



PA PFAS Health Study Update



From the PA PFAS Multi-site Health Study Team

WELCOME

Hello to all PA PFAS Multi-site Health Study participants. We want to thank you again for taking part in this important Health Study and share results for an analysis of the PFAS concentrations for the 25 adults who participated in both the PFAS Exposure Assessment Technical Toolkit (PEATT) Pilot Project and the PA PFAS MSS study. For these results we use the geometric mean because it reduces the impact of a few extreme values on the

overall average. Table 1 reports the percent decrease in mean PFAS concentrations between the PEATT and MSS studies for all 25 participants combined. Table 2 compares the percent decrease in mean concentrations for males and females separately. For both tables, total PFAS was calculated as the simple additive sum of PFOA and PFOS (linear and branched isomers), PFHxS, PFNA, PFDA, PFUnDA, and MeFOSSA.

PEATT Study

During 2018, the Pennsylvania Department of Health (DOH) conducted biomonitoring of 235 randomly selected community members who lived in any of the four public water system service areas in Montgomery and Bucks counties surrounding two military bases as part of a pilot project to evaluate the PEATT developed

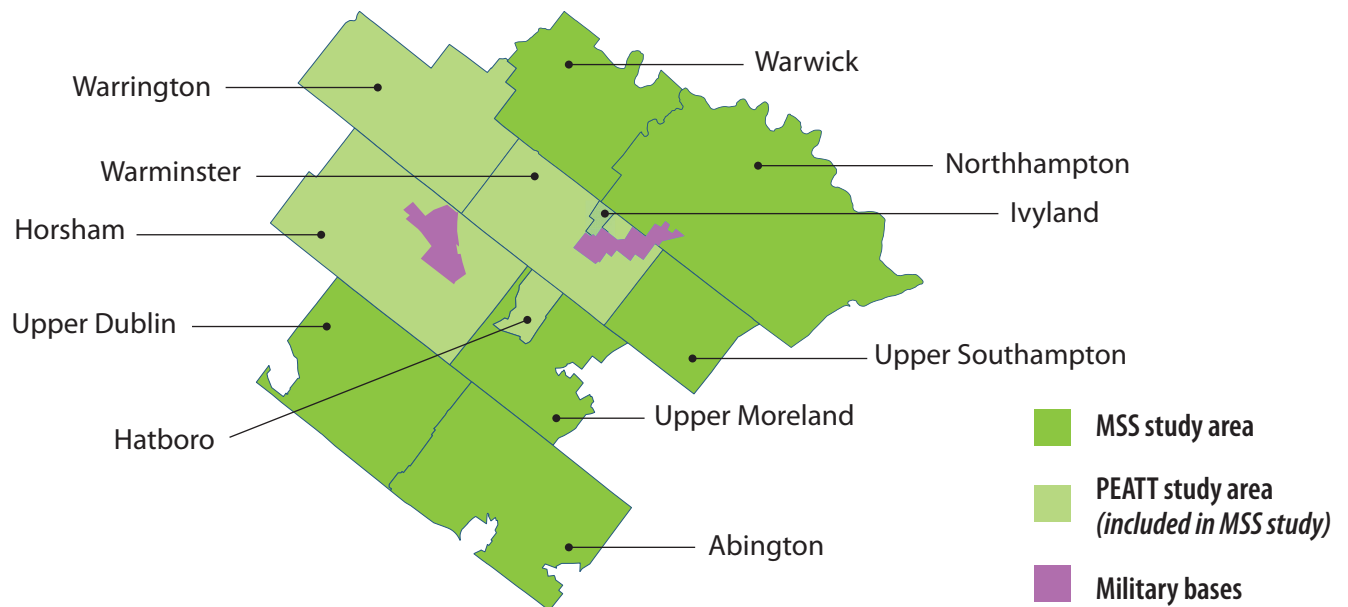
by the Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR). The pilot project was funded through the Association of State and Territorial Health Officials (ASTHO).

PA MSS Study

During 2021-2023, Researchers at RTI International, PA DOH, Temple University, and Brown University conducted biomonitoring of 1,327 community members who lived in any of the 11 Townships in Bucks and Montgomery counties (lighter and darker green areas

on the map) near the two military bases (purple areas on the map) at any time during 2005-2017. The PEATT study area (lighter green area on the map) was within the larger MSS study area. The MSS project was funded by ATSDR/CDC.

PEATT and PA PFAS Multi-site Health Study - Study Areas



Study Results

This analysis, conducted among the 25 adults who participated in both the PEATT and PA MSS studies, was designed to assess changes in PFAS levels over time (up to 4 years) among study participants who lived in the areas most affected by base operations: the townships of Horsham, Warminster, and Warrington and the Borough Ivyland.

Table 1 presents PFAS results for the 25 adults who participated in both the PEATT study in 2018 and the PA MSS study in 2021-2022. PA MSS serum PFAS concentrations were lower than PEATT values for all PFAS. In addition, the percent decrease in means between the PEATT and MSS studies was considered significantly lower for PFOA, PFOS, PFNA, and Total PFAS (bolded values).

Table 1. Comparison of Per- and Polyfluoroalkyl Substance Serum Concentrations Among 25 Adults Who Participated in Both the PEATT Study in 2018 and the MSS Study in 2021-2022

PFAS	PEATT Study Geometric Mean	PA MSS Study Geometric Mean	% Decrease in Means
PFOA	4.00	2.98	25.50
PFOS	16.23	9.50	41.47
PFHxS	11.51	9.40	18.33
PFNA	0.72	0.58	19.44
Total PFAS	33.79	23.64	30.04

Table 2 presents PFAS results for the 10 adult males and 15 adult females who participated in both the PEATT study in 2018 and the PA MSS study in 2021-2022. For both males and females, PA MSS serum PFAS concentrations were lower than PEATT values for all PFAS. In males, the percent decrease in means between the PEATT and MSS studies was considered significantly lower for PFOS (bolded values). In females, the percent decrease in means between the PEATT and MSS studies was considered significantly lower for PFOA, PFOS, PFHxS, and Total PFAS (bolded values). For all individual PFAS and total PFAS the percent decrease in means between the two time points was greater in females than males. In addition, concentrations in the PEATT study were higher for males than females for PFOS, PFHxS, and Total PFAS. Concentrations in the PA MSS study were higher for males than females for all PFAS (PFOA, PFOS, PFHxS, PFNA, and Total PFAS).

Table 2. Comparison of Per- and Polyfluoroalkyl Substance Serum Concentrations Among 10 Men and 15 Women Who Participated in Both the PEATT Study in 2018 and the MSS Study in 2021-2022

PFAS	Sex	PEATT Study Geometric Mean	PA MSS Study Geometric Mean	% Decrease in Means
PFOA	Male	3.65	3.24	11.23
	Female	4.25	2.82	33.66
PFOS	Male	17.21	11.97	30.45
	Female	15.61	8.15	47.79
PFHxS	Male	12.00	11.28	6.00
	Female	11.19	8.32	25.65
PFNA	Male	0.72	0.59	18.06
	Female	0.72	0.58	19.44
Total PFAS	Male	34.74	28.24	18.71
	Female	33.17	20.99	36.72

Summary

Although this sample included only 25 participants, results indicate that when a known PFAS exposure source is removed the PFAS blood levels lowered significantly. As some previous studies had indicated, the reduction in blood PFAS levels was more marked among women. Males are known to have higher serum PFAS; females have more elimination pathways for PFAS because of menstruation, childbirth, and breastfeeding. The small sample size limited our ability to explore these and other factors that influence PFAS levels such as age and blood donation.

Watch for additional information in future newsletters.