Published in final edited form as:

Cancer Epidemiol Biomarkers Prev. 2021 April ; 30(4): 727–735. doi:10.1158/1055-9965.EPI-20-1409.

Comparison of Young Adult Female Cancer Survivors Recruited From a Population-Based Cancer Registry to Eligible Survivors

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Abstract

Background: Population-based cancer registries provide a resource to recruit young adult cancer survivors who may not be easily identified otherwise.

Methods: We compared demographic and cancer-related characteristics of participants in a cohort of female young adult cancer survivors to those of eligible survivors in the Georgia Cancer Registry, a population-based registry in the United States. We examined associations between survivor characteristics and non-participation using logistic regression and associations between survivor characteristics and different types of non-participation (refusal, unable to contact, or unresolved vs. interviewed) using polytomous regression.

Results: The Georgia Cancer Registry was able to contact 60% of eligible women (3,061/5,137). Of those, 78% agreed to study contact (n=2,378), and of those, 56% were interviewed (n=1,342). Participation was similar across age at contact and at diagnosis but varied across cancer type from 17% for cervical cancer to 32% for breast cancer. White women were slightly more likely to be interviewed (28%) than African-American women (23%), which was mostly attributable to greater difficulty in contacting African-American women (odds ratio 1.7, 95% confidence interval: 1.5, 2.1).

Conclusions: The greatest challenge to recruiting women was contacting them, which differed across some but not all demographic and cancer-related characteristics. When successfully contacted, most survivors agreed to participate.

Impact: Population-based cancer registries can serve as an invaluable resource to recruit representative samples of young adult cancer survivors, who are otherwise difficult to identify.

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Conflict of interest: The authors declare no conflict of interest

Keywords

cancer registry; cancer survivorship; population-based research; participation; recruitment

INTRODUCTION

Advances in cancer therapy have improved survival rates (1). However, many treatments affect the long-term health and quality-of-life of survivors. Population-based cancer registries allow for identification of survivors within a defined sampling frame (2). Registry-based studies are particularly relevant for young adult survivors, who experience a wide range of cancer types (3–5) and diverse sociocultural conditions related to insurance, employment, mobility, and familial situation (5–7). Further, treatment is not centralized (4–6), making identifying young adult survivors difficult in a clinical setting. Thus, population-based studies are important to represent the heterogeneity of these survivors, and cancer registries provide a unique resource.

However, few publications directly evaluate whether long-term survivors of young adult cancers recruited from population-based registries are representative of the eligible population (8–11) or examine why eligible survivors are missing from a study population (eg, unable to contact, refusal) by survivor characteristics. The Furthering Understanding of Cancer, Health, and Survivorship In Adult (FUCHSIA) Women's Study is a population-based study of women's health in female survivors of young adult cancers 2–19 years after diagnosis. We evaluate the representativeness of participants compared with those eligible for the study with respect to demographic and cancer-related characteristics. Results from this study can identify characteristics of cancer survivors who may be underrepresented in registry-based studies in order to develop targeted protocols to enhance recruitment. Further, our results provide sampling probabilities, which can be used to address selection bias.

MATERIALS AND METHODS**Identification of eligible women**

Survivors were identified in the Georgia Cancer Registry (GCR), a statewide, population-based tumor registry. All reportable malignant cancers (12) and ductal carcinoma in situ were eligible. Additional criteria included being female, aged 20–35 years at first diagnosis, diagnosed during 1990–2009 in metropolitan Atlanta or 1999–2009 outside metropolitan Atlanta, at least 2 years post-diagnosis, and 22–45 years old. Recruitment for thyroid cancer and melanoma was restricted to metropolitan Atlanta (1995–2008) because these cancers are common and unlikely to receive therapies of interest. The interview was only available in English. Because the study required identifying information, GCR protocol required permission from survivors before study contact.

GCR outreach

GCR staff contacted cancer survivors using updated contact information from LexisNexis® Accurant®. Starting in September 2011, eligible women were sent a letter explaining the cancer registry, describing how the registry protects privacy, and introducing the FUCHSIA

Women's Study. A form for updating contact information or refusing further contact and a pre-paid envelope were provided. After 2 weeks, non-responders were called at all available phone numbers at different times of day on different days of the week, including the weekend. Messages were left on voice mail when possible for the first call to a valid number and every 2 to 3 calls after. In March 2012, women were classified into those contacted by the GCR, those unable to be contacted (no reply by mail and no phone contact), and those reported to be ineligible by a third party (eg deceased) (Figure 1). Those contacted were further classified as agreeing to study contact, refusing study contact, undecided (ie never refusing or agreeing), or ineligible.

Study recruitment

Survivors willing to be contacted by the FUCHSIA Women's study were sent a letter about the study with information on informed consent and the Health Insurance Portability and Accountability Act (HIPAA). Shortly thereafter, women were called for an interview about their reproductive history, demographic characteristics, health, and lifestyle. Before the interview, they were also told that participation required consent to have cancer diagnosis and treatment information abstracted from their medical records. Interested women were screened and interviewed if eligible. Informed consent and the HIPAA authorization were administered by phone prior to the interview. Individuals completing the interview were sent a \$25 gift card and a medical record release form. Recruitment lasted from May 2012 through February 2013. Women were called at different times of day on different days of the week, including the weekend. Messages were left on voice mail when possible. A second letter reminding survivors about the study was sent to individuals who had not been reached by October 2012. After recruitment ended, each woman was assigned a recruitment outcome, including interviewed (partial or complete) or non-participation. Sub-categories of non-participation included refused, ineligible, not locatable (women whose phone numbers changed and could not be updated), or unresolved. Unresolved included women who did not actively refuse or agree to study participation. This category included women who passively refused, who were unavailable during the study timeframe, who we could not talk to directly (eg spouse refused without consulting the eligible woman), and whose phone numbers were unconfirmed.

Data analysis

The GCR provided routinely-collected demographic and cancer-related information on all eligible women. County of the mailing address was categorized using the 2006 National Center for Health Statistics Urban-Rural Classification Scheme.

We performed descriptive analyses by recruitment outcome. We fit a single logistic model to evaluate the associations between all demographic and cancer-related variables and non-participation (versus interviewed, including partial and complete). We also fit a polytomous logistic regression model, including all covariates in the same model, where ever refused, unable to contact (unable to contact and not locatable), and unresolved (undecided and unresolved) were each compared with interviewed. Both models were restricted to eligible women living in Georgia without missing data (Supplemental Figure 1). We evaluated the sensitivity of our results through the following additional analyses: 1) restricting to

metropolitan Atlanta, 2) excluding thyroid and melanoma survivors, and 3) restricting to African-American and white women because other race groups were small.

The study was conducted in accordance with recognized ethical guidelines and was approved by the Emory University and Georgia Department of Public Health Institutional Review Boards.

RESULTS

Recruitment outcomes

The GCR identified 5423 potentially eligible women (Figure 1). Of these, 61% were contacted, 38% could not be contacted, and less than 1% were ineligible (eg, deceased, did not speak English) during GCR outreach. Among those contacted, 23% replied by mail, 71% by phone, and 6% by both methods. Among respondents, 78% agreed to study contact, 15% refused, 2% reported being ineligible, and 6% were undecided or passively refused. Among women providing a reason for refusal, 74% reported lack of interest. The median number of calls to survivors was 5 (interquartile range (IQR): 2–10), including calls to incorrect numbers (31% of all calls). GCR staff spent over 2500 person-hours, calling survivors, mostly weekdays between 4:00–7:00 pm over 29 weeks.

Of women who agreed to be contacted by the study, 50% finished the interview, 2% completed part of the interview, 16% refused, 8% were ineligible, 7% had an incorrect phone number, and 18% were unresolved. Reasons for ineligibility included unable to complete the interview, aging out of eligibility, self-reporting an ineligible age at first cancer diagnosis, being deceased, being unaware of cancer diagnosis, and not answering a screening question. The median number of study calls to survivors was 16 (IQR: 5–30), including unanswered calls, with a median of 2 calls (IQR: 1–4) answered by anyone. Among participants, the median number of calls was 10 (IQR: 4–21) and of answered calls was 3 (IQR: 2–4).

Population characteristics

Differences in being interviewed by age at attempted contact were small (Table 1). White women were slightly more likely to be contacted by the GCR than African-American women, but once contacted, white and African-American women were equally likely to agree to study contact. However, African-American women were more difficult for the study to locate. This pattern generally persisted across demographic and cancer characteristics (Supplemental Figure 2). GCR contact was most successful for women living in metropolitan Atlanta compared with other areas, but once contacted, women were equally willing to release their names to the study across locations. However, study contact was less successful for women outside metropolitan Atlanta. This pattern persisted across demographic and cancer characteristics (Supplemental Figure 3).

The proportion of women interviewed was similar across age at diagnosis but varied across years since diagnosis. Time since diagnosis did not appear to affect the ability to locate African-American or white women (Supplemental Figure 2D). The success of GCR contact varied by cancer type from 45% for cervical cancer to 70% for melanoma. This variability

persisted for study participation from 16% for cervical cancer to 32% for breast cancer. Low participation of cervical cancer survivors was driven by greater difficulty locating them compared with all cancers combined (Supplemental Figure 4).

Model results

Factors most strongly associated with non-participation included race other than African American or white compared with white (odds ratio (OR) 5.5, 95% confidence interval (CI): 2.4, 12.8) and Hispanic compared with non-Hispanic (OR 5.1, 95% CI 3.0, 8.6), but these estimates were imprecise (Figure 2 and Supplemental Table 1). Weaker but more precise estimates were observed for African American versus white (OR 1.5, 95% CI: 1.3, 1.8), living in a rural area versus metropolitan Atlanta (OR 1.8, 95% CI: 1.4, 2.2), and cervical cancer versus the less common cancers combined (OR 1.7, 95% CI: 1.3, 2.2).

In the polytomous model, race other than African American or white compared with white was strongly associated with all non-participation outcomes (refusal, unable to contact, unresolved), but the estimates were imprecise (Figure 3 and Supplemental Table 1). The pattern was less consistent for other characteristics.

The odds of refusing to participate compared with being interviewed and of being unresolved versus being interviewed decreased with increasing age at contact, but the associations for unable to contact versus being interviewed did not vary by age. Being African American compared with being white was associated with unable to contact (OR 1.7, 95% CI: 1.5, 2.1), but not with refusal or unresolved. Being Hispanic compared with non-Hispanic was strongly associated with unable to contact (OR 8.3, 95% CI: 4.9, 14.2), but the estimate was imprecise. Being Hispanic was also moderately associated with refusal and unresolved. The odds of all non-participation outcomes were elevated for women living in a rural area versus a large metropolitan area; the strongest association was for unable to contact (OR 2.1, 95% CI: 1.7, 2.7).

Age at diagnosis was not associated with non-participation. Women who were diagnosed 16–21 years before attempted contact were the most likely to refuse (OR 2.5, 95% CI: 1.1, 5.7) and to be unresolved (OR 1.7 95% CI: 0.7, 4.5) compared with women diagnosed 2–5 years before, but these results were imprecise. Women with cervical cancer were less likely to be contacted than women with the less common cancers (OR 2.1, 95% CI: 1.6, 2.8). However, they were similar to other cancers with respect to refusal and unresolved.

The sensitivity analyses were not meaningfully different from the primary analyses.

DISCUSSION

The overarching goal of the FUCHSIA Women's Study was to assess women's health issues in a population-based cohort of female survivors of young adult cancers. We recruited a cohort of survivors that closely resembled eligible women in a population-based cancer registry with respect to demographic and cancer-related characteristics, but doing so required substantial resources. The greatest challenge was contacting women rather than participant refusal. The GCR was unable to reach approximately 40% of the population,

despite using tracing services. Comparing non-response levels across studies is difficult because definitions of unable to contact differ (eg, invalid addresses only or invalid addresses and non-response) and because of differences in the denominator (eg, only eligible or eligible and unknown eligibility). Nevertheless, our results are consistent with other studies recruiting long-term (1 year) survivors of adult cancers from population-based registries in the United States. These studies report being unable to contact from 24% to 66% of those presumed eligible (8,13–16).

The population interviewed for the FUCHSIA Women's Study was more likely to be white, non-Hispanic, and live in metropolitan Atlanta than the eligible population in the GCR. In addition, women with cervical cancer were less likely to participate. Counter to expectations, the percent of survivors who were unreachable did not increase with years since diagnosis suggesting that survivors can be traced long after diagnosis.

Hispanic women were substantially less likely to participate than non-Hispanic women, which might be in part because study materials were only available in English. Women whose primary language was Spanish may have screened their calls (and may not have been eligible if reached). However, for all women, we could not distinguish passive refusal from incorrect contact information.

The overall difference in recruitment between African-American and white women was small, but similar to other registry-based studies (8,11,15,17,18). Although African-American women were more likely to participate than Hispanic women, African-American women were a larger proportion of the eligible population and therefore, more African-American women did not participate. Similar to other registry-based studies (8,16,17), participation differences between white and African-American women were driven by greater difficulty contacting African-American women. Greater mobility and less use of resources monitored by contact tracing companies may affect the ability to contact some women. According to the 2000 US Census, both African Americans and Hispanics were more likely to move between 1995–2000 than non-Hispanic whites (19). Further, in a study of workers compensation claimants, African-American claimants required more intense tracing than whites (20). In addition, workers requiring more intense tracing reported more financial problems. Financial difficulties might be associated with less use of resources tracked by tracing companies. Thus, investigators might improve recruitment by devoting additional resources to contact tracing of African Americans and Hispanics.

In our study and a hospital-based cancer registry study (21), women living in rural areas were less likely to be contacted. Although a higher proportion of women from rural areas were not interviewed, a greater number of women from metropolitan Atlanta were not interviewed. If urban-rural differences are of interest, then identifying alternative approaches to trace women in rural areas is important. However, if these differences are not critical, greater sample size might be achieved by improving recruitment in metropolitan areas.

Participation by cervical cancer survivors, the second most common cancer in our study, was low. Although half of those contacted participated, only 16.7% of those who were eligible participated. These results are similar to a California registry-based study where 51% of

those contacted and 22% of those eligible participated (13). Low participation in our study was driven by the inability to contact cervical cancer survivors. Because the incidence of cervical cancer can be reduced through routine screening (22,23), we hypothesize that women with cervical cancer were more likely to be from economically disadvantaged populations with less access to care and lower utilization of services audited by tracing companies. This hypothesis gains some support from behavioral surveillance data that indicate women without health insurance are less likely to have been screened for cervical cancer in the past 5 years compared with all women aged 21–65 years (24). This raises concerns about selection bias for registry-based studies of cervical cancer survivors.

Participation is also affected by the protocol for tracing eligible survivors and following-up with non-responders. Our study was complicated by the requirement that the GCR contact women before the study. Follow-up calls after the initial GCR mailing were critical for contacting survivors and required substantial GCR staff effort. A 2004 survey of United States cancer registries reported that 21% did not allow study contact with cancer survivors, and 36% of those allowing contact required the registry to make first contact (25). Further, some registries reported changing their policies to decrease study-initiated contact in response to HIPAA policies. Thus, additional registries may have made similar changes after 2004. Some registries can send study questionnaires to eligible individuals directly on behalf of the study, which might increase participation. However, this protocol is not possible for more complex studies, such as ours, which require access to identifying information (eg, medical records) or have study protocols that require more resources than the registry has available (eg, extensive interviews).

Another challenge was call screening. Call screening is often considered passive refusal, but some women interested in participating contacted us to ask why we had not called them. Typically, we had already left messages at the correct phone number, indicating that call screening may prevent even desired contact. Some studies define cancer survivors as inaccessible after 7 phone calls or fewer (11,15,16), which may affect participation levels. In our study, the median number of calls to eventual study participants was 10 (IQR 4–21), and another registry-based study concluded that up to 15 calls was productive (26). An alternative approach would be to text women who have not been reached. We hypothesize that some women would be more responsive to texts if only to refuse actively instead of passively. Texting has been used to communicate with study participants after enrollment but less often for recruitment (27), presumably because it requires a cell phone number. Nevertheless, registries could facilitate this recruitment approach by collecting cell phone numbers during pre-screening. Collecting e-mail addresses may be of value as well.

Even after pre-screening by the GCR, 7% of women agreeing to study contact could not be reached for the interview at the phone number they provided and could not be traced. We began recruitment after GCR outreach was complete. Participation would likely improve if study recruitment began during registry outreach because women would have less time to change their contact information and would be more likely to remember hearing about the study.

Some women incorrectly reported being ineligible during screening, including women unaware of their cancer diagnosis. This discrepancy between registry data and self-report has been observed in other studies (17,21,26). Thus, it is important that registry and study staff are prepared to address this situation sensitively.

In order to participate in our study, women had to consent to have cancer diagnosis and treatment information abstracted from their medical records. Concerns related to the privacy of their medical records may have caused some women to refuse to participate. Further, although all interviewed women agreed to release their medical records orally, obtaining medical records was affected by numerous factors other than willingness to participate in the study such as failure to return signed medical record release forms, length of time facilities store medical records, and facilities' willingness to process requests.

Generally, our recruitment results are reassuring. However, one of the main limitations of this study is that participation may differ by unmeasured factors. The degree to which this introduces bias would depend on the research question and how strongly the factors are related to the exposure and outcome of interest. A Norwegian cancer survivor study examined bias due to non-response and concluded that low participation introduced minimal biased for many research questions (10). Another limitation is that women were 2 to 21 years post-cancer diagnosis at recruitment. Survival is associated with some of the participant characteristics we considered, which affected the number of eligible women with different characteristics. This may limit generalizability of our results to studies restricted to other times since cancer diagnosis. Further, because this study focused on women's health in survivors of young adult cancers, our results may not be generalizable to male survivors or survivors of childhood or older adult cancers.

Identifying survivors from a cancer registry provides an opportunity to recruit a broad spectrum of cancer survivors including survivors of different cancer types, survivors living in different geographic areas, and survivors who might not attend a specific clinic for other reasons, such as limitations of their insurance coverage. It also provides an opportunity to collect information not available in administrative records (10). The success of registry-based recruitment compared with other methods is affected by whether current patients or long-term survivors are approached, the study burden (eg mail-in questionnaires, medical records release, clinical interventions), and recruitment protocols. The biggest challenge to recruitment in our study was not active refusals but contacting women because of incorrect contact information and unanswered calls. Given the loss of potential participants due to incorrect contact information, contact-tracing services are critical, but there is potential for selection bias. Some studies may be able to perform quantitative bias analyses by estimating participation probabilities based on data from their registries or based on our study. Generally, maximizing the success of population-based recruiting requires substantial resources, which is challenging when funding is limited and rapid results are desired. Nevertheless, the value gained is the opportunity to address research questions that cannot be answered with administrative data in populations that might be underrepresented based on other recruitment schemes.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

ACKNOWLEDGEMENTS

We thank Amy Fothergill for verifying the reported results, Helen Chin for providing feedback on the manuscript, and the Helen Riaboff Whiteley Center, University of Washington (Friday Harbor, Washington), for providing a work environment conducive to writing. Part of this work was previously presented as a poster at the 2013 Annual Meeting of the Society for Epidemiologic Research (Boston, MA).

Financial Support: This work was supported by the *Eunice K. Shriver* National Institute of Child Health and Human Development, National Institutes of Health grant number R01 HD066059 awarded to Penelope P. Howards.

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Figure 1.
Flow chart of study recruitment from the Georgia Cancer Registry.

Figure 2.

Odds ratios (OR) and 95% confidence intervals (CI) from a logistic model comparing non-participation with being interviewed for all demographic and cancer-related characteristics in a single model. The reference group is indicated for each category by an asterisk. All eligible women living in Georgia without missing data were included (n=4,184).

Figure 3. Odds ratios (OR) and 95% confidence intervals (CI) from a polytomous logistic model comparing A) refused, B) not locatable, and C) unresolved with being interviewed for all demographic and cancer-related characteristics in a single model. The reference group is indicated for each category by an asterisk. All eligible women living in Georgia without missing data were included (n=4,184).

Table 1.
Recruitment Outcomes for All Eligible Female Cancer Survivors by Demographic and Cancer-Related Characteristics.

	GCR ^a n=5137	GCR (n=5137)		Contacted by GCR (n=3061)			Agreed to Study Contact (n=2378)			GCR (n=5137)	
		Unable to contact n=2076	Contacted by GCR n=3061	Undecided n=199	Refused Study Contact n=484	Agreed to Study Contact n=2378	Unresolved n=453	Not Locatable n=173	Refused n=410	Interviewed ^{b,c} n=1342	Interviewed ^{b,d} n=1342
Age at First Attempted Contact											
22-24	37	27.0	73.0	11.1	14.8	74.1	15.0	25.0	15.0	45.0	24.3
25-29	338	46.2	53.8	6.0	13.2	80.8	16.3	7.5	17.0	59.2	25.7
30-34	937	43.3	56.7	6.6	14.9	78.5	16.8	9.1	15.3	58.8	26.1
35-39	1,865	38.8	61.2	6.7	14.3	79.0	20.0	7.0	16.2	56.9	27.5
40-45	1,960	39.8	60.2	6.2	18.2	75.7	19.7	6.3	19.3	54.7	24.9
Race											
White	3,438	38.6	61.4	5.9	16.1	78.0	18.1	5.6	17.2	59.1	28.3
African American	1,507	43.6	56.4	7.9	13.8	78.4	20.6	11.4	16.4	51.7	22.8
Asian	91	56.0	44.0	5.0	40.0	55.0	31.8	9.1	27.3	31.8	7.7
AI/AN	2	100.0	0.0	-	-	-	-	-	-	-	0.0
NH/PI	3	33.3	66.7	50.0	0.0	50.0	0.0	0.0	0.0	100.0	33.3
Multiracial	2	0.0	100.0	0.0	50.0	50.0	100.0	0.0	0.0	0.0	0.0
Other	2	100.0	0.0	-	-	-	-	-	-	-	0.0
Unknown	92	40.2	59.8	7.3	20.0	72.7	25.0	5.0	30.0	40.0	17.4
Ethnicity ^e											
Hispanic	239	74.9	25.1	15.0	16.7	68.3	22.0	9.8	19.5	48.8	8.4
Hispanic surname	73	52.1	47.9	8.6	17.1	74.3	23.1	7.7	15.4	53.8	19.2
Non-Hispanic	4,815	38.6	61.4	6.3	15.8	77.9	18.9	7.3	17.2	56.6	27.1
Unknown	10	10.0	90.0	0.0	11.1	88.9	25.0	0.0	25.0	50.0	40.0
Residence ^f											
Large Metro	2,743	36.3	63.7	6.5	17.2	76.4	18.6	6.4	19.3	55.7	27.1
Small Metro	869	48.0	52.0	7.1	14.8	78.1	17.6	9.1	16.7	56.7	23.0

	GCR (n=5137)			Contacted by GCR (n=3061)			Agreed to Study Contact (n=2378)			GCR (n=5137)	
	GCR ^a n=5137	Unable to contact n=2076	Contacted by GCR n=3061	Undecided n=199	Refused Study Contact n=484	Agreed to Study Contact n=2378	Unresolved n=453	Not Locatable n=173	Refused n=410	Interviewed ^{b,c} n=1342	Interviewed ^{b,d} n=1342
Rural	639	49.1	50.9	8.3	16.0	75.7	22.4	11.0	17.9	48.8	18.8
Out of State	710	44.9	55.1	5.1	14.8	80.1	18.8	4.8	11.2	65.2	28.7
Unknown	176	17.0	83.0	-	-	-	-	-	-	-	42.6
Age at Diagnosis											
20-24	753	43.4	56.6	5.9	15.7	78.4	18.6	9.6	17.1	54.8	24.3
25-29	1,510	41.7	58.3	5.6	13.8	80.6	19.2	8.2	14.4	58.3	27.4
30-35	2,874	39.0	61.0	7.1	16.8	76.1	19.1	6.2	18.8	55.8	25.9
Years Since Diagnosis											
2-5	2,076	39.0	61.0	7.3	14.4	78.2	17.4	7.0	15.1	60.5	28.9
6-10	2,207	42.1	57.9	5.9	16.8	77.3	20.2	8.0	19.9	52.0	23.2
11-15	730	40.1	59.9	6.2	16.0	77.8	21.2	5.3	15.3	58.2	27.1
16-21	124	35.5	64.5	5.0	20.0	75.0	16.7	11.7	20.0	51.7	25.0
Cancer Type											
Brain	151	45.0	55.0	14.5	15.7	69.9	13.8	10.3	24.1	51.7	19.9
Breast	1,374	35.4	64.6	6.8	12.3	80.9	18.4	5.8	14.8	61.0	31.9
Cervix Uteri	633	55.0	45.0	6.7	19.3	74.0	17.1	13.7	19.0	50.2	16.7
Colon	123	44.7	55.3	5.9	14.7	79.4	22.2	3.7	9.3	64.8	28.5
Corpus Uteri	170	44.1	55.9	7.4	18.9	73.7	17.1	15.7	21.4	45.7	18.8
Hodgkin Lymphoma	425	40.0	60.0	5.9	12.5	81.6	18.8	7.2	12.5	61.5	30.1
NHL, Extranodal	84	44.0	56.0	6.4	19.1	74.5	20.0	5.7	14.3	60.0	25.0
NHL, Nodal	129	38.8	61.2	5.1	8.9	86.1	22.1	7.4	10.3	60.3	31.8
Melanoma	409	30.3	69.7	5.3	22.8	71.9	22.9	2.0	22.0	53.2	26.7
Ovarian	207	46.4	53.6	8.1	18.0	73.9	22.0	7.3	22.0	48.8	19.3
Soft Tissue	100	49.0	51.0	0.0	11.8	88.2	28.9	6.7	20.0	44.4	20.0
Thyroid	442	35.3	64.7	7.7	18.2	74.1	15.6	4.2	19.8	60.4	29.0
Other	890	40.6	59.4	5.5	16.6	77.9	19.7	9.5	18.9	51.9	24.0

Abbreviations: AI/AN, American Indian/Alaska Native; CATI, computer assisted telephone interview; GCR, Georgia Cancer Registry; Metro, Metropolitan; NH/PI, Native Hawaiian/Pacific Islander; NHL, Non-Hodgkin Lymphoma; SEER, Surveillance, Epidemiology, and End Results Program

^aWomen identified as eligible by the GCR, excluding 286 women determined to be ineligible

^bIncludes 60 women who completed only part of the interview

^cDenominator includes the women with a given characteristic who agreed to study contact

^dDenominator includes the eligible women (from the GCR column) with a given characteristic

^eWomen are coded by the GCR as Hispanic if there is documentation in their medical records indicating that they are Hispanic. Women without documentation indicating they are Hispanic but who have a surname on the 2000 Census Bureau list of Spanish surnames are coded as Hispanic surname.

^fLarge metro includes large fringe and central metropolitan counties (ie, metropolitan Atlanta); small metro includes small and medium metropolitan counties; and rural includes noncore and micropolitan counties.