

Background

- 5-year relative survival of childhood cancer has improved from 30% in 1960 to 80% in 2004 due to improvements in therapy and supportive care.
- Late effects from treatment may continue throughout adulthood and are reported by 66% of survivors.
- Adult survivors are 2 times more likely to be unemployed in contrast to healthy comparisons.
 - Employment has financial and social impacts.
 - Female and central nervous system (CNS) tumor survivors may be at higher risk.

Aims and Hypotheses

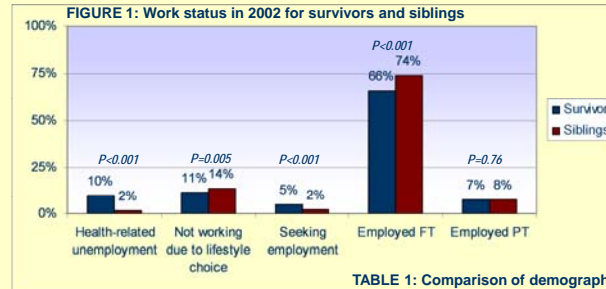
- Aim 1:** Evaluate work status of survivors compared to nearest age and gender-matched siblings.
 - Hypothesis:** Survivors will be more likely to report health-related unemployment.
- Aim 2:** Compare survivors' work status among demographic risk factors and diagnosis groups.
 - Hypothesis:** Survivors who are female or with a history of bone or central nervous system tumors will be more likely to report health-related unemployment.

Methods

- CCSS: 14,370 subjects diagnosed <21 years with cancer between 1970-1986 & randomly selected siblings (N=3418). Baseline questionnaire was completed in 1994-96.
- Current analyses were based on the 2002 follow-up, which had a response rate of 81%. Analyses were limited to survivors (N=6424) and siblings (N=1924) ages ≥25 years who were not unemployed by choice (unemployed but not seeking paid work, student, retired, or home-maker).
- Outcome of employment status obtained via questionnaire:
 - Health-related unemployment (being unable to work due to illness or disability)
 - Currently employed full-time (≥30 hours/week) or part-time (<30 hours/week), or unemployed but seeking work
- Examined risk of health-related unemployment:
 - Multivariable logistic regression compared survivors to siblings using generalized estimating equations (GEE) to account for the case-sibling pairs.
 - Among survivors, multivariable logistic regression was used to assess demographic and diagnosis risk groups.

Results

Aim 1: Health-related unemployment for survivors compared to siblings



- 10% of survivors reported health-related unemployment compared to 2% of siblings (Figure 1).

TABLE 1: Comparison of demographics by health-related unemployment for survivors & siblings

	Survivors N=6424		Siblings N=1924		p-value
	Health-related unemployment (%) N=677	Employed or seeking work ¹ (%) N=5747	Health-related unemployment (%) N=34	Employed or seeking work ¹ (%) N=1924	
Current age (years)					
25-34	10	90	2	98	
35-44	12	88	2	98	0.87
45+	11	89	2	98	
Gender					
Male	9	91	1	99	0.21
Female	13	87	2	98	
Race					
White	10	90	2	98	
Black	18	82	0	100	0.64
Hispanic	14	86	2	98	
Other/mixed	13	87	0	100	
Education					
≤High school	25	73	4	96	0.03
>High school	7	93	2	98	
Marital status					
Married	5	95	1	99	0.01
Not married	15	85	3	97	

¹Survivors and siblings who were unemployed due to being a student, homemaker or retired were not included

Aim 2: Comparison of health-related unemployment among survivor groups

- In Table 2, health-related unemployment was reported by
 - 25% of central nervous system tumor patients
 - 13% of bone tumor patients
 - 10% of soft-tissue sarcoma patients

TABLE 2: Childhood cancer diagnosis for survivors

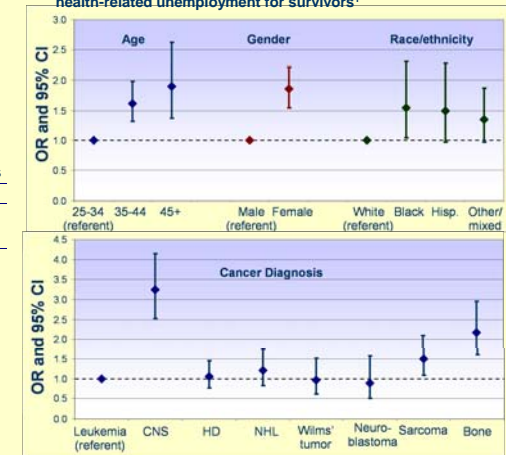
Childhood cancer diagnosis	N=6424	Health-related unemployment (%) N=677	Employed or seeking work ¹ (%) N=5747
Leukemia	2011	8	92
CNS tumors (CNS)	813	25	75
Hodgkin's disease (HD)	1023	7	93
Non-Hodgkin lymphoma (NHL)	574	8	92
Wilms' tumor	441	6	94
Neuroblastoma	265	6	94
Soft tissue sarcoma	630	10	91
Bone cancer	667	13	87

¹Survivors who were unemployed due to being a student, homemaker or retired were not included

Results, continued

- In Figure 2, older age, female gender, black race/ethnicity, and CNS, sarcoma and bone cancers were associated with a significantly higher odds of health-related unemployment among survivors.

FIGURE 2: Odds ratios (OR) and 95% confidence interval (CI) of health-related unemployment for survivors¹



¹Model adjusted for education and marital status

Limitations

- No childhood SES
- Part-time, home-maker or retired categories
- Current therapies less toxic

Next Steps

- NHANES comparison
- Explore variables in causal pathway & gender differences

Conclusions and Implications

- Health-related unemployment disproportionately affects adult survivors of childhood cancer.
 - Female and older age survivors and survivors of CNS, sarcoma and bone cancer are at an increased risk of not working because of health or disability.
 - Assessment of treatment type & dose, late effects and psychosocial factors is in progress.
- Interventions to mitigate health-related work limitations are necessary, especially for high-risk demographic groups.