Breast and Ovarian Cancer Genetic Counseling Among Michigan Women

DATA FROM THE 2011 MICHIGAN BEHAVIORAL RISK FACTOR SURVEY (MIBRFS)

Background: Hereditary breast and ovarian cancer (HBOC) syndrome, which causes about 10% of breast and ovarian cancers, is most often caused by deleterious mutations in the *BRCA1* or *BRCA2* genes.[1] While only an estimated 1/300 - 1/800 people carry a *BRCA* mutation, mutations confer up to an 80% estimated lifetime risk of breast cancer and up to 40% lifetime risk of ovarian cancer.[2]

Genetic counseling and testing can identify those at risk of mutations that cause HBOC. For those with mutations, earlier and more frequent screenings can assist with early cancer detection, and prophylactic medication and surgeries can reduce the risk of breast and ovarian cancer. Because of this benefit, a Healthy People 2020 objective has been established on HBOC. We are measuring progress towards this objective by determining the proportion of Michigan women with a significant personal or family history of breast or ovarian cancer and the proportion that have received genetic counseling.

Healthy People 2020 Objective G-1
Increase the proportion of women with a family history of breast and/or ovarian cancer who receive genetic counseling

Methods: Questions focusing on genetic counseling for breast and ovarian cancer, degree and age of biological relatives diagnosed with breast and ovarian cancer, personal cancer history, and respondent demographics were included within the 2011 MiBRFS. The 2011 MiBRFS included data from both landline and cell phone respondents, but the breast and ovarian cancer questions were only included within one split of the survey and thus analyses based on these questions included data from landline respondents only.

The prevalence of genetic counseling among adult females was calculated based on responses to the following question: "The next few questions are about genetic counseling for breast and ovarian cancer. Genetic counseling is the process of communication between a specially trained health professional and someone concerned about the risk of disease in his or her family. Have you or any of your family members received genetic counseling for breast and ovarian cancer?"

The presence of a significant family history of breast and ovarian cancer was determined according to calculable components of the following guidelines:

1) The 2005 United States Preventive Services Task Force (USPSTF) recommendation statement entitled 'Genetic Risk Assessment and *BRCA* Mutation Testing for Breast and Ovarian Cancer Susceptibility', which includes a list of suggested family history criteria associated with an increased risk of deleterious *BRCA* mutation[3]
2) 2011 National Comprehensive Cancer Network (NCCN) criteria for further risk evaluation, including both family and personal cancer history factors for men and women[4]

Table 1. Proportion meeting USPSTF or NCCN guidelines for breast and ovarian cancer genetic counseling referral, 2011 Michigan BRFS

Guideline	%	(95% CI)
Met USPSTF*	10.4	(8.2-13.1)
Met NCCN**	7.0	(5.6-8.7)

*Adult females, meeting one of the following USPSTF 2005 criteria:
a) ≥ 2 first degree relatives diagnosed with breast cancer, one of whom was diagnosed with early-onset breast cancer (< 50 years)
b) ≥ 3 first or second degree relatives diagnosed with breast cancer at any age
c) ≥ 2 first or second degree relatives diagnosed with ovarian cancer at any age
d) ≥ 1 first or second degree relative diagnosed with breast cancer at any age and ≥ 1 first or second degree relative diagnosed with ovarian cancer at any age.

**Adult males/females, meeting one of the following NCCN 2011 criteria:
a) Personal history of early-onset breast cancer (≤ 50)
b) Personal history of breast cancer and ≥ 1 relative with breast cancer ≤ 50 of age
c) Personal history of breast cancer and ≥ 1 relative with ovarian cancer
d) Personal history of breast cancer and ≥ 2 relatives with breast cancer
e) Personal history of ovarian cancer
f) Personal history of male breast cancer
g) A relative with ovarian cancer
h) ≥ 2 relatives with breast cancer on the same side of the family

Results: In 2011, an estimated 10.4% of women had a family history of breast or ovarian cancer that met USPSTF recommendation family history criteria, and 7.0% of respondents had a personal or family history meeting measureable NCCN criteria for further risk evaluation (Table 1).

Of all female respondents, 2.1% had genetic counseling for breast and ovarian cancer (0.8% respondent only plus 1.3% respondent and at least one family member). The proportion receiving counseling was higher among those who met USPSTF guidelines for referral (8.4%) or NCCN guidelines for further risk evaluation (9.6%). Of those who met USPSTF, 35.1% reported that a family member had HBOC genetic counseling (7.5% respondent and at least one family member plus 27.6% family member only, Table 2).

Counseling access did not noticeably vary by health insurance status or income. Respondents age 18-44 were less likely to access counseling independent of any family members, but this difference was not significant for respondents and at least one family member (Table 2).

Table 2. Prevalence of Genetic Counseling Among Women and their Family Members for Breast and Ovarian Cancer, 2011 Michigan BRFS

Demographics	Respondent Only	Respondent and ≥ 1 family member	≥ 1 family member, not respondent
	% (95% CI)	% (95% CI)	% (95% CI)
All Respondents	0.8 (0.5-1.3)	1.3 (0.8-2.2)	6.5 (4.7-9.0)
Age (in years)			
18-44	0.0 (0.0-0.2)	0.8 (0.2-3.3)	7.1 (4.0-12.4)
45-64	0.8 (0.4-1.9)	1.5 (0.7-3.0)	6.8 (4.4-10.2)
≥ 65	2.4 (1.3-4.2)	1.9 (1.0-3.7)	4.6 (2.9-7.4)
Health Insurance			
Insured	0.9 (0.6-1.5)	1.0 (0.6-1.6)	6.7 (4.8-9.4)
Not insured	0.0 (0.0-0.2)	3.0 (0.8-10.2)	5.3 (1.7-15.3)
Household Income			
< $20,000	0.6 (0.2-1.9)	1.6 (0.7-3.7)	7.6 (4.0-14.0)
$20,000-34,999	1.1 (0.4-2.7)	1.4 (0.5-3.7)	8.6 (4.2-16.9)
$35,000-49,999	0.6 (0.3-1.6)	2.5 (0.5-11.0)	3.0 (1.1-7.6)
$50,000-74,999	0.0 (0.0-0.7)	0.2 (0.0-0.7)	8.3 (3.6-17.9)
≥ $75,000	0.3 (0.1-0.9)	1.9 (0.9-4.2)	3.8 (1.7-8.1)
Met USPSTF*			
Yes	0.9 (0.3-2.7)	7.5 (3.6-15.1)	27.6 (17.3-41.0)
Met NCCN**			
Yes	3.6 (1.9-6.7)	6.0 (2.9-11.9)	17.7 (10.2-29.0)

Conclusions: While we expect the use of genetic counseling for HBOC to be low in the general population, women at higher risk of HBOC due to family or personal cancer history should have counseling. At-risk relatives, especially those with significant personal cancer histories, are also indicated for counseling. Estimates of personal uptake of genetic counseling among those meeting USPSTF and NCCN guidelines are low; estimates of genetic counseling among family members of these respondents are higher, but suggest that not all high-risk family members are receiving counseling.

Counseling promotes accurate risk assessment, genetic testing (if indicated), and appropriate clinical follow-up care, which can impact cancer risks and outcomes. The Michigan Department of Community Health seeks to increase genetic counseling among high-risk women through policy, education and surveillance initiatives.

The Michigan Behavioral Risk Factor Surveillance System (MiBRFSS)
The MiBRFSS comprises annual, statewide telephone surveys of Michigan adults aged 18 years and older and is part of the national BRFSS coordinated by the CDC. The annual Michigan Behavioral Risk Factor Surveys (MiBRFS) follow the CDC BRFSS protocol and use the standardized English core questionnaire that focuses on various health behaviors, medical conditions, and preventive health care practices related to the leading causes of mortality, morbidity, and disability. Landline and cell phone interviews are conducted across each calendar year. Data are weighted to adjust for the probabilities of selection and a raking weighting factor that adjusts for the distribution of the Michigan adult population based on eight demographic variables. All analyses are performed using SAS-callable SUDAAN® to account for the complex sampling design.

References:

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4. National Comprehensive Cancer Network Clinical Practice Guidelines in Oncology. "Genetic/Familial High-Risk Assessment: Breast and Ovarian." Version 1.2011. Retrieved June 2011, from http://www.nccn.org/index.asp.

Suggested Citation: Mange S, Fussman C, Anderson B, Duquette D. Breast and Ovarian Cancer Genetic Counseling Among Michigan Women. Lansing, MI: Michigan Department of Community Health, Lifecourse Epidemiology and Genomics Division, Surveillance and Program Evaluation Section, Chronic Disease Epidemiology Unit, June 2013.