

Proposal No: 98-23
Topic: Methodology

Lead CCSS Investigator: Les Robison

Collaborators: Mertens

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98-23

CCSS Analysis Concept Proposal

Submitted: December 15, 1998

1. Study Title: The Childhood Cancer Survivor Study: A Collaborative Study of Late-Effects in Children with Cancer

2. Working Group and Investigators: This proposed publication will be within the Epidemiology/ Biostatistics Working Group. Proposed investigators (name, email, fax) will include:

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3. Background and Rationale: Due to the improvement of cancer therapies in the last several decades, survival has increased dramatically in most types of cancer seen in children. To evaluate the impact of potential delayed consequences of therapy on these survivors, the Childhood Cancer Survivor Study (CCSS) was initiated to investigate the long-term effects of cancer and its associated therapies. With a study of this magnitude, it is important to describe the methods used to establish this cohort, and an overview of the data collected to date.

4. Specific Aims/Objectives/Research Hypotheses: There are two main objectives of this manuscript:

a) To describe the study design of this project. This manuscript will contain the following topics:

- Overview of study
- Subject eligibility criteria
- Contact of eligible participants
- Selection of sibling controls
- Baseline questionnaire data
- Medical records data abstraction
- Quality control
- Validation of selected endpoints

b) To provide an overview of the:

- demographics of all eligible cases in CCSS
- demographics of participants, refusals, and subjects lost-to follow-up

- overview of cancer treatment received by CCSS participants, by diagnosis
- general health status of CCSS participants

5. Analysis Framework:

- a. Outcome of interest: outcome status of all eligible cases (participant, refusal, lost-to-follow-up), demographic characteristics (sex, vital status, current age, age at diagnosis, diagnosis), type of treatment received, medical conditions reported.
- b. Subject population: all CCSS cases.
- c. Explanatory variables: not applicable.
- d. Specific tables (see attached):
 - Characteristics of eligible cases for the CCSS cohort
 - Characteristics of CCSS Cases by Outcome status
 - Treatment data by diagnosis
 - Reported medical conditions by diagnosis

6. Special Considerations: This publication is for the purpose of providing an overview of CCSS, and is to be used as a reference guide for future publications. The attached tables contain information as of September 23, 1998; they will be updated at the time of manuscript submission.

Table I. Characteristics of the Eligible Cases for the Childhood Cancer Survivor Study Cohort

	All Cases (%)	Males (%)	Females (%)
Sample size	20,319 (100)	11,232 (55)	9,087 (45)
Vital status			
Alive	18,210 (90)	9,966 (89)	8,244 (91)
Dead	2,109 (10)	1,266 (22)	843 (9)
Current age, years *			
11-19	4,470 (22)	2,340 (21)	2,130 (23)
20-29	8,092 (40)	4,524 (41)	3,568 (39)
30-39	4,881 (24)	2,686 (24)	2,195 (24)
40-48	865 (4)	415 (4)	350 (4)
Age at diagnosis			
0-4	8,030 (40)	4,303 (38)	3,727 (41)
5-9	4,546 (22)	2,633 (23)	1,913 (21)
10-14	4,138 (20)	2,274 (20)	1,864 (21)
15-20	3,602 (18)	2,020 (19)	1,582 (17)
Diagnosis			
Leukemia	6,635 (33)	3,589 (32)	3,046 (34)
CNS tumor	2,962 (15)	1,646 (15)	1,316 (15)
Hodgkin's disease	2,712 (13)	1,557 (14)	1,155 (13)
Non-Hodgkin's lymphoma	1,481 (9)	1,049 (9)	432 (5)
Neuroblastoma	1,317 (7)	679 (6)	638 (7)
Wilms' tumor	1,686 (8)	790 (7)	896 (10)
Soft tissue sarcoma	1,814 (9)	992 (9)	822 (9)
Bone tumor	1,712 (8)	930 (8)	782 (9)

* current age for alive cases, as of 12/31/1997

Table II. Characteristics of CCSS Subjects by Outcome Status

	Participant (%)	Refusal(%)	LTFU (%)	Pending (%)
Sample size	13,492 (65)	2,588 (13)	2,600 (13)	1,639 (9)
Sex				
Male	7,211 (53)	1,578 (61)	1,445 (56)	998 (61)
Female	6,281 (47)	1,010 (39)	1,155 (44)	641 (39)
Vital status				
Alive	12,374 (92)	2,228 (86)	2,191 (84)	1,414 (86)
Dead	1,118 (8)	360 (14)	409 (16)	222 (14)
Current age, years *				
11-19	3,780 (28)	609 (24)	757 (29)	416 (26)
20-29	5,793 (43)	1,209 (47)	1,139 (44)	743 (45)
30-39	3,386 (25)	644 (25)	601 (23)	426 (26)
40-48	533 (4)	110 (4)	90 (4)	51 (3)
Age at diagnosis				
0- 4	5,370 (40)	941 (36)	1,134 (44)	585 (35)
5- 9	2,996 (22)	589 (23)	583 (22)	379 (23)
10-14	2,734 (20)	553 (21)	497 (19)	353 (22)
15-20	2,392 (18)	502 (20)	386 (15)	322 (20)
Diagnosis				
Leukemia	4,519 (34)	803 (31)	811 (31)	502 (31)
CNS tumor	1,845 (14)	450 (17)	445 (17)	222 (14)
Hodgkin's disease	1,792 (13)	353 (14)	300 (12)	267 (16)
Non-Hodgkin lymphoma	1,005 (7)	171 (7)	177 (7)	128 (8)
Neuroblastoma	1,168 (9)	165 (6)	228 (9)	125 (7)
Wilms' tumor	875 (6)	138 (5)	203 (8)	101 (6)
Soft tissue sarcoma	1,165 (9)	256 (10)	245 (9)	148 (9)
Bone tumor	1,123 (8)	252 (10)	191 (7)	146 (9)

* current age for alive cases, as of 12/31/1997

TABLE 3. Treatment received by diagnosis (excludes cases with unknown chemo, RT or surgery)

Diagnosis	Total	Chemo only		Surgery only		Radiation only		Chemo + surgery		Chemo + radiation		Surgery + radiation		Chemo + surgery + radiation		All chemo		All surgery		All radiation	
		Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Leukemia	3492	653	19	0	0	0	0	405	12	1168	33	0	0	1266	36	3492	100	1671	48	2434	70
CNS	1443	1	0	368	26	17	1	48	3	10	1	613	42	386	27	445	31	1415	98	1026	71
HD	1379	5	0	0	0	4	0	86	6	10	1	440	32	826	60	927	67	1360	99	1288	93
NNL	720	16	2	10	1	5	1	198	28	27	4	26	4	438	61	679	94	672	93	496	69
Kidney (Wilms)	896	0	0	12	1	0	0	300	34	1	0	2	0	573	64	882	98	895	100	576	64
Neuroblastoma	660	4	1	166	25	3	0	166	25	6	1	113	17	210	31	386	58	655	98	332	50
Soft tissue sarcoma	892	0	0	138	15	0	0	188	21	4	0	53	6	509	57	701	79	888	100	566	63
Bone cancer	856	1	0	81	9	1	0	475	55	4	0	9	1	285	33	765	89	850	99	299	35
	10346	680	7	775	7	30	0	1874	18	1230	12	1264	12	4493	43	8277	80	8406	81	7017	68

Table 4

Reported Medical Conditions	Number who responded Yes (%)								
	All Cases	Leukemia	CNS	HD	NHL	Kidney	Nbl	STS	Bone
Hearing	2305 (17)	578 (12)	637 (35)	281 (16)	137 (14)	127 (11)	114 (13)	227 (20)	204 (19)
Vision	4100 (31)	1251 (28)	981 (54)	437 (25)	259 (26)	278 (23)	232 (27)	34 (35)	25 (26)
Speech	1331 (14)	379 (12)	439 (27)	98 (13)	74 (12)	76 (9)	105 (16)	105 (16)	55 (10)
Urinary system	2225 (16)	490 (11)	255 (14)	255 (15)	153 (14)	469 (39)	163 (19)	261 (23)	179 (16)
Hormonal system	2631 (24)	905 (20)	683 (38)	768 (44)	173 (17)	151 (13)	125 (15)	288 (26)	147 (14)
Heart/circulatory system	2631 (19)	803 (17)	305 (17)	492 (28)	199 (19)	205 (17)	133 (16)	210 (19)	284 (25)
Respiratory system	7916 (59)	2563 (57)	945 (52)	1184 (67)	625 (63)	689 (59)	530 (63)	688 (61)	692 (65)
Digestive system	4625 (34)	1478 (33)	591 (33)	774 (43)	363 (37)	370 (31)	266 (32)	401 (35)	382 (34)
Brian/nervous system	6264 (46)	1841 (40)	1461 (80)	803 (45)	413 (41)	392 (33)	347 (40)	493 (44)	514 (47)
Reported subsequent cancer	752 (5)	178 (4)	95 (5)	215 (11)	60 (6)	32 (2)	31 (4)	84 (7)	57 (5)
First degree relative with cancer	2138 (16)	534 (12)	278 (15)	453 (25)	161 (16)	117 (10)	92 (12)	224 (20)	270 (25)