



Lake County Mercury Screening Project (MSP)

The Lake County Mercury Screening Project (MSP) was a collaborative effort by Lake County Health and Human Services Women, Infants, and Children program (LCHHS WIC) and the Minnesota Department of Health (MDH). The project focused on reducing mercury exposure in women who are or may become pregnant and, therefore, in future babies by raising awareness about risks and benefits of eating fish. Participants included 121 women of childbearing age who live in Lake County, Minnesota.

Most people's exposure to mercury comes from eating fish. All 121 women reported eating fish in the last 2-3 months. In general, women who ate more fish meals had higher levels of mercury. However, the mercury results for most participants were below the level considered safe for women of childbearing age and a growing fetus.

Choosing fish wisely to maximize benefits and minimize risks is often challenging. Benefits outweigh risks if the fish women eat are low in mercury and other contaminants. MSP increased awareness about the health benefits and risks of eating fish to women of childbearing age.

MSP is an extension of the Fish are Important for Superior Health (FISH) Project currently underway in Cook County, Minnesota. Both North Shore projects are in response to a 2011 study (*Mercury in Newborns in the Lake Superior Basin*) that showed that 10% of Minnesota babies tested from the North Shore area had mercury in their blood above the level considered safe. The protocol followed in MSP was developed based on the FISH project. MSP participants answered the same 3 screening questions as FISH participants and provided a blood sample that was tested for mercury.

The project protocol, report to the community, local media coverage of project completion, and a summary of LCHHS WIC staff comments about MSP are attached.



Protocol for Lake County Mercury Screening Project

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Overview

The **Lake County Mercury Screening Project** is part of a larger project funded by a grant received by the Minnesota Department of Health (MDH) in 2013 from the U.S. Environmental Protection Agency Great Lakes Restoration Initiative. The overall project is focused on reducing mercury exposure in women of childbearing age.

Lake County Health and Human Services Women, Infants, and Children (WIC) program is partnering with the Minnesota Department of Health (MDH) on this project. The Mercury Screening Project is an extension of the Fish are Important for Superior Health (FISH) Project currently underway in Cook County, Minnesota. This WIC-based project has 2 main purposes:

1. To find out the blood mercury level in women who are currently pregnant or have children age 5 or younger.
2. To test 3 mercury screening questions to see if they predict the mercury level found in participants' blood.

Women from families who receive WIC services from Lake County Public Health and Lake County Health and Human Services (LCHHS) employees aged 18 to 50 will be asked to take part. All women enrolled through WIC will either be pregnant or have children 5 years old or younger. All participants will be given a \$20 Visa gift card and receive their individual results. Because fish consumption affects a person's blood mercury level, women will also receive information about wisely choosing fish to eat. A summary report will be publicly available once completed. The project will begin in late summer 2014.

Lake County WIC clients and LCHHS employees will be recruited and enrolled in this Project to expand evaluation of the FISH Project mercury screening tool as a predictor of high mercury exposure. In FISH, participants are asked three questions about the amount and type of fish they have eaten in the past two to three months. The questions were designed to be used as a rapid screen during a regular office visit to identify patients at risk for high mercury exposure. The ability of the FISH screening tool to predict mercury exposure is tested by comparison with a blood sample taken during the same clinic visit.

In the Mercury Screening Project, participants will be screened using the FISH screening tool and provide a capillary blood sample to test for total mercury. WIC clients are tested for hemoglobin at the first prenatal visit and first post-partum visit using a finger stick (commonly referred to as a "finger poke" in this clinical setting). From these clients, WIC staff will collect an additional capillary sample. Participants who would not otherwise be tested for hemoglobin will also be recruited and have a capillary sample collected, if they agree to be enrolled. Blood will be analyzed for total mercury by the MDH Public Health Laboratory (MDH PHL).

Women who participate in this Project will receive the results of their blood tests and an explanation of their meaning from Lake County WIC. Participants will also receive materials that provide information on the risks and benefits of eating fish and healthy fish choices.

This Manual provides procedural details of the Mercury Screening Project recruitment, enrollment, consent, mercury screening, blood sampling, and results communication.

Background

A 2011 study (*Mercury in Newborns in the Lake Superior Basin*) showed that 10% of Northeast Minnesota babies tested had mercury in their blood above the level considered safe. This project is working to help reduce mercury exposure in women who are or may become pregnant and therefore in future babies.

Most people's exposure to mercury comes from eating fish. Mercury in Minnesota waters and fish is a result of emissions from coal combustion, mining, other human activities, and natural sources. Fish and fishing are an important part of history and culture for communities in Northeast Minnesota. People living along the North Shore of Lake Superior may eat more fish than other people in Minnesota.

Mercury exposure can affect a person at any age. However, the developing fetus and young children are most at risk from mercury in fish. They are more sensitive to mercury exposure. In the fetus, small amounts of mercury can damage a brain that is starting to form or grow. Too much mercury can affect a child's behavior and lead to learning problems later in life.

Recruitment

Women will be invited to take part during routine WIC clinics held by Lake County Public Health. WIC clinics take place about three times each month; most women are seen about every three months. The goal is to enroll 75 women. Eligible LCHHS employees will self-refer for study participation and will provide informed consent and undergo the same study procedures as WIC clients. WIC staff will invite LCHHS employees to take part using department internal communication methods (word-of-mouth or email).

During the WIC appointment, staff will inquire about the woman's interest in the Project. Women who are interested will be asked to extend their normal WIC appointment another 15-20 minutes to take part, or they may wait until their next WIC appointment. Staff will document if a woman does not want to participate, so she is not asked again at a future appointment.

Eligibility

To take part, participants must meet the following criteria:

1. Woman or her child currently receives WIC services through Lake County Public Health OR she is an employee of LCHHS between ages 18 and 50
2. Answer 3 mercury screening questions
3. Allow blood to be collected and tested for mercury

If women express interest in participating (e.g. through Project publicity or word-of-mouth) and do not meet these requirements, they are not eligible and cannot enroll.

Staff Training

WIC staff training will be provided by MDH prior to enrolling participants and include:

- Project steps
- Obtaining consent
- Incentive tracking
- Blood collection, packaging, and shipping
- Safe-Eating Guidelines and fish consumption
- Data entry and transfer

Steps and Procedures for Participant Visit

The visit steps are described below and will typically take place during a normal WIC appointment with WIC staff from Lake County Public Health. During the visit, WIC Project staff will be in possession of a pre-filled participant folder, lab packet, and incentive items. LCHHS employees will not participate through a WIC clinic, but the same steps and procedures will be followed.

The participant folder contains:

- Informed Consent Form
- Participant ID labels
- Mercury Screening Form
- MDH Safe-Eating Guidelines handout
- Visit Checklist

The lab packet contains:

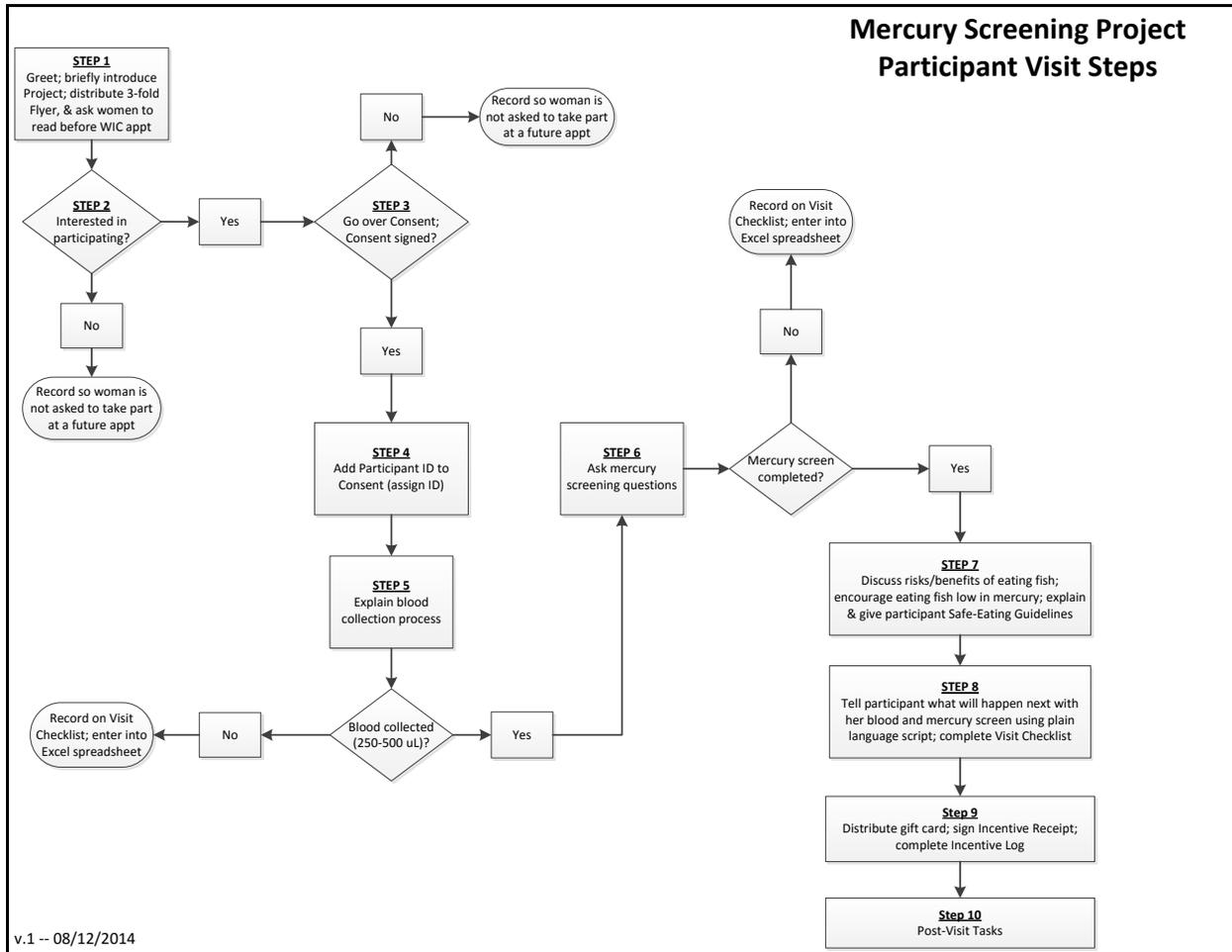
- Blood collection labels (specimen ID labels)
- Blood collection supplies
 - BD microtainer contact-activated lancet (2.0 mm depth, 1.5 mm width blade, Fisher catalog # 02-657-102)
 - RAM Scientific SAFE-T-FILL Capillary Blood Collection Tubes (# 07 7051, EDTA Capillary Collection 200 µL)
- Chain of Custody (COC) Form

The incentive items include:

- \$20 Visa gift card
- Incentive Receipt Form

- Incentive Log

The flowchart below gives an overview of the Visit Steps (also found in Appendix A):



The Visit Checklist (found in Appendix A) will be used throughout the appointment to assist WIC staff with project steps.

Step 1: Introduce Project

When women check-in for a WIC clinic, staff will briefly tell them about the Project and ask them to read the Project Three-fold Flyer before their WIC appointment begins.

The Project Three-fold Flyer is found in Appendix A.

Step 2: Determine Interest

WIC staff will describe the Project, answer questions, and ask each woman if she would like to take part.

- **No, not interested** – Staff will document the woman’s choice not to take part so that she is not asked to take part again.

- **Yes, interested** - Staff continues with Step 2.

Step 3: Obtain Consent

WIC staff will go through the Project Informed Consent with the woman to make sure she understands what she will do as a participant and her rights. After all questions have been answered, the woman will be asked to sign and date the consent if she would like to take part. Her participation is voluntary; she can decide at any time to not continue with the Project. A signed copy will also be offered to her.

The Informed Consent is found in Appendix A.

Step 4: Assign Participant ID

After the consent is signed, the woman becomes a participant and is assigned a Participant ID by WIC staff. This ID (pre-printed labels) will be used on all forms and her blood sample so that her identity will be protected.

Step 5: Collect Blood Sample

The nurse will explain the blood collection to the participant and then collect the sample to test for mercury. A small amount of blood will be collected from the participant as follows:

1. Staff will do a finger poke using the lancet and collect blood in a capillary tube.
2. When full (200 µL of blood), the capillary tube will be inverted so the blood flows into the specimen container. Then the capillary tube will be disposed.
3. The specimen container will be capped, inverted several times to mix the blood and anticoagulant, and properly labeled with the Participant ID and Specimen ID.
4. Staff will fill out the Chain of Custody (COC) form.
5. The container and COC will be stored securely in a refrigerator at Lake County Public Health until shipment.

The lab packet includes the Specimen ID labels and supplies needed for the mercury test. Routine blood collection supplies (gloves, alcohol swabs, gauze or tissue, and bandages) will be supplied by WIC.

A copy of the COC will be kept by WIC. The original COC will be shipped with the blood sample to MDH PHL.

If a blood sample cannot be collected, the nurse will document the reason on the Visit Checklist (see Appendix A). The woman will still receive a \$20 gift card if she is poked with the lancet but is unable to give enough blood for mercury analysis. However, she is not a participant and will not complete the rest of the Project steps.

A detailed description of blood collection and storage procedures is found in Appendix B.

Step 6: Ask Mercury Screening Questions

Next, WIC staff will use the Mercury Screening Form to ask the participant 3 questions about the fish she has eaten in the past 2-3 months. Her answers to these questions will be compared to the mercury level in her blood.

1. How many times a week did you eat any kind of fish?
2. How many times a month did you eat any of these fish – Walleye, Northern Pike, Bass, or Lake Trout from Lake Superior?
3. Did you eat Shark or Swordfish?

The Mercury Screening Form is found in Appendix A.

Step 7: Provide Education

After the blood sample and mercury screen, WIC staff will:

- Discuss risks and benefits of eating fish with the participant.
- Encourage eating fish low in mercury.
- Explain how to use the MDH Safe-Eating Guidelines to plan fish meals.

Staff will answer any questions the participant may have about which fish to eat. She will be encouraged to take the Safe-Eating Guidelines home and refer to them when choosing fish to eat for herself and her family.

The MDH Safe-Eating Guidelines are found in Appendix A.

Step 8: Describe Final Steps

WIC staff will explain to the participant what will happen next using a plain language script similar to the following.

1. Your blood will be sent to the MDH Public Health Laboratory (PHL) and tested for mercury.
2. Your answers to the screening questions will be sent to MDH and compared with your blood mercury result. MDH will get your age and the ZIP Code where you live.
3. Only your Participant ID will be on your blood sample and the information given to MDH, not your name or any other personal information about you.
4. After your blood is tested, your mercury result will be given to WIC staff at Lake County Public Health.
5. WIC staff will mail your mercury result to you within 60-90 days of your appointment and describe what it means.
6. If you have any questions, contact information will be provided in the result letter.

The Result Letter Templates are found in Appendix A.

The nurse will also complete any remaining items on the Visit Checklist (see Appendix A) and document the visit outcome.

Step 9: Distribute Gift Card and Farewell

Before she leaves, WIC staff will give each participant a \$20 Visa gift card, thank them for their time and participation in the Project, and end the visit. Each participant must sign the Incentive Receipt to

acknowledge she has received the gift card. WIC staff will record which gift card was given to the participant on the Incentive Log.

Details for incentive tracking are described in Appendix A as well as the Incentive Receipt and Incentive Log.

Step 10: Post-Visit Tasks

WIC staff will do the following tasks as soon as possible after the participant leaves:

1. Verify all forms are labeled with a Participant ID.
2. Verify consent is clearly written and complete.
3. Verify responses to mercury screening questions are clearly written and complete.
4. Carefully enter Participant ID, age, ZIP Code, and responses to mercury screening questions into an Excel spreadsheet.
5. Verify incentive receipt and log are clearly written and complete.
6. Verify the Visit Checklist, Consent, Mercury Screening, and Incentive Receipt are in the participant's folder.

Administrative Tasks

WIC staff will have a variety of on-going administrative tasks throughout the Project period.

Project Promotion

Staff will...

- Distribute Project Three-fold Flyers to women to read while they are waiting for their WIC appointment.

Communication

Staff will...

- Respond to inquiries from the public and participants about the Project and follow-up with appropriate staff, as needed.
- Regularly update MDH on Project activities, progress, issues, and delays.
- Match mercury results (ID only) with participants' personal information and mail out individual result letters.
- Inform participants of Project updates, summaries, and reports when they become available.

Shipping Blood Samples

Staff will...

- Keep all blood samples properly stored until packaged for shipping.
- Use gel packs and properly labeled shipping coolers to maintain a temperature-controlled environment for samples en route from Lake County WIC to MDH PHL.
- Prepare samples for shipment shortly before FedEx arrives for pickup (to minimize the time samples are in coolers).

- Package and ship blood to MDH PHL on a regular basis (typically twice per month) for mercury analysis. Specimens will not be shipped on Thursdays or Fridays.
- Fill out a Chain of Custody Form (COC) for each specimen. Make a copy for WIC and include the original with the cooler (one COC per cooler).

See Appendix B for packaging and shipment procedures and the COC.

Data Entry and Data Transfer

Staff will...

- Enter the participant's contact information and data for each visit into an Excel spreadsheet as soon as possible after the visit
 - Participant ID
 - First and last name
 - Mailing address (street address, city, state, ZIP)
 - Birthdate and age at Project visit
 - Indicate whether person is with the WIC program or a LCHHS employee
 - Visit Outcome (e.g. completed, refused, not interested)
 - Consent/visit date
 - WIC staff completing the visit
 - Responses to mercury screening questions
- Email information (collected from participants) to MDH on a regular basis using encrypted email:
 - Participant ID
 - Participant age
 - Participant ZIP code
 - Responses to mercury screening questions

MDH will use this information and the participant's mercury result to:

- Give advice to the participant about her mercury exposure.
- Compare participants' mercury screening responses to their mercury results.
- Determine if screening responses predict the mercury results.
- Create summaries and reports.

Encrypted email procedures for MDH are found in Appendix A.

- Enter Project data for each participant into the Excel spreadsheet (once received from MDH):
 - Mercury result
 - Which result letter template to use for participant result letter

Incentives

Staff will...

- Complete the Incentive Log using the Participant ID and distribution date
- Submit the Incentive Log to MDH on a regular basis (at least monthly)

See Appendix A for the Incentive Log.

Reporting

Reporting will occur on three levels: individual participants, the community/North Shore area, and nationally/regionally/GLRI/funding agency. Summaries and reports will be publicly available. Only participants will receive individual mercury results.

Lake County Public Health

- Prepare and send individual mercury result letters to participants within 60-90 days of their appointment
- Review community report
- Assist with public presentation, community events, etc. if scheduled

MDH

- Review mercury results from MDH PHL and send to Lake County Public Health with appropriate advice
- Prepare and distribute summaries and reports for community, Great Lakes states, EPA; may include posting on websites (MDH, Lake County)
- Coordinate with local media for report dissemination

Appendix A

Participant Visit Steps Flowchart

Three-fold Flyer

Visit Checklist

Participant Informed Consent Form

Mercury Screening Form

MDH Safe-Eating Guidelines

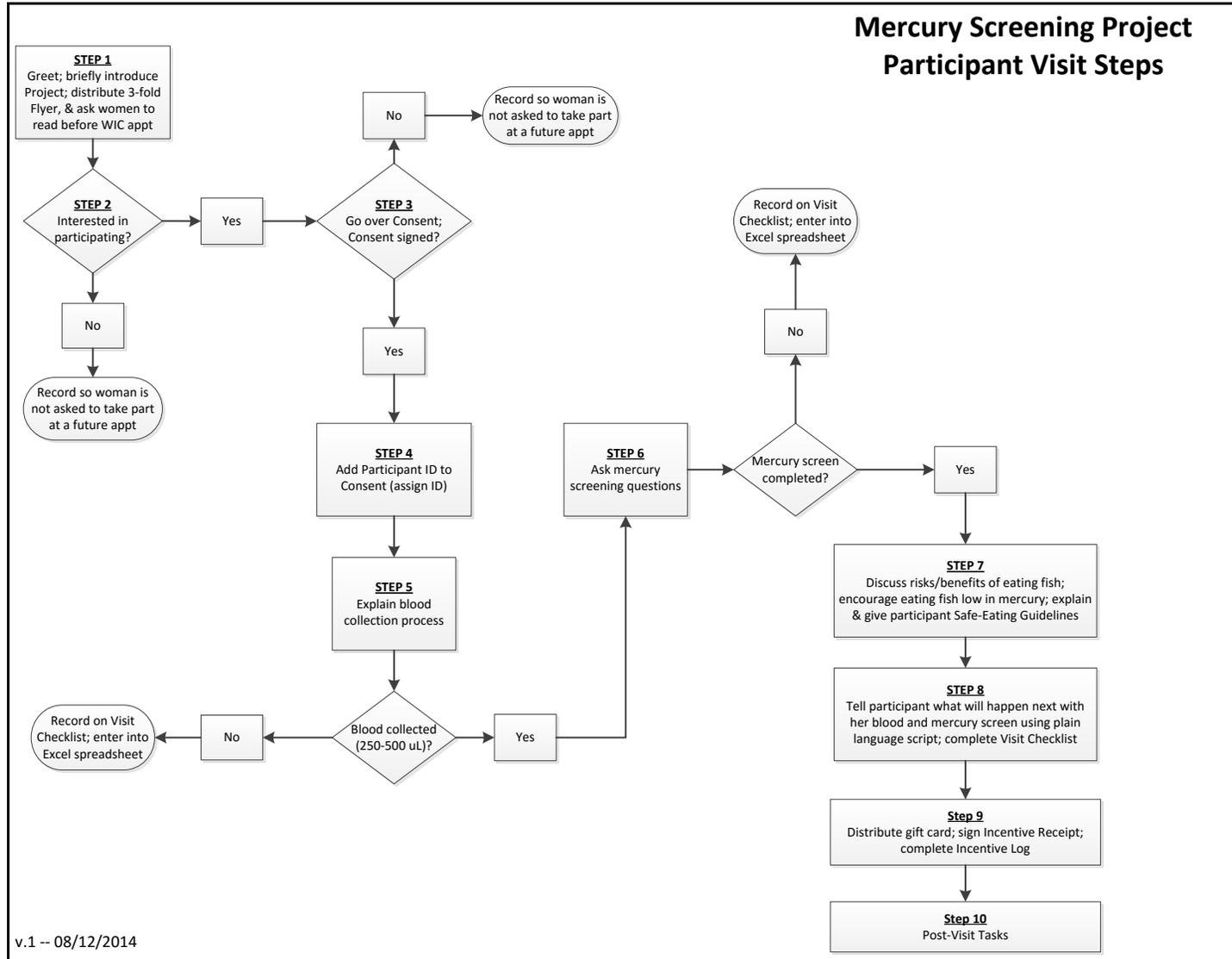
Result Letter Templates

Incentive Receipt

Incentive Log

MDH Encrypted Email Procedures

Participant Visit Steps Flowchart



Three-fold Flyer

Reading level: 5.3

Mercury Screening Project

Women and their families enjoying the health benefits of eating fish while lowering their exposure to mercury



YOU can take part in the Mercury Screening Project!



Mercury Screening Project



For More Information
Molly Gadsby
Public Health Nurse
Lake County Public Health
(218) 834-8434

Project Partners
Lake County Public Health
Minnesota Department of Health

Mercury Screening Project

Why are we doing the Mercury Screening Project?

A recent study showed that 10% of Northeast Minnesota babies tested had mercury in their blood above the level considered safe.

We want women to choose to eat fish that are low in mercury.

Women and their families can have the health benefits of eating fish while lowering their exposure to mercury.

Who can participate?

Women from families who receive WIC services from Lake County Public Health can take part.

Why should I take part?

You will...

- Find out how much mercury is in your body.
- Get information to improve your health and the health of your family.
- Help your community and other communities where people catch and eat fish.



If I decide to take part, what will I do?

You will...

- Have a small amount of blood taken from your finger.
- Answer 3 questions about the fish you have eaten in the last 2-3 months.
- Learn how to choose locally caught and purchased fish for healthy eating.

We will...

- Test your blood sample for mercury found in fish.
- Send you your blood results and what they mean.
- Compare your mercury result to your answers to the 3 fish questions to see if they are related.

How long will it take?

This Project takes 15-20 minutes. It can be done today during your WIC appointment.

Women who complete the 3 questions and give a blood sample will receive a \$20 VISA gift card.

Is my information private?

Yes. Participant names linked with personal results will only be seen by some Lake County Public Health staff.



Why should I eat fish?

Fish are an important part of a healthy diet. Catching and eating fish are part of the history and culture of the Great Lakes region.

- Fish are a great source of low-fat protein.
- Fish contain Omega-3 fatty acids that are important for the developing eyes and brains of a fetus.

Eating fish low in contaminants is good for the health of adults and children.

Visit Checklist

Mercury Screening Project: Visit Checklist

Participant ID:

1. Person would like to take part:

Yes No → Visit Outcome: **Not Interested**

2. Consent completed; give copy to participant:

Yes No → Visit Outcome: **Not Interested**

3. Assign Participant ID (add label to top of Checklist)

4. Blood sample collected (between 250-500 uL blood):

Yes (add Specimen ID label)

Specimen ID: (attach here)

No, did not give enough blood → Visit Outcome: **Not Eligible**

No, refused to give blood → Visit Outcome: **Refusal**

5. Mercury screen completed:

Yes No → Visit Outcome: **Refusal**

6. Fish consumption information explained; copy of Safe-Eating Guidelines given to participant; next steps for results described:

Yes No

7. Visit Outcome (*choose one*):

Not Interested (Person does not want to take part and did not sign the CONSENT)

Visit Complete (CONSENT and MERCURY SCREEN completed; sufficient blood sample obtained)

Not Eligible (Insufficient blood sample)

Refusal (Participant refused MERCURY SCREEN or blood sample after CONSENT)

8. Gift card:

Gift card given to participant

Incentive Receipt signed

Incentive Log completed

Visit Checklist_v1_2014_07_07

<u>WIC Staff</u>	
<input type="checkbox"/> WIC	<input type="checkbox"/> LCHHS
Initials: _____	
Date: ____/____/____	

Participant Informed Consent Form

Reading level: 7.3

Participant ID:

Participant Informed Consent Form

Mercury Screening Project

Purpose: This project will: (1) measure mercury in women of childbearing age; and (2) help women choose fish to eat that are low in mercury.

Lake County Public Health and the Minnesota Department of Health (MDH) are partners in this Project. Funding is from the U. S. Environmental Protection Agency (EPA).

What we will ask you to do: We will ask you to: (1) have a small amount of blood taken from your finger; (2) answer three questions about the kinds of fish that you eat; and (3) talk to a nurse about how to get the health benefits of eating fish while lowering your exposure to mercury in fish.

This will take about 20 minutes.

Project Steps:

- **Giving blood:** A nurse from Lake County Public Health will take a small amount of blood from your finger. The blood will only be tested for mercury.
- **Screening:** The nurse will ask you 3 questions about fish you have eaten in the last 2-3 months. Your answers will be compared to the mercury level found in your blood sample.

All blood will be destroyed at the end of the Project.

- **Health Education Information:** The nurse will talk to you and give you a brochure about choosing which fish to eat and how often to eat fish.

Test Results: Lake County Public Health staff will send your results in a letter with information about what they mean. A summary of Project results will be shared with the public. This will happen after Lake County Public Health has read and approved the report. Participants will not be identified in this report.

Risks: You might feel a slight sting or "pinch" when we take your blood. Your finger may be sore. A small number of people may feel dizzy or faint.

Benefits: Getting your own test result can be helpful. You will know more about the amount of mercury in your body. This Project will help you to plan healthier meals for yourself and your

Participant ID:

family. We will use what we learn from this Project to help people in your area and other communities where people catch and eat fish.

Privacy Protection: All information about you is private. Project records will be in locked files or password-protected computers at Lake County Public Health and MDH. Only Project staff at Lake County Public Health will be able to see information about you. We will share test results and interview answers with EPA. We will not give them any information that could identify you. Personal information will not leave Lake County Public Health.

Costs: The only costs to you are your time and any travel expense. To thank you, we will give you a \$20 Visa gift card at the end of your appointment. If staff try and are unable to collect a blood sample, you will still get the gift card but cannot participate in the Project.

Taking part is your choice: You can choose to participate or not. You may refuse any part or quit at any time. Your choice will not affect your relationship with or services from Lake County Public Health, MDH, or the federal government.

Questions: For more information, you may call Lake County Public Health at 218-834-8434. If you have questions about your rights as a participant in this study, please call Pete Rode, Administrator of the Minnesota Department of Health Institutional Review Board, at 651-201-5942.

Participant ID:

Participant Informed Consent Form

Mercury Screening Project

By marking the boxes and signing below, you are saying you had a chance to ask questions about the Project and freely choose to take part in it. You are also saying that you will allow Project staff to collect, store, and share your Project information as described above. You may keep a copy of this form.

I have read the consent form (or have had it read to me) and understand the information.

Yes No

I choose to answer the 3 screening questions and give a sample of my blood to be tested for mercury.

Yes No

Name (print) _____
First name Middle Initial Last Name

Signature _____ Date: _____
First name Middle Initial Last Name

Staff Signature _____
First name Middle Initial Last Name

<u>WIC Staff</u>
Initials: _____
Date: ____/____/____

Mercury Screening Form

Participant ID:

Mercury Screening Form

Mercury Screening Project

Now, I am going to ask you three questions about the fish you have eaten in the past two to three months. We will compare your answers to the mercury level in your blood.

When answering these questions, please keep in mind how much fish you ate, on average, during the last two to three months.

1. How many times a week did you eat any kind of fish?

(Include fish you ate that were caught or purchased at a store or restaurant - all fresh, frozen, or packaged fish. Examples: walleye, herring from Lake Superior, salmon, shrimp, canned tuna, fish sticks or patties, fast food fish sandwiches, pickled fish, canned sardines.)

_____ times a week (if less than 1 time per week, write <1)

2. How many times a month did you eat any of these fish – Walleye, Northern Pike, Bass, or Lake Trout from Lake Superior?

_____ times a month (if less than 1 time per month, write <1)

3. Did you eat Shark or Swordfish?

Yes No

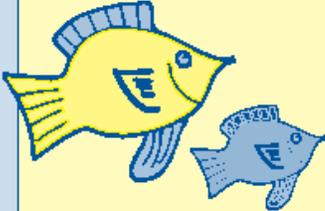
WIC Staff

Initials: _____

Date: ____/____/____

MDH Safe-Eating Guidelines

**A Family Guide
to Eating Fish**



Safe eating guidelines for fish from Minnesota lakes and rivers, and for fish bought in restaurants and stores.



Fish are an excellent low-fat food. Eat a variety of fish as part of your balanced food choices.

There are many reasons to enjoy a variety of fish often:

- Fish are a great source of protein, vitamins and minerals.
- The oils found in fish are important for unborn and breast-fed babies.
- Eating fish may play a role in the prevention of heart disease in adults.

However, fish may contain contaminants that could harm you or your family if you eat certain types of fish or eat fish too often.



If you are pregnant, planning to be pregnant, breastfeeding or have young children, read on to learn how to include fish as part of healthy, balanced food choices.

This brochure will help you to:

- decide *which* fish to eat
- determine *how often* to eat fish
- identify fish high in contaminants

Do you eat...



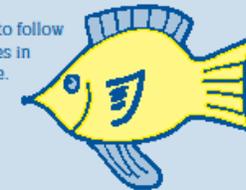
- large walleyes or northern pike?
- canned "white" tuna, fresh tuna or halibut more than once a month?
- swordfish or shark?

If so, you may need to change the *kinds of fish* you eat or *how often* you eat fish.

Your body can handle some exposure to contaminants. However, a developing child or unborn baby can handle less than an adult. If you are pregnant, planning to be pregnant or breastfeeding, you need to be more careful.

Should I just stop eating fish?

NO ...
just be sure to follow the guidelines in this brochure.



This brochure was produced as a collaborative effort between the Minnesota Department of Health and dietitians from HealthPartners, Inc.

What kinds and how much fish should I eat?

The following guidelines are for women of child-bearing age and children under 15 years of age.



Kind of fish	How often can you eat it?
Catfish (farm-raised), cod, crab, flatfish, herring, oysters, pollock, salmon*, sardines, scallops, shrimp, tilapia, and other purchased fish low in mercury *salmon - farm raised or wild, Pacific and Atlantic - not Great Lakes	2 meals per week
OR	
Canned "light" tuna Minnesota caught: Sunfish, crappie, yellow perch, bullheads	1 meal per week
AND	
Canned "white" tuna, Chilean seabass, grouper, halibut, marlin, orange roughy, tuna steak Minnesota caught: Bass, catfish, walleye shorter than 20 inches, northern pike shorter than 30 inches, and other MN gamefish	1 meal per month

What is a meal of fish?

The amount of fish in a meal depends on your body weight. A person's weight is important, because body size affects how the body processes contaminants.

If you weigh 150-pounds, you could safely eat one-half pound/8 ounces of fish in a meal (precooked weight) to stay within the MDH fish consumption guidelines.

To adjust the meal size for a lighter or heavier weight - subtract or add 1 ounce of fish for every 20 pounds of body weight. For example, one meal would be:

- 7 ounces for a 130-pound person, and
- 9 ounces for a 170-pound person.

Be sure to space out meals throughout the month. For example, don't eat all of your fish meals for the entire month within a few days. Give your body time to handle the contaminants in-between fish meals.

Don't eat:

Shark, swordfish, tile fish, king mackerel

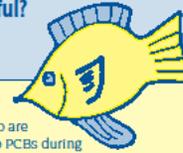
Minnesota caught: walleye longer than 20 inches, northern pike longer than 30 inches, muskellunge

How to Follow the Consumption Guidelines --
Example of fish choices for one month:

1 meal of halibut
AND
Week 1: 1 meal of catfish (farm-raised) and 1 meal of tilapia
Week 2: 1 meal of MN-caught Bluegill
Week 3: 2 meals of salmon
Week 4: 1 meal of canned light tuna

How can contaminants in fish be harmful?

Fish advisories in Minnesota are based on levels of mercury, PCBs and PFOS in the fish.



Mercury

Small amounts of mercury can damage a brain that is just starting to form or grow. That's why young children, unborn and breast-fed babies are at most risk. Too much mercury may affect a child's behavior and lead to learning problems later in life.

Mercury can also harm older children and adults, but it takes larger amounts. It may cause tingling, prickling or numbness in hands and feet or changes in vision.

PCBs

Babies who are exposed to PCBs during pregnancy may have lower birth weight, reduced head size and delayed physical development. Exposure to PCBs may also cause cancer.

PFOS

Studies of laboratory animals exposed to low levels of PFOS show decreases in high-density lipoprotein (HDL or good cholesterol) and changes in thyroid hormone levels. The concern about PFOS is with long-term exposure: Consuming larger amounts of fish over a long period of time.

By following the guidelines in this brochure, you can reduce your exposure to the contaminants in fish and help reduce your health risks.

Methods for cleaning and cooking fish:

Mercury and PFOS are not removed through cooking or cleaning.

However, by removing fat when you clean and cook fish, you *can* help to reduce the amount of other contaminants like PCBs.



Diagram from Wisconsin Fish Advisory

Where do the contaminants in fish come from?

Mercury in Minnesota's lakes and rivers comes from air pollution. About 70 percent of the mercury in the air is the result of emissions from coal combustion, mining, incineration of mercury-containing products and other human sources. All fish have some mercury.

PCBs are man-made substances that were once used in electrical transformers, carbonless papers, cutting oils and hydraulic fluids. PCBs were banned in 1976. Although levels have declined, PCBs are still found in the environment. They are found mainly in the Great Lakes and major rivers such as the Mississippi River.

PFOS (Perfluorooctane sulfonate), a chemical in the perfluorochemical (PFC) group, has been measured in fillets of several species of fish from the Mississippi River and metro lakes. PFCs are a family of manmade chemicals that have been used for decades to make products that resist heat, oil, stains, grease and water. The Pollution Control Agency is leading an investigation into environmental contamination from perfluorochemicals.

For more information on fish consumption guidelines call 651/201-4911 or 1-800-657-3908 or visit our Web site at www.health.state.mn.us

Minnesota Department of Health
625 Robert Street North
P.O. Box 64975
St. Paul, MN 55164-0975

To request this document in another format, such as large print, Braille or cassette tape, call 651/201-4911; TDD 651/201-5797 or toll-free through the MN Relay Service, 1-800-627-3529.

Printed on recycled paper

IC #141-0709
March 2009

Result Letter Templates

Template used for participants who reported eating fish on Mercury Screening Form and have a mercury result above 5.8 µg/L of blood. Reading level: 8.6 (7.9 with Minnesota Department of Health Fish Advisory Program removed)

Date

[First Name] [Last Name]
[Address]
[City], [State] [ZIP]

Dear [First Name] [Last Name],

Thank you for taking part in the Mercury Screening Project! One main purpose of this Project was to test your blood for mercury. Your mercury result is below.

Appointment: <insert date>

Your Total Mercury: <insert value> µg/L (micrograms per liter of blood)

Your total mercury is above 5.8 µg/L, which is the level considered safe for women who are or may become pregnant. Based on your responses to the screening questions, you could reduce your mercury by _____.

At the end of your visit, WIC staff talked with you about eating fish low in mercury as part of a healthy diet. Following that advice (also found in the take-home materials) is important for keeping the mercury in your body at a level safe for your health.

If you have questions about your result or eating fish, please contact Pat McCann at (651) 201-4915. She works for the Minnesota Department of Health Fish Advisory Program and is leading this Project.

Thank you again for being a part of the Mercury Screening Project!

Sincerely,

Template used for participants who reported eating fish on Mercury Screening Form and have a mercury result below 5.8 µg/L of blood. Reading level: 8.9 (8.2 with Minnesota Department of Health Fish Advisory Program removed)

Date

[First Name] [Last Name]
[Address]
[City], [State] [ZIP]

Dear [First Name] [Last Name],

Thank you for taking part in the Mercury Screening Project! One main purpose of this Project was to test your blood for mercury. Your mercury result is below.

Appointment: <insert date>

Your Total Mercury: <insert value> µg/L (micrograms per liter of blood)

Your total mercury is below 5.8 µg/L, which is the level considered safe for women who are or may become pregnant. Based on your responses to the screening questions and your mercury result, we encourage you to eat more fish low in mercury.

At the end of your visit, WIC staff talked with you about eating fish low in mercury as part of a healthy diet. Following that advice (also found in the take-home materials) is important for keeping the mercury in your body at a level safe for your health.

If you have questions about your result or eating fish, please contact Pat McCann at (651) 201-4915. She works for the Minnesota Department of Health Fish Advisory Program and is leading this Project.

Thank you again for being a part of the Mercury Screening Project!

Sincerely,

Template used for participants who did NOT report eating fish on Mercury Screening Form and have a mercury result above 2.0 µg/L of blood. Note: if the mercury level is above 2 µg/L and the participant doesn't eat fish, their exposure is most likely to inorganic mercury. The level of concern for inorganic mercury is lower than methylmercury, the form of mercury in fish. Reading level: 8.7 (8.2 with Minnesota Department of Health Fish Advisory Program removed)

Date

[First Name] [Last Name]
[Address]
[City], [State] [ZIP]

Dear [First Name] [Last Name],

Thank you for taking part in the Mercury Screening Project! One main purpose of this Project was to test your blood for mercury. Your mercury result is below.

Appointment: <insert date>

Your Total Mercury: <insert value> µg/L (micrograms per liter of blood)

Based on your responses to the screening questions, you eat very little fish or no fish at all. However, your total mercury is above 2.0 µg/L, which is higher than expected for someone who eats little or no fish. **Please call Carl Herbrandson at (651) 201-4906 to talk about your results and discuss other possible sources to mercury.** He works for the Minnesota Department of Health (MDH).

At the end of your visit, WIC staff talked with you about eating fish low in mercury as part of a healthy diet. Following that advice (also found in the take-home materials) is important for keeping the mercury in your body at a level safe for your health.

If you have questions about eating fish, please contact Pat McCann at (651) 201-4915. She works for the MDH Fish Advisory Program and is leading this Project.

Thank you again for being a part of the Mercury Screening Project!

Sincerely,

Incentive Tracking

Preloaded Visa gift cards (\$20 each card) will be purchased by MDH. An Incentive Log is created by MDH each time a batch of cards is ordered. The Incentive Log lists every card in the batch by its unique tracking number (found on the back of each card).

Upon arrival, MDH will check that each card in the batch is listed on the Incentive Log. Once accounted for, cards will be hand-delivered by MDH to WIC staff with the Incentive Log. After delivery, WIC staff are responsible for all cards. Cards are to be securely locked when not in use and only accessible to staff working on the Project.

Following each visit, WIC staff will have each participant sign the Incentive Receipt stating they have received a gift card for participating in the Project. Staff will write the Participant ID and date on the Incentive Log to record the card was given to the participant. Women who are poked with the lancet but are unable to provide enough blood for mercury analysis will also be given a \$20 gift card.

When the Incentive Log is complete (or when requested), WIC staff will make a copy and return the original to MDH for auditing and record keeping purposes.

WIC staff will return any unused cards at the end of the Project to MDH.

Incentive Receipt

Reading level: 7.2

Mercury Screening Project Incentive Receipt	Participant ID: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<p>I have received a \$20 gift card for my participation in the Mercury Screening Project. This signed receipt will remain in my private file.</p>	
Print Name: _____	
Sign Here: _____	
Date: _____	
Card #: _____	
	

Incentive Log

**MINNESOTA DEPARTMENT OF HEALTH
SECTION OF FINANCIAL MANAGEMENT
INCENTIVE RECONCILIATION REPORT
FISCAL YEAR 2015**

Date of Memo:
Requestor:
Name of Program:
Type of Card:
Budget:
Program Contact:
Amount Requested:

<i>Please complete this section quarterly:</i>	
Reconciliation for Quarter Ending (Indicate): 3/31 6/30 9/30 12/31 FINAL	
Number of cards available for distribution from list:	
Physical count of cards held in secure storage:	
Report completed by:	
Date completed:	
<i>This section needs to be completed quarterly and sent to Financial Management by the 15th day of the month following quarter end. Please send this reconciled report to Jane Olson in FM by interoffice mail or email: Jane.R.Olson@state.mn.us</i>	
Date received in FM:	

#	FM Distribution Date	Denomination	Gift Card Number	Program Distribution Date	Name/Recipient ID#
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					



Encrypted Messaging and How to use it

Encrypted or “secure” messaging is a server based approach to protect sensitive email data when it is sent to citizens, businesses or anyone outside the Enterprise Unified Communication and Collaboration (EUCC) Email system. One advantage over classical (un-encrypted) email is that confidential and authenticated exchanges can be started immediately by any internet user worldwide since there is no requirement to install any software. MN.IT Services uses Microsoft’s Exchange Hosted Encryption to provide email encryption services.

Note: Messages sent to between EUCC Email recipients stay within the State’s secure system and therefore do not use Microsoft Exchange Hosted Encryption. However these messages are transmitted securely between email servers, using the Transport Layer Security (TLS) network protocol.

When should I use encrypted messaging?

In approved or mandated situations, encrypted email should be used to communicate sensitive information to the recipient(s). You should always check your organization’s policy about the type of information suitable for email communication as some information should NEVER be communicated via email.

Where is my encrypted message stored?

Encrypted messages are stored in the end user’s email inbox, not in Microsoft’s Exchange Hosted Encryption system. Microsoft’s servers simply decrypt the message for recipients; they do not store it.

Are my attachments encrypted?

The entire email, including attachment(s), are encrypted using an Identity Based Encryption (IBE) algorithm. This means the recipient’s email address is used as part of the encryption key. Once the encryption is unlocked, however, recipients can save attachments and distribute them without encryption.

What is the difference between TLS and encrypted email?

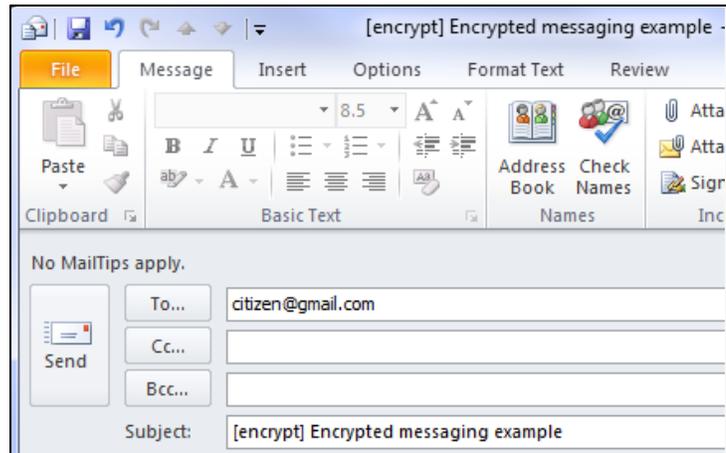
Transport Layer Security or TLS is used to encrypt mail at the communication level - email between messaging systems. The EUCC email system is configured to be “TLS opportunistic” which means it tries to use TLS, but if the destination system does not support it, the message is sent unencrypted. Encrypted messaging means the email message itself is encrypted and then communicated to the recipient’s email system. Therefore, whether or not the message is encrypted at the communication level is irrelevant.

How to send an encrypted message

- 1) Create a new in Outlook or Outlook Web App (OWA)
- 2) Enter the recipients in the To: and Cc: lines
- 3) Type [encrypt] in the beginning of your subject line, then enter the subject of the message (see Outlook 2010 example to the right.)

Note: The [encrypt] term indicates to the messaging service that you want the message encrypted to external recipients.

- 4) Compose the message and then click **Send**.



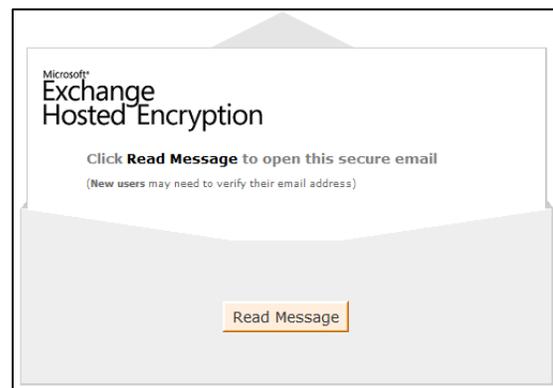
What do recipients receive?

Recipients will receive a notification when they are sent an encrypted email asking them to open an attachment to view the email. At that point, they are redirected to the Exchange Hosted Encryption website to unlock the encrypted message (see the example to the right.)



How to read an encrypted message

- 1) At the bottom of the Exchange Hosted Encryption message you will see "message_zdm.html". Click **View** (see example from previous section)
- 2) In the window that opens, click **Read Message** (see example to the right).
- 3) Login to the Exchange Hosted Encryption system.
 - a. If you have already registered in the system, you just need to enter your password.
 - b. If you have NOT registered, you will need to do so. The registration prompts/instructions are direct and easy to follow. You must enter your full name and choose (and confirm) a password.



- 4) A window opens with the message including the From, To, Sent, Subject and message body.

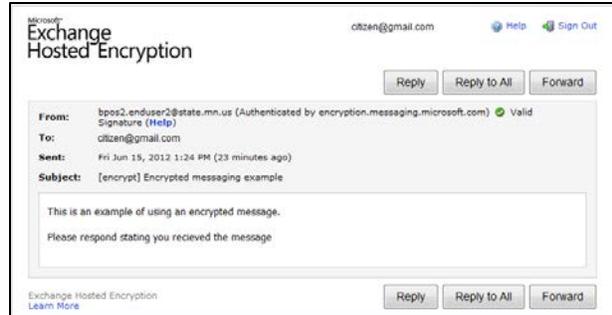
Note: Each subsequent time the recipient receives an encrypted message, they will simply login to view it.

How to forward/reply to an encrypted message

Once opened in Exchange Hosted Encryption, messages can be forwarded or replied to, and will remain encrypted. (See the example to the right.)

- 1) Open the encrypted message.
- 2) Click **Reply**, **Reply to All**, or **Forward**.
- 3) Enter a reply message.
- 4) Click the **Send Secure** button.

Note: The recipient of a reply or forwarded message will be required to log into Microsoft Exchange Hosted Encryption to view it (even if they are in the EUCC Email system).



How to reset your password

There is an easy-to-find link on the Microsoft Exchange Hosted Encryption login page to reset a forgotten password (see example to the right). Once clicked, users are sent an email with instructions on how to complete the resetting process.

[Forgot your password?
Click here to reset your password.](#)

For more information, please visit our website at mn.gov/mnit or contact OET Client Relations at 651-296-4466 oet.services@state.mn.us

Appendix B

Blood Collection and Storage Procedure

Specimen Shipping and Handling

Chain of Custody (COC) Form

Blood Collection and Storage Procedure

Procedure for collecting capillary blood for mercury analysis

Supplies:

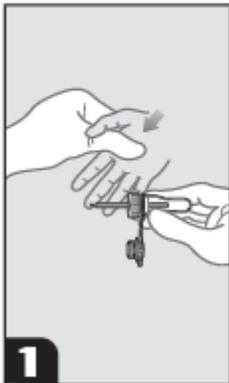
- BD Microtainer Contact-Activated Lancets (2.0 mm depth, 1.5 mm width blade, Fisher catalog # 02-657-102)
- RAM Scientific SAFE-T-FILL Capillary Blood Collection Tubes (# 07 7051, EDTA Capillary Collection 200 µL)
- Gloves
- Alcohol swabs
- Gauze or tissue
- Bandages

Specimen Collection Procedure for Mercury Analysis:

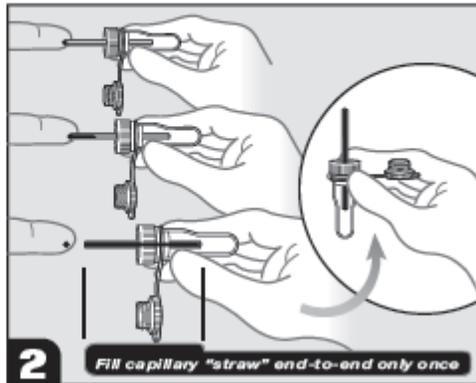
- 1) Follow the same procedure as for hemoglobin testing (see below). Massage the fleshy portion of the finger and wipe the puncture site with an alcohol swab.
- 2) Perform the puncture at the side of the finger with the BD Microtainer lancet. Make the puncture deep enough for blood to flow freely. If blood flow is inadequate, gently massage the proximal portion of the finger and then press firmly on the distal joint of the finger.
- 3) Wipe off the first droplet of blood with a sterile gauze or cotton ball. Do not let the blood run down the finger or onto the fingernail.
- 4) Touch the tip of the capillary tube to the beaded drop of blood. Draw the blood into the tube maintaining a continuous flow of blood.
- 5) When the tube is full (2µL of blood), invert it so the blood flows out and into the specimen container. Cap the container and invert the container several times to mix the blood with the anticoagulant. Properly dispose of capillary tube.
- 6) Check that the container is properly labeled (with the Specimen ID and Participant ID labels). Store in the refrigerator with the Chain of Custody (COC) until shipment to MDH PHL.
- 7) Stop the bleeding and cover the finger with a bandage.

The blood collection procedure is also illustrated below.

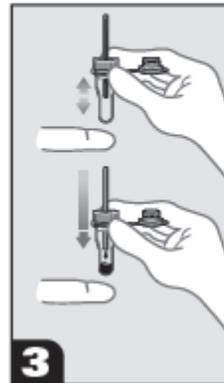
Instructions: SAFE-T-FILL® Capillary Blood Collection Tube



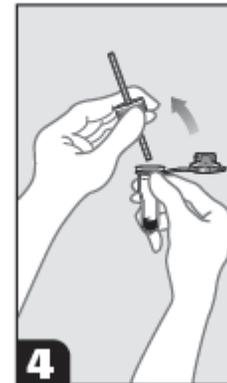
1
Hold the open end of the SAFE-T-FILL® Capillary Blood Collection Tube close to the puncture site at a horizontal or slight angle so that the end of the capillary "straw" touches **only** the blood drop.



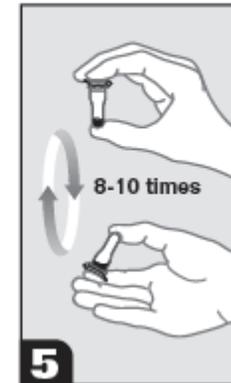
2
The blood drop will be pulled into the straw via capillary action. Repeat drawing capillary blood from the puncture site until the capillary straw is **filled end-to-end only once**. A complete end-to-end fill of the capillary straw is equal to the stated fill volume. Invert the tube to a vertical position to allow the blood to flow down into the microtube.



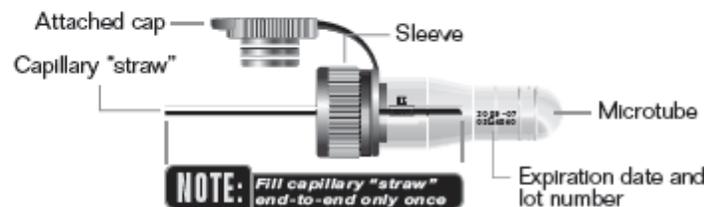
3
Gently tap the bottom of the microtube on a soft surface (finger or palm) to drop the blood from the capillary straw into the microtube.



4
Remove the capillary straw together with its colored sleeve from the microtube and properly discard the capillary straw and colored sleeve in a biohazard container.



5
Close the microtube with attached cap. Mix by holding the tube between thumb and forefinger and inverting 8-10 times. Label the tube and process the sample according to your organization's guidelines.



RAM Scientific Customer Service at 1.800.535.6734 or visit us on the web at www.ramscl.com

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Procedure for Hemoglobin Testing

(excerpted and reformatted from Lake County policy 5.3.2 Hematologic Assessment, Federal Regulation 7 CFR 246.7; dated August 1, 2001)

Equipment, Reagents, and Supplies:

- HemoCue® photometer
- HemoCue® calibration cuvette
- HemoCue® microcuvettes, (store at room temperature – see Note no. 1)
- Blood lancets single use, spring-loaded and retractable (e.g., Genie Vacutainer, Unistick or Saf-T-Pro
- Gloves
- Alcohol
- Gauze or tissue
- Bandages

Specimen Collection Procedure for Hemoglobin Testing:

Blood may be obtained from capillaries in the ear, finger, toe, or heel of an infant. For an infant, obtaining the capillary blood sample from the toe or heel may be easier. The procedure explained here is for obtaining a sample from a finger.

1. Remove a cuvette from the vial and immediately replace the cap tightly to avoid humidity damage to the remaining cuvettes.
2. It is important that the blood circulate freely in the sample finger, so fingers with rings on should not be used. The patient's fingers should be straight but not tense, to avoid the stasis effect which occurs when the fingers are bent.
3. Using your thumb in a gentle rocking movement, lightly press the finger from the top knuckle to the tip. This stimulates the flow of blood to the sampling point. Circulation can be stimulated by having the WIC applicant hold her/his hand down below her/his heart and making a fist several times.
4. Cleanse the skin with a 70% alcohol swab and dry the finger before making the puncture. Drying the finger prior to the stick is important because alcohol is painful in a cut, and it could mix with and dilute the blood giving a spuriously low reading or it could cause clotting of the sample.
5. Using gentle pressure, hold the finger at the top knuckle with your thumb. Perform the puncture at the side of the fingertip with a lancet. Make the puncture deep enough so blood will FLOW FREELY from the puncture. Do NOT "milk" or squeeze the finger because this forces tissue fluid into the sample resulting in an incorrectly low reading.
6. Using a dry gauze, wipe away the first three good size drops of blood. This stimulates blood flow and "clears" tissue fluid from the site which could dilute the specimen. Do not use cotton balls. Cotton fibers may hinder the flow of blood.

7. Apply light pressure until another drop of blood appears but avoid squeezing the finger near the puncture site. Make sure that the drop of blood is big enough to fill the cuvette completely. Place the cuvette tip in the middle of the drop of blood. The cuvette should fill in a continuous process.
8. Wipe off any excess blood from the outside of the cuvette, being careful not to touch the curved edge. Check for the presence of air bubbles in the center of the cuvette. If present, a new sample should be tested. Small air bubbles around the edge do not influence the result.
9. Place the filled cuvette into the holder and insert to the “measuring” position. The results will be displayed in approximately 45 seconds. Record hemoglobin result immediately.
10. Discard the cuvette in an appropriate bio-hazard container.

Specimen Shipping and Handling

Lake County WIC staff are responsible for packaging specimens for shipment to MDH PHL by FedEx. **Staff are required to wear latex or nitrile gloves when handling specimens.** Specimens will be shipped approximately twice per month. Specimens will not be shipped on Thursdays or Fridays.

Pre-shipment Inventory

1. Remove all specimens from the refrigerator.
 - Verify all tubes have a Participant ID label and a Specimen ID label.
 - Inspect tubes for leaks or breakage.
 - Document any broken tubes and report these to Pat McCann (MDH Project Investigator) as soon as possible after discovered.
2. Verify that each specimen has a COC and the COC is complete. Make one copy for WIC and keep the original for shipment with the specimen.

Specimen Packaging and Shipping

Shipment of biospecimens must meet specific requirements. The specimen packaging picture on the next page visualizes the packaging steps described below.

1. Add specimen tubes to polycarbonate box (if not already in box). Place 2 absorbent sheets on top of the tubes and add bubble wrap to keep tubes from moving around before replacing the box cover.
2. Place polycarbonate box into clear seal-top bag. Remove as much air from inside the bag as possible and seal. Only put 1-2 boxes per seal-top bag.
3. Place bagged box inside the white Tyvek Saf-T-Pak ® envelope. Seal white Tyvek securely.
4. Put gel packs in bottom of cooler. Place packaged specimens on top of gel packs. Make sure box is situated so that specimens remain upright. Add more gel packs on top of specimens and then bubble wrap (if needed) to fill space around and on top of the specimens to minimize movement during transport.
5. Add COC forms for all specimens into a zip top bag. Place bag on top of packed specimens.
6. Securely tape cooler closed and attach FedEx tracking form to cooler.

MDH PHL

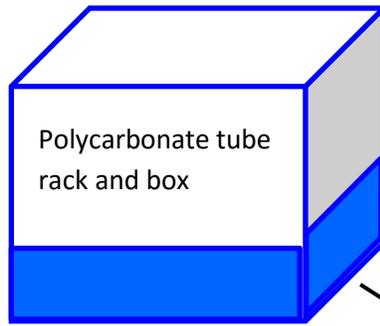
Upon arrival, MDH PHL staff will...

1. Inspect all specimens for leaks or container breakage.
2. Verify that each specimen is listed on the COC and in the cooler.
3. Document any partial samples, broken containers, or discrepancies between COC and cooler contents and report these to Pat McCann (MDH Project Investigator) as soon as possible after discovered.
4. Log specimens into PHL sample receiving database.

Specimen Packaging

absorbent sheets

Step 1



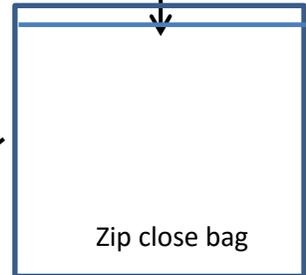
Step 2



Step 3



Chain of Custody Forms



Step 5

Zip close bag

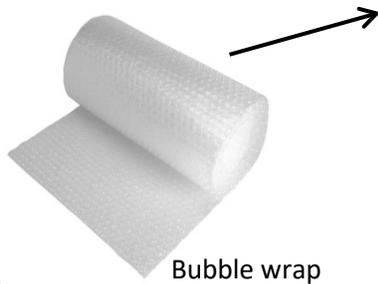
Step 4



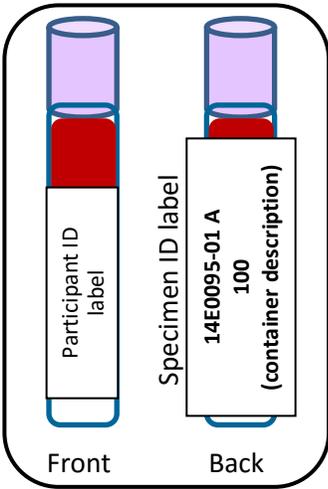
Gel packs

Step 6

FedEx Label
(adhere to outside of cooler)



Bubble wrap



Single Specimen
(1 tube)

Chain of Custody (COC) Form

		<h1 style="margin: 0;">Chain-of-Custody Form</h1>		Minnesota Department of Health Environmental Laboratory 601 Robert St. North St. Paul, MN 55155-2531 651-201-5300 www.health.state.mn.us/divs/phi/environmental/index.html		Page 1 of 1															
Lab Use Only	Program Code (2 Letters)	Project Name	Client / Agency		<input checked="" type="checkbox"/> Standard Chain of Custody																
	Site ID	Project Manager Name / Phone	Report to Name		Potential Hazard <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If Yes please add information to Sampler Comments below																
	Report to Email	Report to Email	Report to Email		TAT <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Priority <input type="checkbox"/> Emergency Matrix Codes DW = Drinking Water WP = Wipe OT = Other NW = Non-potable Water AR = Air TS = Tissue SD = Soil/Solid BI = Biological Material																
Sampled by (print)		Affiliation		# of Containers / Preservatives																	
Sampler Signature		Phone		Unpreserved	Hydrochloric Acid	Sulfuric Acid	Nitric Acid	Sodium Hydroxide	Sodium Thiosulfate	Ascorbic Acid	Other	Total # Containers	Samples Field Filtered Y / N	↓ Analyses ↓	Blood Mercury	Seal Intact Y / N / NA	Lab Temp (°C)				
#	MDH # (Lab Use Only)	Location ID (Unique Identifier)	Sample Point	Collection Date	Time (24 Hour)	Matrix Code	Unpreserved	Hydrochloric Acid	Sulfuric Acid	Nitric Acid	Sodium Hydroxide	Sodium Thiosulfate	Ascorbic Acid	Other	Total # Containers	Samples Field Filtered Y / N	↓ Analyses ↓	Blood Mercury	Seal Intact Y / N / NA	Lab Temp (°C)	
1						BL	0	0	0	0	0	0	0	0	1						
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
Sampler Comments																					
Whole blood samples																					
Receiving Comments																					
Relinquished By / Affiliation				Date		Time		Accepted By / Affiliation				Date		Time							
(Sampler)																					

Revised 2/2012



Community Report for the Lake County Mercury Screening Project

August 2015

Women of childbearing age recently participated in a project with Lake County Health and Human Services Women, Infants, and Children program (LCHHS WIC) and the Minnesota Department of Health (MDH). The Lake County Mercury Screening Project (MSP) focused on reducing mercury exposure in women of childbearing age.

Why did we do this project?

We did MSP to reduce mercury exposure in women who are or may become pregnant and, therefore, in future babies by raising awareness about fish consumption.

- A 2011 study (Mercury in Newborns in the Lake Superior Basin) showed that 10% of Minnesota babies tested from the North Shore area had mercury in their blood above the level considered safe.
- Fish and fishing are an important part of history and culture for communities in Northeast Minnesota. Women living along the North Shore of Lake Superior have reported frequently eating fish with higher levels of mercury.

MSP is an extension of the Fish are Important for Superior Health (FISH) Project currently underway in Cook County. Information gathered from MSP

and FISH will be combined to evaluate how predictive screening questions are for blood mercury levels.

In the future, screening questions could aid doctors and nurses in quickly screening patients for high mercury exposure. Screening would guide patient education for choosing fish low in mercury to lower exposures.



Mercury Screening Project Goals

1. Measure mercury in blood to see if women have exposure above a level of concern
 2. Educate women on health benefits of eating fish and eating fish low in mercury
 3. Determine if screening questions predict blood mercury level
-

What did a MSP participant have to do?

Between September and December 2014, 121 women age 16 to 49 who participate in LCHHS WIC or work as LCHHS employees took part in MSP. They each provided a blood sample to be analyzed for mercury and answered three screening questions about fish they recently ate.

Participants were given information about the health benefits of eating fish and how to choose fish to eat that are low in mercury. Most women completed the project in 20-30 minutes.

Each participant received her personal mercury blood result, information on wisely choosing fish to eat, and a \$20 gift card for taking part.



How much fish did participants report eating?

Responses to three screening questions described how much fish participants ate in the last 2-3 months.

Screening Question #1

How many times a week did you eat any kind of fish?

All 121 participants reported eating fish in the last 2-3 months. Overall, younger women tended to eat fewer fish meals than older women.

- Benefits from eating fish are maximized at 1-2 meals per week. 38% of women said they ate 1 or more fish meals per week.



Screening Question #2

How many times a month did you eat any of these fish – Walleye, Northern Pike, Bass, or Lake Trout from Lake Superior?

About 12% of women reported eating 2 or more meals per month of walleye, northern pike, bass, or lake trout from Lake Superior.

- This is more frequent than the fish safe-eating guidelines recommend. In general, these fish should be eaten up to one meal per month.

Screening Question #3

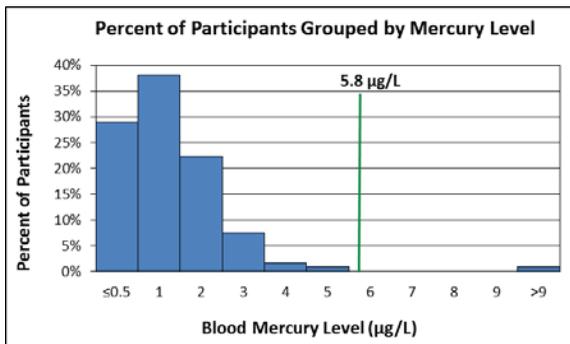
Did you eat shark or swordfish?

No one reported eating shark or swordfish in the last 2-3 months.

- Both shark and swordfish are high in mercury and should be avoided by women of childbearing age.

What mercury levels were found in participants' blood?

The mercury level in blood considered safe for women who are or may become pregnant is 5.8 µg/L or below. This level is protective for a growing fetus. The mercury results for most participants were below this level (shown as a green line in the graph below).



In general, women who ate more fish meals had higher levels of mercury. Participants with a mercury level above

5.8 µg/L were given specific advice to lower mercury exposure by choosing to eat lower mercury fish and fewer meals of higher mercury fish.

Less than 1% of MSP participants were above 5.8 µg/L compared to about 2% in the U.S.

Source: 2011-2012 National Health and Nutrition Examination Survey (NHANES)

It's important to note that fish consumption varies by season and so can mercury levels, depending on the types of fish eaten. MSP blood samples were collected between September and December.

Why is mercury a concern?

Most people's exposure to mercury comes from eating fish. Mercury in Minnesota waters and fish is a result of worldwide emissions from coal combustion, mining, other human activities, and natural sources.

Mercury exposure can affect a person at any age. However, the developing fetus and young children are most at risk from mercury in fish. Too much mercury can affect a child's ability to learn and process information.

All fish contain at least a small amount of mercury. Some fish have more than others. Bigger/older fish have more mercury than smaller/younger fish of the same species. When you eat fish, the mercury in the fish gets into your body. Your body is able to get rid of mercury over time.

Following the **MN Safe-Eating Guidelines** will give you the benefits of eating fish while keeping your exposure to contaminants low. Find them here: www.health.state.mn.us/fish

Are there benefits from eating fish?

Even though fish contain mercury and possibly other contaminants, there are good reasons to eat fish. Fish is low in bad fats and a good source of protein, iodine, and vitamin D. Fish is also one of the only foods naturally high in DHA and EPA omega-3 fatty acids, which are needed by the body, especially for eye and brain development.

In research studies, moms who ate more fish during pregnancy had a lower risk of premature birth, fewer pregnancy complications, and children with better development and higher IQ.

Should women eat fish?

Choosing fish wisely to maximize benefits and minimize risks is often challenging. MSP increased awareness about the health benefits and risks of eating fish to women of childbearing age.

MDH recommends eating fish as part of a healthy and nutritious diet. Experts agree eating fish 1-2 times per week will maximize benefits. Benefits outweigh risks if the fish women eat are low in mercury and other contaminants.

Many women who took part in MSP said they ate fish less than 1 time per week. Both the number of fish meals eaten per week and the mercury levels measured in blood indicate that women in MSP could eat more fish.

By choosing fish wisely, women could gain more of the benefits of eating fish for their health and their future children while still keeping their exposure to mercury low and at a safe level.

Questions?

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Report is also available at www.co.lake.mn.us

Local Fish Project Wraps Up, Report Available

The Community Report for the Lake County Mercury Screening Project (MSP) was recently completed by Lake County Health and Human Services Women, Infants, and Children program (LCHHS WIC) and the Minnesota Department of Health (MDH). The report is a summary of results from MSP. The project focused on reducing mercury exposure in women who are or may become pregnant and, therefore, in future babies by raising awareness about risks and benefits of eating fish. Participants included 121 women of childbearing age who live in Lake County.

Most people's exposure to mercury comes from eating fish. All 121 women reported eating fish in the last 2-3 months. In general, women who ate more fish meals had higher levels of mercury. However, the mercury results for most participants were below the level considered safe for women of childbearing age and a growing fetus.

There are good reasons to eat fish. Fish is low in bad fats and a good source of protein, iodine, and vitamin D. Fish is also one of the only foods naturally high in DHA and EPA omega-3 fatty acids, which are needed by the body, especially for eye and brain development. Benefits of eating fish outweigh risks if the fish are low in mercury and other contaminants.

MDH recommends eating fish as part of a healthy and nutritious diet. Studies show that benefits to developing babies are maximized when women who are or may become

pregnant eat fish 1-2 times per week. Benefits outweigh risks if the fish women eat are low in mercury and other contaminants.

MSP is an extension of the Fish are Important for Superior Health (FISH) Project currently underway in Cook County. Both North Shore projects are in response to a 2011 study (Mercury in Newborns in the Lake Superior Basin) that showed that 10% of Minnesota babies tested from the North Shore area had mercury in their blood above the level considered safe.

Information gathered from MSP and FISH will be combined to evaluate how predictive screening questions are for blood mercury levels. In the future, screening questions could aid doctors and nurses in quickly screening patients for high mercury exposure. Screening would guide patient education for choosing fish low in mercury to lower exposures.

Choosing fish wisely to maximize benefits and minimize risks is often challenging. MSP increased awareness about the health benefits and risks of eating fish to women of childbearing age.

The full MSP Report is available at:
[http://www.co.lake.mn.us/departments/health_and_human_services/women_infants_and_children\(wic\).php](http://www.co.lake.mn.us/departments/health_and_human_services/women_infants_and_children(wic).php)

For questions, please contact LCHHS WIC at (218) 834-8434.

WIC Staff Evaluation of the Lake County Mercury Screening Project



August 2015

Lake County Health and Human Services (LCHHS) WIC recently partnered with the Minnesota Department of Health (MDH) Fish Consumption Advisory Program for the Lake County Mercury Screening Project (MSP). MSP focused on reducing mercury exposure in women of childbearing age and, therefore, in future babies by raising awareness about fish consumption. While the project was viewed positively by staff and clients, improvements can always be made to guide planning and enhance future projects. The lessons learned and ideas for improving future projects follow in a Q&A with LCHHS WIC.

Project Snapshot

Between September and December 2014, 104 women from LCHHS WIC and 23 LCHHS female employees were asked to take part. Out of 127 women, 125 agreed to give a small sample of blood for the mercury test and answer three screening questions about fish they recently ate. Collection of capillary blood occurred with a finger poke using a lancet and collection tube. Four women were unable to give enough blood for the test, and 121 women completed the blood sample and screening.

Participants were given information about the health benefits of eating fish and how to choose to eat fish that are low in mercury.

Most women completed the informed consent, screening questions, blood sample, and education in 20-30 minutes.

Each participant received her personal mercury blood result, information on wisely choosing fish to eat, and a \$20 gift card for taking part.

While no significant differences were seen in blood mercury levels, older participants tended to eat more fish.

MSP Staff Feedback

Evaluating MSP identified weaknesses and strengths in project design and implementation. The following Q&A with MDH and Molly Gadsby, WIC nurse for LCHHS, provides valuable insight that could be applied to improve future screening projects.

Q: How much time did it take for each participant to complete the project steps?

A: It took approximately 25 minutes per person from start to finish. This included both our clerk's time briefly explaining the project and getting the folders ready, and the CPA's time doing the consent, blood work, screening questions, and gift card.

This project did add time to a mid-certification or a certification appointment. However, during a Nutrition Education appointment, it was nice for that mom who did not have any questions regarding their health or eating because we were able to discuss safe fish eating habits.



Q: How much time did it take WIC staff to do the post-visit data entry, data transfer to MDH, and results spreadsheet to send results letters?

A: It took the most time to enter the post-visit data, about 3-5 minutes per person. This is because I had to look up each participant's address and DOB. If this is done in the future, the address and DOB should be added as part of the consent form.

Because of the MDH templates, the data transfers and prepping the results spreadsheet for letters were quite easy and very simple, only taking about 10-15 minutes. The time-consuming part was stuffing and labeling the envelopes. Overall, each batch of approximately 30 result letters took about 1.5 hours.

Q: What worked well? What didn't work? What could be improved?

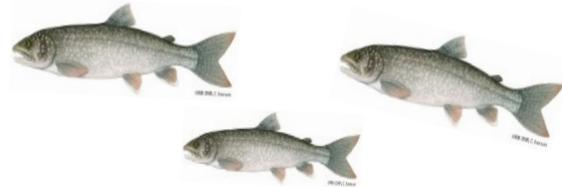
A: Everything went pretty well. MDH had so much of the legwork completed for us that it was really just entering data and shipping blood samples after WIC clinics. Everything was well spelled out in the protocol, and MDH staff were readily available for questions.

It was completely worth our time – both staff and clients. It would have been great to start the screening in June when women may have been eating more fish over the summer fishing season instead of September.

As I stated earlier, I would just change the consent form so it included the participant's DOB and address.

Q: What's your impression – how did participants feel about the project?

A: Participants were very excited about the \$20 gift card and seemed interested in knowing their mercury level. A lot of moms had no idea the harm of too much mercury and were glad to have the information.



Q: If funding were available in the future, would you consider adding mercury screening questions and the blood collection to your WIC clinics?

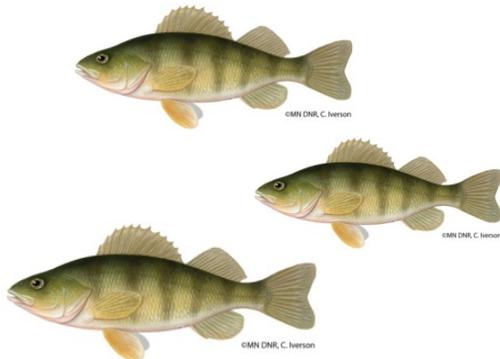
A: If we had someone who strictly did the mercury screening after participant's WIC appointments, we would be completely willing to add this to our WIC clinics with adequate funding. However, it does make for a longer appointment when a mom has three or five children with them, and we have to get through all of the other things required by WIC.

Q: Would you recommend the mercury screen (questions and blood collection) to WIC in other counties?

A: We would definitely recommend this to other clinics. It is a great educational piece for our moms and staff to know. It would work well if it could be offered to clients coming in for Nutrition Educations versus a mid-certification or certification.

Q: What are your personal thoughts on the project from a staff perspective?

A: Overall, we have very positive thoughts about the project. At times, clinic was very hectic, and it would have made it a lot easier not to offer the screening, but for the majority of the time it was good. As LCHHS employees, we took part and enjoyed finding out what our own mercury levels were.



Project Key Points

MSP provided valuable lessons for reaching women of childbearing age and improving future projects to reduce mercury exposure.

Education is the Key! Because all fish contain at least a small amount of mercury, exposure isn't going to go away. Educating women on how to choose fish to eat low in mercury will help them maximize benefits for themselves and their families while keeping exposure to mercury and other contaminants low.

WIC is one venue for reaching women of childbearing age in Minnesota about wisely choosing fish to eat.

MSP offered opportunity to discuss fish in diet! LCCHS WIC found MSP to be a great avenue for discussing fish consumption with WIC clients. Participants found the screening questions easy to answer. Mercury results and fish consumption education materials were helpful for future meal planning. And with the \$20 gift card and mercury results, it was worthwhile!

More MSP future projects! With minor modifications to the consent form and possibly additional staff with adequate funding, LCCHS WIC would be willing to do MSP again as part of their WIC clinics. Since WIC's focus includes women of childbearing age and young children, LCCHS WIC also recommends MSP to other WIC programs in MN in order to lower mercury exposures and increase fish consumption education.