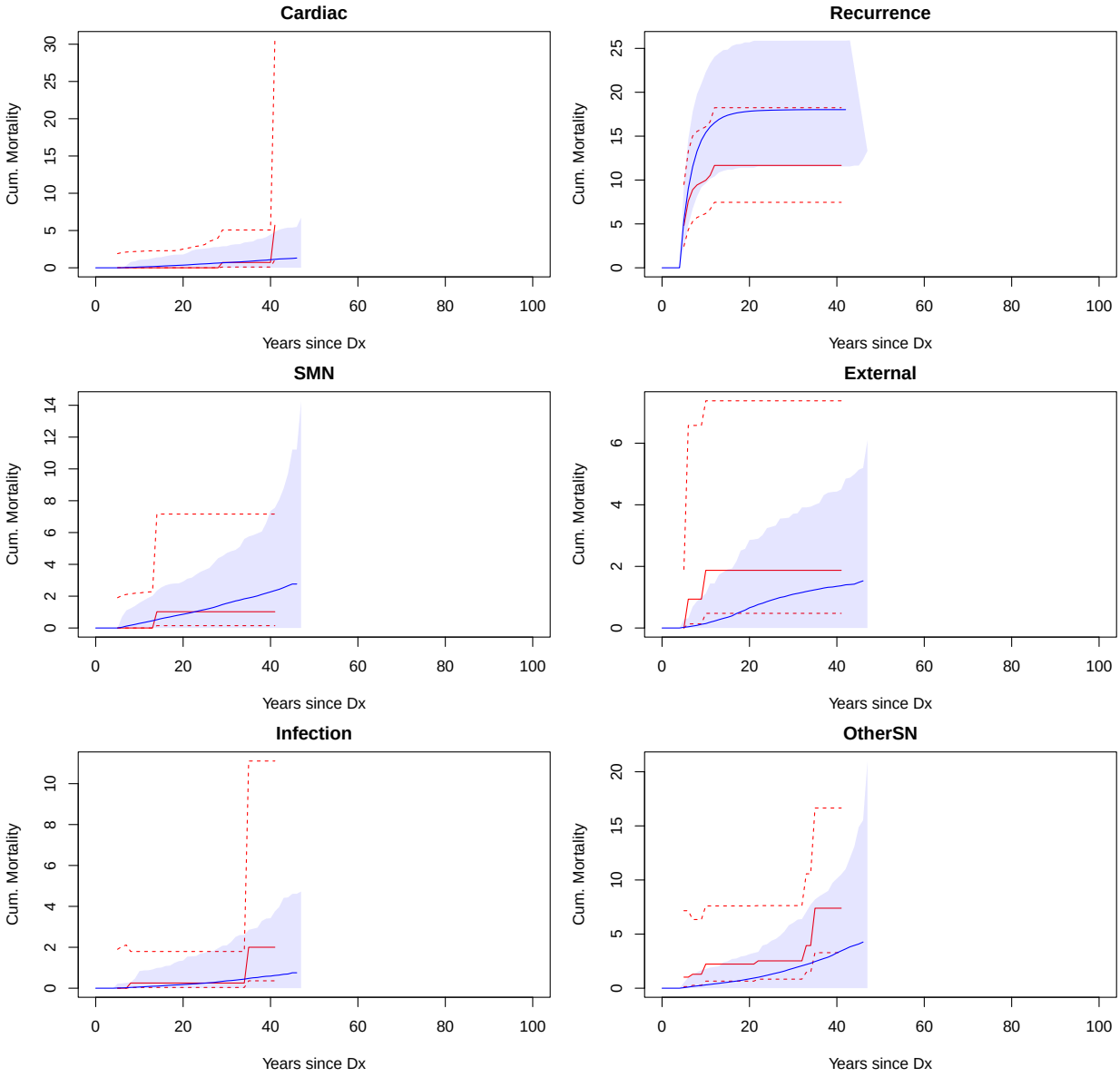


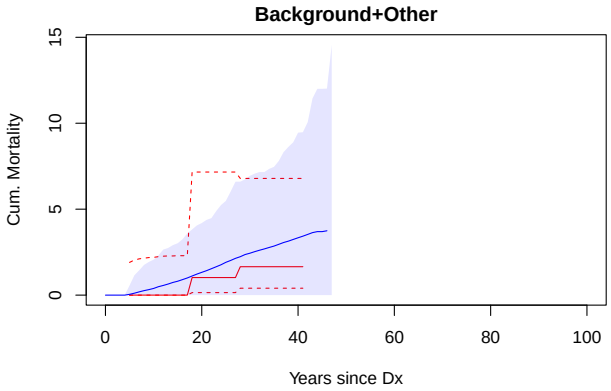






6.5.5.86 ALL grp: Relapse/Transplant




Background+Other
Cum. Mortality
0
5
10
15
0
20
40
60
80
100
Years since Dx

7 References

1. Robison LL, Armstrong GT, Boice JD, Chow EJ, Davies SM, Donaldson SS, et al. The Childhood Cancer Survivor Study: a National Cancer Institute-supported resource for outcome and intervention research. J Clin Oncol. 2009;27(14):2308-18.
2. Children's Oncology Group. Long-Term Follow-Up Guidelines for Survivors of Childhood, Adolescent, and Young Adult Cancers. Version 5.0 - October 2018. Children's Oncology Group.
3. Surveillance Research Program, National Cancer Institute. SEER*Stat software (www.seer.cancer.gov/seerstat) version 8.3.6. Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 18 Regs Reseach.
4. National Heart Lung and Blood Institute. Incidence and Prevalence: 2006 Chart Book on Cardiovascular and Lung Diseases. Bethesda: National Institutes of Health; 2006.
5. Nkomo VT, Gardin JM, Skelton TN, Gottdiener JS, Scott CG, Enriquez-Sarano M. Burden of valvular heart diseases: a population-based study. Lancet. 2006;368(9540):1005-11.
6. Dixon SB, Chen Y, Yasui Y, Pui CH, Hunger SP, Silverman LB, et al. Reduced Morbidity and Mortality in Survivors of Childhood Acute Lymphoblastic Leukemia: A Report From the Childhood Cancer Survivor Study. J Clin Oncol. 2020;38(29):3418-29.
7. Oeffinger KC, Stratton KL, Hudson MM, Leisenring WM, Henderson TO, Howell RM, et al. Impact of Risk-Adapted Therapy for Pediatric Hodgkin Lymphoma on Risk of Long-Term Morbidity: A Report From the Childhood Cancer Survivor Study. J Clin Oncol. 2021;39(20):2266-75.
8. Centers for Disease Control and Prevention, National Center for Health Statistics;Pageshttp://wonder.cdc.gov/cmf-icd9.html on Mar 24, 2009.