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Prevalence of Americans reporting a family history of cancer indicative of increased cancer risk: estimates from the 2015 National Health Interview Survey

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Abstract

The collection and evaluation of family health history in a clinical setting presents an opportunity to discuss cancer risk, tailor cancer screening recommendations, and identify people with an increased risk of carrying a pathogenic variant who may benefit from referral to genetic counseling and testing. National recommendations for breast and colorectal cancer screening indicate that men and women who have a first-degree relative affected with these types of cancers may benefit from talking to a healthcare provider about starting screening at an earlier age and other options for cancer prevention. The prevalence of reporting a first-degree relative who had cancer was assessed among adult respondents of the 2015 National Health Interview Survey who had never had cancer themselves (n=27,999). We found 35.6% of adults reported having at least one first-degree relative with cancer at any site. Significant differences in reporting a family

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Conflicts of interest

The authors do not have any conflicts of interest to disclose.

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

history of cancer were observed by sex, age, race/ethnicity, educational attainment, and census region. Nearly 5% of women under age 50 and 2.5% of adults under age 50 had at least one first-degree relative with breast cancer or colorectal cancer, respectively. We estimated that 5.8% of women had a family history of breast or ovarian cancer that may indicate increased genetic risk. A third of U.S. adults who have never had cancer report a family history of cancer in a first-degree relative. This finding underscores the importance of using family history to inform discussions about cancer risk and screening options between healthcare providers and their patients.

Keywords

family history; neoplasm; hereditary neoplastic syndromes; hereditary breast and ovarian cancer syndrome; public health surveillance

Introduction

Having a first-degree relative affected with some types of cancer can increase a person's risk of cancer twofold and has implications for cancer screening (Albright et al., 2019; Olsen et al., 2010; Ren et al., 2010; Valdez et al., 2010; Win et al., 2015). According to the United States Preventive Services Task Force (USPSTF), women who have a first-degree relative with breast cancer may benefit more than average-risk women from starting breast cancer screening between ages 40–49 (Grade C recommendation) (Siu et al., 2016). In addition, the National Comprehensive Cancer Network (NCCN) Colorectal Cancer Screening (v2.2019) recommendation states that individuals with one or more first-degree relatives diagnosed with colorectal cancer may begin colonoscopy screening at age 40 or ten years before the earliest diagnosis of colorectal cancer (NCCN, 2019a). A previous study found 8.7% of women between ages 40–49 had a first-degree relative with breast cancer, and 5.4% of individuals between ages 40–49 had a first-degree relative with colorectal cancer (Ramsey et al., 2006). Although the study included those with a personal history of cancer, it indicated that a sizable percentage of U.S. adults had a family history and may benefit from starting cancer screening early.

Clinical review of family history can also identify patients with an increased risk of having a pathogenic variant associated with a hereditary cancer syndrome. The NCCN Genetic/Familial High-Risk Assessment: Breast and Ovarian (v3.2019) and Genetic/Familial High-Risk Assessment: Colorectal (v2.2019) recommend the use of family history criteria to identify patients who may have an increased risk of having a hereditary cancer syndrome, such as Hereditary Breast and Ovarian Cancer syndrome (HBOC) and Lynch syndrome (LS) (NCCN, 2019b; NCCN, 2019c). Patients who had a family history of cancer, had higher perceived risk of developing cancer, and those who discussed their family history with a provider were more likely to have had genetic counseling and testing (Allen et al., 2019; Bellcross et al., 2015; Turbitt et al., 2019). One study found that 11.6% of those not affected with cancer in Utah had a family history appropriate for referral to genetic counseling and testing for HBOC (Greenberg et al., 2019).

By routinely collecting, updating, and interpreting family history, healthcare providers can discuss cancer risk and cancer prevention options with patients and identify patients who are

at increased risk. However, notable challenges to collecting and using family history in clinic persist (Lu et al., 2014; Ziogas et al., 2011). Patients may not be knowledgeable of their family history and few report actively collecting health information from relatives to record their family history (Ashida et al., 2013; Lu et al., 2015; Welch et al., 2015; Wood et al., 2008). Although cancer family history information is regularly collected in clinic, providers may not have adequate tools or expertise to collect, update, and interpret family history (Lu et al., 2014; Wood et al., 2013), and few providers report collecting family history information beyond first-degree relatives, about specific cancer types, or age at diagnosis (Flynn et al., 2010; Wood et al., 2008; Murff et al., 2007). Women with a family history of breast or ovarian cancer have described conversations with healthcare providers about family history to be brief and lacking in detail and report having insufficient information to communicate with family about cancer risk (Peipins et al., 2018; Lunsford et al., 2018). Furthermore, the inconsistent collection of family history is reflected in electronic health records (EHRs), with less than half of people at increased risk for breast or colorectal cancer based on family history having documentation of their risk in their health record (Lu et al., 2014; Murff et al., 2007; Wood et al., 2014).

Additionally, there may be gaps in identifying individuals who have a clinically actionable family history of cancer. People with at least some college education were more likely to collect family history information compared with those with less educational attainment (Halbert et al., 2016; Welch et al., 2015). While Hispanic and Black families report collecting family history more often than Non-Hispanic White families (Halbert et al., 2016; Welch et al., 2015), Non-Hispanic White people have been found to be more likely to be referred due to family cancer history compared to all other ethnicities (Chapman-Davis et al., 2021). Despite ethnic minority groups reporting perceived benefits of genetic testing for their personal health and sharing information about cancer risk with family members, it has been shown providers are less likely to discuss genetic testing with them and they have lower levels of awareness and knowledge of genetic counseling and testing (Cragun et al., 2017; Hann et al., 2017; Rajpal et al., 2017). Men and younger age groups may be less likely to collect their family history (Welch et al., 2015).

The goal of this study is to estimate the prevalence of having a clinically actionable family history of cancer within the adult U.S. population who have not had cancer. While some previous national estimates have been published (Ramsey et al., 2006), this study seeks to update those estimates using the most recent data available and highlight the percentage of those who have a family history that may have implications for breast or colorectal cancer screening and that may suggest an increased risk of hereditary cancer syndromes.

Methods

We calculated the prevalence of reporting first-degree relative(s) who had cancer at any site using the public-use datafile from the 2015 National Health Interview Survey (NHIS), excluding respondents who reported having had cancer themselves (National Center for Health Statistics, 2016). The NHIS is a yearly cross-sectional survey that collects data through personal household interviews with a nationally representative sample of the civilian, noninstitutionalized population in the United States. In 2015, the final response

rate for the sample adult component was 55.2% (National Center for Health Statistics, 2016). As part of that year's Cancer Control Supplement, all adult respondents were asked to report whether their biological father, mother, brother(s), sister(s), son(s), or daughter(s) had ever had cancer. For each relative reported to have cancer, the respondent reported one or more cancer types through a free response question that was coded by the interviewer as a categorical variable describing cancer type. The interviewer collected whether multiple brothers, sisters, sons, or daughters were affected by each cancer type reported and whether the respondent's relative(s) had been under age 50 at the time of diagnosis. This analysis of publicly available data was exempt from human subjects review.

Statistical analyses

Several exploratory descriptive analyses were conducted. The percentage of adults reporting a family history of cancer was estimated overall and by sex, age, race/ethnicity, educational attainment, census region, cancer type, and the number of first-degree relatives affected. Chi-squared tests were conducted to determine whether the differences observed between demographic groups were significant. The prevalence of having one or more first-degree relative(s) with cancer was estimated for the cancer types most frequently reported. We estimated the prevalence of reporting one or more first-degree relatives with breast or colorectal cancers among adults ages 40–49 years, for whom discussions with their provider about starting cancer screening at an earlier age may be appropriate (Siu et al., 2016; NCCN, 2019a), and among adults ages 18–49, for whom providers may use family history to engage in discussions about cancer prevention. To capture family history patterns that may indicate increased risk of carrying a pathogenic variant affecting cancer risk, we adapted the NCCN Genetic/Familial High-Risk Assessment: Breast and Ovarian (v3.2019) and Genetic/Familial High-Risk Assessment: Colorectal (v2.2019) recommendations to data captured in the NHIS and estimated the prevalence of reporting these family history criteria (NCCN, 2019b, 2019c). While these were the most recent NCCN recommendations at the time of analyses, the NCCN has published updated recommendation statements. Respondents who only reported a family history of one or more non-melanoma skin cancer(s) or unclassified skin cancer(s) and no other cancer types were classified as having no family history of cancer for all analyses. All analyses were conducted using SAS/SUDAAN (Release 11.0.3; RTI International) to weight survey estimates and account for the complex sampling design of the NHIS.

Results

Among adults who had never been diagnosed with cancer (n=27,999), 35.6% reported having at least one first-degree relative who had been previously diagnosed with cancer at any site. A family history of cancer was reported by 37.4% of women and 33.6% of men ($p<0.001$). The percentage reporting family history of cancer increased with age, from 13.0% among those 18 to 29 years to 59.3% among those 60 to 69 years ($p<0.001$). A greater percentage of non-Hispanic White adults reported having a first-degree relative that had been affected with cancer (42.0%) than other racial and ethnic groups ($p<0.001$). Fewer people with less than a high school education (32.4%) reported having a first-degree relative diagnosed with cancer compared to those with more education ($p<0.001$) (Table

1). Differences in reporting family history were observed by census region (p<0.001). The cancers for which a family history were most frequently reported were breast cancer (8.5%), lung cancer (6.6%), colorectal cancer (5.0%), prostate cancer (4.9%), melanoma (2.3%) and ovarian cancer (1.8%). Among all adults, 23.8% reported having one first-degree relative and 11.8% reported having two or more first-degree relatives diagnosed with cancer at any site (Table 2).

We found 7.4% of women ages 40–49 reported having a first-degree relative with breast cancer, and 5.2% of men and women ages 40–49 reported a first-degree relative with colorectal cancer that may indicate potential benefit from starting cancer screening earlier. We found 4.7% of women ages 18–49 had a first-degree relative with breast cancer, and 2.5% of adults ages 18–49 reported a first-degree relative with colorectal cancer that may affect their cancer risk (Table 3). We found 5.8% of women have a family history that may indicate increased risk of carrying a pathogenic variant associated with HBOC, including two percent (2.0%) who reported a first-degree relative with ovarian cancer, 3.8% who reported at least one relative with breast cancer diagnosed under age 50, and 0.7% who reported two or more relatives with breast cancer. We found 2.1% of men and women reported a family history that may be associated with LS, including 1.2% who reported at least one relative with colorectal cancer under age 50, 0.7% who reported at least one relative with uterine cancer under age 50, and 0.4% who reported two or more relatives with colorectal or uterine cancer (Table 4).

Discussion

A third of the U.S. population who have never had cancer reported a family history of one or more cancer diagnoses in a first-degree family member, indicating that over 72 million men and women have a family history of cancer that should be discussed with their primary care provider. Previous research estimated that having one first-degree relative diagnosed with cancer increased one's cancer risk twofold for breast cancer, lung cancer, colorectal cancer, and prostate cancer; threefold for ovarian cancer; and doubled the odds of developing melanoma (Olsen et al., 2010; Valdez et al., 2010). Our results indicate that many U.S. adults may have an increased risk of developing cancer based on their family history of cancer alone, including 9.1 million women who have a first-degree relative with breast cancer, 13.1 million adults who have a first-degree relative with lung cancer, 9.9 million adults who have a first-degree relative with colorectal cancer, 4.6 million adults who have a first-degree relative with melanoma, 4.4 million men who have a first-degree relative with prostate cancer, and 2.1 million women who have a first-degree relative with ovarian cancer.

Primary care providers should educate patients about having annual conversations with their families to collect accurate and complete family history information and help their patients understand how their family history may impact their cancer risk. By using clinical support tools and promoting patient-facing applications, providers may encourage discussion of family history among patients and family members (Wang et al., 2015). This creates an opportunity to engage patients in shared decisions about primary prevention behaviors, cancer screening practices, and tertiary cancer prevention. We found 7.4% (95% CI 6.0% −9.0%) of women ages 40–49 had a first-degree relative with breast cancer, representing

1.3 million Americans who may benefit from starting breast cancer screening early (Siu et al., 2016). Women who place higher value on the potential benefit over the potential harms may choose to start mammography between the ages of 40 to 49 (Siu et al., 2016). Additionally, 5.2% (95% CI 4.4%−6.2%) of men and women ages 40–49 reported a first-degree relative with colorectal cancer, representing 1.8 million Americans who may begin colonoscopy beginning at age 40 or ten years before the earliest diagnosis of colorectal cancer in the family (NCCN, 2019a). These estimates are similar to those reported by Ramsey et al. (2006), which may indicate stability in reporting family history of cancer. Those with a mother, sister or daughter with breast cancer were more likely to report having a mammogram in the last two years (Donley et al., 2020). One study found that adults with a first-degree relative with colorectal cancer aged 40 to 49 were one-third as likely to engage in colonoscopy as those who were ages 50–64 or over 65 (Tsai et al., 2015), suggesting that there is room for improvement in identifying and discussing cancer screening with these patients. However, the USPSTF recently updated their recommendation for colorectal cancer screening in the average-risk population to start at age 45 which may have implications for identifying patients who may begin colonoscopy at younger ages (Davidson et al., 2021). Furthermore, all adults under age 50 who have a first-degree relative with breast or colorectal cancer may benefit from discussions with their provider to understand their cancer risk and engage in health behavior change to reduce their risk (CDC, 2021a, 2021b). Our findings suggest 2.8 million women ages 18–49 have a mother, sister or daughter who had been diagnosed with breast cancer and 2.9 million men and women ages 18–49 have a parent, sibling or child who had been diagnosed with colorectal cancer.

In addition, some family history patterns may indicate individuals who have an increased risk for carrying a pathogenic variant associated with a hereditary cancer syndrome. To identify these individuals, primary care providers should collect and update family history information, offer genetic counseling and testing for some genetic conditions, identify patients who may benefit from referral to specialists, and provide clinical management (Hull et al., 2020).[34] The USPSTF recommends that providers screen individuals with a personal or family history of breast or ovarian cancer with a brief risk assessment tool to identify those who may be appropriate for genetic counseling and testing (Owens et al., 2019). This study found 5.8% of women with no personal history of cancer had a family history that may increase their genetic risk, such as having a first-degree relative diagnosed with ovarian cancer, a first-degree relative diagnosed with breast cancer under age 50, or two or more first-degree relatives with breast cancer at any age. A study linking a genealogy database to the state cancer registry found that 11.6% of the unaffected Utah population met criteria for genetic testing based on their family history of cancer (Greenberg et al., 2019). The current study used a more limited set of family history criteria and was limited to first-degree relatives, which suggests our results may underestimate the true proportion of individuals who may be at increased risk for carrying a pathogenic variant. While our study adapted criteria for further genetic risk evaluation from NCCN Genetic/Familial High-Risk Assessment: Breast and Ovarian (v3.2019), the most recent version has been updated to only include criteria for genetic testing, which may yield a lower estimate.

This study identified several significant demographic group differences in reporting cancer family history. We found that women were more likely to report having a first-degree

relative with cancer than men. Consistent with our findings, past studies revealed that women were more likely than men to report a family history across most cancer types and women were about twice as likely to have collected their family history compared to men (Halbert et al., 2016, Ramsey et al., 2006; Welch et al., 2015). This may contribute to increased reporting of a family history of cancer in maternal relatives compared to paternal relatives (Ricks-Santi et al., 2016). Older age groups were more likely to have a first degree relative who had cancer, which may result in population estimates for reporting a family history increasing as the U.S. population ages. A previous study observed regional differences in collecting family history (Welch et al., 2015), which may help to explain differences in reporting family history by census region. Our study also showed a greater percentage of non-Hispanic White adults reported having a family history of cancer compared to other racial and ethnic groups, which is consistent with a previous finding that the prevalence of reporting a family history of cancer was higher for White adults than Black adults across all ages (Ramsey et al., 2006). Although some cancers are more prevalent among non-Hispanic White families, it has been shown that Black and Hispanic families express different preferences for the collection of family history and existing strategies may need to be adapted (Corona et al., 2013; Rostitch et al., 2019; Thompson et al., 2013; Thompson et al., 2015). This study found that those with higher levels of education reported having a family history of cancer more often than those with lower levels of education, consistent with previous survey findings (Halbert et al., 2017; Welch et al., 2015). This may be compounded by the fact that the reading grade levels for family history collection tools averaged 13.6 for multimedia tools and 12.0 for tools in print (Wang et al., 2011). These differences in reporting family history may represent missed opportunities to identify persons at elevated risk for cancer and potentially contribute to health disparities. Public health education campaigns, such as CDC's Bring Your Brave, and family history tools, such as My Family Health Portrait, can be used to reach underserved groups to underscore the importance of collecting complete family history and sharing it with a provider. Formative research may be necessary to assess needs and preferences for updating family history tools and to develop linguistically and culturally appropriate strategies to collecting family history in clinic.

There are several limitations to this analysis. Family history data collected by the NHIS was self-reported and not clinically validated. Among respondents to an earlier population-based survey that confirmed cancer cases, sensitivity varied from 26.8% for colorectal cancers to 71.3% for lung cancers, and specificity was around 99% for cancers of any type reported in first-degree relatives (Mai et al., 2011). Among families at high risk for breast or ovarian cancers, one study found sensitivity and specificity of reporting family history of all cancer sites in first-degree relatives was 91.0% and 90.0%, respectively (Tehranifar et al., 2015). Those findings suggest that cancer-specific family history collected in this study is likely underreported. The NHIS collects comprehensive cancer family history for first-degree relatives only, and we were not able to consider second- and third-degree relatives or Ashkenazi Jewish ancestry to estimate adults with increased risk of HBOC. Given that family history of cancer in second-degree relatives may contribute significantly to meeting NCCN criteria for genetic testing (Greenberg et al., 2019; Solomon et al., 2016), our methods may underestimate the percentage who may be at increased risk of carrying

a pathogenic variant. Data were not collected for all cancer types, cancer subtype, cancer stage, or tumor grade (e.g., metastatic prostate cancer or endometrial cancer). Several family history criteria were not able to be assessed because the data was suppressed in the NHIS 2015 public data set (e.g., male breast cancer or pancreatic cancer). Age at diagnosis was ascertained by asking whether each reported cancer diagnosis was under 50 years of age, which limited the precision we could use for determining early age at diagnosis. Due to these limitations in the data, we adapted criteria from the NCCN Genetic/Familial High-Risk Assessment: Breast and Ovarian (v3.2019) to include only those with a first-degree relative diagnosed with ovarian cancer, breast cancer under 50 years of age, or two first-degree relatives with breast cancer. Previous analyses of NHIS data have used similar adaptations to estimate the percentage of adults who may be appropriate for genetic counseling and testing (Allen et al., 2019; Baer et al., 2010; Murff et al., 2006). The percentage who reported a family history of uterine cancer was used as a proxy for endometrial cancer to estimate adults with increased risk of LS. NCCN recommendations are updated annually, or as new evidence emerges that affects clinical management; and this study did not use the most current NCCN recommendations available upon publication. Based on these limitations, the percentage calculated in this study is a rough estimate of the percentage of individuals who have a family history that indicates increased genetic risk. Combined, these limitations may result in underestimation of the prevalence of family history of cancer in the United States. These analyses were descriptive, which limited our ability to identify confounding variables. Future research may further explore these associations to address confounding relationships.

Given that disease risk is modified by shared genetics, environment, and health behaviors, the collection of family history is an important tool for cancer prevention and control. With few providers actively collecting family history and reporting use of family history collection tools (Welch et al., 2015; Sweeney et al., 2016), there exists a great opportunity for primary care providers to promote tools to support families in collecting their family history of chronic diseases (Allen et al., 2020; Cleophat et al., 2018; Li et al., 2021; Welch et al., 2018). Currently, a major challenge to family history collection is insufficient integration into EHRs. Strategies to update the integration of family history into health systems have been described previously, such as leveraging clinical decision support systems in EHRs to identify patients with actionable family history (Wildin et al., 2021). Providers should improve their practice of family history collection by including more complete family history information such as cancer type, age of onset, age of death, and cause of death, and initiating discussions about family history as part of broader conversations about cancer risk factors and cancer prevention and screening strategies with their patients (Lu et al., 2014). While few interventions have been conducted outside of oncology and clinical genetic settings (Guan et al., 2020), public health agencies can work with academic, clinical, and non-profit partners to educate providers on how to collect complete family history information, routinely update data, interpret family history to understand cancer risk and screening needs, use brief risk assessment tools, and appropriately refer to genetic counseling and testing (Rodriguez et al., 2016).

Conclusions

A third of U.S. adults who have never had cancer reported a family history of cancer in a first-degree relative, highlighting the importance of collecting and using family history to inform discussions about reducing cancer risk and options for cancer screening.

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Highlights

- Over a third of U.S. adults have a first-degree relative who has had cancer
- Nearly 5% of women under age 50 have a first-degree relative with breast cancer
- 2.5% of adults under age 50 have a first-degree relative with colorectal cancer

Table 1.

Weighted percentage reporting a first-degree relative with cancer by demographic group, United States, 2015

The number of respondents and weighted percentage of people reporting a first-degree relative with any cancer was estimated for demographic groups by sex, age, race/ethnicity, census region and educational attainment. Categories are based on response options reported by the National Health Interview Survey.

	All cancer types	
	n (weighted %)	95% CI
Sex		
Male	4,462 (33.6%)	32.6%−34.7%
Female	6,050 (37.4%)	36.3%−38.6%
Age (years)		
18–29	716 (13.0%)	11.8%−14.3%
30–39	1,108 (22.0%)	20.5%−23.6%
40–49	1,606 (35.6%)	33.9%−37.4%
50–59	2,454 (50.6%)	48.6%−52.7%
60–69	2,470 (59.3%)	57.4%−61.2%
70–85	2,158 (55.0%)	52.6%−57.3%
Race/Ethnicity		
Hispanic	1,134 (21.2%)	19.8%−22.6%
Non-Hispanic White	7,586 (42.0%)	41.0%−43.1%
Non-Hispanic Black	1,253 (29.1%)	27.1%−31.1%
Non-Hispanic Asian	413 (22.0%)	19.7%−24.5%
All other races[a]	126 (31.1%)	23.9%−39.4%
Census Region		
Northeast	1,868 (37.7%)	36.0%−39.5%
Midwest	2,346 (37.7%)	35.9%−39.5%
South	3,460 (35.0%)	33.7%−36.4%
West	2,838 (32.9%)	31.5%−34.3%
Education[b]		
Less than high school	1,323 (32.4%)	30.4%−34.5%
High school graduate/GED[c]	2,692 (36.3%)	34.8%−37.9%
Some college/Associate's degree	3,226 (34.2%)	32.8%−35.7%
College graduate	3,239 (37.8%)	36.5%−39.1%

[a]This category includes adults who reported American Indian/Alaska Native heritage, those reporting multiple races, and those who reported a race that was not releasable due to data confidentiality or other reasons; and are not of Hispanic/Spanish origin.

[b]The education variable had a different samples size (n = 27,888) than the other variables (n=27,999) due to missing data

[c]GED=General Education Development certification

Table 2.

Weighted percentage reporting one or more first-degree relatives with cancer by cancer site, United States, 2015

The number of respondents, weighted percentage of people, and U.S. population estimate reporting one or more first-degree relative with cancer for all cancer sites, female breast cancer, lung cancer, colorectal cancer, prostate cancer, melanoma, or ovarian cancer.

	Percentage by cancer site						U.S. Population
	1 FDR[a]		2+ FDR[a]		Total		
	n (weighted %)	*95% CI*	*n* (weighted %)	*95% CI*	*n* (weighted %)	*95% CI*	Total *(millions)*
All cancer sites	6,839 (23.8%)	23.2%−24.5%	3,673 (11.8%)	11.2%−12.3%	10512 (35.6%)	34.8%−36.4%	72.2
Female Breast Cancer	2,293 (7.9%)	7.5%−8.3%	200 (0.6%)	0.5%−0.8%	2,493 (8.5%)	8.1%−9.0%	17.1
Females only	1,303 (8.2%)	7.6%−8.8%	121 (0.7%)	0.5%−0.8%	1,424 (8.8%)	8.2%−9.5%	9.1
Lung Cancer	1,773 (6.1%)	5.7%−6.5%	159 (0.5%)	0.4%−0.7%	1,932 (6.6%)	6.2%−7.0%	13.1
Colorectal Cancer	1,334 (4.6%)	4.3%−5.0%	118 (0.4%)	0.3%−0.5%	1,452 (5.0%)	4.6%−5.3%	9.9
Prostate Cancer	1,343 (4.6%)	4.3%−5.0%	91 (0.3%)	0.2%−0.4%	1,434 (4.9%)	4.6%−5.3%	9.8
Males only	552 (4.2%)	3.7%−4.7%	41 (0.3%)	0.2%−0.4%	593 (4.5%)	4.0%−5.0%	4.4
Melanoma	600 (2.2%)	2.0%−2.4%	46 (0.2%)	0.1%−0.2%	646 (2.3%)	2.1%−2.6%	4.6
Ovarian Cancer	499 (1.8%)	1.6%−2.0%	20 (0.1%)	0.0%−0.1%	519 (1.8%)	1.6%−2.1%	3.7
Females only	310 (2.0%)	1.7%−2.3%	11 (0.1%)	0.0%−0.1%	321 (2.0%)	1.7%−2.3%	2.1

[a]FDR= first-degree relative

Table 3.

Weighted percentage reporting family history of select cancer types by age, United States, 2015

The number of respondents and weighted percentage of people reporting a first-degree relative with female breast cancer in females only or colorectal cancer in males and females by age.

	Female breast cancer			Colorectal cancer		
	***n* (weighted %)**	***95% CI***	***Population estimate (millions)***	***n* (weighted %)**	***95% CI***	***Population estimate (millions)***
Age (years)						
18–49	**391 (4.7%)**	**4.1%–5.4%**	**2.8**	**347 (2.5%)**	**2.1%–2.8%**	**2.9**
18–29	75 (2.7%)	2.0%–3.6%	0.6	42 (0.8%)	0.5%–1.2%	0.4
30–39	129 (4.7%)	3.7%–6.0%	0.9	104 (1.9%)	1.5%–2.5%	0.7
40–49	187 (7.4%)	6.0%–9.0%	1.3	201 (5.2%)	4.4%–6.2%	1.8
50–85	**1,033 (14.5%)**	**13.4%–15.7%**	**6.3**	**1,105 (8.7%)**	**8.0%–9.4%**	**7.0**
50–59	322 (13.2%)	11.5%–15.1%	2.4	338 (7.1%)	6.2%–8.2%	2.5
60–69	363 (16.5%)	14.6%–18.6%	2.2	384 (9.4%)	8.2%–10.8%	2.4
70–85	348 (14.0%)	12.3%–15.9%	1.6	383 (10.6%)	9.2%–12.0%	2.0

Table 4.

Weighted percentages reporting family history of cancers meeting criteria that may indicate increased risk for a pathogenic mutation, United States, 2015

The number of respondents and weighted percentage of people who reported family history associated with HBOC and Lynch syndromes based on criteria in the NCCN recommendation statements

	n (weighted %)	*95% CI*
Family history associated with HBOC[a] syndrome (Males and females)	1,599 (5.5%)	5.2%−5.9%
Any family history of ovarian cancer[b]	519 (1.8%)	1.6%−2.1%
At least one relative with breast cancer under age 50[b]	1,060 (3.6%)	3.3%−3.9%
Two or more relatives with breast cancer	200 (0.6%)	0.5%−0.8%
Family history associated with HBOC[a] syndrome (Females only)	942 (5.8%)	5.3%−6.4%
Any family history of ovarian cancer[b]	321 (2.0%)	1.7%−2.3%
At least one relative with breast cancer under age 50[b]	619 (3.8%)	3.4–4.3%
Two or more relatives with breast cancer	121 (0.7%)	0.5%−0.8%
Family history associated with Lynch Syndrome (Males and females)	623 (2.1%)	1.9%−2.4%
At least one relative with colorectal cancer under age 50[c]	350 (1.2%)	1.1%−1.5%
At least one relative with endometrial cancer under age 50[c]	213 (0.7%)	0.6%−0.8%
Two or more relatives with colorectal OR uterine cancers	129 (0.4%)	0.3%−0.5%

[a]HBOC= Hereditary Breast and Ovarian Cancer syndrome

[b]Adapted from NCCN Genetic/Familial High-Risk Assessment: Breast and Ovarian (v3.2019)

[c]Adapted from NCCN Genetic/Familial High-Risk Assessment: Colorectal (v2.2019)