

STATE OF MICHIGAN

GRETCHEN WHITMER GOVERNOR DEPARTMENT OF HEALTH AND HUMAN SERVICES LANSING

ELIZABETH HERTEL DIRECTOR

Today's_date

SAMPLE PARTICIPANT SAMPLE ADDRESS

Dear SAMPLE PARTICIPANT,

Thank you for taking part in MiPEHS, the Michigan PFAS Exposure and Health Study. We appreciate your time and dedication to this project.

This mailing includes several important pieces of information about your **venous (from your arm)** blood test for PFAS, including fact sheets that can help you understand your results. Please read each piece and call us at 844-464-7327 if you have any questions.

What Your Results Can Tell You

We tested your blood for 39 PFAS, plus two different forms for three PFAS (so you will see 45 rows of PFAS results). If you have participated in more than one phase of MiPEHS, you will find your past results included alongside the results from your most recent participation. There is also a spot for your future test results, which we will add if you continue your participation through the end of this study. We are doing this to help you track how the amount of PFAS in your blood changes over time. We expect many of your PFAS results will change over time and our study staff are available to speak with you more about these changes. **Table 1 (PFAS Venous Blood Test Results and NHANES Comparison Ranges)** included in this mailing shows your blood test results.

Scientific studies show that most people in the United States have PFAS in their blood. Your blood test results table includes the most recent amounts of PFAS found in the blood of people in the U.S. who were part of the National Health and Nutrition Examination Survey (NHANES). NHANES is conducted by the Centers for Disease Control and Prevention (CDC). This information will help you compare your results to other people living in the U.S.

What Your Results Cannot Tell You

Your test results cannot tell you with certainty whether any past, present, or future health problems are related to the PFAS found in your blood. Research, like MiPEHS, will provide more information to see if there are health risks from different amounts of PFAS in blood.

If you are concerned about your health, consider speaking with your health care provider and share your results with them.

We have included several handouts that share information about what is currently known, and that can help you speak with your health care provider about your results:

- "How to Read Your Venous PFAS Blood Test Results" explains your results table.
- "Percentiles" explains the comparison groups in your results table.
- "PFAS Exposure and Your Health" describes health effects associated with PFAS.
- "Talking to Your Doctor about PFAS Exposure" includes information on talking with your healthcare provider about PFAS.
- "Are You Worried About the Water, Soil, or Air in Your Community?" can help you identify and cope with stress caused by environmental contamination.

Your Personal Test Results are Kept Private and Confidential

Your information will be protected to the fullest extent allowed by law. Anything written publicly about the project will only share group results. It will not include information that could identify any participant, such as name or address. We can provide you with a copy of any report written when it is available.

Other Test Results

If you have not yet received your results for the health marker tests, or any other testing you participated in through MiPEHS, those results should be arriving soon.

If you provided a sample of blood from your finger for PFAS testing, those results are not yet available. It could take 6 months or longer for those to arrive. If you gave your consent to allow MDHHS to access your newborn blood spot (for people born 1987 or later in Michigan only), those results are not yet available. You will receive those results after the third phase.

Sincerely,

MiPEHS Team Michigan Department of Health and Human Services

Enclosures:

- How to Read Your Venous PFAS Blood Test Results (Fact sheet)
- Percentiles (Fact sheet)
- PFAS Exposure and Your Health (Fact sheet)
- Talking to Your Doctor about Exposure to PFAS (Fact sheet)
- Are You Worried About the Water, Soil, or Air in Your Community? (Fact sheet and Resource Guide)

For More Information

- If you have questions about your results, call us at 844-464-7327 and ask to speak with MiPEHS staff. Visit <u>Michigan.gov/DEHBio</u> for more information about MiPEHS.
- The National Health and Nutrition Examination Survey (NHANES) Fourth Report can be found at <u>cdc.gov/exposurereport/pdf/FourthReport_UpdatedTables_Volume1_Jan2019</u> <u>-508.pdf</u>. The section on PFAS starts on page 381.
- The State of Michigan PFAS Action Response Team (MPART) website serves as the main resource for public information on PFAS contamination in Michigan. Visit <u>Michigan.gov/PFASResponse.</u>
- The Agency for Toxic Substances and Disease Registry (ASTDR) website includes information about PFAS and health. Visit <u>www.atsdr.cdc.gov/pfas.</u>
- The United States Environmental Protection Agency (U.S. EPA) website includes PFAS information, U.S. EPA actions, and links to other resources. Visit <u>www.epa.gov/pfas.</u>

Table 1. PFAS Venous Blood Test Results and NHANES Comparison Ranges

Name: study_pl_name, study_pf_name Most Recent Collection Date: study_date_collect

NHANES Reference Range^{1,2}

Name of PFAS	MiPEHS Phase 1 [Collection_date1] Your Result (ug/L)	MiPEHS Phase 2 [Collection_date2] Your Result (ug/L)	MiPEHS Phase 3 [Collection_date3] Your Result (ug/L)	Age Group (years)	50th - 95th Percentile (ug/L)
				12-19:	
PFOA, total Perfluorooctanoic acid	total_pfoa	total_pfoa	total_pfoa	20+:	1.17 - 2.37
				12-19:	1.10 - 2.30
n-PFOA, linear isomer of PFOA	l_pfoa	l_pfoa	l_pfoa	20+:	1.40 - 3.80
				12-19:	<lod200< td=""></lod200<>
Sb-PFOA, serum branched isomer of PFOA	l_pfoa	l_pfoa	l_pfoa	20+:	<lod200< td=""></lod200<>
				12-19:	2.60 - 7.30
PFOS, total Perfluorooctane sulfonic acid	total_pfos	total_pfos	total_pfos	20+:	4.70 - 15.1
				12-19:	1.90 - 5.70
n-PFOS, linear isomer of PFOS	I_pfos	I_pfos	I_pfos	20+:	3.20 - 11.0
		*		12-19:	.700 - 2.00
Sm-PFOS, serum branched isomer of PFOS	br_pfos	br_pfos	br_pfos	20+:	1.40 - 4.60
				12-19:	<lod -="" <lod<="" td=""></lod>
PFOSA, Perfluorooctane sulfonamide	pfosa	pfosa	pfosa	20+:	<lod -="" <lod<="" td=""></lod>
				12-19:	.100500
Me-FOSAA, 2-(N-methyl-perfluorooctane sulfonamido) acetic acid	mefosaa	mefosaa	mefosaa	20+:	.100600
				12-19:	<lod -="" <lod<="" td=""></lod>
Et-FOSAA, 2-(N-ethyl-perfluorooctane sulfonamido) acetic acid	etfosaa	etfosaa	etfosaa	20+:	<lod110< td=""></lod110<>
				12-19:	<lod -="" <lod<="" td=""></lod>
PFBS, Perfluorobutane sulfonic acid	pfbs	pfbs	pfbs	20+:	<lod -="" <lod<="" td=""></lod>
				12-19:	<lod200< td=""></lod200<>
PFHpA, Perfluoroheptanoic acid	pfhpa	pfhpa	pfhpa	20+:	<lod100< td=""></lod100<>
				12-19:	<lod -="" <lod<="" td=""></lod>
PFDoA, Perfluorododecanoic acid	pfdoa	pfdoa	pfdoa	20+:	<lod -="" <lod<="" td=""></lod>
		_		12-19:	.100200
PFUnA, Perfluoroundecanoic acid	pfuna	pfuna	pfuna	20+:	.100400
Page 4 of 6					

Table 1. PFAS Venous Blood Test Results and NHANES Comparison Ranges

Name: study_pl_name, study_pf_name Most Recent Collection Date: study_date_collect

NHANES Reference Bange ^{1,2}
NITANES Reference Range

	MiPEHS Phase 1	MiPEHS Phase 2	MiPEHS Phase 3		50th - 95th
	[Collection_date1]	[Collection_date2]	[Collection_date3]	Age Group	Percentile
Name of PFAS	Your Result (ug/L)	Your Result (ug/L)	Your Result (ug/L)	(years)	(ug/L)
				12-19:	.200400
PFDA, Perfluorodecanoic acid	pfda	pfda	pfda	20+:	.200600
				12-19:	.400 - 1.20
PFNA, Perfluorononanoic acid	pfna	pfna	pfna	20+:	.400 - 1.40
PFPrS, Perfluoropropane sulfonic acid	pfprs	pfprs	pfprs	Not Available	Not Available
PFTeA, Perfluorotetradecanoic acid	pftea	pftea	pftea	Not Available	Not Available
PFTriA, Perfluorotridecanoic acid	pftria	pftria	pftria	Not Available	Not Available
	nfhya			12-19:	<lod -="" <lod<="" td=""></lod>
PFHxA, Perfluorohexanoic acid	рши	pfhxa	pfhxa	20+:	<lod -="" <lod<="" td=""></lod>
PFPeA, Perfluoropentanoic acid	pfpea	pfpea	pfpea	Not Available	Not Available
PFBA, Perfluorobutanoic acid	pfba	pfba	pfba	Not Available	Not Available
PFDS, Perfluorodecane sulfonic acid	pfds	pfds	pfds	Not Available	Not Available
PFNS, Perfluorononane sulfonic acid	pfns	pfns	pfns	Not Available	Not Available
				12-19:	.100 - 1.50
PFHpS, Perfluoroheptane sulfonic acid	pfhps	pfhps	pfhps	20+:	.200 - 1.00
				12-19:	.800 - 3.40
PFHxS, total Perfluorohexane sulfonic acid	total_pfhxs	total_pfhxs	total_pfhxs	20+:	1.20 - 3.80
PFHxS, Perfluorohexane sulfonic acid, linear	l_pfhxs	l_pfhxs	l_pfhxs	Not Available	Not Available
PFHxS, Perfluorohexane sulfonic acid, branched	br_pfhxs	br_pfhxs	br_pfhxs	Not Available	Not Available
PFPeS, Perfluoropentane sulfonic acid	pfpes	pfpes	pfpes	Not Available	Not Available
FtS 8:2, Fluorotelomer sulfonic acid 8:2	fts82	fts82	fts82	Not Available	Not Available
FtS 6:2, Fluorotelomer sulfonic acid 6:2	fts62	fts62	fts62	Not Available	Not Available
FtS 4:2, Fluorotelomer sulfonic acid 4:2	fts42	fts42	fts42	Not Available	Not Available
PFBSA, Perfluorobutane sulfonamide	pfbsa	pfbsa	pfbsa	Not Available	Not Available
PFHxSA, Perfluorohexane sulfonamide	pfhxsa	pfhxsa	pfhxsa	Not Available	Not Available
5:3 FTCA, 2H,2H,3H,3H-perfluorooctanoic acid (3-perfluoropentyl propanoic					
acid)	ftca53	ftca53	ftca53	Not Available	Not Available
Page 5 of 6					

.

Table 1. PFAS Venous Blood Test Results and NHANES Comparison Ranges

Name: study_pl_name, study_pf_name
Most Recent Collection Date: study_date_collect

NHANES	Reference	Range ^{1,2}
--------	-----------	----------------------

	MiPEHS Phase 1	MiPEHS Phase 2	MiPEHS Phase 3		50th - 95th
	[Collection_date1]	[Collection_date2]	[Collection_date3]	Age Group	Percentile
Name of PFAS	Your Result (ug/L)	Your Result (ug/L)	Your Result (ug/L)	(years)	(ug/L)
3:3 FTCA, 2H,2H,3H,3H-perfluorohexanoic acid (3 perfluoropropyl propanoic					
acid)	ftca33	ftca33	ftca33	Not Available	Not Available
7:3 FTCA, 2H,2H,3H,3H-perfluorodecanoic acid (3 perfluoroheptyl propanoic					
acid)	ftca73	ftca73	ftca73	Not Available	Not Available
PFecHS, Perfluoro-4-ethylcyclohexane sulfonate	pfechs	pfechs	pfechs	Not Available	Not Available
NFDHA, Nonafluoro-3,6-dioxaheptanoic acid	nfdha	nfdha	nfdha	Not Available	Not Available
PFEESA, Perfluoro (2-ethoxyethane) sulfonic acid	pfeesa	pfeesa	pfeesa	Not Available	Not Available
PFMPA, Perfluoro-3-methoxypropanoic acid	pfmpa	pfmpa	pfmpa	Not Available	Not Available
PFMBA, Perfluoro-4-methoxybutanoic acid	pfmba	pfmba	pfmba	Not Available	Not Available
				12-19:	<lod -="" <lod<="" td=""></lod>
HFPO-DA, Hexafluoropropylene oxide dimer acid (GenX)	hfpo_da	hfpo_da	hfpo_da	20+:	<lod -="" <lod<="" td=""></lod>
				12-19:	<lod -="" <lod<="" td=""></lod>
ADONA, Dodecafluoro-3H-4,8-dioxanonanoic acid	adona	adona	adona	20+:	<lod -="" <lod<="" td=""></lod>
				12-19:	<lod -="" <lod<="" td=""></lod>
9CI-PF3ONS, 9-chlorohexadecafluoro-3- oxanononane-1-sulfonate (F53B)	f53b	f53b	f53b	20+:	<lod100< td=""></lod100<>
11Cl-PF3OUdS, 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (R53B)	r53b	r53b	r53b	Not Available	Not Available

¹ Centers for Disease Control and Prevention (CDC). (2019) Fourth National Report on Human Exposure to Environmental Chemicals: Updated Tables, January 2019, Volume 2. Retrieved from: <u>https://www.cdc.gov/exposurereport/</u>. Data extracted from NHANES tables 50th to 95th percentiles among children 12-19 years and adults 20+ years old. Reference ranges are reported from the **most recent data available** for each PFAS analyte. Note: if a particular PFAS was not reported in the Fourth Report, data from the CDC (1994) Third Report on Human Exposure to Environmental Chemicals was used, if available.

² Early Release: Per- and Polyfluorinated Substances (PFAS) Tables, NHANES 2011-2018 | CDC

Notes: "<" means less than, ">" means greater than, "LOD" means limit of detection, "not available" means the PFAS has not been tested among NHANES participants, although future data on many of these PFAS may become available in Michigan through the ongoing Michigan Chemical Exposure Monitoring (MiChEM) program. MiPEHS is a longitudinal study with three phases, each of those phases are listed in separate columns in this table.

If you need help understanding these test results, please call 844-464-7327 and ask for MiPEHS staff.

How to Read Your Venous PFAS Blood Test Results for the Michigan PFAS Exposure and Health Study (MiPEHS)

This sheet is meant to help you understand your blood test results for Per- and Polyfluoroalkyl Substances (PFAS). PFAS are a large group of individual chemicals. An example of a PFAS blood test results table is shown below. Your results table will include 45 types of PFAS. Keep reading to learn more about key parts of the results table.

Figure 1. Example PFAS Venous Blood Test Results and NHANES Comparison Ranges Table

able 1. PFAS Venous Blood Test Results and NHANI lame: study_pl_name, study_pf_name Most Recent Collection Date: study_date_collect	ES Comparison Ranges			3 NHANES Referen	nce Range ^{1,2}
	MiPEHS Phase 1	MiPEHS Phase 2	MiPEHS Phase 3		50th - 95th
	[Collection_date1]	[Collection_date2]	[Collection_date3]	Age Group	Percentile
Name of PFAS	Your Result (ug/L)	Your Result (ug/L)	Your Result (ug/L)	(years)	(ug/L)
				12-19:	
PFOA, total Perfluorooctanoic acid	total_pfoa	total_pfoa	total_pfoa	20+:	1.17 - 2.37
				12-19:	1.10 - 2.30
DECA linear inemer of DECA	L ofoo	L ofoo	L nfoa	20+-	1 40 - 3 80

NAME OF PFAS

0

This column includes the name of each PFAS your blood was tested for.

 Certain PFAS have two different isomers (physical shapes) that are measured: linear and branched. These isomers are listed separately in the results, beneath a row for the total of both isomers.

YOUR RESULT (µg/L)



- PFAS were measured in micrograms per liter (μg/L).
- Your test result is given as **ND** (Not Detected) if the amount of that PFAS in your blood was lower than the amount that could be measured by the laboratory equipment.
- Your test result has a "<" sign if the amount of PFAS in your blood was below the amount the lab could measure with certainty.
- This report shows your results from MiPEHS only. There are three columns of test results because MiPEHS has three phases. Your results from each phase you participated in are shown in the table beneath the date you provided a blood sample. If you did not participate in a phase or that phase has not occurred yet, that column is blank.







NHANES REFERENCE RANGE (µg/L)



One way to understand your blood test results is to compare them with results from other people in your age group who have been tested. Your blood test results table shows the most recent amount of PFAS found in the blood of people in the U.S. who were part of the National Health and Nutrition Examination Survey (NHANES).

Your blood test <u>result</u> is compared to the 50th and 95th percentile <u>results</u> from NHANES. Percentiles are a way to compare one person's results to the results of a group of people.

- The NHANES **50th percentile** is a result that 50% of results are below and 50% of results are above.
- The NHANES **95th percentile** is a result that 95% of results are below and 5% of results are above.
- The 50th to 95th percentiles are only available for some PFAS types.
 - 0 Not available means that particular PFAS was not measured in NHANES.
 - <LOD, or less than the Limit of Detection, means NHANES didn't detect enough of that PFAS among their participants to accurately measure.
- To find out more about percentiles, see the Percentiles: What are They? fact sheet available at <u>Michigan.gov/DEHBio</u>. Click on the MiPEHS image, then click on the "Resources" link in the Jump to a Page section.

CHANGES IN YOUR RESULTS



Some of your blood test results may change over time or stay the same. This is expected. Below are a few reasons why:

- If a new test result is lower than a past test result: This could happen because your contact with that PFAS in your environment has ended or it is less than it was in the past. Different PFAS, levels of exposure, and your own unique body make a difference in how quickly PFAS leaves your body.
- If a new test result and past test result are the same or similar: This could happen if your exposure to that PFAS hasn't changed, or your blood draws were too close in time and your body didn't have enough time to remove much PFAS.

Additionally, the measurement of PFAS is a complex process. There are some unavoidable increases or decreases that we may find between PFAS levels from two or more measurements. This can happen even if they are from exactly the same blood sample. When comparing your current MiPEHS results to past results, keep in mind that small changes are more likely due to variation in the laboratory processes than to a change in your exposure to PFAS.

• If a new test result is higher than a past test result: This could happen because your exposure to that PFAS increased. This could also happen if your exposure hasn't changed and you have a health condition, like certain kidney problems. Conditions like these make it more difficult for PFAS to leave your body and can cause PFAS to gradually build up in your body.

WANT TO LEARN MORE ABOUT MIPEHS OR OTHER MDHHS HEALTH STUDIES?

If you have any questions about your results or how they've changed over time, call 844-464-7327 to talk to MiPEHS study staff. Staff are available Monday-Friday, 8 a.m - 5 p.m.

To learn more about MiPEHS or other MDHHS health studies, visit Michigan.gov/DEHBio.



Percentiles

Percentiles are used to compare a person's test result to the results of a group of people. Commonly, a person's test result is compared to the 50th and 95th percentile of the group results.

- The 50th percentile is the result which 50% of results are below and 50% are above.
- The 95th percentile is the result which 95% of results are below and 5% of results are above.

AN EXAMPLE OF HOW THE 50TH AND 95TH PERCENTILES CAN BE USED

In **Figure 1**, Aria's height is compared to the heights of women who joined the National Health and Nutrition Examination Survey (NHANES). The 50th percentile for height across all the women who participated in NHANES is 5'3". Aria is 5'1" and is below the 50th percentile for height. This means she is *shorter than at least* 50% of women who joined NHANES.



In **Figure 2**, Chloe's height is also compared to heights of women who joined NHANES. Chloe is 5'8" inches tall and is above the 95th percentile for height. This means she is *taller than at least* 95% of other women who joined NHANES.

Figure 2. Illustration of 95th Percentile Scores







HOW PERCENTILES ARE USED IN MIPEHS

In the Michigan PFAS Exposure and Health Study (MiPEHS), we compare blood PFAS and PCB results for MiPEHS participants with the 50th and/or 95th percentile values of people from across the country who participated in NHANES.

- People in NHANES have had many of the same blood tests as participants in MiPEHS.
- By comparing the MiPEHS participants to NHANES participants we can see how people from Michigan living near a PFAS contamination site who drank their water compare to people from the rest of the country.

Figure 3. Example PFAS Results Tables

	NHANES Reference Range				
Name of PFAS	Your Age 5 Result Group Perc (ug/L) (years)				
		12-19:	1.27-2.47		
PFOA – total perfluorooctanoic acid	1.35	20+:	1.67-4.27		

ONLY A COMPARISON

It is important to point out that percentiles are only helpful for comparing results.

- Comparing your result to the 50th or 95th percentile from NHANES only tells you how many people have results like yours.
- Percentiles do not tell you if your result is "good" or "bad".

IF IT IS ONLY A COMPARISON, THEN WHY USE PERCENTILES?

With some tests, there is a normal range, and we know that results outside of the normal range can be harmful to your health. For example:

• A fasting glucose test result 126 mg/dL or higher can mean a person has diabetes and requires follow-up with their health care provider for treatment.

Figure 4.	Example	of C	Blucose	Parameter	s and (Clinical	Guidelines	and	Ranges

Glycemic Parameters	Clinical Guidelines and
	Ranges
Glucose, Fasting, 8-hr	Normal: <100 mg/dL
	Prediabetes: 100–125 mg/dL
	Diabetes: ≥126 mg/dL
1	

- At this time, there are no specific levels of PCB or PFAS that can be used to predict or diagnose disease.
- We compare your results to the NHANES 50th and 95th percentile to give you an idea of how your blood levels compare to people your age living in the U.S.

WANT MORE INFORMATION?

For more information about your results, contact the MiPEHS study staff: 844-464-7327 .



Are you worried about the water, soil, or air in your community?

You can take steps to manage stress and work toward positive change.

If you've learned that your community's water, soil, or air may not be safe (for example, because of chemicals from a nearby factory), you may be facing difficult questions like:

- Is my health at risk?
- How can I protect myself and my loved ones?
- Is it safe to stay in my home?
- Where can I get reliable information about what's happening?

It's hard to wait for answers, especially if you don't know who to trust. And people may not agree about how to handle the situation, even among family and friends. When you're dealing with these complex and frustrating issues, it's normal to feel stressed.

What is stress?

Stress is a common response to new, uncertain, or threatening situations. In a stressful situation, you may notice changes in how you think, feel, and act.

Everyone feels stressed sometimes. But over time, too much stress can harm your health. **You can take steps to manage your stress and deal with the situation.**

How can stress affect me?

Everyone feels and responds to stress differently. People who are going through difficult situations often notice these common signs of stress:

Constantly feeling worried or on

edge. You may have trouble sleeping or suddenly have a lot more or less energy than usual. Or you might find yourself getting annoyed or even angry at everyday problems.

Having a hard time thinking clearly or remembering things. You may feel like your brain is in a fog.

Feeling tired or run down. You may also have headaches, muscle aches, or even stomach problems, like pain or diarrhea.

Drinking or using drugs more often. Some people may use alcohol or drugs to try to deal with stress.

What can I do if stress is a problem for me?



Take care of yourself.

This doesn't mean forgetting about the problem or pretending everything is okay. But taking steps to manage stress can help you cope and feel ready to act in support of your loved ones and community.

- **Take time for yourself.** To help your body deal with stress, try to get plenty of sleep, stay physically active, and keep doing things you enjoy.
- Share your thoughts and feelings. Your friends and neighbors may have similar frustrations and fears. Talking about it can help you feel like you're not alone.
- **Reach out to a professional.** If you're feeling overwhelmed, you may choose to talk to your doctor, a religious leader, or a counselor, therapist, or social worker.

Stay informed and take action.

There may be a lot of things you can't control. But there's also a lot you *can* do to learn about what's happening, stay safe, and work toward positive change.

- Learn more about the problem. You can reach out to your state or local health department, local universities, or community groups for information.
- Join (or form) a community group. In these groups, people work together to share the latest updates, learn how to stay safe, and make their voices heard. Some groups meet in person, while others use social media to stay connected.
- Take steps to protect yourself and your neighbors. If you learn about ways to avoid harmful chemicals in your community, like using a water filter or not eating vegetables grown in unsafe soil, be sure to take those steps — and help others do the same.



U.S. Department of Health and Human Services Centers for Disease Control and Prevention Agency for Toxic Substances and Disease Registry



How do I find a counselor or therapist?

You can ask your doctor or health insurance plan for a referral or visit <u>https://findtreatment.</u> <u>samhsa.gov.</u>

If you need help right away, the Disaster Distress Helpline is available 24/7. Call or text 1-800-985-5990 to connect with a helpline counselor anytime.

Learn more about ATSDR at www.atsdr.cdc.gov.

The Disaster Distress Helpline is provided by the Substance Abuse and Mental Health Services Administration (SAMHSA).





PFAS Exposure and Your Health

Are you concerned about your health because you may have been exposed to high amounts of perfluoroalkyl and polyfluoroalkyl substances (PFAS)? This fact sheet answers some of the questions you may have.

How can exposure to high amounts of PFAS affect my health?



- Decreased chance of a woman getting pregnant
- Increased chance of high blood pressure in pregnant women
- Increased chance of thyroid disease

Animal studies have been done to understand what might happen in people. Some animals given high amounts of PFOA and PFOS (two types of PFAS), showed:

- Changed immune response
- Increased cholesterol levels
- Increased chance of cancer, especially kidney and testicular cancers
- Birth defects, slow growth, and newborn pup deaths
- Harm to the liver
- Changed immune response

What should I do if I have health concerns related to PFAS exposure? Talk to your doctor about your health concerns. It is always good to have regular check-ups for possible health problems.

Although some PFAS are no longer used, almost everyone has been exposed to PFAS. Common ways people are exposed include food or food packaging and household products such as carpet treatments and upholstery.



Should I have my blood tested for PFAS? PFAS blood test results can only tell you the amount of PFAS in your blood at the time of the test. The test will not tell you if PFAS has affected your health or if it will in the future.

PFAS blood testing is not a routine test. If you have been exposed to high amounts of PFAS and want or need to know the amount of PFAS in your blood, talk to your doctor.

I am pregnant. How will my PFAS exposure affect my pregnancy? Exposure to PFAS in drinking water may be associated with high blood pressure in pregnancy. Checking a woman's blood pressure is common during prenatal checkups. If you are concerned about your exposure to PFAS, it is important that you go to all your prenatal visits and discuss any health concerns with the doctor.

Can I breastfeed my baby if I have been exposed to PFAS? PFAS can be passed to your baby through breast milk. Research on PFAS in breast milk is on-going. Breastfeeding is linked to many benefits for babies and nursing mothers. Current research shows that the health benefits of breastfeeding outweigh health risks from PFAS, so moms are encouraged to breastfeed. Parents should talk to their doctors if they have concerns about breastfeeding and PFAS.

For more information about PFAS:

Visit www.michigan.gov/pfasresponse

Visit <u>www.atsdr.cdc.gov/pfas</u>



Call MDHHS at 1-800-648-6942

The Michigan Department of Health and Human Services (MDHHS) does not discriminate against any individual or group because of race, religion, age, national origin, color, height, weight, marital status, genetic information, sex, sexual orientation, gender identity or expression, political beliefs or disability.

Talking to Your Doctor about Exposure to PFAS

If you have been exposed to perfluoroalkyl and polyfluoroalkyl substances (PFAS) and are concerned about your health, you can tell your doctor.

You can share this fact sheet with your doctor to help start a conversation about how PFAS can affect your health.

1. Can exposure to PFAS cause health problems?

- Some scientific studies suggest that certain PFAS may affect different systems in the body. NCEH/ATSDR is working with various partners to better understand how exposure to PFAS might affect people's health—especially how exposure to PFAS in water and food may be harmful.
- Some (but not all) PFAS build up in the body. The levels of some PFAS go down slowly over time once exposure stops. Scientists are studying how different amounts of PFAS in the body over time may affect health.
- More research is needed, but some studies in people have shown that certain PFAS may:
 - » affect growth, learning, and behavior of infants and older children
 - » lower a woman's chance of getting pregnant
 - » interfere with the body's natural hormones
 - » increase cholesterol levels
 - » affect the immune system
 - » increase the risk of cancer

If you have any of these conditions and have been exposed to PFAS, you can tell your doctor.

2. Should my family and I be tested for any of the health conditions possibly linked to PFAS exposure?

- Laboratory test results can't tell you if PFAS exposure has caused your health condition.
- Some of the health effects possibly linked to PFAS exposure, like high cholesterol, can be checked as part of your annual physical. It is important to have regular check-ups and screenings.
- You can tell your doctor about any exposure to PFAS and any symptoms you have.

3. Should my family and I get a blood test for PFAS if we have been exposed to PFAS?

- PFAS blood test results can tell you the amount of PFAS in your blood. However, test results won't tell you how PFAS will affect your health now or in the future.
- Blood testing for PFAS is not a regular test offered by doctors or health departments.
- If you want or need to know your PFAS blood levels, you can talk to
 - your doctor or health care provider
 - » other health professionals (for example, for concerns about babies and children contact your regional Pediatric Environmental Health Specialty Unit or PEHSU: <u>http://www.pehsu.net/findhelp.html</u>).
- **Remember** that test results will only tell you and your health care provider if you have been exposed to PFAS.
- Keep in mind that most people in the United States have one or more specific PFAS in their blood, especially PFOS and PFOA.

Agency for Toxic Substances and Disease Registry Division of Community Health Investigations





4. Could exposure to PFAS in drinking water harm my health in the future?

We don't know if exposure to PFAS may cause health problems in the future. You can tell your doctor if you have been exposed to PFAS and ask if you need to be monitored for symptoms or conditions that may be caused by PFAS exposure (see list in question #1) in the future.

5. How will exposure to PFAS in drinking water affect my pregnancy?

Exposure to PFAS in drinking water at levels above the EPA Lifetime Health Advisory has been associated with pregnancy-induced high blood pressure. This complication can include not only high blood pressure, but also signs of damage to other organ systems, most often the liver and kidneys.

Tell your doctor if you have been exposed to PFAS so that he/she can provide appropriate medical care. Checking for high blood pressure should be part of your routine prenatal care. It is important to go to all of your prenatal checkups and discuss with the doctor or nurse any health concerns.

6. Can I breastfeed my baby if I've been exposed to PFAS in drinking water?

Nursing mothers should continue to breastfeed.

- While we do not know a lot about the health effects of exposure to PFAS in breast milk, we do know that the benefits of breastfeeding are well documented.
- PFAS in a mother's body can move from her blood into her unborn child and from her breastmilk into her breastfed baby. However, based on current science, the benefits of breastfeeding appear to outweigh the risks for infants exposed to PFAS in breast milk.
- Breastfeeding is good for the health of both infants and mothers.
- Scientists continue to do research in this area.
- If you have concerns, talk to your doctor.
- For more information about the benefits of breastfeeding, please visit: <u>https://www.womenshealth.gov/breastfeeding/breastfeeding-benefits.html</u>.

7. How can I learn more about PFAS?

- Contact 1-800-CDC-INFO for updated information on PFAS.
- Visit the following websites:
 - » ATSDR website: <u>http://www.atsdr.cdc.gov/pfc/index.html</u>
 - » ATSDR's PFAS Clinician Factsheet: https://www.atsdr.cdc.gov/pfc/docs/pfas_clinician_fact_sheet_508.pdf
 - » Environmental Protection Agency website: https://www.epa.gov/chemical-research/research-and-polyfluoroalkyl-substances-pfas
- Contact your state health department.
- Contact the Consumer Product Safety Commission at (800)-638-2772 if you have questions about the products you use in your home.



STATE OF MICHIGAN

DEPARTMENT OF HEALTH AND HUMAN SERVICES

GRETCHEN WHITMER GOVERNOR

LANSING

ELIZABETH HERTEL DIRECTOR

<<Date>>

<<Name>> <<Address>> <<City, State Zip Code>>

Dear [NAME],

Thank you for taking part in MiPEHS, the Michigan PFAS Exposure and Health Study. We appreciate your time and dedication to this project.

This mailing includes several pieces of information about your home's **water PFAS test results**. Please read each piece and call us at 844-464-7327 if you have any questions.

What Your Results Can Tell You

We tested your home's water for 39 types of PFAS. The table included in this letter shows your home's water test results for the seven PFAS that have a comparison value. These values were developed by health scientists to protect everyone. Michigan Department of Health and Human Services (MDHHS) uses health-based comparison values to understand contaminant levels detected in your water (see **Table 1**, below).

The water PFAS test results are provided for the drinking water source that you identified as being your "current" drinking water (for example, this could be the water that comes out of your kitchen faucet after being filtered). If it was possible to also collect a water sample that represents your "past" drinking water (for example, water taken before it goes through your newly installed filter), that is included here too. Not all homes had a "past" sample taken— sometimes it was not possible to capture the water you were drinking before PFAS was discovered in your area.

In addition to **Table 1**, your full lab report is included in this mailing. The lab report contains the results for all 39 PFAS that were tested in your water. If the sanitarian took both a "current" and "past" sample, you would see two lab reports, otherwise you will just have a "current" lab report. These results tell you how much of each type of PFAS was in your home's water *at the*

time it was collected. Your home's water test results cannot tell you how much PFAS is in your blood.

Your Test Results are Kept Private and Confidential

Michigan Law requires that your water PFAS test results be kept private and confidential. Anything written publicly about the project will only share group results. It will not include information that could identify any participant, such as name or address. We can provide you with a copy of any report written when it is available.

Other Test Results

If you or anyone in your household have not yet received results from the sample of blood from your arm (for those who were eligible), PCBs testing (adults 18 and older only), or results for health tests, those results will be arriving soon – it can take more than three months from the time of your study office visit for those results to arrive.

If you or anyone in your household provided a sample of blood from their finger for PFAS testing, those results are not yet available. We will send them to you as soon as they are available.

If you or anyone in your household gave consent to allow MDHHS to access their newborn blood spot (for people born 1987 or later in Michigan only), those will be analyzed, and results mailed after the final data collection time-point of MiPEHS.

Sincerely,

MiPEHS Team Michigan Department of Health and Human Services

Enclosures:

- PFAS Water Laboratory Report
- Understanding Your Well Test Results for PFAS from the Michigan Department of Health and Human Services Laboratory

For More Information

- If you have questions about your results, call us at 844-464-7327 and ask to speak with MiPEHS staff. Visit <u>michigan.gov/DEHBio</u> for more information about MiPEHS.
- The State of Michigan PFAS Action Response Team (MPART) website serves as the main resource for public information on PFAS contamination in Michigan. Visit <u>michigan.gov/PFASresponse</u> to learn more.
- The Agency for Toxic Substances and Disease Registry (ASTDR) website includes information about PFAS and health. Visit <u>www.atsdr.cdc.gov/pfas</u> to learn more.
- The United States Environmental Protection Agency (U.S. EPA) website includes PFAS information, U.S. EPA actions, and other resources. Visit <u>epa.gov/pfas</u> to learn more.

Table 1. PFAS water test results with compa	rison values
---	--------------

Collection Date: Location of past co Location of curren			
Type of PFAS ¹	"Past" Water Sample	PFAS Comparison Values (ng/L)	
PFOA	ng/L	ng/L	8 ng/L
PFOS	ng/L	ng/L	8 ng/L
PFHxS	ng/L	ng/L	51 ng/L
PFNA	ng/L	ng/L	6 ng/L
PFBS	ng/L	ng/L	420 ng/L
PFHxA	ng/L	ng/L	400,000 ng/L
HFPO-DA ²	ng/L	ng/L	370 ng/L

¹Some PFAS, e.g., PFOA, are presented as the total of branched and linear forms here. The lab reports (provided in this mailing) often have additional detail, like the amounts of branched and linear forms on separate lines. These test results are shown in nanograms per liter (ng/L), which is equal to parts per trillion (ppt), i.e., 1 ng/L = 1 ppt.

²This is one of the compounds commonly referred to as "Gen-X."

Table notes

- A "past" water sample was not taken at every home. The goal of this measurement is to better understand the amount of PFAS in the water that you and other members of your household typically drank before we knew there was PFAS contamination in the area. Some homes do not have access to the water that they used to drink before PFAS was discovered. In this case, only one sample, the "current water sample" was tested. In this case, "NA", meaning not applicable, will appear in the "Past" Water Sample column.
- MDHHS compares your test results to our comparison values. These values were developed by health scientists to protect everyone. If a person drinks water with PFAS below these values, they are unlikely to be harmed, even over a lifetime of drinking that water.
 - MDHHS comparison values are the lower of two sets of numbers:
 - 1. Public health screening levels for PFAS in drinking water, set by MDHHS and finalized by the Michigan PFAS Action Response Team (MPART) in April 2019
 - 2. Health-based PFAS drinking water values developed by the Michigan Science Advisory Workgroup and published in June 2019
- Your water was tested for several types of PFAS, all of which are included in your enclosed lab test results. The table above shows results only for the types of PFAS that have MDHHS comparison values.

Understanding Your Water Test Results for PFAS from the Michigan Department of Health and Human Services Laboratory

The Michigan Department of Health and Human Services (MDHHS) is providing this sheet to help you understand your water test results for the group of chemicals called per- and polyfluoroalkyl substances (PFAS). An example of a water test results table is shown below. Your results table will include more PFAS than those listed here. Keep reading to learn more about key columns of the results table.

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	ISTD % Rec	ISTD Limits	Qualifier	Analyst ID
375-22-4	PFBA	ND	2.00	ng/L	1	03/31/2020	115%	50-150%		SSY
2706-90-3	PFPeA	ND	2.00	ng/L	1	03/31/2020	104%	50-150%		SSY
307-24-4	PFHxA	7.1	2.00	ng/L	1	03/31/2020	95%	50-150%		SSY

This example is based on **MDHHS Laboratory** reports. Other labs may show results in a different way or with different measurement units.

CAS

The CAS # is a unique number that identifies the specific PFAS.

Analyte

Your water sample was tested for the PFAS shown in this column. For some PFAS, there are two forms: branched (Br) and linear (L).

Result

- If the result listed is a number, the lab found that amount of that specific PFAS in your water sample.
- If the result listed is "ND," the amount of that PFAS in your water sample was not detected, or found, above the amount the lab can reliably report.
- Branched (Br) and linear (L) are listed separately and added together as "Total."

Reporting Limit (RL)

This number is the smallest amount of that PFAS the lab can reliably report.

Units

The PFAS were measured in ng/L (ng/L=parts per trillion [ppt]).

Dilution

- If a number larger than "1" appears, the lab needed to dilute, or thin down, your water for testing.
- If a "1" appears, the lab did not dilute your water sample during testing.

Either way, the number in the "Result" column is the amount of that PFAS in your water sample, not the dilution.

Qualifier

In the column marked Qualifier, the lab will sometimes include letters to share more information about the sample. Your lab report provides explanations for these letters below the results table.

Other Columns

- Internal Standard Percent Recovered (ISTD % Rec) and Internal Standard Limits (ISTD Limits) are used for the lab's quality assurance reporting to ensure that the analysis is accurately measuring the PFAS in samples.
- Analyzed Date and Analyst ID are part of the lab's tracking.

