

Attachment 10. Results Reporting and Communications

Table 1. Respondent Results Reporting Overview

Green - performed and clinically relevant (action levels and reference ranges to be reported); Pink - performed and to be reported; White-performed but not to be reported; Gray - not performed.

ANALYTES *required	MICHIGAN ^A		MINNESOTA ^B		NEW YORK ^C	
	State-Specific Action Levels for Additional Surveillance or Medical Referral					
Toxic Metals (US NHANES Years and 50 th - 95 th Reference Values)	(Action Levels)	MATRI X	(Action Levels)	MATRI X	(Action Levels)	MATRI X
*Mercury (07-08) Blood: 0.89-5.32 µg/L	>15 µg/L	blood	No Tier 1 Tier 2: Female 18-44 years, >5.8 µg/L	blood	0.5 µg/dL is reportable 2.5 µg/dL is call trigger	blood
Tier 2: All other adults, >17.4 µg/dL						
Hg speciation if Total Hg >5.8 µg/L						
Mercury (07-08) Urine: 0.50-2.56 µg/g creatinine or 0.47 – 2.82 µg/L	(>20 µg/L or >35 µg/g creatinine)	urine			(2.0 µg/dL is reportable)	urine
*Lead (07-08) Blood: 1.34-3.90 µg/dL	≥10 µg/dL	blood	Tier 1: >5 to ≤15 µg/dL	blood	10 µg/dL	blood
			Tier 2: >15 µg/dL			
Arsenic (07-08) Urine: 7.55-59.4 µg/g creatinine	≥100 µg/L	urine				
Cadmium (07-08) Urine: 0.24-1.05 µg/g creatinine Blood: 0.33-1.70 µg/L	>2 µg/L or >3 µg/g creatinine	urine	Tier 1: >1.7 to ≤5 µg/L	blood	1 µg/dL is reportable 1 µg/dL is call trigger	blood
			Tier 2: >5 µg/L			

^A MICHIGAN - Heavy Metals Surveillance Program - all metals are reportable (required action levels)

^B MINNESOTA - No state heavy metals surveillance program - Action levels set at greater than the 95th percentiles are presented in two tiers (and are detailed in Attachment 10b2).

Tier 1 Action Levels are based on the lowest identified level of statistically significant increased risk for adverse human health effects demonstrated in epidemiologic studies. These levels are not expected to result in overt symptoms of metal poisoning and are not considered an immediate hazard to health.

Tier 2 Action Levels are of greater concern for health based on effects seen on a population level in epidemiologic studies. These levels are not expected to result in overt symptoms of metal poisoning. It is anticipated that Tier 2 action levels will rarely be exceeded. Exceedences may be found in people who are

occupationally exposed, eat a diet very high in fish (mercury) or organ meats (cadmium), or have contact with an uncommon source of exposure.

Blood Mercury > 5.8 µg/L will be further speciated.

^c NEW YORK – NYS Heavy Metals Registry – all blood lead levels are reportable. Blood and urine cadmium and mercury and urine arsenic are reportable for follow-up at state-determined thresholds.

ANALYTES *required	MICHIGAN		MINNESOTA		NEW YORK	
	US NHANES Reference Values					
Organohalides and Pesticides (US NHANES Years)	50 th %-95 th %	MATRIX	50 th %-95 th %	MATRIX	50 th %-95 th %	MATRIX
Total PCBs *PCB-28 *PCB-52 *PCB-101 *PCB-105 *PCB-118 *PCB-138 *PCB-153 *PCB-180	TBD	serum	TBD	serum	TBD	serum
Total Dioxin-like Compounds (Dioxins, Furans, Co-planar PCBs)	Age 18-39 years: < 18.7 pg-TEQ/g of lipid	serum				
	Age 40-59 years: < 32.0 pg-TEQ/g of lipid					
	Age 60 years and older: < 63.2 pg-TEQ/g of lipid					
PBB-153 (03-04)	Age 18-39 yrs: 1.6 – 12.2 ng/g lipid	serum				
	Age 40 -59 yrs: 2.9 – 36.9 ng/g lipid					
	Age 60+ yrs: 3.4 – 52.8 ng/g lipid					
PBDEs					Not reported	serum
1-Hydroxypyrene (03-04)			73.5-424 ng/g creatinine	urine		
*Mirex (03-04)	<LOD -15.4 ng/g lipid	serum	<LOD-15.4 ng/g lipid	serum	<LOD –15.4 ng/g lipid	serum
*Hexachlorobenzene (03-04)	15.1-29.0 ng/g lipid	serum	15.1-29.0 ng/g lipid	serum	15.1-29.0 ng/g lipid	serum

*** No NHANES; PBB-153 based on – Sjodin A, et al. Serum concentrations of polybrominated diphenyl ethers (PBDEs) and Polybrominated Biphenyls (PBB) in the United States Population: 2003-2004. *Environmental Sciences & Technology*. 2008;42:1377-1384.

ANALYTES (continued) *required	MICHIGAN		MINNESOTA		NEW YORK	
	US NHANES Reference Values					
Organohalides and	50 th %-95 th %	MATRIX	50 th %-95 th %	MATRIX	50 th %-95 th %	MATRIX

Pesticides (US NHANES Years)						
*(p,p')-DDT (03-04)	<LOD -20.7 lipid	serum	<LOD-20.7 ng/g lipid	serum	<LOD -20.7 ng/g lipid	serum
*(o,p')-DDT (03-04)	<LOD-<LOD ng/g lipid	serum	<LOD-<LOD ng/g lipid	serum		
*(p,p')-DDE (03-04)	233-1990 ng/g lipid	serum	233-1990 ng/g lipid	serum	233-1990 ng/g lipid	serum
Lindane ***	*** <0.002 µg/mL	serum				
Oxychlorthane (03-04)	11.4 - 39.2 ng/g lipid	serum			11.4 - 39.2 ng/g lipid	serum
Heptachlor epoxide (03-04)	<LOD - 20.6 ng/g lipid	serum				
Trans-nonachlor (03-04)	17.3 - 74.7 ng/g lipid	serum			17.3 - 74.7 ng/g lipid	serum
Toxaphene			***	serum	Not reported	serum

*** No NHANES; LINDANE based on - Aks SE, et al. Acute accidental lindane ingestion in toddlers. Ann Emerg Med. 1995 Nov;26(5):647-51.

ANALYTES	MICHIGAN		MINNESOTA		NEW YORK	
	US NHANES Reference Values					
Emerging and Other Exposure Biomarkers (US NHANES Years)	50 th %-95 th %	MATRIX	50 th %-95 th %	MATRIX	50 th %-95 th %	MATRIX
Total Perfluorinated Compounds (07-08)						
PFOA			4.30-9.80 µg/L	serum	Not reported	serum
PFOS			14.0-42.8 µg/L		Not reported	
PFBA			***			
PFHxS			1.9-9.0 µg/L			
PFBS			<LOD - <LOD µg/L			
PFHxA			***			
PFPeA			***			
PFNA			1.5-4.1 µg/L			
Bisphenol-A (07-08)			1.92-9.32 µg/g	urine		
Triclosan (07-08)			12.6-484 µg/g	urine		
Cotinine			***	urine		

*** No NHANES; Minnesota PFC Biomonitoring Program has detected these PFCs in other community investigations.

ANALYTES † used in analyte reporting adjustment	MICHIGAN		MINNESOTA		NEW YORK	
	*** Non-NHANES Clinical Reference Values					
Trace Metals, Nutrients, and Lipids	Clinical References	MATRIX	Clinical References	MATRIX	Clinical References	MATRIX
Manganese	4.7-18.3 ng/mL	blood				
Selenium			15-50 µg/L	urine		
† Cholesterol (Fasting not required)	(Fasting) Desirable: <200 mg/dL	serum	(Fasting) Normal: <200 mg/dL	serum	(Fasting)	serum
	Borderline High: 200-239 mg/dL		Borderline High: 200-239 mg/dL		Borderline High: 200-239 mg/dL	
	High: 240 mg/dL		High: ≥240 mg/dL		High: 240 mg/dL	
† Triglyceride (Fasting not required)	Not reported	serum			(Fasting) Borderline High: 150-199 mg/dL	serum
					High: 200-499 mg/dL	
^A Creatinine	Not reported	urine	Not reported	urine	Not reported	urine

Manganese - <http://www.mayomedicallaboratories.com/test-catalog/Clinical+and+Interpretive/89120>

Selenium - <http://www.mayomedicallaboratories.com/test-catalog/Overview/89120>

Cholesterol/Triglycerides - National Institute of Health Cholesterol Education Program

ANALYTES	MICHIGAN		MINNESOTA		NEW YORK	
	US NHANES Reference Values					
Additional Nutrients (NHANES Years)	2.5 th %-97.5 th %	MATRIX	2.5 th %-97.5 th %	MATRIX	2.5 th %-97.5 th %	MATRIX
Total Omega-3 fatty acids (03-04)						
Eicosapentaenoic acid (EPA)			14.8-151 µmol/L	plasma		
Docosahexaenoic acid (DHA)			54.9-323 µmol/L			
Docosatetraenoic acid			12.1-47.7 µmol/L			
Docosapentaenoic acid (DPA)			22.1-82.9 µmol/L			
Gamma-Linoleic acid			17.1-117 µmol/L			
Alpha-Linoleic acid			25.2-165 µmol/L			
Homo-gamma-Linoleic acid			73.2-289 µmol/L			
Arachnidonic acid (AA)			445-1320 µmol/L			
Linoleic acid (LA)			2210-5410 µmol/L			
ANALYTES	MICHIGAN		MINNESOTA		NEW YORK	
*** Non-NHANES Reference Values						
Clinical Biomarkers	Clinical References	MATRIX	Clinical References	MATRIX	Clinical References	MATRIX
Glycohemoglobin (A1C)			Normal (<5.7%) Pre-diabetes/or under control (≥5.7% to <6.5%) Possible diabetes/Diabetes management needed (≥6.5%)	blood		

A1C - American Diabetes Association: Diagnosis and Classification of Diabetes Mellitus: Position Statement, DIABETES CARE, VOLUME 35, SUPPLEMENT 1, JANUARY 2012.

ANALYTES	MICHIGAN		MINNESOTA		NEW YORK	
	*** Non-NHANES Reference Values					
Body Measures	Clinical References	MATRIX	Clinical References	MATRIX	Clinical References	MATRIX
Body Mass Index	Not reported	body measure	Normal – (<25.0)	body measure	Not reported	body measure
			Overweight – (25.0-29.9)			
			Obese – (>30.0)			
Waist Circumference (in conjunction with BMI) [‡]			Normal – (BMI < 25) and (WC ≤ 40 inches Male); (WC ≤ 35 inches Female)	body measure		
			Increased Risk – (BMI ≥ 25) and (WC > 40 inches Male); (WC > 35 inches Female)			
Blood Pressure	(Used as eligibility criterion [§])	body measure	Normal – (SBP <120 and DBP <80)	body measure		
			PreHBP – (SBP 120-139 or DBP 80-89)			
			Stage 1 HBP – (SBP 140-159 or DBP 90-99)			
			Stage 2 HBP – (SBP ≥160 or DBP ≥ 100)			

[‡] MDH - National Heart, Lung, and Blood Institute classification of overweight and obesity and associated disease risk for type 2 diabetes, hypertension, and cardiovascular disease.

[§] MDCH - Blood pressure will be assessed prior to blood sample collection to ensure that participants may safely give the required volume of blood. The Certified Phlebotomy Technician or other qualified person will assess the participants' blood pressure prior to collection of a blood sample. Blood samples will be collected from participants whose blood pressure is below 180/100 (systolic/diastolic) and above 80/50 (systolic/diastolic). Participants will be given an American Heart Association blood pressure information (Attachment 10a6) sheet with blood pressure measures recorded. Blood pressure readings will be verbally shared with participants and recorded, but will not be retained for any analytical purpose.