

Mercury Exposure Among Women in a Private OB/GYN Practice



Presenter: Lori Copan, MPH, AE-C

Delta Watershed Fish Project, Exposure Assessment Section





Acknowledgements







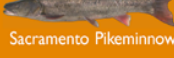


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- Funders:
 - Delta Tributaries Mercury Council of the Sacramento River Watershed Program
 - State Water Resources Control Board
 - CALFED Bay-Delta Program

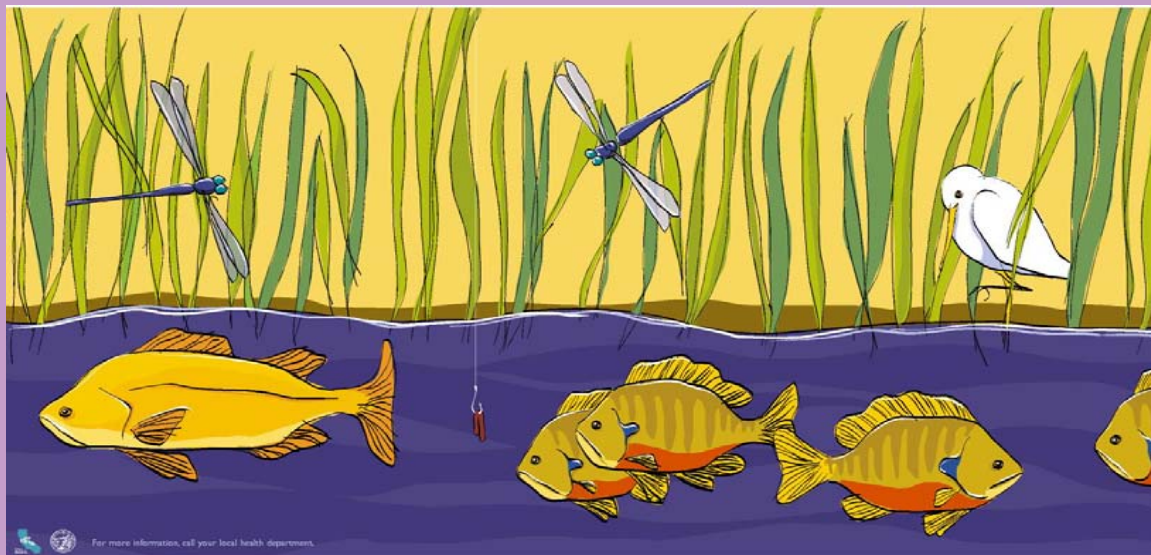
National Perspective

- Fish consumption is believed to be the primary source of mercury exposure in the general population.
- 6% of women of childbearing age have blood mercury levels of potential health concern (>5.8 mg/L; MMWR 2004).
- Among Asian, Pacific Islander, Native American, and multiracial women, this percentage is much higher ($16.59 \pm 4.0\%$; Hightower et al. 2006).

Advisories

- Sacramento has numerous nearby water bodies with sport fish consumption advisories due to mercury contamination.

Safer — Less Chemicals	How much can you eat?	Less Safe — More Chemicals
 Bluegill  Salmon  Sunfish  Trout	<p>Women age 18 – 45 Pregnant women Breastfeeding women Children and teens</p> <p>Eat 1 meal or less of striped bass or sturgeon per month. Avoid striped bass longer than 27 inches.</p> <p>Other Adults</p> <p>Eat 2 meals or less of striped bass or sturgeon per month. Avoid striped bass longer than 35 inches.</p> <p>For more information, call your local health department.</p> <p><small>Photography: Rene C. Reyes, Zak Sutphin</small></p>	 Crappie  Carp  Sacramento Pikeminnow  Largemouth Bass  Catfish



Protect Your Health if You Eat DELTA FISH

CAUTION! Eating fish is good for your health. But striped bass and sturgeon caught in the Delta have a harmful chemical called mercury in them. Eating these fish may harm your health or the health of your family. Mercury can cause babies to develop and learn slower.

How much can you eat?


Women age 18 – 45
Pregnant women
Breastfeeding women
Children and teens

Eat **1** meal or less of **striped bass** or **sturgeon** per month. Avoid **striped bass** longer than 27 inches.










Other Adults

Eat **2** meals or less of **striped bass** or **sturgeon** per month. Avoid **striped bass** longer than 35 inches.

Limit eating fish caught in the Delta



Information about other fish caught in the Delta

Safer — Less Chemicals	Less Safe — More Chemicals
 Salmon  Bluegill  Sunfish  Trout	 Crappie  Carp  Sacramento Pikeminnow  Largemouth Bass  Catfish

For more information, call your local health department.



Principal Objectives

1. Characterize mercury exposure in clinic population.
2. Assess the feasibility of incorporating blood mercury test into clinical practice, and the extent to which Medi-Cal and other health insurance providers will pay for these tests.
3. Through training and education, increase knowledge among Dr. Brode's office staff and patients about health risks and benefits of fish and ways to reduce exposure to mercury.

Study Partner & CPSP

- Sacramento office of Dr. James Brode, M.D., FACOG.
- Serves primarily low-income women of color.
- A Comprehensive Perinatal Services Program (CPSP) provider, a statewide program administered through Medi-Cal and the CDHS' MCH Branch



Comprehensive Perinatal Services Program (CPSP)

- Goal – improve pregnancy outcomes and lower health care costs
- Available to all Medi-Cal pregnant women enrolled in Medi-Cal managed care plan
- Prenatal, delivery, and postpartum care
- Health education, nutrition and psychosocial services



Study Inclusion Criteria

- Patients seeking pre-natal services from 10/16/06 to 2/6/07
- Age ≥ 18 and ≤ 49 years
- Pregnant and prior to 32 weeks' gestation
- Fluency in English, Vietnamese, or Hmong.



Study Phases

Phase I Activities

Phase II

Consent
& HIPAA

Consumption
Survey

Education

Blood
Draw

Clinical
Follow-up
all patients

CPSP
Screening
Protocol

\$15.00
Incentive

\$25.00
Incentive

Staff Capacity Building

- Study introduction
- Mercury in fish, health effects, advisories, education
- Tools and techniques for educating patients
- Obtaining patient consent
- Administering the survey
- Delivering the educational protocol
- Practice



Consumption Survey

- Administered by clinic staff in English, Hmong, and Vietnamese
- Fish consumption habits while pregnant
- Advisories awareness
- Portion sizes
- Demographic information
- Flip book demo.
- Summary Sheet

Brode Survey Version 3J. 10/3/06 Pt Chart # _____

7. SHARK
Turn flipbook to page 3 ...

7 a. Do you eat SHARK that come from stores, markets, or restaurants?
☐ Yes
☐ No → *Go to Question 8*
☐ Don't know or unsure → *Go to Question 8*
☐ Refused → *Go to Question 8*

7 b. In the last 3 months, have you eaten SHARK?
☐ Yes
☐ No → *Go to Question 8*
☐ Don't know or unsure → *Go to Question 8*
☐ Refused → *Go to Question 8*

7 c. In the last 30 days, how many times did you eat SHARK?
 _____ Times ☐ Don't know or unsure
☐ Refused
 → *If zero, Go to Question 8*

7 d. The last time you ate SHARK, how much did you eat? Use these models to show me.
 _____ A _____ B _____ C _____ D _____ E
☐ Don't know or unsure
☐ Refused

8. SWORDFISH
Turn flipbook to page 4 ...

8 a. Do you eat SWORDFISH that come from stores, markets, or restaurants?
☐ Yes
☐ No → *Go to Question 9*
☐ Don't know or unsure → *Go to Question 9*
☐ Refused → *Go to Question 9*

8 b. In the last 3 months, have you eaten SWORDFISH?
☐ Yes
☐ No → *Go to Question 9*
☐ Don't know or unsure → *Go to Question 9*
☐ Refused → *Go to Question 9*

8 c. In the last 30 days, how many times did you eat SWORDFISH?
 _____ Times ☐ Don't know or unsure
☐ Refused
 → *If zero, Go to Question 9*

8 d. The last time you ate SWORDFISH, how much did you eat? Use these models to show me.
 _____ A _____ B _____ C _____ D _____ E
☐ Don't know or unsure
☐ Refused

Brode Survey Version 3J. 10/3/06 Pt Chart # _____

Cover Sheet

TO BE COMPLETED BY INTERVIEWER Before SURVEY

Date:	Interviewer Name:
Patient Chart #:	Time Start: _____ am pm

A. Payment Type

☐ Cash Pay
☐ Private Insurance (specify) _____
☐ Medi-Cal
☐ CPSP
☐ Non-CPSP
☐ Disability Insurance

B. Current Weight

_____ lbs or _____ kilos

C. Pre-Pregnancy Weight

_____ lbs or _____ kilos
☐ Don't Know

D. Due Date _____

Page 1

Summary Sheet

Used for Education & Clinical FU Quick assessment for blood

Survey Summary Sheet																														
Patient Chart Number: _____ Patient chose to have blood test: <input type="checkbox"/> Yes <input type="checkbox"/> No																														
Patient's blood mercury level: <input type="checkbox"/> ≤ 5.8 g/L <input type="checkbox"/> > 5.8 g/L and ≤ 58 μ g/L <input type="checkbox"/> > 58 μ g/L																														
Introduction (Interviewer): <i>Now that we are done with the survey, I'd like to give you some information about how to eat fish safely.</i>																														
<input type="checkbox"/> Patient does not eat fish or shellfish (record reason): <ul style="list-style-type: none"> Fish is good for your health and your baby. If you can, you should try to include it in your diet up to 2 times a week, but follow the guidelines in this brochure. 	Fish Eaten	Follow-Up																												
	<table border="1"> <thead> <tr> <th>Bought Fish</th> <th>Eaten in Last 3 months?</th> </tr> </thead> <tbody> <tr><td>Shark.....</td><td><input type="checkbox"/></td></tr> <tr><td>Swordfish.....</td><td><input type="checkbox"/></td></tr> <tr><td>King Mackerel.....</td><td><input type="checkbox"/></td></tr> <tr><td>Tilefish.....</td><td><input type="checkbox"/></td></tr> <tr><td>Tuna Steak.....</td><td><input type="checkbox"/></td></tr> <tr><td>Albacore (solid white).....</td><td><input type="checkbox"/></td></tr> <tr><td>Chunk light tuna.....</td><td><input type="checkbox"/></td></tr> <tr><td>Shrimp / prawns.....</td><td><input type="checkbox"/></td></tr> <tr><td>Fish sticks / burgers.....</td><td><input type="checkbox"/></td></tr> <tr><td>Salmon.....</td><td><input type="checkbox"/></td></tr> <tr><td>Catfish.....</td><td><input type="checkbox"/></td></tr> <tr><td>Other.....</td><td><input type="checkbox"/></td></tr> <tr><td>Other.....</td><td><input type="checkbox"/></td></tr> <tr><td>Other.....</td><td><input type="checkbox"/></td></tr> </tbody> </table>		Bought Fish	Eaten in Last 3 months?	Shark.....	<input type="checkbox"/>	Swordfish.....	<input type="checkbox"/>	King Mackerel.....	<input type="checkbox"/>	Tilefish.....	<input type="checkbox"/>	Tuna Steak.....	<input type="checkbox"/>	Albacore (solid white).....	<input type="checkbox"/>	Chunk light tuna.....	<input type="checkbox"/>	Shrimp / prawns.....	<input type="checkbox"/>	Fish sticks / burgers.....	<input type="checkbox"/>	Salmon.....	<input type="checkbox"/>	Catfish.....	<input type="checkbox"/>	Other.....	<input type="checkbox"/>	Other.....	<input type="checkbox"/>
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<input type="checkbox"/> Patient eats fish: <ul style="list-style-type: none"> It's good that you're eating fish. Fish is good for your health and your baby, and it's a good alternative to other kinds of meat. It sounds like you are eating: Sometimes fish can have mercury. Too much mercury in your body could harm your baby's brain and growth. That's why you should learn which fish have more mercury in them. You should never eat shark, swordfish, tilefish, or king mackerel. They have the highest mercury. Children should not eat these fish either. 	CAUGHT FISH	Follow-Up																												
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<input type="checkbox"/> Patient eats commercial fish: <ul style="list-style-type: none"> For fish that you buy, keep eating it up to 2 times a week. Remember, since fish is a meat protein, each time you should only eat about as much as your hand. Try to eat a variety of different fish, instead of only one kind of fish, such as tuna. These are some low-mercury fish to choose. 	If <u>any</u> box in red is checked, please bill blood test to Medi-Cal or Insurance																													
<input type="checkbox"/> Patient eats tuna: <ul style="list-style-type: none"> It sounds like you are eating canned tuna. You can eat tuna as part of your two meals a week. Chunk light tuna has less mercury than albacore or white tuna, or tuna steaks. When you buy tuna, look for this label (show example). If you eat albacore or white tuna, or tuna steaks (show example), you should only eat 1 can in a week, because it has more mercury. 	Commercial Fish Portions <input type="checkbox"/> SAFE ($\leq 6x / 30d$) <input type="checkbox"/> HIGH (9-15x / 30d) <input type="checkbox"/> VERY HIGH ($\geq 16x / 30d$)																													
<input type="checkbox"/> Patient eats sport fish (caught by self, friends, family) <ul style="list-style-type: none"> Make sure you know where your fish comes from. Check the advisory for that place, before you eat any fish. (FAQ) The safest fish to eat from around here are salmon, bluegill, trout, and sunfish. Eat up to 1 meal a week of these fish. Avoid other fish unless there is an advisory for that place. Remember, since fish is a meat protein, each time you should only eat about as much as your hand. 																														
<input type="checkbox"/> Patient eats both commercial and sport fish: <ul style="list-style-type: none"> Every week, you can either eat 2 meals of fish that you buy (except shark, swordfish, albacore tuna or tuna steaks) OR 1 meal of fish caught by friends or family. Don't eat both commercial and sport fish in the same week. 																														

Survey Summary Sheet	
<input type="checkbox"/> Patient wants information about the Delta: <ul style="list-style-type: none"> Some of the fish caught around here have high levels of mercury in them, especially striped bass and sturgeon. You should avoid these fish or only eat them once in a month. (Show Delta Postcard)	
<input type="checkbox"/> Patient wants information about the American River: <ul style="list-style-type: none"> If you get fish from the American River, you should avoid catfish, bass, pikeminnow, and sucker (show pictures). You can eat the safer fish, such as sunfish and bluegill, up to one time a week. 	
<input type="checkbox"/> Patient eats fish from other Northern CA waterbodies: Stick the correct water body advisory label to the back of the brochure and explain. Place a copy of the sticker(s) here:	
<input type="checkbox"/> Ask if patient has any questions. Record patient's questions:	
<input type="checkbox"/> Explain blood test instructions <ul style="list-style-type: none"> As part of this study, we want to find out how much mercury is in your body right now..... 	Interviewer initials and date: _____

Referral Type: If applicable, indicate type of referral made, the date of the referral, and your initials. <input type="checkbox"/> Sutter Medical Center, Perinatologist <input type="checkbox"/> UC Davis Medical Center, Occupational and Environmental Health Clinic <input type="checkbox"/> Other: _____

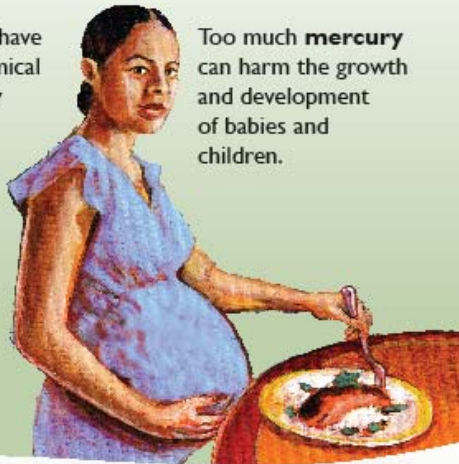
Education

Safety Tips for Eating Fish: Protect your Baby's Health!

Eating fish is good for your health.

But some fish have a harmful chemical called mercury in them.

Too much **mercury** can harm the growth and development of babies and children.



Never eat shark, swordfish, tilefish, or king mackerel.

These fish are highest in mercury.



- * Post survey
- * Review types of fish

- * Advisory info.
- * Q & A

Fish has protein and healthy fats. These are good for you and your children.



FOR MOST OF THE FISH THAT YOU BUY:

You can eat up to **2 meals of fish in a week**. It's best to eat a **variety** of fish. Choose **low-mercury fish**, such as:



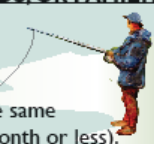
* If you eat tuna, choose **chunk light** canned tuna. It has **less mercury** than white or albacore canned tuna, or tuna steaks.

Children can eat fish too. They may eat up to **2 meals** in a week, but give them **smaller amounts**.

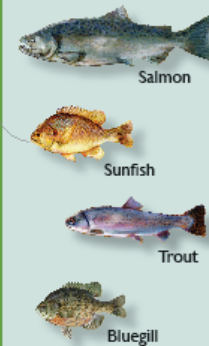


FOR FISH CAUGHT BY YOU, FRIENDS, OR FAMILY:

Always follow the health and fishing advisories in your area. If there is no advisory, eat up to **1 meal a week** of this safer fish, and no other fish in the same week. Avoid less safe fish (eat once a month or less).



SAFER



LESS SAFE



Within the same week, don't eat fish you buy **AND** fish caught by you, friends, or family.

Blood Draw

- Location
- Fees negotiated with clinical laboratory
- ICP-MS
- EHLB provides 10% validation sample for comparison

Typical Fees	
Hg in whole blood analysis	\$95.25
Blood draw	\$8.00
Medi-Cal reimbursement	\$14.12
Negotiated draw and analysis	\$25.00

Clinical Follow-up Protocol

Above 5.8 µg/L and ≤58 µg/L

Health Impacts	<u>To infant</u> : No significant risk of adverse effects, but some uncertainty exists due to incomplete data and individual variability.
Provider Action	<ul style="list-style-type: none">▪ Review blood test result at next scheduled visit.▪ Review Survey Summary▪ Provide counseling on ways to reduce exposure.▪ Reinforce key messages about fish consumption.▪ Respond to patient's questions/concerns.▪ Repeat blood test at 2 months.▪ Continue follow-up
Information	<ul style="list-style-type: none">▪ Review benefits of fish consumption▪ Recommend health advisories for commercial and sport fish.▪ Recommend consuming low mercury fish.▪ Answer questions as needed.
Referrals	If no fish consumption reported on the <i>Survey Summary</i> , non-fish sources of mercury exposure should be suspected. Refer patient to UC Davis Medical Center, Occupational and Environmental Health Clinic.

Mercury Exposure Among Women in a Private OB/GYN Practice

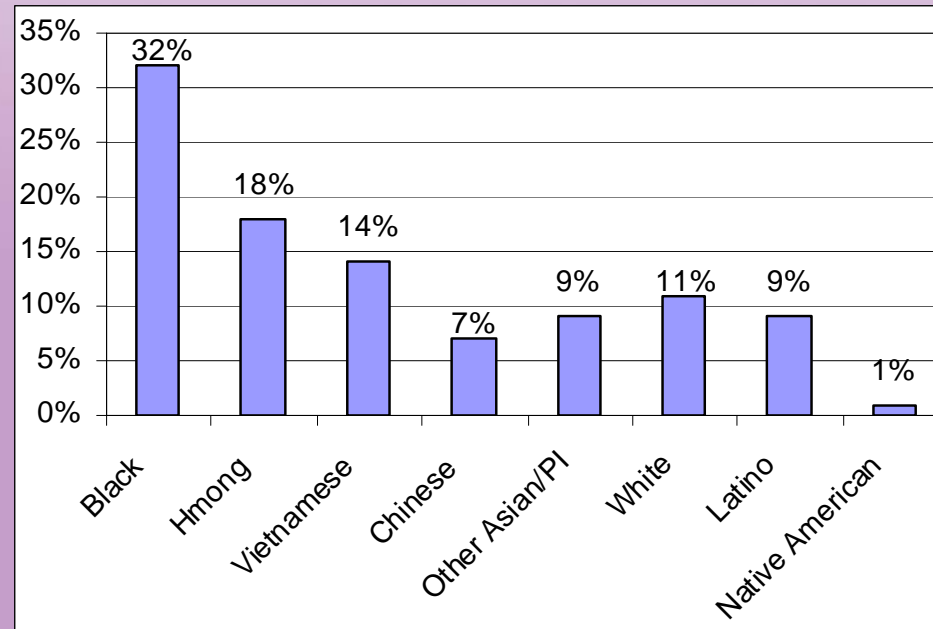


Descriptive Preliminary Results

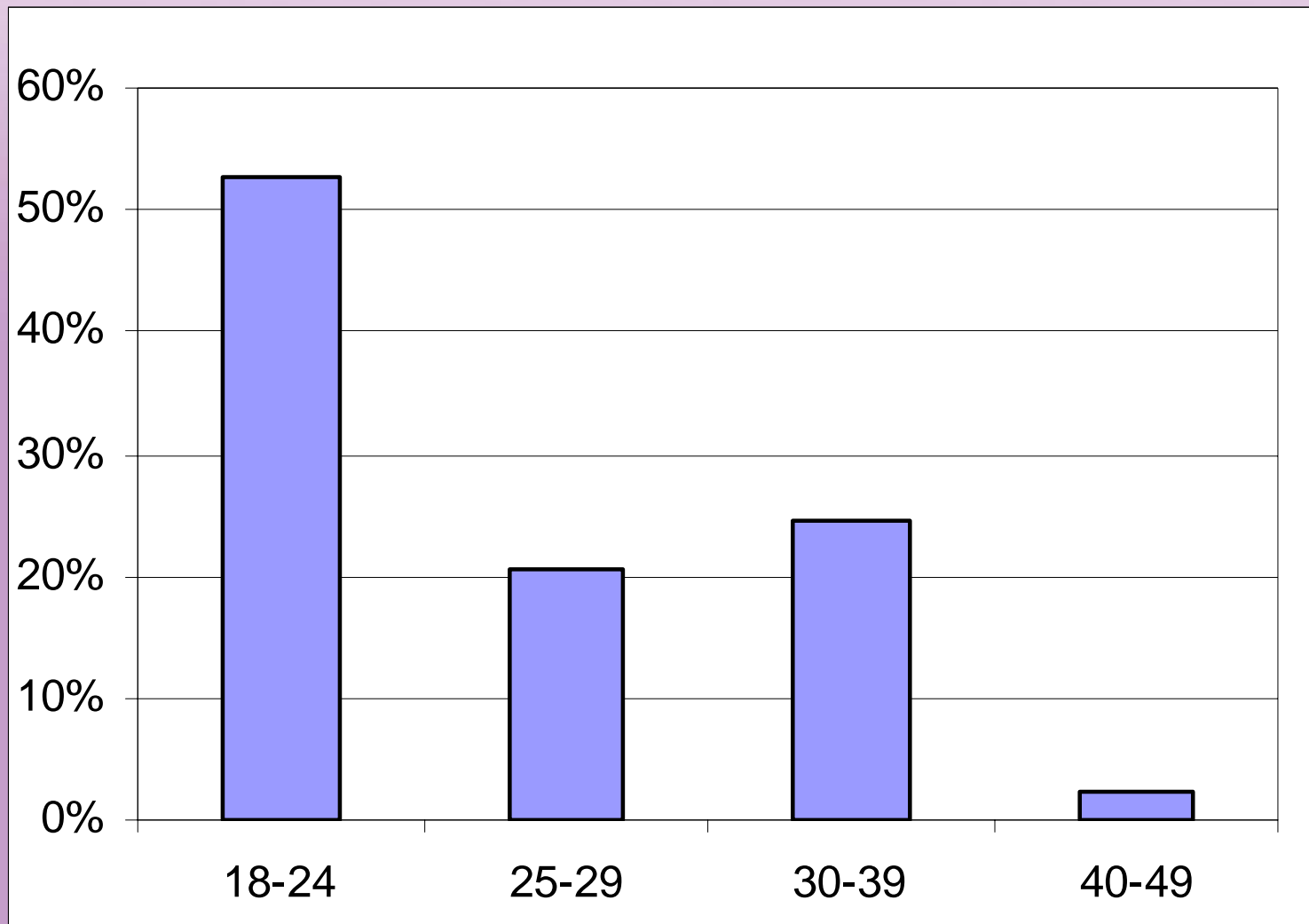


Ethnicity (n=180)

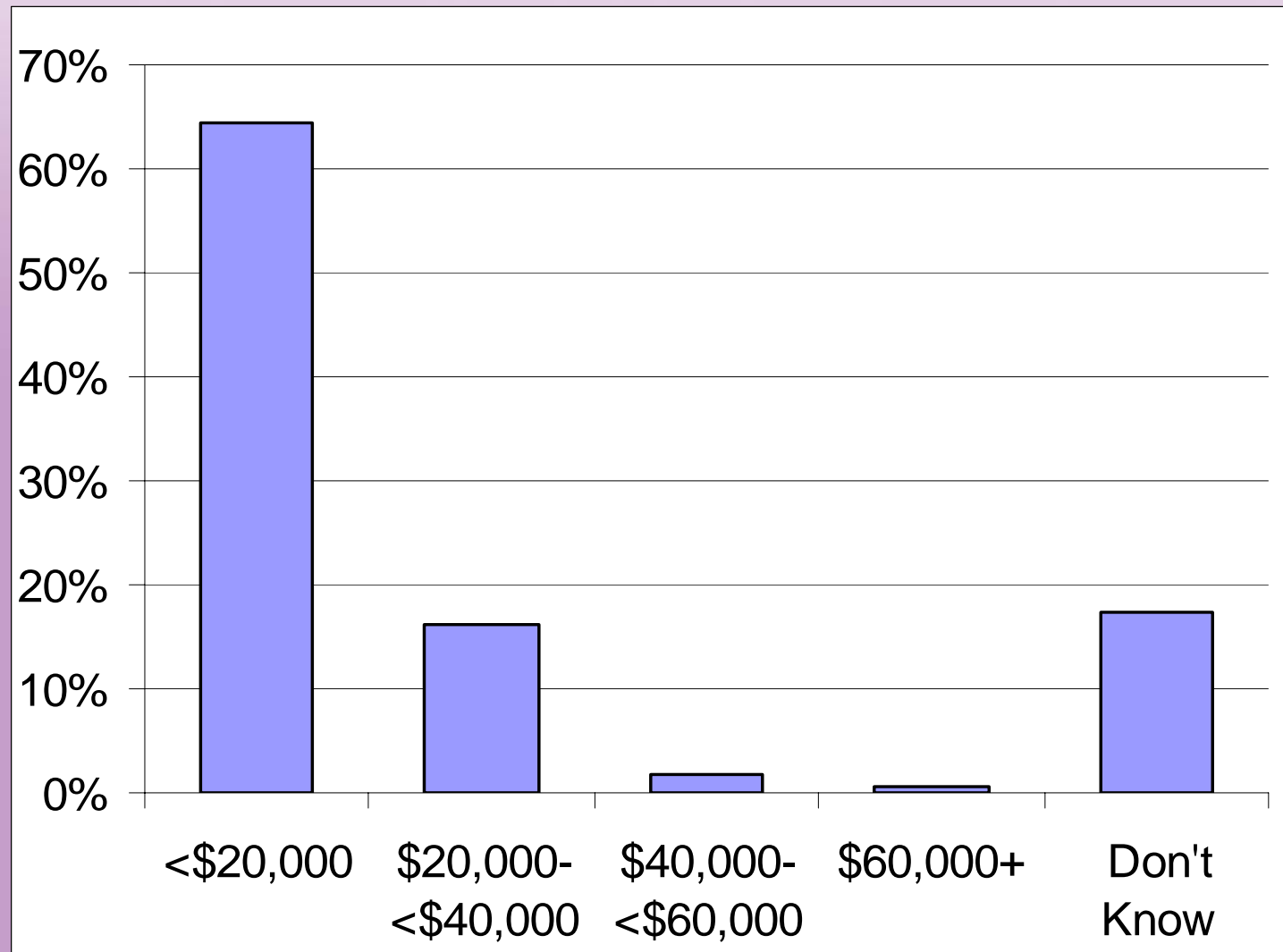
Black	57	32%
Asian/PI	86	48%
Hmong	33	18%
Vietnamese	25	14%
Chinese	11	7%
Other	17	9%
White	19	11%
Latino	16	9%
Native Am.	2	1%
TOTAL	180	100%



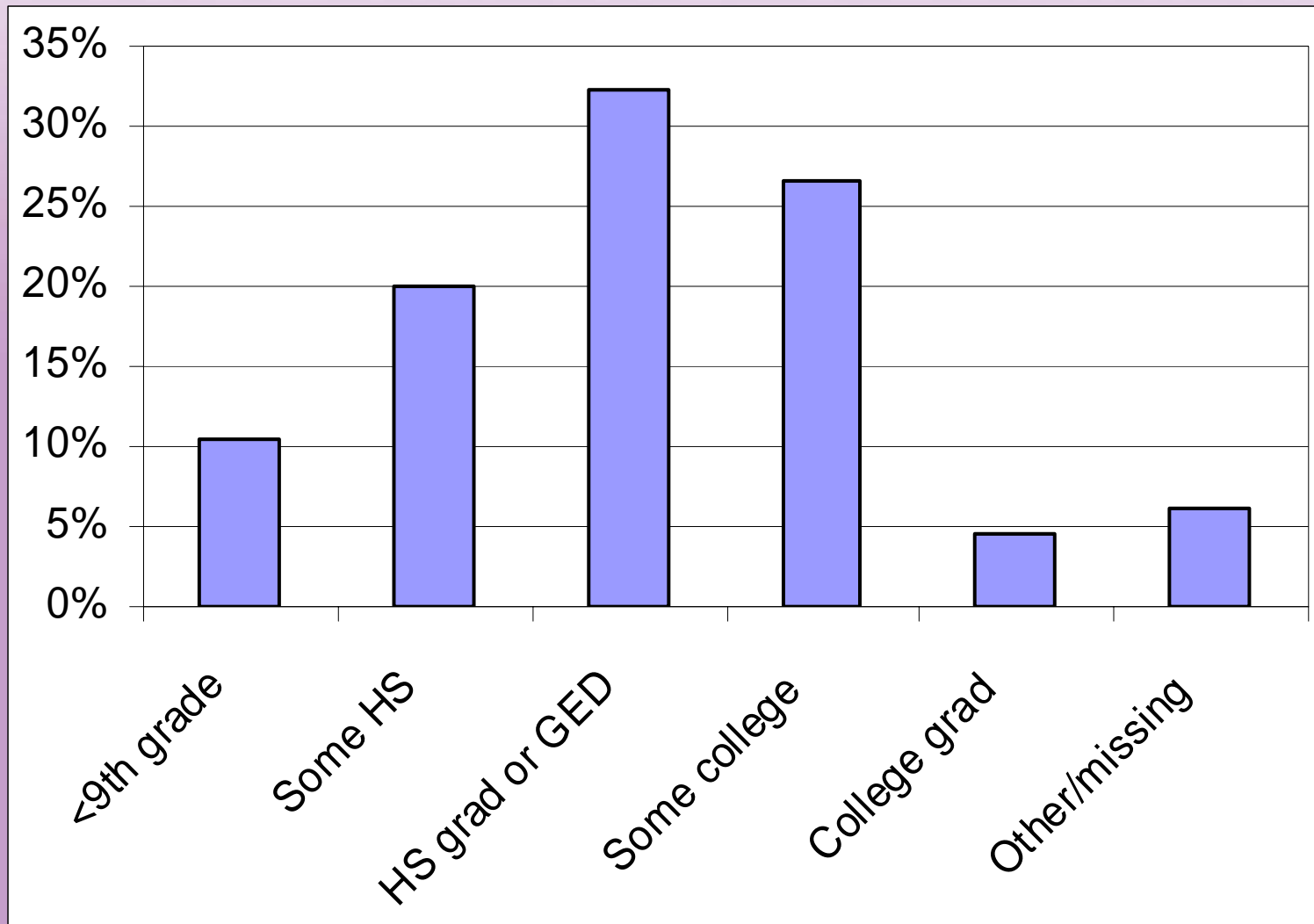
Age (n=180)



Annual Household Income n=180



Education (n=180)



Blood Mercury Results

- 18 pts (11%, 18/163 pts) elevated ($\geq 6 \mu\text{L}$)
- Range 6 to 15 μL
 - 14 pts retested
 - 11 pts, levels declined
 - 3 pts received 3rd test, still following up
 - 4 pts no follow up
 - 3 could not be contacted
 - 1 clinic chose not to recontact
- Ethnicity of elevated pts
 - 11 Vietnamese
 - 7 Chinese



Insurance Coverage

- Successfully demonstrated that MediCal will pay for mercury in whole blood.
- Need correct ICD-9 codes for
 - a.) pregnancy and
 - b.) exposure to heavy metals
- Not sure of percentage tested for whom suspected elevated exposure from Summary Sheet, but more than $\frac{1}{4}$.

Mercury Exposure Among Women in a Private OB/GYN Practice



Evaluation



Focus Group Findings

- Retention of information at follow up: Most all participants seemed to remember some information, ranging from remembering one kind of fish to avoid to several.
- Most all participants remembered that fish caught out of nearby rivers, etc. should not be consumed or consumed only in small amounts.
- Many participants drew big distinctions between store-bought fish and caught fish. All store-bought safe; caught fish unsafe.
- Many participants seemed unclear about the dangers of mercury—what it does and what makes it harmful. They just understood it to be “bad for the baby.”
- All participants said they found the brochure easy to understand. Most still had it. Some posted it on walls at home and some filed it in a drawer.



Importance of Blood Test

- Many participants said that they found the blood-mercury test to be important and informative.
- One rated it equal to genetic tests she had recently undergone. One said that it was important, but not as important as an HIV test.
- One wanted her whole family to go out and have their blood-mercury tested and that everyone should have this information.



Understanding the test

- Very important because it gave them more concrete information about their health.
- Understandings of the test results were somewhat varied. Generally, most people understood their low levels to be an indication of “safety.”
- A few conveyed the feeling that the test offered “truth” about their blood-mercury level that could not be obtained in a different way.
- One person said she was “negative.”
- One asked me if it was okay to have low mercury? In other words, was that healthy.



Implications for Biomonitoring

- A few participants drew on other health tests as templates to understand and frame test results.
- Many participants, despite having low mercury, still cut down on fish consumption.
- Challenges for communicating results with no clinical action point, or for exposures that are difficult to avoid in daily life
- Will become more difficult and will require careful crafting and participant feedback.

Mercury Exposure Among Women in a Private OB/GYN Practice



Next Steps



Data Analysis

- Study population characteristics
- Fish consumption rate (commercial, sport, overall; g/d and g/kg body weight/day; above advisory limits)
- Predictors of mercury level, fish consumption, and advisory awareness



Svetlana

CPSP

- Access to shared population of concern
- Assessment of fish intake can be component of both health education and/or nutrition assessment
- Education and follow-up regarding safe consumption of fish can be integrated into care plan
- Coverage for laboratory testing for mercury if needed, based on fish intake
- State-wide CPSP presentation in October 2007

