

PFASs measured in Biomonitoring California's Asian/Pacific Islander Community Exposures (ACE) Project



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Biomonitoring California

- Established by the Legislature in 2006 with these main goals:
 - Determine levels of chemicals in Californians
 - Establish trends in the levels of these chemicals over time
 - Help assess the effectiveness of public health efforts and environmental policies to reduce chemical exposures
- Guiding principles in the enabling legislation:
 - Environmental justice
 - “Right to know” – return of all individual results to study participants

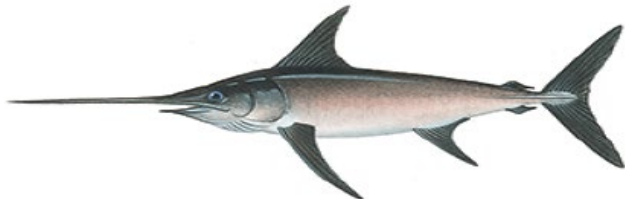
Asian/Pacific Islander Community Exposures (ACE) Project

- Extension of collaborations with community groups on health education & outreach related to safer fish consumption
- Community-based study to biomonitor Asian populations
 - Metals in blood and/or urine: arsenic, cadmium, lead, mercury
 - 32 PFASs in serum (blood)



Concerns about PFASs

- Persistence
- Widespread use
- Linked to serious human health effects
- Widespread detections in the environment and in human and animal samples, including fish
- Continuing substitution of new PFASs



Two phases of ACE

- ACE 1: 100 Chinese American participants, mostly in San Francisco
 - Collaboration with APA Family Support Services
 - Urine and blood samples collected in 2016
- ACE 2: 100 Vietnamese American participants, mostly in San Jose
 - Collaboration with **Vietnamese Voluntary Foundation (VIVO)**
 - Urine and blood samples collected in 2017



Demographics

		ACE 1 N=96	ACE 2 N=99
Age	Average	44	47
Sex	% Female	52%	55%
Income	<\$25K	27%	45%
	\$25-\$75K	41%	26%
	>\$75K	13%	10%
	Declined	20%	18%
Education	% Greater than high school	58%	42%
Birth country	% Outside the U.S.	81%	96%
Portion of life in U.S.	Average %	51%	36%
Interview language	% Not English	57%	63%
Home language	% Not English	79%	97%

Overall detections

- 19 of the 32 PFASs measured were detected in at least 1 participant
- 11 PFASs were detected in at least half of the participants

Data available online at: <https://biomonitoring.ca.gov/results/chemical/2183>

Overall detections, continued

- 6 PFASs detected in 50-98% of participants

Me-PFOSA-AcOH

PFDoA

PFBA

PFDS

PFDeA

PFHxA

- 5 PFASs detected in >98% of participants

PFOA

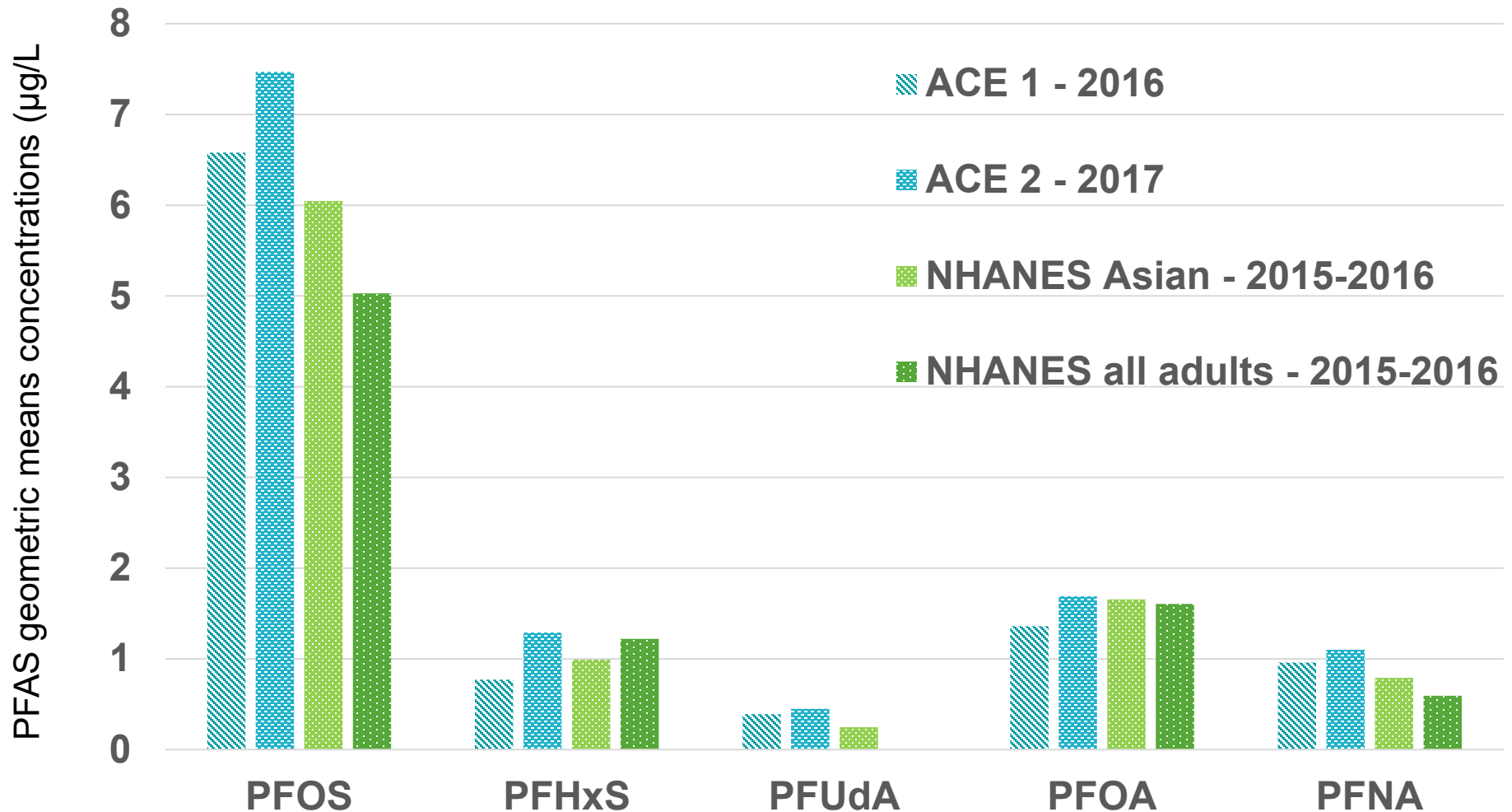
PFUdA

PFOS

PFNA

PFHxS

ACE compared to NHANES*



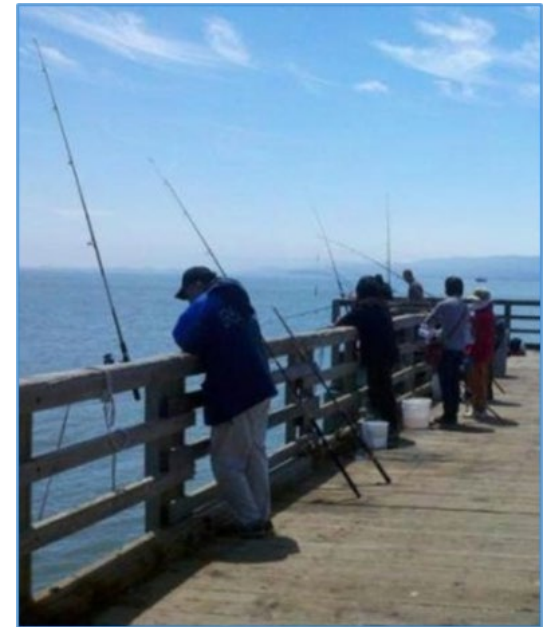
*National Health and Nutrition Examination Survey

Demographics associated with PFAS levels

- Sex
- Age
- Birth country
- Time spent in the U.S.
- Interview language

What have we learned?

- Targeted studies can reveal more about subgroups within California
- California's regional immigration and racial/ethnicity patterns may contribute to differences in PFAS and other contaminants across the state



What else have we learned?

- Work closely with community partners on outreach, recruitment, education, and dissemination of findings
- Include bilingual and bicultural staff at all levels
- Offer financial incentives for participation
- Be proactive in addressing community concerns (for example, cultural beliefs about giving blood)



瞭解亞裔/太平洋群島居民社區化學物質污染研究項目

我們從這項研究中學到了什麼，為什麼對我們很重要？

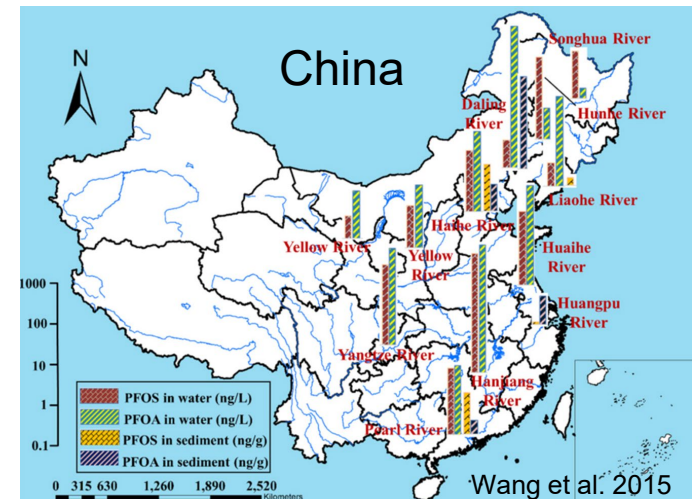
了解如何減少接觸水銀(汞)，
砷和其他有害化學物質。

2017年9月9日
1:30 - 2:30
APA 亞裔家援服務處
10 Nottingham Place
San Francisco

提供托兒
和茶點!

Next steps for data analysis

- Further explore exposure questionnaire items
 - Extensive questions on fish & seafood consumption (frequency, types, sources, parts consumed)
 - Other foods (baked goods, dim sum)
 - Use of nonstick rice cooker, personal care products, and waterproofing sprays, waxes, etc. that might contain PFASs
 - Limitations: does not address drinking water sources or ask about number of children or breastfeeding
- Exposures from home country vs. in California



For more information

- Presentation – Serum PFAS levels and their predictors in San Francisco Bay Area Asian and Pacific Islander Communities:

<https://biomonitoring.ca.gov/events/biomonitoring-california-scientific-guidance-panel-meeting-august-2018>

- Exposure questionnaire and results packet:

<https://biomonitoring.ca.gov/events/biomonitoring-california-scientific-guidance-panel-meeting-november-2018>

Your Lab Results for PFASs in Blood

PFAS tested	Your PFAS result (µg/L)	Lowest result found in the ACE II Project (µg/L)	Highest result found in the ACE II Project (µg/L)	Number of ACE II participants with this PFAS found in their blood	Middle level in the U.S. (µg/L)	95 th percentile in the U.S. (µg/L)	Level of concern
PFOA	1.4	0.25	19.9	All 99	2.1	5.6	No state or federal agency has established a level of concern for any PFAS.
PFHxS	0.77	0.34	9.5	All 99	1.4	5.5	
PFOS	6.5	1.5	43.2	All 99	5.6	19.5	
PFNA	1.6	0.35	4.3	98 of 99	0.70	2.0	
PFHxA	0.19	0.06	1.6	97 of 99	NA	NA	
PFUdA	1.2	0.07	2.9	97 of 99	*	0.50	
Me-PFOA-AcOH	0.24	0.01	0.52	96 of 99	*	0.60	
PFDeA	0.73	0.26	2.7	87 of 99	0.20	0.80	
PFBA	0.08	0.05	0.92	67 of 99	NA	NA	
PFDS	0.05	0.01	0.10	59 of 99	NA	NA	
PFDoA	0.07	0.05	0.29	52 of 99	*	0.20	
PFHpA	Not found	0.05	0.36	20 of 99	*	0.10	
7:3FTA	Not found	0.05	0.15	5 of 99	NA	NA	
PFBuS	Not found	0.05	0.80	3 of 99	*	**	
6:2 FTS	Not found	0.05	0.15	3 of 99	NA	NA	
PFOSA	Not found	0.01	0.02	3 of 99	*	**	
Et-PFOA-AcOH	Not found	0.05	0.29	3 of 99	*	0.11	
5:3 FTA	Not found	0.06	0.16	2 of 99	NA	NA	
6:2 diPAP	Not found	0.05	0.35	2 of 99	NA	NA	

We looked for the following additional PFASs, but we did not find any them in anyone's blood: 4:2 FTS, 6:6 PFPI, 6:8 PFPI, 8:2 FTS, 8:2 PAP, 8:2 diPAP, FHEA, FHUEA, FOEA, FOUEA, PFHxPA, PFOPA, and FOSA.

NA: Not available

* The middle level in the U.S. cannot be calculated because this PFAS was not found in enough people.

** The 95th percentile in the U.S. cannot be calculated because this PFAS was not found in enough people.

Perfluoroalkyl and Polyfluoroalkyl Substances (PFASs) Fact Sheet

PFASs are used to make various products resistant to oil, stains, grease, and water. These chemicals are very long lasting and have spread through the environment.

- PFASs are found in**
- Some food, such as:
 - Some meat and seafood, because some PFASs in the environment can accumulate in animals, fish, and shellfish.
 - Some vegetables grown with water that contains PFASs.
 - Food in certain grease-repellent packaging, including some fast-food wrappers, microwave popcorn bags, take-out boxes, and cardboard containers for frozen foods.
 - Some textiles, such as stain-resistant carpets, water-repellent outdoor fabrics, and leather.
 - Certain stain- and water-repellent sprays; sealants for granite and other natural stone tiles or countertops; cleaning products; lubricants; polishes; and waxes.
 - Some personal care products, such as some skin creams, eye makeup, and dental floss.
 - Some nonstick cookware.
 - Drinking water sources affected by releases of PFASs into the environment.

- Possible health concerns**
- Some PFASs:
- May harm the fetus and child, including effects on growth and development.
 - May affect the immune system and liver function.
 - May increase the risk of thyroid disease.
 - May interfere with the body's natural hormones.
 - May increase cancer risk.

- Possible ways to reduce exposure**
- Include plenty of variety in your and your child's diet, and limit how often you eat foods in grease-repellent wrappers and containers.
 - Avoid products labeled as stain- or water-resistant, such as carpets, furniture, and clothing.
 - Check labels of household and personal care products, and avoid those with "fluoro" ingredients. Contact the manufacturer if you can't find the ingredients on the label.
 - If you choose to use protective sprays, sealants, polishes, waxes, or similar products, make sure you have enough ventilation and follow other safety precautions.
 - Because PFASs can come out of products and collect in dust:
 - Wash your and your child's hands often, especially before preparing or eating food.
 - Clean floors regularly, using a wet mop or HEPA vacuum if possible, and use a damp cloth to dust.

Thanks to:

- ACE 1 and ACE 2 participants
- APA Family Support Services
 - Farmmary Saephan
 - Alex Nguyen
 - Amor Santiago
- VIVO
 - Hang Ho
- All Biomonitoring California staff who contributed to ACE 1 and ACE 2



Thank you for your time!



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