High Incidence & Low Utilization Regions*: Hereditary Breast and Ovarian Cancer in Michigan, 2013-2017

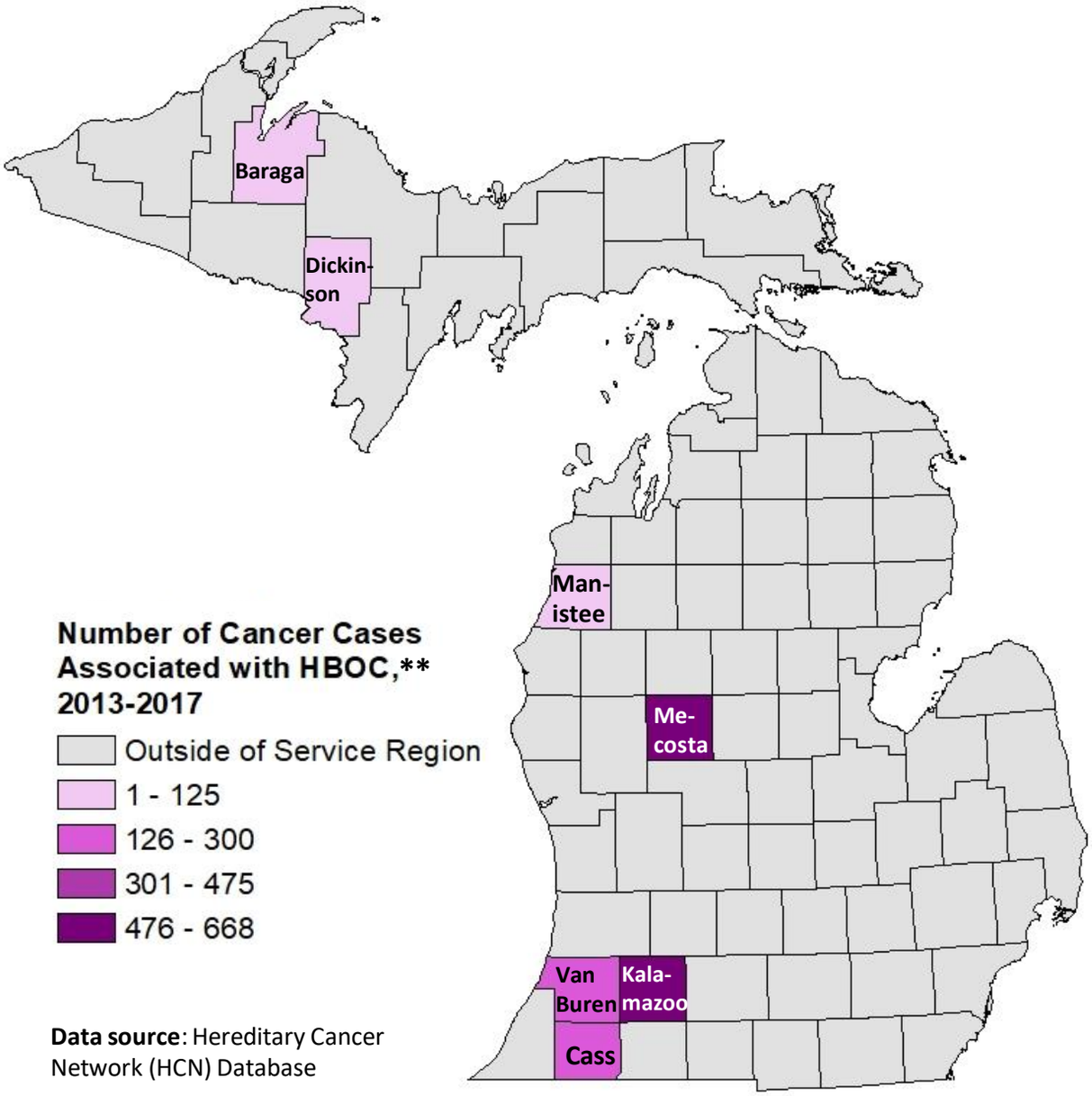
Background: Hereditary breast and ovarian cancer syndrome (HBOC) is an inherited cancer predisposition syndrome caused by pathogenic variants in the *BRCA1* or *BRCA2* genes. HBOC causes an increased risk of developing breast, ovarian, pancreas and prostate cancer.

Table 1: Number of Patients with Breast, Ovarian, Pancreatic or Prostate Cancer, 2013-2017

Cancer Registry		HCN Database	
Michigan Total Records	95,148	**Michigan Total Records**	9,004
High Incidence & Low Utilization Serviced Total**	3,994	**High Incidence & Low Utilization Counseled*** Total**	811

Table 2: Incidence Rates for Select Hereditary Cancers per 100,000 Population

	National	Michigan
Breast	**128.5**	**82.0**
Ovarian	**11.2**	**10.8**
Prostate	**109.8**	**105.8**
Pancreatic	**13.1**	**13.2**



Data source: Hereditary Cancer Network (HCN) Database

* High incidence and low utilization regions are counties where the incidence rate of select cancers is 136.2 per 100,000 individuals and less than 60% of individuals per county receiving genetic testing according to the HCN database. **Seen at an MPCA clinic. ***Seen at a cancer genetic counseling clinic.

March 2021

High Incidence & Low Utilization Regions: Hereditary Breast and Ovarian Cancer in Michigan, 2013-2017

Did you know that in these 7 counties there were…

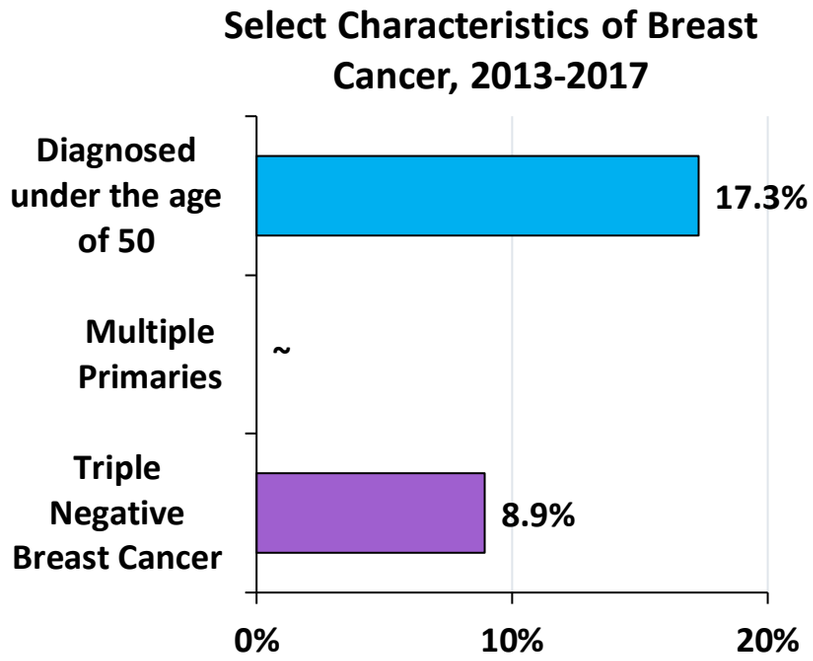
2,058 cases of breast cancer

395 cases of pancreatic cancer

187 cases of ovarian cancer

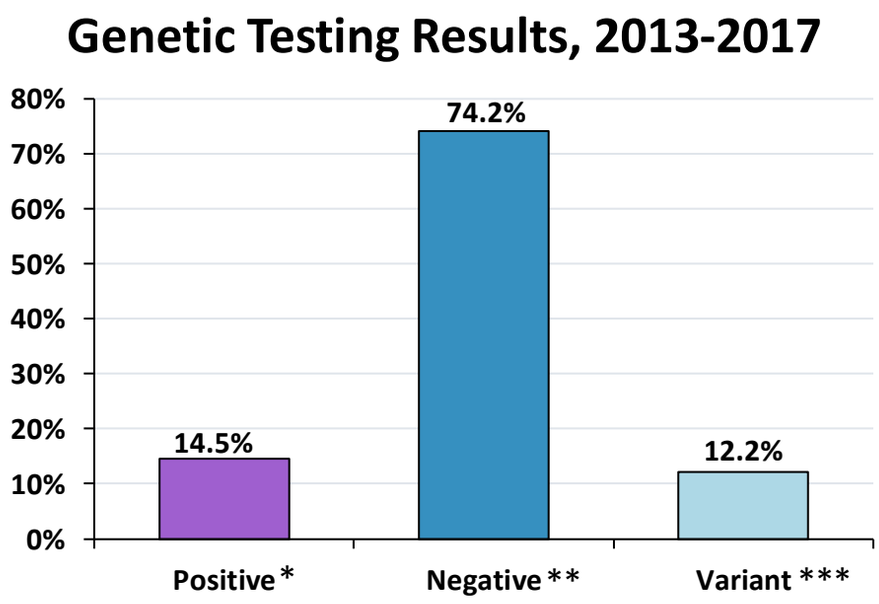
1,354 cases of prostate cancer

Breast cancer patients diagnosed under the age of 50, have multiple primaries, OR diagnosed with Triple Negative Breast Cancer (TNBC) **should be referred to genetic counseling and testing.**



811 patients from the HCN database were from one of the 7 counties in these regions and received genetic counseling between 2013 and 2017

557 patients pursued genetic testing



* Positive result refers to a genetic test result being Pathogenic or Likely Pathogenic. ** Negative result refers to a genetic test result being Benign, Likely Benign or Not Clinically Significant. *** Variant result refers to a result that is classified as a Variant of Unknown Significance (VUS).~ Data are suppressed if count is less than 20

High Incidence & Low Utilization*: Lynch syndrome in Michigan, 2013-2017

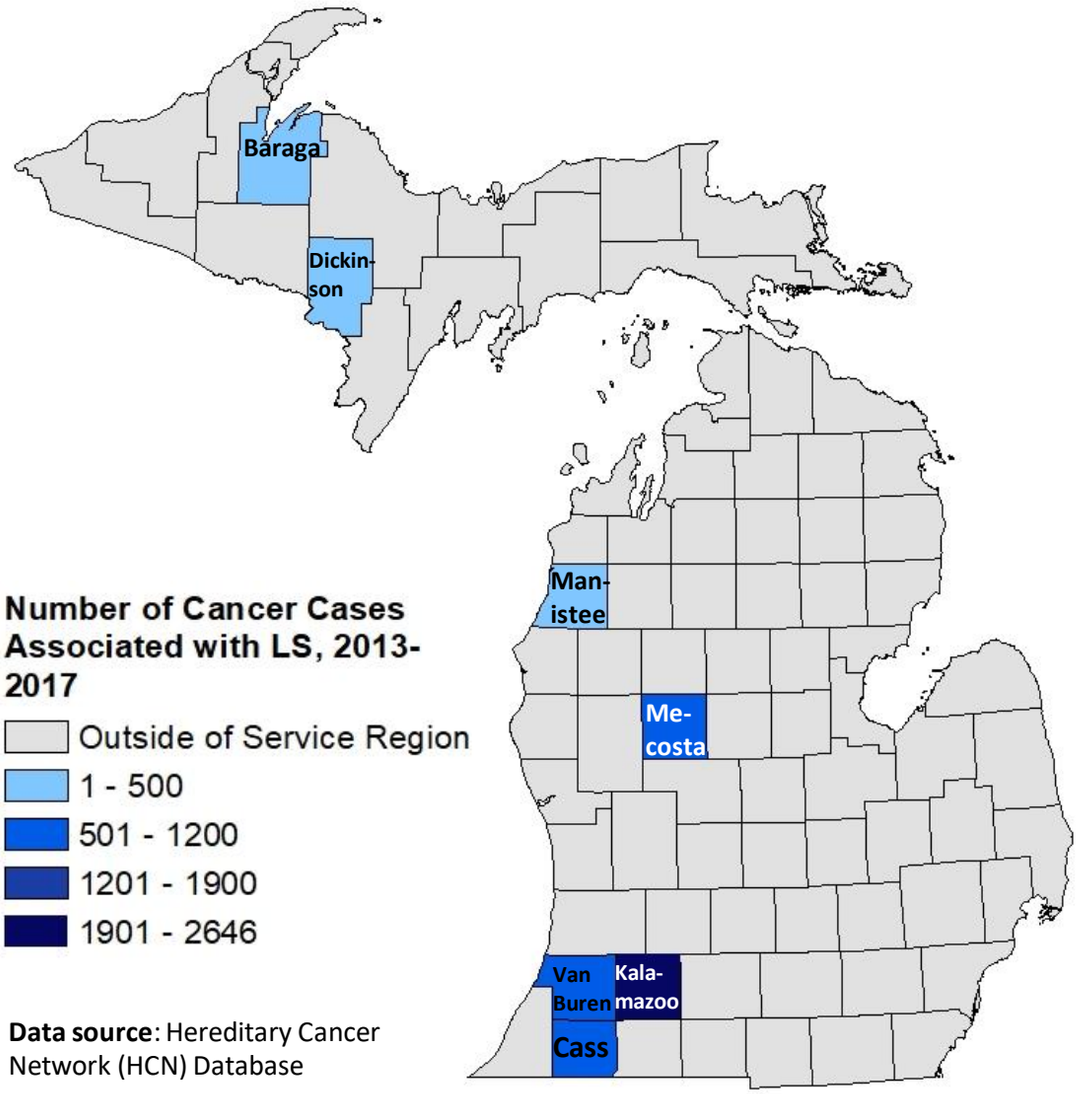
Background: Lynch syndrome (LS) is an inherited cancer predisposition syndrome caused by pathogenic variants in the genes *MLH1*, *MSH2*, *MSH6*, *PMS2* or *EPCAM*. LS causes an increased risk of developing colorectal, endometrial, ovarian, and other cancers. LS can be screened for by testing endometrial and colorectal cancers for microsatellite instability (MSI) and immunohistochemistry (IHC) patterns. The National Comprehensive Cancer Network (NCCN) recommends that all endometrial and colorectal cancers are screened for LS.

Table 3: Number of Patients with Colorectal or Endometrial Cancer, 2013-2017

Cancer Registry		HCN Database	
Michigan Total Records	33,571	**Michigan Total Records**	1,271
High Incidence & Low Utilization Serviced Total**	1,552	**High Incidence & Low Utilization Counseled*** Total**	72

Table 4: Incidence Rates for Select Hereditary Cancers per 100,000 Population

	National	Michigan
Colorectal	**38.2**	**38.7**
Endometrial	**27.8**	**28.2**



Data source: Hereditary Cancer Network (HCN) Database

* High incidence and low utilization regions are counties where the incidence rate of select cancers is 136.2 per 100,000 individuals and less than 60% of individuals per county receiving genetic testing according to the HCN database. **Seen at an MPCA clinic. *** Seen at a cancer genetic counseling clinic.

March 2021

High Incidence & Low Utilization: Lynch syndrome in Michigan, 2013-2017

Did you know that in these 7 counties there were…

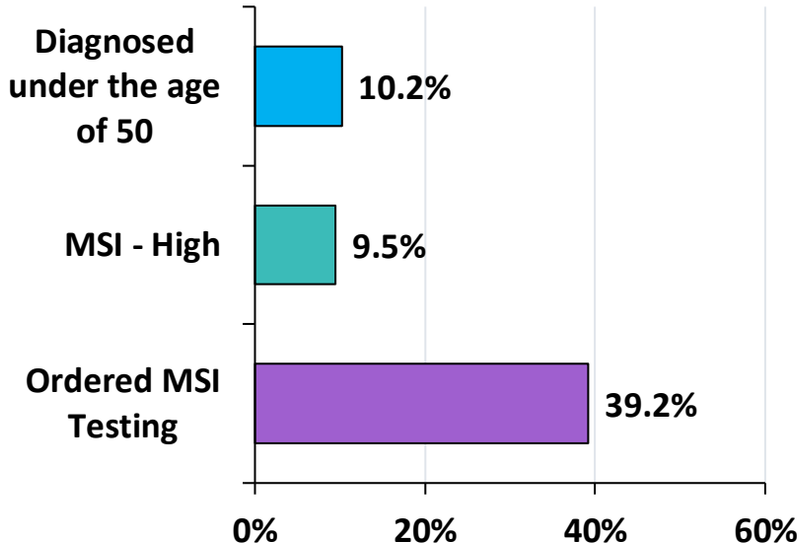
1,103 cases of colorectal cancer

449 cases of endometrial cancer

All colorectal cancer patients should be screened for Lynch syndrome through tumor testing (MSI, IHC or both)

Patients that receive a result of MSI-High or a missing protein in the IHC test **should be referred to a genetic counselor**

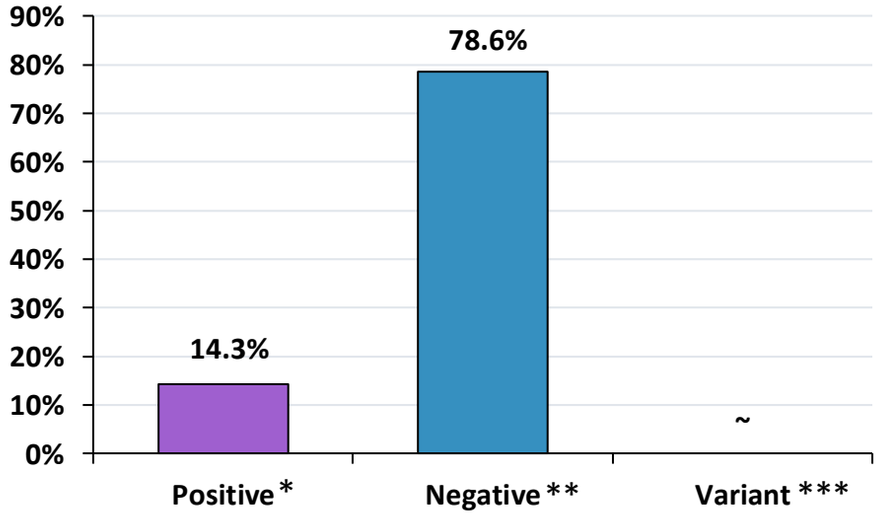
Select Characteristics of Colorectal Cancer, 2013-2017



72 patients in the HCN database were from one of the 7 counties in these region received genetic counseling between 2013 and 2017

42 patients pursued genetic testing

Genetic Testing Results, 2013-2017



* Positive result refers to a genetic test result being Pathogenic or Likely Pathogenic. ** Negative result refers to a genetic test result being Benign, Likely Benign or Not Clinically Significant. *** Variant result refers to a result that is classified as a Variant of Unknown Significance (VUS). ~ Data are suppressed if count is less than 6

High Incidence & Low Utilization Regions: Hereditary Cancer & Cancer Genetic Counseling & Testing in Michigan

Methods: The data were collected from the Michigan Department of Health and Human Services (MDHHS) Michigan Cancer Surveillance Program (MCSP) and the Hereditary Cancer Network (HCN) database and include information on patients seen between **January 1, 2013 and December 31, 2017** who have been diagnosed with one of these cancer types: breast, ovarian, colorectal, pancreatic, prostate, and endometrial. Cancer burden was determined using data obtained from MCSP and cancer genetic counseling and testing data was obtained from the HCN database.

Please contact Jessica Fritzler at FritzlerJ1@Michigan.gov for any questions about this report.

Conclusions: Hereditary cancer is a type of inherited condition in which there is a higher-than-typical risk of developing certain types of cancer. Five to ten percent of all cancer diagnoses are considered heritable.[1] Patients who are suspected to have a hereditary cancer syndrome should have a formal risk assessment by a suitably trained health care provider to discuss the appropriate indications for genetic testing. Genetic counseling with a board certified and/or eligible genetics provider, followed by genetic testing as appropriate, are the recommended first steps for anyone with a qualifying personal and/or family history of cancer. While there are many genes associated with hereditary cancer predisposition syndromes, two such syndromes are more common: Hereditary Breast and Ovarian Cancer (HBOC) and Lynch syndrome (LS). A diagnosis of one of these hereditary cancer syndromes allows for increased cancer screening starting at a younger age, which can help to reduce the impact of cancer and save lives. Family members can be identified before developing cancer through a process known as cascade screening, which involves testing eligible family members following an initial genetic diagnosis of a cancer predisposition syndrome in a family member.

For More Information on the MDHHS Cancer Genomics Program:

Visit Michigan.gov/HereditaryCancer to learn more about hereditary cancers.
Visit Michigan.gov/CGE to view more data on hereditary cancers.

Cancer Genomics Hotline Phone #: 866-852-1247
Email: genetics@michigan.gov

References:

1. Beitsch et al. (2019). Underdiagnosis of Hereditary Breast Cancer: Are Genetic Testing Guidelines a Tool or an Obstacle?. Journal of clinical oncology : official journal of the American Society of Clinical Oncology, 37(6), 453–460. https://doi.org/10.1200/JCO.18.01631

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Michigan Department of Health & Human Services
GRETCHEN WHITMER, GOVERNOR | ELIZABETH HERTEL, DIRECTOR

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