

Supplemental Online Content

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eTable 1. Demographic Characteristics of Female Survivors of Childhood Cancer with Invasive BC and DCIS[†]

Characteristic	Decade											
	1970-1979				1980-1989				1990-1999			
	Invasive BC (N=206)		DCIS (N=65)		Invasive BC (N=141)		DCIS (N=52)		Invasive BC (N=37)		DCIS (N=24)	
	N	%	N	%	N	%	N	%	N	%	N	%
Childhood cancer diagnosis												
Leukemia	23	11	7	11	27	21	4	8	3	14	2	9
CNS	6	3	1	2	1	1	0	0	0	0	1	4
Hodgkin lymphoma	116	56	43	66	72	50	30	58	21	53	17	70
Non-Hodgkin lymphoma	6	3	0	0	10	7	5	10	2	5	0	0
Wilms tumor	13	6	1	2	5	3	4	8	0	0	0	0
Neuroblastoma	5	2	1	2	2	1	0	0	0	0	1	4
Bone cancer	27	13	8	12	21	15	8	15	11	28	3	12
Soft tissue sarcoma	10	5	4	6	3	2	1	2	0	0	0	0
Chest RT												
No	56	29	17	27	46	37	18	38	15	48	3	12
Yes	136	71	46	73	82	63	29	62	19	52	21	88
Primary chest radiation field												
None	56	29	17	27	46	37	18	38	15	48	3	12
Mantle	97	51	38	60	63	48	26	55	10	27	15	62
Mediastinal/IFRT	14	7	4	6	5	4	1	2	3	8	0	0
Whole lung	16	8	1	2	3	2	2	4	1	3	1	4
TBI	1	1	0	0	8	6	0	0	3	8	4	17
Spine	3	2	3	5	0	0	0	0	0	0	0	0
Other	5	3	0	0	3	2	0	0	2	5	1	4
Chest radiation dose, Gy												
None	56	29	17	27	46	38	18	38	15	48	3	12
< 10	1	1	0	0	1	1	1	2	0	0	0	0
10-19	19	10	3	5	11	8	2	4	5	14	4	17
20-29	12	6	5	8	15	12	9	19	8	22	12	50
30-39	49	26	19	30	24	19	7	15	1	3	3	12
40+	54	28	19	30	30	23	10	21	5	14	2	8
Alkylating agents												
No	100	52	31	49	47	35	23	45	8	21	6	25
Yes	93	48	32	51	83	65	28	55	27	79	18	75
Cyclophosphamide equivalent dose, mg/m ²												
0	100	57	31	65	47	41	23	53	8	22	6	26
1-5,999	13	7	3	6	18	18	6	14	11	37	4	17
6,000-17,999	51	29	11	23	44	38	14	33	10	27	11	48
≥18,000	11	6	3	6	4	3	0	0	5	14	2	9
Anthracyclines												
No	146	75	48	75	58	43	17	33	3	8	2	8
Yes	49	25	16	25	73	57	34	67	32	92	22	92
Anthracycline cumulative dose, mg/m ²												
0	146	76	48	80	58	46	17	37	3	8	2	8
1-249	13	7	3	5	32	27	13	28	17	54	13	54
≥ 250	32	17	9	15	34	27	16	35	14	38	9	38
Pelvic radiation												
No	141	73	46	73	93	73	35	74	27	81	16	66
Yes	51	27	17	27	35	27	12	26	7	19	8	34

Abbreviations: CNS, central nervous system; radiation therapy: RT; involved field radiation therapy (IFRT), TBI: total body irradiation therapy
[†]Individual patients could be included in both invasive BC and DCIS columns.

*Analyses, including reported percentages and means/medians, were weighted to account for under-sampling of acute lymphoblastic leukemia (ALL) survivors (1987-1999).

eTable 2. Clinical Characteristics of Breast Cancers

Clinical Characteristic	Total N (%)	Chest Radiotherapy - Yes	Chest Radiotherapy - No
Median Time from primary diagnosis to diagnosis of BC, years, median (Range) Quartiles: Q1-Q3	25.6 (6.7-47.4) 19.8-30.5	24.9 (6.7-47.4) 19.4-30.5	27.2 (7.4-45.6) 21.9-31.5
Age at diagnosis of BC, years, mediana (Range) Quartiles: Q1-Q3	40.3 (19.9-62.1) 34.7-45.2	40.0 (19.9-62.1) 35.1-45.7	40.5 (20.9-59.0) 34.3-44.6
Site of BC			
Unilateral	398 (81.4)	236 (77.6)	130 (87.8)
Bilateral breast cancer	86 (17.6)	63* (20.7)	18 (12.2)
-Metachronous	44 (9.0)	32 (10.5)	10 (6.8)
-Synchronous	40 (8.2)	29 (9.5)	8 (5.4)
-bilateral time Cannot be determined	2 (0.4)	2 (0.7)	0
Unilateral/Bilateral cannot be determined	5 (1.0)	5 (1.6)	0
BC Receptor Status (Invasive +DCIS)			
ER			
Yes	325 (56)	202 (54)	101 (62)
No	74 (13)	45 (12)	25 (15)
Not available	119 (20)	83 (22)	24 (14)
Missing	65 (11)	45 (12)	16 (9)
PR			
Yes	268 (46)	164 (44)	85 (51)
No	109 (19)	68 (18)	36 (23)
Not available	140 (24)	97 (26)	29 (17)
Missing	66 (11)	46 (12)	16 (9)
HER-2			
Yes	62 (11)	35 (9)	22 (13)
No	214 (37)	122 (33)	77 (48)
Not available	239 (41)	172 (46)	49 (29)
Missing	68 (12)	46 (12)	18 (11)
BC Receptor Status (Invasive BC only)			
ER			
Yes	262 (62)	165 (62)	79 (63)
No	65 (15)	38 (14)	23 (17)
Not available	62 (14)	39 (15)	15 (11)
Missing	38 (9)	24 (9)	11 (8)
PR			
Yes	218 (51)	135 (51)	66 (52)
No	96 (23)	60 (23)	32 (26)
Not available	74 (17)	46 (17)	19 (14)
Missing	39 (9)	25 (9)	11 (8)
HER-2			
Yes	58 (13)	31 (12)	22 (17)
No	200 (47)	115 (43)	70 (56)
Not available	129 (30)	95 (36)	24 (18)
Missing	40 (9)	25 (9)	12 (9)

*The chest radiotherapy fields of the 63 women are: 2 TBI, 4 whole lung, 52 Mantle, 4 Mediastinal/IFRT and 1 other chest. Bilateral breast cancer (BC) definitions: Synchronous (2 BCs within 12 months); metachronous (2 BCs>12 months apart).

eTable 3. Treatment exposures for HL survivors and all survivors other than HL

Characteristics	HL survivors			All survivors other than HL				
	Total	1970s	1980s	1990s	Total	1970s	1980s	1990s
Chest or TBI, yes/no								
No	235 (18)	42 (9)	68 (16)	125 (28)	7,603 (85)	1,646 (79)	2,978 (85)	2,979 (88)
Yes	1,097 (82)	415 (91)	357 (84)	325 (72)	1,525 (15)	441 (21)	562 (15)	522 (12)
Received anthracyclines								
No	693 (51)	400 (87)	245 (57)	48 (10)	4,896 (47)	1,404 (66)	1,843 (48)	1,649 (38)
Yes	664 (49)	58 (13)	187 (43)	419 (90)	4,450 (53)	729 (34)	1,776 (52)	1,945 (62)
Pelvis or TBI, yes/no								
No	939 (70)	257 (56)	293 (69)	389 (86)	7,532 (85)	1,638 (78)	2,962 (85)	2,932 (87)
Yes	393 (30)	200 (44)	132 (31)	61 (14)	1,597 (15)	450 (22)	578 (15)	569 (13)
Chest RT by anthracycline (mg/m ²)								
No chest, no anthracycline	52 (4)	32 (7)	17 (4)	3 (1)	3,996 (41)	1,067 (54)	1,546 (43)	1,383 (35)
No chest, anthracycline (1-249)	131 (10)	2 (0)	24 (6)	105 (24)	2,101 (32)	197 (10)	784 (27)	1,120 (44)
No chest, anthracycline (≥250)	39 (3)	6 (1)	20 (5)	13 (3)	1,218 (12)	291 (15)	524 (15)	403 (10)
chest RT, no anthracycline	615 (48)	357 (82)	214 (54)	44 (10)	756 (7)	288 (15)	244 (7)	224 (5)
chest RT, anthracycline (1-249)	315 (25)	11 (3)	89 (22)	215 (50)	420 (5)	58 (3)	174 (5)	188 (5)
chest RT, anthracycline (≥250)	118 (9)	30 (7)	35 (9)	53 (12)	266 (3)	66 (3)	112 (3)	88 (2)

Abbreviations: CNS, central nervous system; TBI: total body irradiation RT, radiation therapy

*Analyses, including reported percentages and means/medians, were weighted to account for undersampling of acute lymphoblastic leukemia (ALL) survivors (1987-1999).

eTable 4. Cumulative incidence (%) for survivors diagnosed 0-9 years of age

	By age 30 yr % (95% CI)	By age 35 yr % (95% CI)	By age 40 yr % (95% CI)	By age 45 yr % (95% CI)
All BC				
Entire cohort				
All years	0.2 (0.1 - 0.3)	0.7 (0.4 - 1.0)	1.3 (0.9 - 1.8)	2.9 (2.1 - 3.8)
1970s	0.3 (0.0 - 0.6)	0.8 (0.3 - 1.2)	1.2 (0.6 - 1.8)	2.7 (1.7 - 3.7)
1980s	0.2 (0.0 - 0.3)	0.7 (0.3 - 1.1)	1.6 (0.8 - 2.4)	3.5 (1.4 - 5.6)
1990s	0.0 (0.0 - 0.1)	0.5 (0.0 - 1.2)		
Non-HL survivors				
All years	0.2 (0.1 - 0.3)	0.7 (0.5 - 1.0)	1.4 (0.9 - 1.8)	2.8 (1.9 - 3.6)
1970s	0.3 (0.0 - 0.6)	0.8 (0.3 - 1.2)	1.3 (0.7 - 1.9)	2.6 (1.7 - 3.6)
1980s	0.2 (0.0 - 0.3)	0.7 (0.4 - 1.1)	1.6 (0.8 - 2.4)	2.8 (1.2 - 4.4)
1990s	0.0 (0.0 - 0.1)	0.6 (0.0 - 1.3)		
Invasive BC				
Entire cohort				
All years	0.1 (0.0 - 0.2)	0.7 (0.4 - 0.9)	1.1 (0.7 - 1.5)	2.2 (1.5 - 2.9)
1970s	0.2 (0.0 - 0.5)	0.7 (0.3 - 1.1)	1.1 (0.5 - 1.6)	1.9 (1.1 - 2.7)
1980s	0.1 (0.0 - 0.3)	0.6 (0.3 - 1.0)	1.3 (0.6 - 2.1)	3.3 (1.1 - 5.3)
1990s	0.0 (0.0 - 0.1)	0.5 (0.0 - 1.2)		
Non-HL survivors				
All years	0.1 (0.0 - 0.2)	0.7 (0.4 - 0.9)	1.2 (0.8 - 1.6)	2.2 (1.4 - 2.9)
1970s	0.3 (0.0 - 0.5)	0.7 (0.3 - 1.2)	1.1 (0.6 - 1.7)	2.0 (1.2 - 2.8)
1980s	0.1 (0.0 - 0.3)	0.6 (0.3 - 1.0)	1.4 (0.6 - 2.1)	2.6 (1.0 - 4.1)
1990s	0.0 (0.0 - 0.1)	0.6 (0.0 - 1.3)		

eTable 5. Cumulative incidence (%) for survivors diagnosed 10-20 years of age

	By age 30 yr % (95% CI)	By age 35 yr % (95% CI)	By age 40 yr % (95% CI)	By age 45 yr % (95% CI)	By age 50 yr % (95% CI)
All BC					
Entire cohort					
All years	0.8 (0.6 - 1.1)	2.6 (2.1 - 3.1)	6.3 (5.4 - 7.1)	11.5 (10.2 - 12.8)	17.8 (16.0 - 19.6)
1970s	1.2 (0.5 - 1.8)	3.1 (2.1 - 4.1)	8.4 (6.7 - 10.0)	13.5 (11.4 - 15.6)	19.6 (17.0 - 22.1)
1980s	0.7 (0.3 - 1.1)	2.5 (1.7 - 3.3)	5.4 (4.2 - 6.6)	10.5 (8.6 - 12.3)	16.7 (13.9 - 19.5)
1990s	0.8 (0.3 - 1.2)	2.5 (1.7 - 3.3)	5.3 (3.5 - 7.0)	12.0 (6.4 - 17.3)	
HL survivors					
All years	1.3 (0.7 - 2.0)	5.3 (4.0 - 6.6)	12.5 (10.5 - 14.5)	20.0 (17.3 - 22.6)	30.2 (26.5 - 33.6)
1970s	2.0 (0.7 - 3.3)	4.9 (2.9 - 6.9)	14.4 (11.0 - 17.7)	21.5 (17.4 - 25.4)	31.3 (26.4 - 35.9)
1980s	1.0 (0.0 - 1.9)	5.4 (3.2 - 7.6)	11.7 (8.4 - 14.9)	19.0 (14.7 - 23.1)	28.7 (22.8 - 34.2)
1990s	1.0 (0.0 - 2.0)	5.8 (3.3 - 8.1)	10.0 (6.2 - 13.7)	19.9 (10.1 - 28.6)	
HL survivors with chest RT					
All years	1.4 (0.7 - 2.2)	5.8 (4.3 - 7.3)	14.4 (12.0 - 16.8)	21.4 (18.4 - 24.3)	32.5 (28.5 - 36.4)
1970s	2.1 (0.7 - 3.6)	5.0 (2.8 - 7.2)	15.9 (12.1 - 19.6)	22.9 (18.3 - 27.1)	33.4 (28.0 - 38.4)
1980s	1.0 (0.0 - 2.0)	6.3 (3.6 - 9.0)	13.7 (9.7 - 17.5)	20.5 (15.5 - 25.2)	31.9 (24.9 - 38.3)
1990s	1.1 (0.0 - 2.3)	6.5 (3.5 - 9.5)	12.2 (7.2 - 16.9)	20.5 (9.3 - 30.3)	
Non-HL survivors					
All years	0.6 (0.3 - 0.9)	1.4 (1.0 - 1.9)	3.2 (2.5 - 4.0)	7.1 (5.8 - 8.4)	11.0 (9.1 - 12.8)
1970s	0.6 (0.0 - 1.2)	1.8 (0.8 - 2.9)	4.2 (2.6 - 5.7)	8.0 (5.8 - 10.2)	11.5 (8.7 - 14.1)
1980s	0.6 (0.1 - 1.0)	1.3 (0.6 - 2.0)	2.8 (1.7 - 3.9)	6.8 (5.0 - 8.6)	10.9 (8.1 - 13.6)
1990s	0.7 (0.2 - 1.2)	1.2 (0.5 - 1.9)	3.2 (1.4 - 5.0)	6.6 (1.5 - 11.3)	
Invasive BC					
Entire cohort					
All years	0.8 (0.5 - 1.1)	2.2 (1.7 - 2.6)	4.6 (3.9 - 5.4)	8.8 (7.7 - 9.9)	14.0 (12.4 - 15.7)
1970s	1.2 (0.5 - 1.8)	2.7 (1.8 - 3.7)	6.4 (4.9 - 7.9)	11.1 (9.1 - 13.0)	16.1 (13.7 - 18.5)
1980s	0.7 (0.3 - 1.1)	2.1 (1.4 - 2.9)	4.1 (3.1 - 5.2)	7.9 (6.3 - 9.4)	13.2 (10.6 - 15.7)
1990s	0.6 (0.2 - 1.0)	1.8 (1.1 - 2.6)	3.3 (2.0 - 4.7)	6.3 (3.2 - 9.4)	
HL survivors					
All years	1.2 (0.6 - 1.8)	4.1 (3.0 - 5.2)	8.6 (6.9 - 10.2)	14.9 (12.5 - 17.2)	23.3 (19.9 - 26.5)
1970s	2.0 (0.7 - 3.3)	4.2 (2.4 - 6.1)	10.2 (7.3 - 13.0)	17.0 (13.3 - 20.6)	24.7 (20.2 - 29.0)
1980s	1.0 (0.0 - 1.9)	4.2 (2.2 - 6.1)	8.3 (5.5 - 11.0)	14.0 (10.2 - 17.6)	22.9 (17.3 - 28.1)
1990s	0.5 (0.0 - 1.2)	3.8 (1.8 - 5.8)	6.4 (3.2 - 9.5)	9.3 (4.7 - 13.7)	
HL survivors with chest RT					
All years	1.3 (0.6 - 2.1)	4.4 (3.1 - 5.7)	9.8 (7.8 - 11.8)	15.7 (13.0 - 18.3)	25.0 (21.2 - 28.5)
1970s	2.1 (0.7 - 3.6)	4.2 (2.2 - 6.3)	11.2 (7.9 - 14.4)	17.9 (13.8 - 21.8)	26.0 (21.0 - 30.7)
1980s	1.0 (0.0 - 2.0)	4.7 (2.4 - 7.0)	9.6 (6.2 - 12.9)	15.2 (10.8 - 19.4)	26.2 (19.5 - 32.3)
1990s	0.7 (0.0 - 1.7)	4.2 (1.7 - 6.6)	7.5 (3.4 - 11.4)	7.5 (3.4 - 11.4)	
Non-HL survivors					
All years	0.6 (0.3 - 0.9)	1.3 (0.9 - 1.7)	2.7 (2.0 - 3.4)	5.6 (4.5 - 6.8)	8.9 (7.2 - 10.6)
1970s	0.6 (0.0 - 1.2)	1.7 (0.7 - 2.7)	3.8 (2.3 - 5.3)	7.0 (4.9 - 9.0)	10.2 (7.6 - 12.7)
1980s	0.6 (0.1 - 1.0)	1.3 (0.6 - 2.0)	2.5 (1.5 - 3.4)	5.2 (3.6 - 6.8)	8.2 (5.7 - 10.6)
1990s	0.7 (0.2 - 1.2)	1.0 (0.4 - 1.6)	1.9 (0.6 - 3.1)	5.3 (0.4 - 10.0)	
DCIS					
Entire cohort					
All years	0.1 (0.0 - 0.2)	0.7 (0.5 - 1.0)	2.1 (1.6 - 2.6)	3.7 (2.9 - 4.4)	5.2 (4.2 - 6.2)
1970s	0.0 (0.0 - 0.0)	0.5 (0.1 - 0.9)	2.1 (1.2 - 3.0)	3.7 (2.5 - 4.9)	5.2 (3.8 - 6.7)
1980s	0.0 (0.0 - 0.0)	0.6 (0.2 - 1.1)	1.8 (1.1 - 2.5)	3.4 (2.3 - 4.4)	4.8 (3.3 - 6.2)
1990s	0.2 (0.0 - 0.5)	1.1 (0.5 - 1.6)	2.3 (1.2 - 3.5)	6.1 (1.3 - 10.7)	
HL survivors					
All years	0.2 (0.0 - 0.4)	1.9 (1.1 - 2.7)	4.9 (3.6 - 6.3)	7.5 (5.7 - 9.2)	10.1 (7.8 - 12.2)
1970s	0.0 (0.0 - 0.0)	0.9 (0.0 - 1.8)	4.6 (2.5 - 6.6)	7.0 (4.5 - 9.5)	10.6 (7.4 - 13.7)
1980s	0.0 (0.0 - 0.0)	2.2 (0.8 - 3.6)	5.3 (3.0 - 7.5)	7.2 (4.5 - 9.9)	8.0 (5.1 - 10.9)
1990s	0.5 (0.0 - 1.2)	2.8 (1.1 - 4.4)	4.5 (2.1 - 6.9)	11.4 (2.7 - 19.4)	
HL survivors with chest RT					
All years	0.1 (0.0 - 0.3)	2.3 (1.4 - 3.3)	5.8 (4.3 - 7.4)	8.6 (6.5 - 10.6)	11.4 (8.8 - 13.9)
1970s	0.0 (0.0 - 0.0)	1.1 (0.0 - 2.1)	5.1 (2.8 - 7.3)	7.9 (5.0 - 10.7)	11.9 (8.3 - 15.5)
1980s	0.0 (0.0 - 0.0)	2.8 (1.0 - 4.7)	6.4 (3.5 - 9.1)	8.0 (4.8 - 11.2)	8.5 (5.2 - 11.8)
1990s	0.3 (0.0 - 1.0)	3.5 (1.2 - 5.7)	5.9 (2.6 - 9.0)	14.3 (3.6 - 23.7)	
Survivors other than HL					
All years	0.1 (0.0 - 0.1)	0.2 (0.0 - 0.4)	0.6 (0.3 - 1.0)	1.8 (1.1 - 2.4)	2.6 (1.7 - 3.6)

1970s	0.0 (0.0 - 0.0)	0.2 (0.0 - 0.5)	0.5 (0.0 - 1.0)	1.4 (0.4 - 2.4)	1.6 (0.6 - 2.7)
1980s	0.0 (0.0 - 0.0)	0.0 (0.0 - 0.0)	0.3 (0.0 - 0.7)	1.7 (0.7 - 2.7)	3.5 (1.7 - 5.1)
1990s	0.1 (0.0 - 0.3)	0.4 (0.0 - 0.8)	1.5 (0.2 - 2.8)	1.5 (0.2 - 2.8)	

eTable 6. Cumulative incidence (%) by age for all breast cancers, invasive breast cancer and DCIS

	By age 30 yr % (95% CI)	By age 35 yr % (95% CI)	By age 40 yr % (95% CI)	By age 45 yr % (95% CI)	By age 50 yr % (95% CI)
All BC					
Entire cohort					
All years	0.4 (0.3 - 0.6)	1.6 (1.4 - 1.9)	4.1 (3.6 - 4.6)	8.1 (7.3 - 9.0)	13.5 (12.1 - 14.9)
1970s	0.7 (0.4 - 1.0)	1.7 (1.2 - 2.2)	4.4 (3.6 - 5.3)	7.8 (6.6 - 9.0)	12.6 (10.9 - 14.2)
1980s	0.3 (0.2 - 0.5)	1.4 (1.0 - 1.8)	3.6 (2.9 - 4.4)	8.4 (6.9 - 9.9)	14.9 (12.2 - 17.5)
1990s	0.4 (0.2 - 0.6)	1.9 (1.3 - 2.6)	4.7 (3.1 - 6.4)	11.5 (5.9 - 16.8)	
HL survivors					
All years	1.2 (0.6 - 1.8)	5.0 (3.8 - 6.1)	11.8 (9.9 - 13.7)	19.3 (16.7 - 21.8)	29.4 (25.9 - 32.8)
1970s	1.8 (0.6 - 3.0)	4.4 (2.6 - 6.2)	13.2 (10.0 - 16.2)	20.0 (16.2 - 23.6)	29.9 (25.2 - 34.3)
1980s	0.9 (0.0 - 1.8)	5.1 (3.0 - 7.1)	11.1 (8.0 - 14.2)	18.7 (14.5 - 22.7)	28.4 (22.5 - 33.9)
1990s	0.9 (0.0 - 1.9)	5.6 (3.2 - 7.9)	9.8 (6.0 - 13.5)	19.7 (9.9 - 28.4)	
HL survivors with chest RT					
All years	1.3 (0.6 - 2.0)	5.6 (4.1 - 7.0)	13.8 (11.5 - 16.0)	20.9 (17.9 - 23.8)	31.9 (28.0 - 35.7)
1970s	2.0 (0.6 - 3.3)	4.7 (2.6 - 6.7)	14.9 (11.2 - 18.3)	21.8 (17.4 - 25.8)	32.2 (27.0 - 37.0)
1980s	0.9 (0.0 - 1.9)	6.1 (3.5 - 8.6)	13.2 (9.3 - 16.9)	20.4 (15.5 - 25.1)	31.9 (24.9 - 38.2)
1990s	1.0 (0.0 - 2.2)	6.3 (3.4 - 9.2)	12.0 (7.1 - 16.7)	20.4 (9.2 - 30.2)	
Non-HL survivors					
All years	0.3 (0.2 - 0.4)	1.0 (0.7 - 1.2)	2.2 (1.8 - 2.6)	5.0 (4.2 - 5.9)	8.0 (6.7 - 9.3)
1970s	0.4 (0.1 - 0.7)	1.1 (0.7 - 1.6)	2.2 (1.6 - 2.9)	4.6 (3.5 - 5.6)	7.0 (5.5 - 8.4)
1980s	0.3 (0.1 - 0.4)	0.9 (0.6 - 1.2)	2.1 (1.5 - 2.8)	5.8 (4.3 - 7.2)	9.8 (7.2 - 12.4)
1990s	0.3 (0.1 - 0.4)	0.8 (0.3 - 1.2)	2.8 (1.0 - 4.5)	6.2 (1.1 - 11.1)	
Invasive BC					
Entire cohort					
All years	0.4 (0.3 - 0.5)	1.4 (1.1 - 1.6)	3.1 (2.6 - 3.5)	6.2 (5.4 - 7.0)	10.7 (9.4 - 12.0)
1970s	0.6 (0.3 - 0.9)	1.5 (1.1 - 2.0)	3.5 (2.7 - 4.2)	6.3 (5.2 - 7.3)	10.3 (8.7 - 11.8)
1980s	0.3 (0.1 - 0.5)	1.2 (0.9 - 1.6)	2.8 (2.1 - 3.4)	6.4 (5.1 - 7.7)	11.9 (9.4 - 14.3)
1990s	0.3 (0.1 - 0.5)	1.4 (0.8 - 2.0)	2.9 (1.6 - 4.2)	6.0 (2.8 - 9.0)	
HL survivors					
All years	1.1 (0.5 - 1.6)	3.8 (2.8 - 4.8)	8.1 (6.5 - 9.6)	14.2 (11.9 - 16.5)	22.7 (19.5 - 25.8)
1970s	1.8 (0.6 - 3.0)	3.8 (2.1 - 5.5)	9.3 (6.6 - 11.9)	15.6 (12.2 - 18.9)	23.5 (19.2 - 27.6)
1980s	0.9 (0.0 - 1.8)	3.9 (2.1 - 5.7)	7.9 (5.2 - 10.5)	13.8 (10.1 - 17.4)	22.8 (17.2 - 28.0)
1990s	0.5 (0.0 - 1.1)	3.7 (1.8 - 5.6)	6.3 (3.1 - 9.4)	9.2 (4.6 - 13.6)	
HL survivors with chest RT					
All years	1.3 (0.6 - 1.9)	4.2 (2.9 - 5.4)	9.4 (7.5 - 11.3)	15.2 (12.6 - 17.8)	24.4 (20.8 - 27.9)
1970s	2.0 (0.6 - 3.3)	3.9 (2.0 - 5.8)	10.5 (7.4 - 13.5)	16.8 (12.9 - 20.5)	24.9 (20.1 - 29.4)
1980s	0.9 (0.0 - 1.9)	4.5 (2.3 - 6.8)	9.3 (6.0 - 12.5)	15.3 (10.9 - 19.5)	26.3 (19.6 - 32.4)
1990s	0.7 (0.0 - 1.6)	4.1 (1.7 - 6.4)	7.4 (3.3 - 11.3)	7.4 (3.3 - 11.3)	
Non-HL survivors					
All years	0.3 (0.2 - 0.4)	0.9 (0.7 - 1.1)	1.9 (1.5 - 2.2)	4.0 (3.3 - 4.7)	6.5 (5.3 - 7.7)
1970s	0.4 (0.1 - 0.6)	1.0 (0.6 - 1.4)	2.0 (1.4 - 2.7)	3.8 (2.9 - 4.7)	6.0 (4.7 - 7.4)
1980s	0.2 (0.1 - 0.4)	0.8 (0.5 - 1.2)	1.8 (1.2 - 2.4)	4.4 (3.1 - 5.6)	7.4 (5.1 - 9.6)
1990s	0.3 (0.1 - 0.4)	0.7 (0.3 - 1.1)	1.6 (0.3 - 2.7)	5.0 (0.0 - 9.8)	
DCIS					
Entire cohort					
All years	0.0 (0.0 - 0.1)	0.4 (0.3 - 0.6)	1.3 (1.0 - 1.6)	2.5 (2.0 - 3.0)	3.7 (3.0 - 4.5)
1970s	0.0 (0.0 - 0.1)	0.3 (0.1 - 0.5)	1.1 (0.7 - 1.6)	2.2 (1.6 - 2.9)	3.3 (2.4 - 4.2)
1980s	0.0 (0.0 - 0.1)	0.3 (0.1 - 0.5)	1.1 (0.7 - 1.6)	2.5 (1.7 - 3.3)	3.9 (2.6 - 5.1)
1990s	0.1 (0.0 - 0.2)	0.8 (0.4 - 1.2)	2.1 (1.0 - 3.1)	5.9 (1.0 - 10.4)	
HL survivors					
All years	0.2 (0.0 - 0.4)	1.8 (1.1 - 2.5)	4.7 (3.4 - 5.9)	7.2 (5.5 - 8.9)	9.7 (7.6 - 11.8)
1970s	0.0 (0.0 - 0.0)	0.8 (0.0 - 1.6)	4.2 (2.3 - 6.0)	6.7 (4.3 - 9.0)	10.1 (7.0 - 13.0)
1980s	0.0 (0.0 - 0.0)	2.1 (0.7 - 3.4)	5.0 (2.8 - 7.1)	6.9 (4.3 - 9.5)	7.7 (4.9 - 10.5)
1990s	0.5 (0.0 - 1.1)	2.7 (1.0 - 4.3)	4.4 (2.0 - 6.7)	11.4 (2.6 - 19.4)	
HL survivors with chest RT					

All years	0.1 (0.0 - 0.3)	2.2 (1.3 - 3.1)	5.6 (4.1 - 7.1)	8.4 (6.4 - 10.3)	11.1 (8.6 - 13.6)
1970s	0.0 (0.0 - 0.0)	1.0 (0.0 - 2.0)	4.7 (2.6 - 6.8)	7.7 (4.9 - 10.4)	11.6 (8.0 - 15.0)
1980s	0.0 (0.0 - 0.0)	2.7 (1.0 - 4.5)	6.2 (3.4 - 8.8)	7.8 (4.7 - 10.9)	8.3 (5.0 - 11.5)
1990s	0.3 (0.0 - 1.0)	3.4 (1.2 - 5.6)	5.8 (2.5 - 8.9)	14.2 (3.5 - 23.7)	
Survivors other than HL					
All years	0.0 (0.0 - 0.1)	0.1 (0.1 - 0.2)	0.4 (0.2 - 0.6)	1.3 (0.8 - 1.7)	1.8 (1.2 - 2.5)
1970s	0.0 (0.0 - 0.1)	0.2 (0.0 - 0.4)	0.4 (0.1 - 0.6)	1.0 (0.5 - 1.5)	1.2 (0.6 - 1.7)
1980s	0.0 (0.0 - 0.1)	0.1 (0.0 - 0.1)	0.3 (0.1 - 0.6)	1.5 (0.7 - 2.3)	3.2 (1.6 - 4.8)
1990s	0.0 (0.0 - 0.1)	0.2 (0.0 - 0.4)	1.3 (0.0 - 2.6)	1.3 (0.0 - 2.6)	

eTable 7. SIRs (95% CI) by age by treatment decade

Entire cohort:

	Age	All years	1970s	1980s	1990s
All BCs	<30	9.6 (7.1 - 12.7)	16.9 (10.3 - 26.1)	6.9 (3.8 - 11.5)	8.0 (4.4 - 13.3)
	30-39	9.0 (7.9 - 10.2)	10.1 (8.3 - 12.3)	7.7 (6.2 - 9.4)	10.1 (7.3 - 13.5)
	40-49	6.0 (5.2 - 6.8)	5.3 (4.5 - 6.3)	7.1 (5.8 - 8.6)	6.9 (3.0 - 13.6)
	50+	3.3 (2.4 - 4.3)	3.1 (2.2 - 4.2)	4.5 (2.1 - 8.6)	
	All ages	6.6 (6.1 - 7.2)	6.0 (5.3 - 6.7)	7.1 (6.2 - 8.1)	9.1 (7.0 - 11.5)
Invasive	<30	9.4 (6.8 - 12.7)	17.3 (10.4 - 27.1)	6.9 (3.7 - 11.9)	7.0 (3.6 - 12.4)
	30-39	7.2 (6.2 - 8.4)	8.7 (6.9 - 10.9)	6.3 (4.8 - 8.0)	6.3 (4.1 - 9.4)
	40-49	5.9 (5.1 - 6.8)	5.4 (4.4 - 6.5)	6.8 (5.4 - 8.6)	5.8 (1.9 - 13.6)
	50+	3.2 (2.3 - 4.5)	3.1 (2.1 - 4.5)	4.0 (1.5 - 8.7)	
	All ages	6.1 (5.6 - 6.7)	5.9 (5.2 - 6.7)	6.4 (5.5 - 7.5)	6.4 (4.6 - 8.7)
DCIS	<30	11.8 (3.8 - 27.5)	11.1 (0.1 - 61.5)	6.1 (0.1 - 33.7)	17.7 (3.6 - 51.8)
	30-39	20.9 (16.4 - 26.3)	19.1 (12.6 - 27.8)	16.9 (11.1 - 24.8)	36.6 (22.4 - 56.3)
	40-49	6.1 (4.8 - 7.8)	5.1 (3.5 - 7.1)	7.8 (5.2 - 11.2)	10.0 (2.0 - 29.2)
	50+	3.3 (1.7 - 5.8)	2.9 (1.3 - 5.5)	6.1 (1.2 - 17.8)	
	All ages	8.5 (7.3 - 10.0)	6.3 (4.9 - 7.9)	10.0 (7.6 - 12.9)	25.6 (16.8 - 37.5)

All survivors exposed stratified by chest radiotherapy exposure:

	Age	All years	1970s	1980s	1990s
Chest RT Yes					
All BCs	<30	24.0 (15.7 - 35.1)	43.2 (24.1 - 71.2)	15.6 (5.7 - 33.9)	14.2 (4.6 - 33.2)
	30-39	22.8 (19.4 - 26.6)	23.1 (18.0 - 29.1)	20.8 (15.7 - 26.9)	26.3 (18.3 - 36.5)
	40-49	10.6 (9.0 - 12.5)	10.3 (8.3 - 12.7)	11.7 (8.8 - 15.3)	6.0 (1.2 - 17.5)
	50+	6.1 (4.3 - 8.4)	5.5 (3.7 - 7.8)	10.6 (4.6 - 20.9)	
	All ages	13.2 (11.9 - 14.6)	11.7 (10.2 - 13.4)	14.7 (12.3 - 17.6)	19.7 (14.3 - 26.5)
Invasive	<30	23.1 (14.6 - 34.6)	46.6 (26.0 - 76.8)	14.1 (4.5 - 32.9)	9.4 (1.9 - 27.4)
	30-39	17.1 (14.0 - 20.7)	19.6 (14.7 - 25.6)	15.6 (11.0 - 21.5)	14.5 (8.4 - 23.2)
	40-49	10.3 (8.4 - 12.4)	9.8 (7.6 - 12.5)	12.2 (8.8 - 16.6)	0.0 (0.0 - 10.0)
	50+	6.3 (4.3 - 9.1)	6.0 (3.9 - 8.9)	8.8 (2.8 - 20.5)	
	All ages	11.9 (10.5 - 13.4)	11.4 (9.7 - 13.4)	13.2 (10.6 - 16.3)	10.7 (6.5 - 16.6)
DCIS	<30	34.4 (6.9 - 100.5)	0.0 (0.0 - 145.7)	32.7 (0.4 - 181.8)	64.0 (7.2 - 231.0)
	30-39	60.2 (45.6 - 78.0)	46.1 (27.7 - 71.9)	54.0 (33.0 - 83.4)	109.1 (64.8 - 172.0)
	40-49	11.7 (8.4 - 15.8)	11.8 (7.7 - 17.3)	10.2 (5.3 - 17.9)	23.2 (4.7 - 67.7)
	50+	5.3 (2.3 - 10.5)	3.8 (1.2 - 8.9)	16.2 (3.3 - 47.3)	
	All ages	18.1 (14.8 - 21.8)	12.6 (9.4 - 16.7)	20.5 (14.3 - 28.3)	70.8 (45.0 - 106.1)
Chest RT No					
All BCs	<30	5.5 (3.3 - 8.5)	5.7 (1.5 - 14.6)	4.1 (1.5 - 8.8)	7.0 (3.3 - 13.0)
	30-39	3.3 (2.5 - 4.3)	3.6 (2.3 - 5.4)	3.1 (2.0 - 4.6)	3.1 (1.4 - 6.0)
	40-49	3.5 (2.8 - 4.3)	2.7 (2.0 - 3.7)	4.8 (3.5 - 6.5)	5.2 (1.0 - 15.1)
	50+	1.2 (0.5 - 2.2)	1.3 (0.6 - 2.5)	0.0 (0.0 - 3.8)	
	All ages	3.2 (2.8 - 3.7)	2.7 (2.1 - 3.3)	3.8 (3.0 - 4.8)	4.5 (2.8 - 6.8)
Invasive	<30	5.4 (3.2 - 8.6)	4.6 (0.9 - 13.5)	4.4 (1.6 - 9.6)	6.9 (3.1 - 13.2)
	30-39	3.1 (2.2 - 4.1)	3.3 (1.9 - 5.2)	3.0 (1.8 - 4.6)	2.8 (1.1 - 5.7)
	40-49	3.6 (2.8 - 4.5)	3.0 (2.1 - 4.2)	4.3 (2.8 - 6.2)	7.0 (1.4 - 20.4)
	50+	0.8 (0.3 - 2.0)	1.0 (0.3 - 2.2)	0.0 (0.0 - 5.1)	
	All ages	3.1 (2.6 - 3.7)	2.7 (2.0 - 3.4)	3.5 (2.6 - 4.6)	4.4 (2.7 - 7.0)
DCIS	<30	6.6 (0.7 - 23.7)	18.2 (0.2 - 101.2)	0.0 (0.0 - 30.7)	7.8 (0.1 - 43.1)
	30-39	4.9 (2.4 - 8.7)	5.8 (1.9 - 13.5)	3.9 (1.0 - 9.9)	5.7 (0.6 - 20.6)
	40-49	3.3 (2.1 - 5.1)	1.8 (0.7 - 3.6)	6.3 (3.5 - 10.7)	0.0 (0.0 - 24.4)
	50+	2.1 (0.6 - 5.4)	2.4 (0.7 - 6.2)	0.0 (0.0 - 15.4)	
	All ages	3.5 (2.5 - 4.8)	2.6 (1.5 - 4.2)	5.0 (3.0 - 7.9)	4.8 (1.0 - 13.9)

HL survivors:

	Age	All years	1970s	1980s	1990s
All BCs	<30	27.5 (16.3 - 43.4)	45.8 (21.9 - 84.3)	19.4 (5.2 - 49.6)	17.3 (4.7 - 44.3)
	30-39	27.8 (23.4 - 32.7)	31.5 (24.2 - 40.3)	26.8 (19.9 - 35.3)	23.3 (15.7 - 33.3)
	40-49	13.3 (11.2 - 15.7)	13.9 (11.1 - 17.3)	12.7 (9.5 - 16.7)	11.1 (4.0 - 24.1)
	50+	6.6 (4.6 - 9.2)	5.7 (3.8 - 8.4)	11.5 (5.2 - 21.8)	
	All ages	15.5 (13.9 - 17.3)	14.3 (12.3 - 16.6)	16.5 (13.7 - 19.8)	19.4 (13.9 - 26.5)

Invasive	<30	26.5 (15.1 - 43.0)	49.3 (23.6 - 90.6)	20.9 (5.6 - 53.6)	9.5 (1.1 - 34.3)
	30-39	20.1 (16.2 - 24.7)	24.7 (17.8 - 33.2)	18.7 (12.6 - 26.7)	15.1 (8.8 - 24.2)
	40-49	12.8 (10.5 - 15.6)	13.2 (10.1 - 17.0)	13.0 (9.3 - 17.7)	7.5 (1.5 - 21.8)
	50+	6.9 (4.6 - 10.0)	6.4 (4.0 - 9.7)	10.2 (3.7 - 22.1)	
	All ages	13.8 (12.1 - 15.7)	13.6 (11.4 - 16.1)	14.6 (11.6 - 18.2)	12.7 (7.9 - 19.2)
DCIS	<30	39.4 (4.4 - 142.2)	0.0 (0.0 - 244.2)	0.0 (0.0 - 240.1)	98.5 (11.1 - 355.5)
	30-39	78.3 (58.7 - 102.5)	78.1 (47.7 - 120.6)	77.0 (47.0 - 118.9)	80.8 (43.0 - 138.2)
	40-49	14.8 (10.6 - 20.2)	16.2 (10.4 - 24.1)	12.1 (6.4 - 20.7)	21.4 (4.3 - 62.5)
	50+	5.5 (2.2 - 11.3)	3.7 (1.0 - 9.5)	15.6 (3.1 - 45.5)	
	All ages	21.7 (17.7 - 26.3)	16.9 (12.5 - 22.4)	23.3 (16.3 - 32.3)	56.0 (33.2 - 88.5)

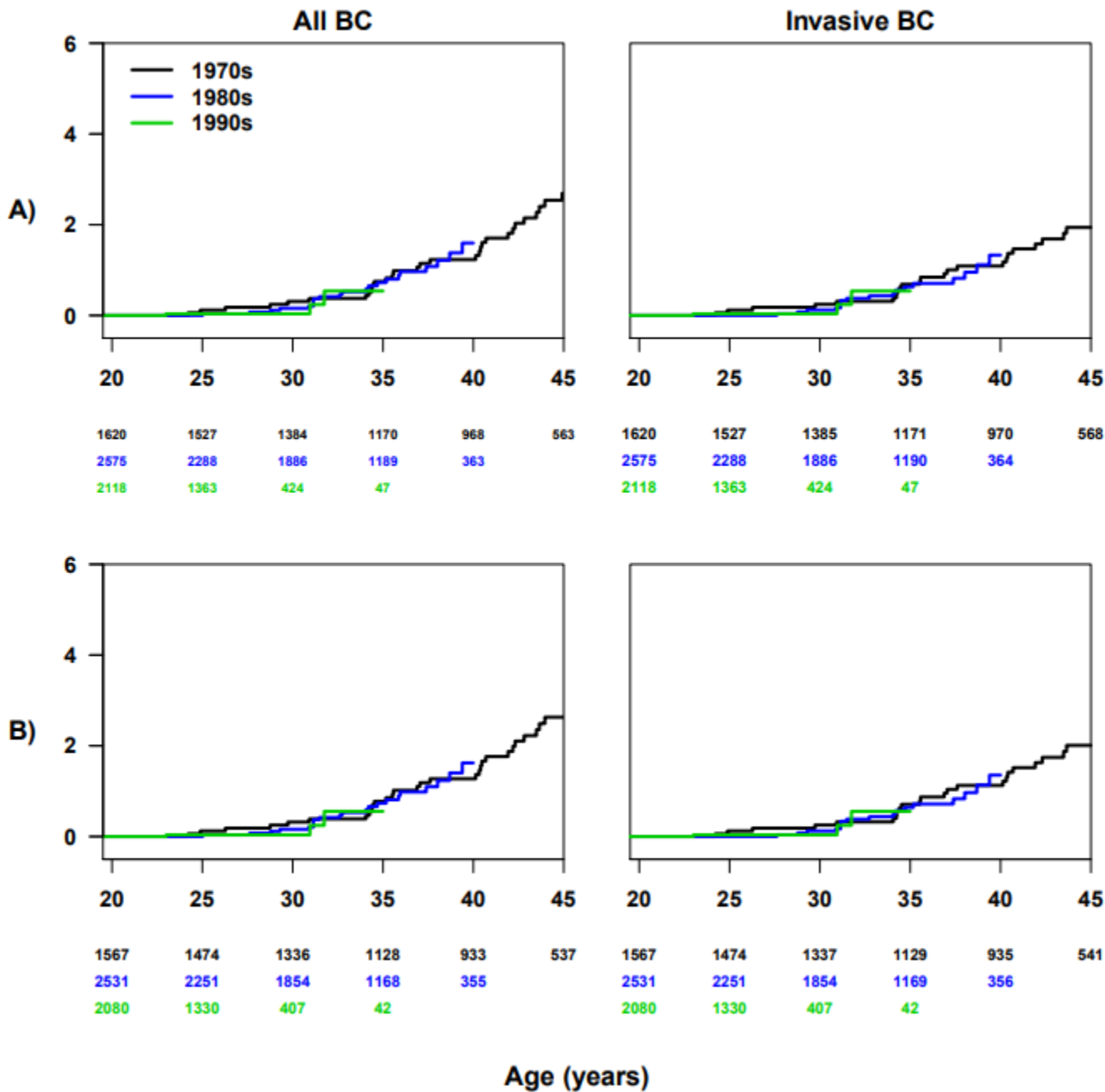
HL survivors with chest RT:

	Age	All years	1970s	1980s	1990s
All BCs	<30	31.1 (17.4 - 51.3)	51.2 (23.4 - 97.2)	19.7 (3.9 - 57.4)	19.5 (3.9 - 56.9)
	30-39	33.0 (27.6 - 39.2)	35.7 (27.2 - 46.0)	32.3 (23.6 - 43.1)	29.4 (19.4 - 42.8)
	40-49	14.1 (11.7 - 16.8)	14.8 (11.7 - 18.6)	13.9 (10.1 - 18.6)	7.1 (1.4 - 20.7)
	50+	7.6 (5.3 - 10.6)	6.7 (4.4 - 9.8)	13.7 (5.9 - 26.9)	
	All ages	17.2 (15.3 - 19.2)	15.7 (13.4 - 18.2)	18.9 (15.4 - 22.9)	22.1 (15.2 - 31.0)
Invasive	<30	31.4 (17.2 - 52.7)	55.0 (25.1 - 104.4)	21.2 (4.3 - 62.0)	14.3 (1.6 - 51.5)
	30-39	23.3 (18.5 - 29.0)	27.7 (19.8 - 37.8)	22.0 (14.5 - 32.1)	17.4 (9.5 - 29.3)
	40-49	13.4 (10.7 - 16.5)	13.7 (10.3 - 17.9)	14.6 (10.2 - 20.3)	0.0 (0.0 - 11.7)
	50+	8.0 (5.2 - 11.6)	7.5 (4.7 - 11.3)	11.3 (3.6 - 26.4)	
	All ages	15.1 (13.1 - 17.3)	14.7 (12.2 - 17.5)	16.6 (13.0 - 21.0)	12.7 (7.3 - 20.7)
DCIS	<30	27.1 (0.4 - 150.6)	0.0 (0.0 - 305.3)	0.0 (0.0 - 328.7)	73.4 (1.0 - 408.2)
	30-39	97.0 (72.2 - 127.5)	89.8 (54.1 - 140.3)	95.4 (57.4 - 149.0)	112.7 (59.9 - 192.7)
	40-49	16.3 (11.4 - 22.6)	18.3 (11.6 - 27.4)	11.9 (5.7 - 21.9)	27.3 (5.5 - 79.8)
	50+	6.5 (2.6 - 13.5)	4.3 (1.2 - 11.0)	20.9 (4.2 - 61.1)	
	All ages	24.7 (20.0 - 30.2)	19.1 (14.0 - 25.4)	26.8 (18.3 - 37.9)	71.2 (41.4 - 114.0)

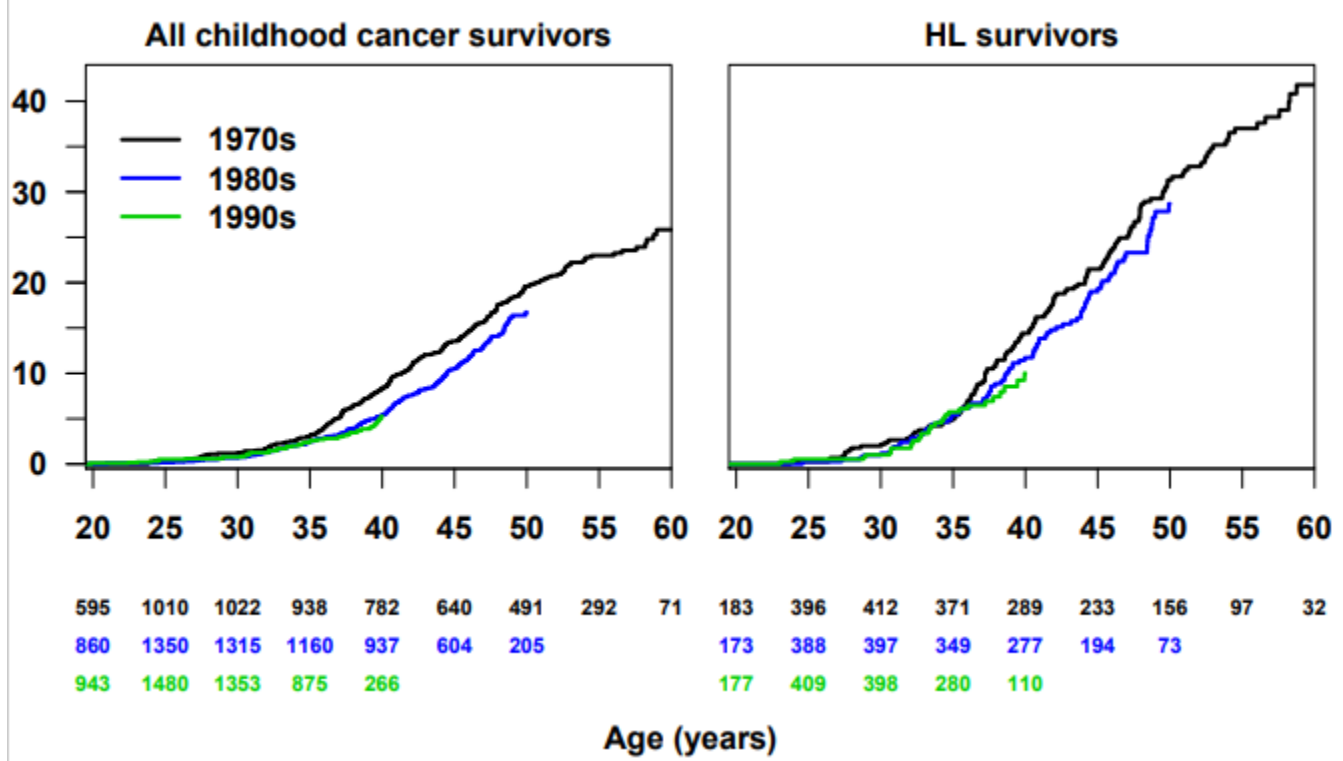
Survivors other than HL:

	Age	All years	1970s	1980s	1990s
All BCs	<30	7.0 (4.7 - 9.9)	10.3 (4.9 - 19.0)	5.5 (2.6 - 10.0)	6.7 (3.3 - 12.0)
	30-39	4.5 (3.7 - 5.5)	5.1 (3.7 - 6.8)	4.0 (2.9 - 5.5)	4.7 (2.7 - 7.8)
	40-49	3.4 (2.8 - 4.1)	2.8 (2.1 - 3.6)	4.8 (3.5 - 6.3)	3.2 (0.4 - 11.7)
	50+	1.4 (0.8 - 2.4)	1.6 (0.9 - 2.8)	0.0 (0.0 - 3.0)	
	All ages	3.7 (3.3 - 4.2)	3.2 (2.7 - 3.8)	4.3 (3.5 - 5.2)	5.1 (3.4 - 7.4)
Invasive	<30	6.9 (4.6 - 10.0)	10.1 (4.6 - 19.2)	5.3 (2.4 - 10.2)	6.7 (3.1 - 12.4)
	30-39	4.2 (3.3 - 5.2)	4.9 (3.5 - 6.8)	3.9 (2.7 - 5.5)	2.8 (1.2 - 5.6)
	40-49	3.5 (2.8 - 4.3)	3.0 (2.2 - 4.1)	4.4 (3.0 - 6.1)	4.4 (0.5 - 15.8)
	50+	1.2 (0.6 - 2.3)	1.4 (0.6 - 2.7)	0.0 (0.0 - 4.0)	
	All ages	3.7 (3.2 - 4.2)	3.4 (2.7 - 4.1)	4.0 (3.2 - 5.1)	4.2 (2.5 - 6.4)
DCIS	<30	8.0 (1.6 - 23.5)	13.3 (0.2 - 73.8)	6.7 (0.1 - 37.2)	6.7 (0.1 - 37.4)
	30-39	7.2 (4.4 - 11.0)	6.1 (2.4 - 12.5)	4.7 (1.7 - 10.2)	18.4 (7.5 - 37.5)
	40-49	3.2 (2.1 - 4.7)	1.9 (0.9 - 3.5)	6.0 (3.4 - 9.8)	0.0 (0.0 - 23.0)
	50+	2.1 (0.7 - 5.0)	2.4 (0.8 - 5.7)	0.0 (0.0 - 12.3)	
	All ages	4.0 (3.0 - 5.2)	2.7 (1.7 - 4.1)	5.3 (3.3 - 7.9)	11.7 (5.1 - 22.9)

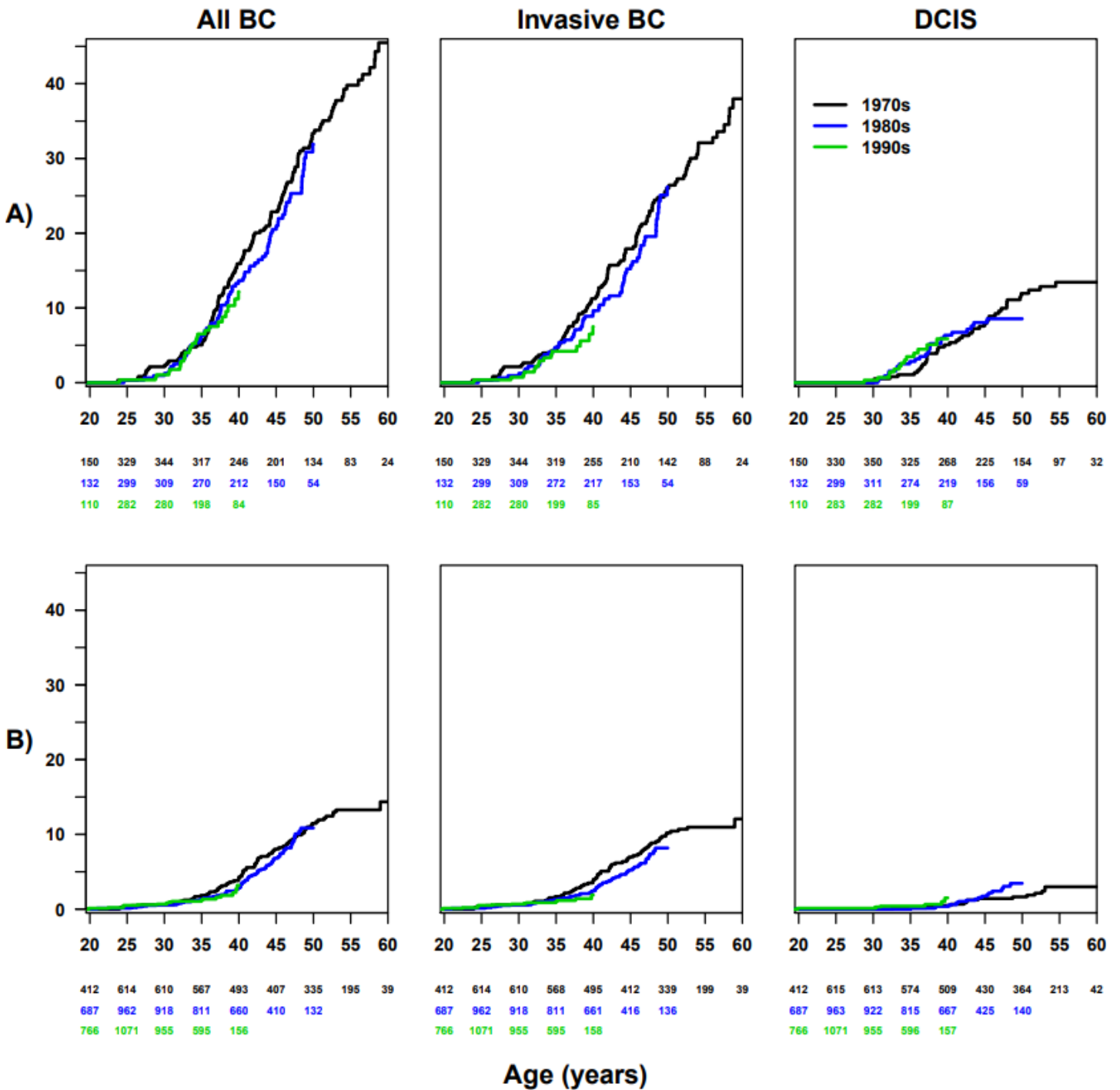
eFigure 1. Cumulative incidence (%) curves by treatment decade among survivors diagnosed in 0-9 years old for all breast cancers, invasive breast cancer and DCIS (A. All childhood cancer survivors; B. All survivors except HL)



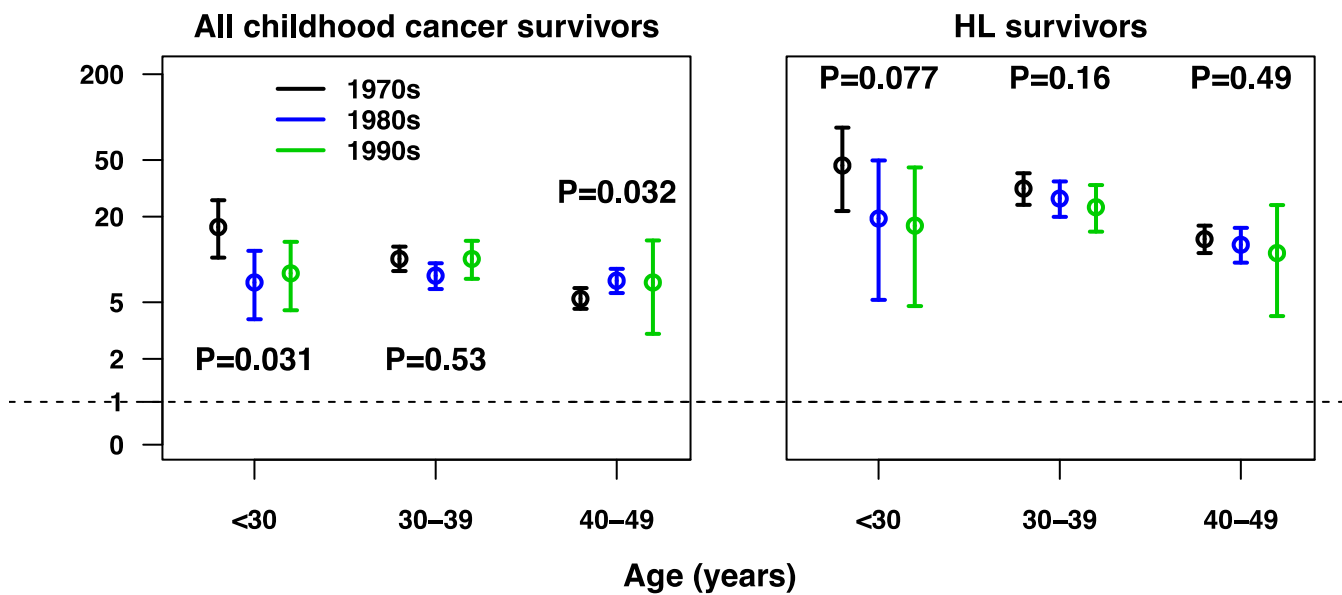
eFigure 2. Cumulative incidence (%) curves by treatment decade among survivors diagnosed in 10-20 years old for all breast cancers



eFigure 3. Cumulative incidence (%) curves by treatment decade among survivors diagnosed in 10-20 years old for all breast cancers, invasive breast cancer and DCIS (A. HL survivors with chest RT; B. All survivors except HL)



eFigure 4. SIRs (95% CI) of all breast cancers by age by treatment decade in all survivors and HL survivors



eFigure 5. SIRs (95% CI) by age by treatment decade in all survivors stratified by exposure to chest radiotherapy

