

# **Perfluoroalkyl and Polyfluoroalkyl Substances: Surfactants**

## Serum 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (2017 - 2018)

CAS Number 73606-19-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	17-18	*	<LOD	<LOD	<LOD	.100 (.100-.200)	1672
Age 12-19 years	17-18	*	<LOD	<LOD	<LOD	<LOD	268
Age 20+ years	17-18	*	<LOD	<LOD	<LOD	.100 (.100-.200)	1404
Male	17-18	*	<LOD	<LOD	<LOD	.100 (<LOD-.100)	843
Female	17-18	*	<LOD	<LOD	<LOD	.100 (<LOD-.200)	829
Mexican American	17-18	*	<LOD	<LOD	<LOD	.100 (<LOD-.100)	258
Non-Hispanic Black	17-18	*	<LOD	<LOD	.100 (<LOD-.100)	.100 (<LOD-.200)	344
Non-Hispanic White	17-18	*	<LOD	<LOD	<LOD	<LOD	617
All Hispanic	17-18	*	<LOD	<LOD	<LOD	.100 (<LOD-.200)	414
Non-Hispanic Asian	17-18	*	<LOD	.200 (.100-.700)	1.30 (.200-3.30)	2.50 (.500-10.9)	208

Limit of detection (LOD, see Data Analysis section) for Survey year 17-18 is 0.1.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Adona (4,8-dioxa-3H-perfluorononanoic) (2017 - 2018)

CAS Number 958445-44-8

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	17-18	*	<LOD	<LOD	<LOD	<LOD	1672
Age 12-19 years	17-18	*	<LOD	<LOD	<LOD	<LOD	268
Age 20+ years	17-18	*	<LOD	<LOD	<LOD	<LOD	1404
Male	17-18	*	<LOD	<LOD	<LOD	<LOD	843
Female	17-18	*	<LOD	<LOD	<LOD	<LOD	829
Mexican American	17-18	*	<LOD	<LOD	<LOD	<LOD	258
Non-Hispanic Black	17-18	*	<LOD	<LOD	<LOD	<LOD	344
Non-Hispanic White	17-18	*	<LOD	<LOD	<LOD	<LOD	617
All Hispanic	17-18	*	<LOD	<LOD	<LOD	<LOD	414
Non-Hispanic Asian	17-18	*	<LOD	<LOD	<LOD	<LOD	208

Limit of detection (LOD, see Data Analysis section) for Survey year 17-18 is 0.1.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum GenX (2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (HFPO-DA)) (2017 - 2018)

CAS Number 13252-13-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	17-18	*	<LOD	<LOD	<LOD	<LOD	1672
Age 12-19 years	17-18	*	<LOD	<LOD	<LOD	<LOD	268
Age 20+ years	17-18	*	<LOD	<LOD	<LOD	<LOD	1404
Male	17-18	*	<LOD	<LOD	<LOD	<LOD	843
Female	17-18	*	<LOD	<LOD	<LOD	<LOD	829
Mexican American	17-18	*	<LOD	<LOD	<LOD	<LOD	258
Non-Hispanic Black	17-18	*	<LOD	<LOD	<LOD	<LOD	344
Non-Hispanic White	17-18	*	<LOD	<LOD	<LOD	<LOD	617
All Hispanic	17-18	*	<LOD	<LOD	<LOD	<LOD	414
Non-Hispanic Asian	17-18	*	<LOD	<LOD	<LOD	<LOD	208

Limit of detection (LOD, see Data Analysis section) for Survey year 17-18 is 0.1.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluorobutane sulfonic acid (PFBS) (2003-2010)

CAS Number 375-73-5

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	03-04	*	<LOD	<LOD	<LOD	<LOD	2094
Total population	05-06	*	<LOD	<LOD	<LOD	.100 (<LOD-.200)	2120
Total population	07-08	*	<LOD	<LOD	<LOD	<LOD	2100
Total population	09-10	*	<LOD	<LOD	<LOD	<LOD	2233
Age 12-19 years	03-04	*	<LOD	<LOD	<LOD	<LOD	640
Age 12-19 years	05-06	*	<LOD	<LOD	<LOD	.100 (<LOD-.100)	640
Age 12-19 years	07-08	*	<LOD	<LOD	<LOD	<LOD	357
Age 12-19 years	09-10	*	<LOD	<LOD	<LOD	<LOD	364
Age 20+ years	03-04	*	<LOD	<LOD	<LOD	<LOD	1454
Age 20+ years	05-06	*	<LOD	<LOD	<LOD	.100 (<LOD-.200)	1480
Age 20+ years	07-08	*	<LOD	<LOD	<LOD	<LOD	1743
Age 20+ years	09-10	*	<LOD	<LOD	<LOD	<LOD	1869
Male	03-04	*	<LOD	<LOD	<LOD	<LOD	1053
Male	05-06	*	<LOD	<LOD	<LOD	.100 (<LOD-.200)	1048
Male	07-08	*	<LOD	<LOD	<LOD	<LOD	1059
Male	09-10	*	<LOD	<LOD	<LOD	<LOD	1075
Female	03-04	*	<LOD	<LOD	<LOD	<LOD	1041
Female	05-06	*	<LOD	<LOD	<LOD	.100 (<LOD-.200)	1072
Female	07-08	*	<LOD	<LOD	<LOD	<LOD	1041
Female	09-10	*	<LOD	<LOD	<LOD	<LOD	1158
Mexican American	03-04	*	<LOD	<LOD	<LOD	<LOD	485
Mexican American	05-06	*	<LOD	<LOD	<LOD	.100 (<LOD-.200)	499
Mexican American	07-08	*	<LOD	<LOD	<LOD	<LOD	391
Mexican American	09-10	*	<LOD	<LOD	<LOD	<LOD	461
Non-Hispanic Black	03-04	*	<LOD	<LOD	<LOD	<LOD	538
Non-Hispanic Black	05-06	*	<LOD	<LOD	<LOD	.100 (<LOD-.100)	544
Non-Hispanic Black	07-08	*	<LOD	<LOD	<LOD	<LOD	419
Non-Hispanic Black	09-10	*	<LOD	<LOD	<LOD	<LOD	391
Non-Hispanic White	03-04	*	<LOD	<LOD	<LOD	<LOD	962
Non-Hispanic White	05-06	*	<LOD	<LOD	<LOD	.100 (<LOD-.400)	935
Non-Hispanic White	07-08	*	<LOD	<LOD	<LOD	<LOD	931
Non-Hispanic White	09-10	*	<LOD	<LOD	<LOD	<LOD	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.4, 0.1, 0.1, and 0.1 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluorobutane sulfonic acid (PFBS) (2011 - 2014)

CAS Number 375-73-5

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	11-12	*	<LOD	<LOD	<LOD	<LOD	1904
Total population	13-14	*	<LOD	<LOD	<LOD	<LOD	2168
Age 12-19 years	11-12	*	<LOD	<LOD	<LOD	<LOD	344
Age 12-19 years	13-14	*	<LOD	<LOD	<LOD	<LOD	402
Age 20 + years	11-12	*	<LOD	<LOD	<LOD	<LOD	1560
Age 20 + years	13-14	*	<LOD	<LOD	<LOD	<LOD	1766
Male	11-12	*	<LOD	<LOD	<LOD	<LOD	966
Male	13-14	*	<LOD	<LOD	<LOD	<LOD	1032
Female	11-12	*	<LOD	<LOD	<LOD	<LOD	938
Female	13-14	*	<LOD	<LOD	<LOD	<LOD	1136
Mexican American	11-12	*	<LOD	<LOD	<LOD	<LOD	211
Mexican American	13-14	*	<LOD	<LOD	<LOD	<LOD	332
Non-Hispanic Black	11-12	*	<LOD	<LOD	<LOD	<LOD	485
Non-Hispanic Black	13-14	*	<LOD	<LOD	<LOD	<LOD	455
Non-Hispanic White	11-12	*	<LOD	<LOD	<LOD	<LOD	666
Non-Hispanic White	13-14	*	<LOD	<LOD	<LOD	<LOD	862
All Hispanic	11-12	*	<LOD	<LOD	<LOD	<LOD	406
All Hispanic	13-14	*	<LOD	<LOD	<LOD	<LOD	537
Non-Hispanic Asian	11-12	*	<LOD	<LOD	<LOD	<LOD	291
Non-Hispanic Asian	13-14	*	<LOD	<LOD	<LOD	<LOD	236

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.100 and 0.100 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluorobutane sulfonic acid (PFBS) (Special Sample of Serum PFAS in Children, 2013-2014)

CAS Number 375-73-5

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	*	<LOD	<LOD	<LOD	<LOD	525
Age 3-5 years	13-14	*	<LOD	<LOD	<LOD	<LOD	149
Age 6-11 years	13-14	*	<LOD	<LOD	<LOD	.130 (<LOD-.140)	376
Male	13-14	*	<LOD	<LOD	<LOD	.120 (<LOD-.140)	284
Female	13-14	*	<LOD	<LOD	<LOD	<LOD	241
All Hispanic	13-14	*	<LOD	<LOD	<LOD	<LOD	186
Other	13-14	*	<LOD	<LOD	<LOD	.130 (<LOD-.140)	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluorodecanoic acid (PFDA) (1999-2000, 2003-2010)

CAS Number 335-76-2

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	99-00	*	<LOD	.200 (<LOD-.300)	.400 (.300-.600)	.600 (.400-1.00)	1432
Total population	03-04	*	<LOD	.300 (<LOD-.500)	.600 (.400-1.10)	.900 (.500-1.80)	2094
Total population	05-06	.355 (.297-.423)	.300 (.300-.400)	.500 (.400-.700)	.900 (.600-1.60)	1.50 (.900-2.60)	2120
Total population	07-08	.286 (.264-.309)	.300 (.300-.300)	.400 (.400-.500)	.700 (.600-.700)	.900 (.800-1.00)	2100
Total population	09-10	.279 (.258-.303)	.300 (.300-.300)	.400 (.400-.500)	.700 (.600-.800)	.900 (.800-1.10)	2233
Age 12-19 years	99-00	*	<LOD	<LOD	.300 (.200-.400)	.400 (.300-.700)	497
Age 12-19 years	03-04	*	<LOD	<LOD	.500 (<LOD-1.00)	.800 (.300-1.20)	640
Age 12-19 years	05-06	.295 (.258-.338)	.300 (.200-.300)	.500 (.400-.500)	.600 (.500-.800)	.800 (.600-1.60)	640
Age 12-19 years	07-08	.231 (.214-.248)	.200 (.200-.300)	.300 (.300-.400)	.500 (.400-.500)	.600 (.500-.700)	357
Age 12-19 years	09-10	.220 (.198-.245)	.200 (.200-.200)	.300 (.300-.300)	.400 (.400-.600)	.600 (.400-.800)	364
Age 20+ years	99-00	*	<LOD	.300 (.200-.300)	.400 (.300-.700)	.600 (.400-1.40)	935
Age 20+ years	03-04	*	<LOD	.400 (<LOD-.500)	.700 (.400-1.00)	.900 (.500-1.80)	1454
Age 20+ years	05-06	.364 (.303-.438)	.300 (.300-.400)	.500 (.400-.700)	1.00 (.600-1.70)	1.50 (.900-2.60)	1480
Age 20+ years	07-08	.295 (.271-.321)	.300 (.300-.300)	.400 (.400-.500)	.700 (.600-.800)	.900 (.800-1.10)	1743
Age 20+ years	09-10	.289 (.265-.314)	.300 (.300-.300)	.400 (.400-.500)	.700 (.600-.800)	.900 (.800-1.20)	1869
Male	99-00	*	<LOD	.300 (.200-.300)	.400 (.300-.700)	.500 (.300-1.90)	684
Male	03-04	*	<LOD	.400 (<LOD-.500)	.800 (.400-1.40)	1.10 (.600-2.10)	1053
Male	05-06	.381 (.318-.456)	.400 (.300-.400)	.600 (.400-.800)	1.00 (.600-2.20)	1.70 (1.00-2.60)	1048
Male	07-08	.306 (.283-.331)	.300 (.300-.300)	.400 (.400-.500)	.700 (.600-.800)	.900 (.800-1.20)	1059
Male	09-10	.289 (.264-.318)	.300 (.300-.300)	.400 (.400-.500)	.600 (.500-.800)	.800 (.600-1.20)	1075
Female	99-00	*	<LOD	.200 (<LOD-.300)	.400 (.300-.600)	.600 (.300-1.40)	748
Female	03-04	*	<LOD	.300 (<LOD-.400)	.500 (.400-.800)	.800 (.500-1.20)	1041
Female	05-06	.331 (.277-.396)	.300 (.300-.400)	.500 (.400-.600)	.900 (.600-1.40)	1.30 (.800-2.30)	1072
Female	07-08	.267 (.245-.292)	.300 (.200-.300)	.400 (.400-.500)	.600 (.500-.800)	.800 (.700-1.10)	1041
Female	09-10	.270 (.248-.295)	.300 (.200-.300)	.400 (.400-.500)	.700 (.600-.800)	1.00 (.800-1.10)	1158
Mexican American	99-00	*	<LOD	<LOD	.300 (<LOD-.400)	.300 (<LOD-1.50)	521
Mexican American	03-04	*	<LOD	<LOD	.500 (.400-.500)	.600 (.500-.800)	485
Mexican American	05-06	.283 (.245-.327)	.300 (.200-.300)	.400 (.300-.500)	.600 (.500-1.00)	1.00 (.500-2.40)	499
Mexican American	07-08	.253 (.222-.289)	.200 (.200-.300)	.400 (.300-.500)	.600 (.400-.700)	.600 (.500-1.40)	391
Mexican American	09-10	.242 (.215-.272)	.200 (.200-.300)	.400 (.300-.400)	.500 (.500-.600)	.700 (.600-.800)	461
Non-Hispanic Black	99-00	*	.200 (<LOD-.300)	.400 (.200-.800)	.800 (.500-1.40)	1.10 (.600-2.30)	269
Non-Hispanic Black	03-04	*	<LOD	.400 (<LOD-.700)	.800 (.400-1.50)	1.00 (.500-3.10)	538
Non-Hispanic Black	05-06	.405 (.309-.531)	.400 (.300-.500)	.600 (.400-.900)	1.20 (.600-2.90)	2.30 (1.10-3.70)	544
Non-Hispanic Black	07-08	.331 (.298-.368)	.300 (.300-.400)	.500 (.400-.600)	.800 (.600-.900)	1.00 (.800-1.50)	419
Non-Hispanic Black	09-10	.336 (.298-.379)	.300 (.300-.300)	.500 (.400-.600)	.800 (.600-1.00)	1.10 (.800-2.60)	391
Non-Hispanic White	99-00	*	<LOD	.200 (<LOD-.300)	.400 (.300-.500)	.500 (.400-.800)	491
Non-Hispanic White	03-04	*	<LOD	.300 (<LOD-.500)	.600 (.400-1.00)	.900 (.500-1.80)	962
Non-Hispanic White	05-06	.350 (.294-.417)	.300 (.300-.400)	.500 (.400-.700)	.900 (.600-1.50)	1.40 (.800-2.30)	935
Non-Hispanic White	07-08	.276 (.254-.301)	.300 (.200-.300)	.400 (.400-.500)	.600 (.500-.700)	.900 (.700-.900)	931
Non-Hispanic White	09-10	.270 (.240-.304)	.300 (.200-.300)	.400 (.300-.500)	.600 (.500-.800)	.800 (.600-1.10)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.3, 0.2, 0.2, and 0.1 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.



## Serum Perfluorodecanoic acid (PFDA) (2011 - 2018)

CAS Number 335-76-2

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	11-12	.199 (.181-.220)	.190 (.170-.210)	.300 (.270-.340)	.480 (.420-.580)	.690 (.600-.770)	1904
Total population	13-14	.185 (.165-.208)	.200 (.200-.200)	.300 (.300-.300)	.500 (.400-.600)	.700 (.600-.900)	2168
Total population	15-16	.154 (.140-.169)	.100 (.100-.200)	.300 (.200-.300)	.400 (.400-.600)	.700 (.500-.900)	1993
Total population	17-18	.193 (.178-.209)	.200 (.200-.200)	.300 (.300-.300)	.400 (.300-.500)	.600 (.500-.900)	1929
Age 12-19 years	11-12	.146 (.126-.168)	.150 (.120-.170)	.200 (.180-.230)	.290 (.240-.340)	.360 (.290-.560)	344
Age 12-19 years	13-14	.136 (.122-.152)	.100 (.100-.200)	.200 (.200-.200)	.300 (.200-.400)	.400 (.300-.500)	402
Age 12-19 years	15-16	*	.100 (<LOD-.100)	.200 (.100-.200)	.200 (.200-.400)	.300 (.200-.500)	353
Age 12-19 years	17-18	.153 (.136-.173)	.200 (.100-.200)	.200 (.200-.300)	.300 (.200-.300)	.400 (.300-.600)	313
Age 20+ years	11-12	.209 (.189-.230)	.200 (.180-.230)	.320 (.280-.370)	.510 (.440-.590)	.730 (.630-.850)	1560
Age 20+ years	13-14	.193 (.171-.218)	.200 (.200-.200)	.300 (.300-.400)	.500 (.400-.600)	.800 (.600-.900)	1766
Age 20+ years	15-16	.160 (.144-.178)	.200 (.100-.200)	.300 (.200-.300)	.400 (.400-.600)	.700 (.500-1.00)	1640
Age 20+ years	17-18	.199 (.183-.216)	.200 (.200-.200)	.300 (.300-.300)	.400 (.300-.600)	.600 (.500-.900)	1616
Male	11-12	.206 (.184-.232)	.200 (.180-.230)	.310 (.260-.370)	.440 (.380-.550)	.620 (.480-.810)	966
Male	13-14	.198 (.175-.225)	.200 (.200-.200)	.300 (.300-.400)	.500 (.400-.700)	.800 (.600-1.00)	1032
Male	15-16	.153 (.137-.172)	.100 (.100-.200)	.300 (.200-.300)	.400 (.300-.600)	.700 (.400-1.00)	964
Male	17-18	.190 (.177-.204)	.200 (.200-.200)	.300 (.200-.300)	.400 (.300-.400)	.500 (.400-.600)	952
Female	11-12	.193 (.177-.211)	.190 (.170-.210)	.290 (.260-.340)	.530 (.410-.640)	.690 (.640-.830)	938
Female	13-14	.174 (.155-.195)	.200 (.100-.200)	.300 (.200-.300)	.500 (.400-.500)	.700 (.500-.900)	1136
Female	15-16	.154 (.141-.168)	.100 (.100-.200)	.200 (.200-.300)	.400 (.400-.600)	.800 (.500-1.10)	1029
Female	17-18	.196 (.176-.219)	.200 (.200-.200)	.300 (.200-.300)	.500 (.400-.600)	.700 (.500-1.10)	977
Mexican American	11-12	.176 (.150-.205)	.170 (.150-.200)	.260 (.210-.300)	.380 (.300-.530)	.530 (.360-.600)	211
Mexican American	13-14	.145 (.125-.169)	.100 (.100-.200)	.200 (.200-.300)	.300 (.200-.500)	.400 (.300-1.40)	332
Mexican American	15-16	.124 (.111-.138)	.100 (<LOD-.100)	.200 (.200-.200)	.300 (.200-.300)	.400 (.300-.800)	370
Mexican American	17-18	.162 (.138-.190)	.200 (.100-.200)	.200 (.200-.300)	.300 (.200-.500)	.400 (.300-.800)	297
Non-Hispanic Black	11-12	.214 (.193-.237)	.200 (.180-.220)	.330 (.280-.380)	.590 (.420-.850)	.880 (.670-1.06)	485
Non-Hispanic Black	13-14	.200 (.162-.246)	.200 (.200-.200)	.300 (.200-.500)	.600 (.400-.900)	.900 (.700-1.20)	455
Non-Hispanic Black	15-16	.155 (.140-.171)	.100 (.100-.200)	.300 (.200-.300)	.500 (.400-.500)	.800 (.500-1.10)	439
Non-Hispanic Black	17-18	.189 (.162-.220)	.200 (.100-.200)	.300 (.200-.300)	.500 (.400-.700)	.800 (.500-1.10)	430
Non-Hispanic White	11-12	.193 (.171-.219)	.190 (.170-.220)	.290 (.260-.340)	.440 (.360-.590)	.620 (.480-.740)	666
Non-Hispanic White	13-14	.184 (.158-.213)	.200 (.200-.200)	.300 (.200-.400)	.500 (.400-.500)	.700 (.500-.800)	862
Non-Hispanic White	15-16	.150 (.136-.166)	.100 (.100-.200)	.200 (.200-.300)	.400 (.300-.500)	.600 (.400-.700)	619
Non-Hispanic White	17-18	.196 (.178-.215)	.200 (.200-.200)	.300 (.200-.300)	.400 (.300-.600)	.600 (.400-.900)	667
All Hispanic	11-12	.182 (.156-.212)	.170 (.150-.200)	.270 (.210-.330)	.430 (.330-.530)	.540 (.440-.760)	406
All Hispanic	13-14	.150 (.135-.167)	.200 (.100-.200)	.200 (.200-.300)	.300 (.300-.400)	.400 (.300-1.00)	537
All Hispanic	15-16	*	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.300-.400)	.500 (.400-.600)	629
All Hispanic	17-18	.176 (.154-.201)	.200 (.200-.200)	.200 (.200-.300)	.300 (.300-.500)	.400 (.300-.600)	473
Non-Hispanic Asian	11-12	.367 (.308-.438)	.350 (.280-.420)	.670 (.510-.870)	1.35 (.870-2.05)	2.05 (1.19-2.52)	291
Non-Hispanic Asian	13-14	.360 (.294-.439)	.400 (.300-.500)	.700 (.500-.900)	1.50 (1.00-2.10)	2.20 (1.60-3.30)	236
Non-Hispanic Asian	15-16	.308 (.254-.373)	.300 (.200-.400)	.700 (.400-.900)	1.30 (.800-1.90)	2.10 (1.00-4.60)	220
Non-Hispanic Asian	17-18	.278 (.227-.340)	.200 (.200-.300)	.500 (.300-.600)	1.10 (.600-1.20)	1.20 (.900-2.40)	257

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, 15-16, and 17-18 are 0.100, 0.100, 0.100, and 0.100 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluorodecanoic acid (PFDA) (Special Sample of Serum PFAS in Children, 2013-2014)

CAS Number 335-76-2

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	*	<LOD	.170 (.130-.230)	.310 (.240-.360)	.370 (.300-.440)	525
Age 3-5 years	13-14	*	<LOD	.170 (.120-.320)	.340 (.160-.470)	.410 (.330-.750)	149
Age 6-11 years	13-14	*	<LOD	.170 (.140-.200)	.290 (.240-.320)	.350 (.320-.380)	376
Male	13-14	*	<LOD	.160 (.120-.230)	.300 (.210-.360)	.360 (.250-.510)	284
Female	13-14	*	.100 (<LOD-.120)	.180 (.150-.230)	.320 (.240-.370)	.380 (.270-.470)	241
All Hispanic	13-14	*	<LOD	.180 (.130-.230)	.270 (.240-.340)	.400 (.270-.470)	186
Other	13-14	*	<LOD	.170 (.120-.240)	.320 (.230-.370)	.370 (.270-.470)	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluorododecanoic acid (PFDoDA) (1999-2000, 2003-2010)

CAS Number 307-55-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	99-00	*	<LOD	<LOD	<LOD	<LOD	1432
Total population	03-04	*	<LOD	<LOD	<LOD	<LOD	2094
Total population	05-06	*	<LOD	<LOD	<LOD	<LOD	2120
Total population	07-08	*	<LOD	<LOD	<LOD	<LOD	2100
Total population	09-10	*	<LOD	<LOD	<LOD	<LOD	2233
Age 12-19 years	99-00	*	<LOD	<LOD	<LOD	<LOD	497
Age 12-19 years	03-04	*	<LOD	<LOD	<LOD	<LOD	640
Age 12-19 years	05-06	*	<LOD	<LOD	<LOD	<LOD	640
Age 12-19 years	07-08	*	<LOD	<LOD	<LOD	<LOD	357
Age 12-19 years	09-10	*	<LOD	<LOD	<LOD	<LOD	364
Age 20+ years	99-00	*	<LOD	<LOD	<LOD	<LOD	935
Age 20+ years	03-04	*	<LOD	<LOD	<LOD	<LOD	1454
Age 20+ years	05-06	*	<LOD	<LOD	<LOD	<LOD	1480
Age 20+ years	07-08	*	<LOD	<LOD	<LOD	<LOD	1743
Age 20+ years	09-10	*	<LOD	<LOD	<LOD	.100 (<LOD-.100)	1869
Male	99-00	*	<LOD	<LOD	<LOD	<LOD	684
Male	03-04	*	<LOD	<LOD	<LOD	<LOD	1053
Male	05-06	*	<LOD	<LOD	<LOD	<LOD	1048
Male	07-08	*	<LOD	<LOD	<LOD	<LOD	1059
Male	09-10	*	<LOD	<LOD	<LOD	<LOD	1075
Female	99-00	*	<LOD	<LOD	<LOD	<LOD	748
Female	03-04	*	<LOD	<LOD	<LOD	<LOD	1041
Female	05-06	*	<LOD	<LOD	<LOD	<LOD	1072
Female	07-08	*	<LOD	<LOD	<LOD	<LOD	1041
Female	09-10	*	<LOD	<LOD	<LOD	.100 (<LOD-.100)	1158
Mexican American	99-00	*	<LOD	<LOD	<LOD	<LOD	521
Mexican American	03-04	*	<LOD	<LOD	<LOD	<LOD	485
Mexican American	05-06	*	<LOD	<LOD	<LOD	<LOD	499
Mexican American	07-08	*	<LOD	<LOD	<LOD	<LOD	391
Mexican American	09-10	*	<LOD	<LOD	<LOD	<LOD	461
Non-Hispanic Black	99-00	*	<LOD	<LOD	<LOD	<LOD	269
Non-Hispanic Black	03-04	*	<LOD	<LOD	<LOD	<LOD	538
Non-Hispanic Black	05-06	*	<LOD	<LOD	<LOD	<LOD	544
Non-Hispanic Black	07-08	*	<LOD	<LOD	<LOD	<LOD	419
Non-Hispanic Black	09-10	*	<LOD	<LOD	<LOD	.100 (<LOD-.400)	391
Non-Hispanic White	99-00	*	<LOD	<LOD	<LOD	<LOD	491
Non-Hispanic White	03-04	*	<LOD	<LOD	<LOD	<LOD	962
Non-Hispanic White	05-06	*	<LOD	<LOD	<LOD	<LOD	935
Non-Hispanic White	07-08	*	<LOD	<LOD	<LOD	<LOD	931
Non-Hispanic White	09-10	*	<LOD	<LOD	<LOD	<LOD	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 1, 0.2, 0.2, and 0.1 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluorododecanoic acid (PFDoDA) (2011 - 2016)

CAS Number 307-55-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	11-12	*	<LOD	<LOD	<LOD	.140 (<LOD-.240)	1904
Total population	13-14	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (.100-.300)	2168
Total population	15-16	*	<LOD	<LOD	<LOD	<LOD	1993
Age 12-19 years	11-12	*	<LOD	<LOD	<LOD	<LOD	344
Age 12-19 years	13-14	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (<LOD-.300)	402
Age 12-19 years	15-16	*	<LOD	<LOD	<LOD	<LOD	353
Age 20 + years	11-12	*	<LOD	<LOD	<LOD	.150 (<LOD-.280)	1560
Age 20 + years	13-14	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (.100-.300)	1766
Age 20 + years	15-16	*	<LOD	<LOD	<LOD	<LOD	1640
Male	11-12	*	<LOD	<LOD	<LOD	.140 (<LOD-.240)	966
Male	13-14	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (.100-.300)	1032
Male	15-16	*	<LOD	<LOD	<LOD	<LOD	964
Female	11-12	*	<LOD	<LOD	<LOD	.130 (<LOD-.280)	938
Female	13-14	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (.100-.300)	1136
Female	15-16	*	<LOD	<LOD	<LOD	<LOD	1029
Mexican American	11-12	*	<LOD	<LOD	<LOD	.110 (<LOD-.230)	211
Mexican American	13-14	*	<LOD	<LOD	.200 (<LOD-.300)	.300 (.200-.300)	332
Mexican American	15-16	*	<LOD	<LOD	<LOD	<LOD	370
Non-Hispanic Black	11-12	*	<LOD	<LOD	<LOD	.110 (<LOD-.160)	485
Non-Hispanic Black	13-14	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (.100-.300)	455
Non-Hispanic Black	15-16	*	<LOD	<LOD	<LOD	<LOD	439
Non-Hispanic White	11-12	*	<LOD	<LOD	<LOD	.130 (<LOD-.290)	666
Non-Hispanic White	13-14	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (<LOD-.300)	862
Non-Hispanic White	15-16	*	<LOD	<LOD	<LOD	<LOD	619
All Hispanic	11-12	*	<LOD	<LOD	<LOD	.110 (<LOD-.150)	406
All Hispanic	13-14	*	<LOD	<LOD	.200 (.100-.300)	.300 (.200-.300)	537
All Hispanic	15-16	*	<LOD	<LOD	<LOD	<LOD	629
Non-Hispanic Asian	11-12	*	<LOD	<LOD	.180 (.130-.350)	.360 (.180-.440)	291
Non-Hispanic Asian	13-14	*	<LOD	.100 (<LOD-.200)	.200 (.200-.500)	.300 (.200-.500)	236
Non-Hispanic Asian	15-16	*	<LOD	<LOD	<LOD	<LOD	220

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.100, 0.100, and 0.100 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluorododecanoic acid (PFDoDA) (Special Sample of Serum PFAS in Children, 2013-2014)

CAS Number 307-55-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	*	<LOD	<LOD	<LOD	<LOD	525
Age 3-5 years	13-14	*	<LOD	<LOD	<LOD	<LOD	149
Age 6-11 years	13-14	*	<LOD	<LOD	<LOD	<LOD	376
Male	13-14	*	<LOD	<LOD	<LOD	<LOD	284
Female	13-14	*	<LOD	<LOD	<LOD	<LOD	241
All Hispanic	13-14	*	<LOD	<LOD	<LOD	<LOD	186
Other	13-14	*	<LOD	<LOD	<LOD	<LOD	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluoroheptane sulfonic acid (PFHpS) (2017 - 2018)

CAS Number 375-92-8

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	17-18	.221 (.185-.263)	.200 (.200-.200)	.400 (.300-.500)	.600 (.500-1.20)	1.00 (.500-4.60)	1672
Age 12-19 years	17-18	.152 (.116-.200)	.100 (.100-.200)	.200 (.200-.300)	.400 (.200-1.60)	1.50 (.200-13.2)	268
Age 20+ years	17-18	.233 (.197-.275)	.200 (.200-.300)	.400 (.300-.500)	.700 (.500-1.00)	1.00 (.500-4.10)	1404
Male	17-18	.277 (.224-.342)	.300 (.200-.300)	.400 (.400-.500)	.700 (.500-1.90)	1.60 (.600-5.00)	843
Female	17-18	.178 (.150-.212)	.200 (.100-.200)	.300 (.200-.300)	.500 (.300-1.20)	.900 (.400-3.20)	829
Mexican American	17-18	.187 (.126-.277)	.200 (.100-.200)	.300 (.200-.500)	1.10 (.300-5.20)	2.40 (.400-6.70)	258
Non-Hispanic Black	17-18	.208 (.173-.250)	.200 (.200-.200)	.400 (.300-.400)	.700 (.500-1.10)	1.00 (.600-3.40)	344
Non-Hispanic White	17-18	.234 (.194-.283)	.200 (.200-.300)	.400 (.300-.500)	.600 (.400-1.00)	.900 (.500-4.80)	617
All Hispanic	17-18	.194 (.145-.260)	.200 (.100-.200)	.300 (.200-.400)	.600 (.300-3.90)	1.90 (.400-5.30)	414
Non-Hispanic Asian	17-18	.220 (.155-.312)	.200 (.100-.300)	.400 (.300-.600)	.800 (.300-4.00)	1.80 (.400-4.00)	208

Limit of detection (LOD, see Data Analysis section) for Survey year 17-18 is 0.1.

## Serum Perfluoroheptanoic acid (PFHpA) (1999-2000, 2003-2010)

CAS Number 375-85-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	99-00	*	<LOD	<LOD	.500 (<LOD-.600)	.700 (.500-1.00)	1432
Total population	03-04	*	<LOD	<LOD	<LOD	.400 (<LOD-.500)	2094
Total population	05-06	*	<LOD	<LOD	<LOD	.700 (<LOD-1.70)	2120
Total population	07-08	*	<LOD	<LOD	<LOD	.500 (.400-.600)	2100
Total population	09-10	*	<LOD	<LOD	.200 (.100-.200)	.200 (.200-.300)	2233
Age 12-19 years	99-00	*	<LOD	<LOD	.800 (.600-1.10)	1.20 (.800-1.80)	497
Age 12-19 years	03-04	*	<LOD	<LOD	.400 (<LOD-.600)	.600 (.500-.900)	640
Age 12-19 years	05-06	*	<LOD	<LOD	.700 (<LOD-1.10)	1.10 (.600-2.70)	640
Age 12-19 years	07-08	*	<LOD	<LOD	.500 (<LOD-.600)	.600 (.500-.700)	357
Age 12-19 years	09-10	*	<LOD	.100 (.100-.200)	.200 (.200-.400)	.400 (.200-.500)	364
Age 20+ years	99-00	*	<LOD	<LOD	.400 (<LOD-.600)	.600 (<LOD-1.00)	935
Age 20+ years	03-04	*	<LOD	<LOD	<LOD	<LOD	1454
Age 20+ years	05-06	*	<LOD	<LOD	<LOD	.600 (<LOD-2.10)	1480
Age 20+ years	07-08	*	<LOD	<LOD	<LOD	.500 (<LOD-.500)	1743
Age 20+ years	09-10	*	<LOD	<LOD	.100 (.100-.200)	.200 (.200-.200)	1869
Male	99-00	*	<LOD	<LOD	.500 (<LOD-.600)	.700 (.500-1.00)	684
Male	03-04	*	<LOD	<LOD	<LOD	.300 (<LOD-.400)	1053
Male	05-06	*	<LOD	<LOD	.400 (<LOD-1.00)	.800 (<LOD-2.10)	1048
Male	07-08	*	<LOD	<LOD	<LOD	.600 (.400-.700)	1059
Male	09-10	*	<LOD	<LOD	.200 (.100-.200)	.200 (.200-.300)	1075
Female	99-00	*	<LOD	<LOD	.500 (<LOD-.700)	.700 (<LOD-1.50)	748
Female	03-04	*	<LOD	<LOD	<LOD	.400 (.300-.600)	1041
Female	05-06	*	<LOD	<LOD	<LOD	.600 (<LOD-1.30)	1072
Female	07-08	*	<LOD	<LOD	<LOD	.500 (.400-.500)	1041
Female	09-10	*	<LOD	<LOD	.200 (.100-.200)	.200 (.200-.300)	1158
Mexican American	99-00	*	<LOD	<LOD	.500 (<LOD-.900)	.900 (.500-1.30)	521
Mexican American	03-04	*	<LOD	<LOD	<LOD	.500 (<LOD-.900)	485
Mexican American	05-06	*	<LOD	<LOD	<LOD	.500 (<LOD-1.50)	499
Mexican American	07-08	*	<LOD	<LOD	<LOD	.500 (<LOD-.500)	391
Mexican American	09-10	*	<LOD	<LOD	.200 (.100-.200)	.200 (.200-.300)	461
Non-Hispanic Black	99-00	*	<LOD	<LOD	<LOD	.600 (<LOD-1.50)	269
Non-Hispanic Black	03-04	*	<LOD	<LOD	<LOD	<LOD	538
Non-Hispanic Black	05-06	*	<LOD	<LOD	<LOD	.500 (<LOD-1.80)	544
Non-Hispanic Black	07-08	*	<LOD	<LOD	<LOD	.600 (.400-.700)	419
Non-Hispanic Black	09-10	*	<LOD	<LOD	.100 (.100-.200)	.200 (.200-.200)	391
Non-Hispanic White	99-00	*	<LOD	<LOD	.500 (<LOD-.600)	.600 (.500-1.00)	491
Non-Hispanic White	03-04	*	<LOD	<LOD	<LOD	.300 (<LOD-.500)	962
Non-Hispanic White	05-06	*	<LOD	<LOD	<LOD	.800 (<LOD-2.10)	935
Non-Hispanic White	07-08	*	<LOD	<LOD	<LOD	.500 (.400-.700)	931
Non-Hispanic White	09-10	*	<LOD	<LOD	.200 (.100-.200)	.200 (.200-.300)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.4, 0.3, 0.4, 0.4, and 0.1 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluoroheptanoic acid (PFHpA) (2011 - 2014)

CAS Number 375-85-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	11-12	*	<LOD	<LOD	.140 (.120-.170)	.220 (.180-.260)	1904
Total population	13-14	*	<LOD	<LOD	.100 (<LOD-.100)	.200 (.100-.200)	2168
Age 12-19 years	11-12	*	<LOD	.100 (<LOD-.130)	.160 (.130-.200)	.190 (.160-.270)	344
Age 12-19 years	13-14	*	<LOD	<LOD	.200 (.100-.200)	.200 (.100-.600)	402
Age 20 + years	11-12	*	<LOD	<LOD	.140 (.120-.180)	.220 (.160-.280)	1560
Age 20 + years	13-14	*	<LOD	<LOD	.100 (<LOD-.100)	.100 (.100-.200)	1766
Male	11-12	*	<LOD	<LOD	.140 (.120-.200)	.220 (.180-.270)	966
Male	13-14	*	<LOD	<LOD	.100 (<LOD-.100)	.100 (.100-.200)	1032
Female	11-12	*	<LOD	<LOD	.140 (.110-.180)	.200 (.140-.360)	938
Female	13-14	*	<LOD	<LOD	.100 (<LOD-.100)	.200 (.100-.300)	1136
Mexican American	11-12	*	<LOD	<LOD	.130 (<LOD-.180)	.170 (.120-.230)	211
Mexican American	13-14	*	<LOD	<LOD	<LOD	.100 (<LOD-.300)	332
Non-Hispanic Black	11-12	*	<LOD	<LOD	.130 (.100-.150)	.180 (.140-.230)	485
Non-Hispanic Black	13-14	*	<LOD	<LOD	.100 (<LOD-.100)	.100 (<LOD-.200)	455
Non-Hispanic White	11-12	*	<LOD	<LOD	.150 (.120-.190)	.230 (.160-.290)	666
Non-Hispanic White	13-14	*	<LOD	<LOD	.100 (<LOD-.100)	.200 (.100-.200)	862
All Hispanic	11-12	*	<LOD	<LOD	.140 (.100-.180)	.190 (.160-.230)	406
All Hispanic	13-14	*	<LOD	<LOD	<LOD	.100 (<LOD-.300)	537
Non-Hispanic Asian	11-12	*	<LOD	<LOD	.160 (.120-.220)	.230 (.180-.310)	291
Non-Hispanic Asian	13-14	*	<LOD	<LOD	.100 (<LOD-.100)	.100 (.100-.200)	236

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.100 and 0.100 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.



## Serum Perfluoroheptanoic acid (PFHpA) (Special Sample of Serum PFAS in Children, 2013-2014)

CAS Number 375-85-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	*	<LOD	<LOD	.160 (.130-.190)	.230 (.170-.310)	525
Age 3-5 years	13-14	*	<LOD	.110 (<LOD-.170)	.230 (.140-.380)	.330 (.180-.580)	149
Age 6-11 years	13-14	*	<LOD	<LOD	.140 (<LOD-.170)	.170 (.130-.250)	376
Male	13-14	*	<LOD	<LOD	.150 (.100-.190)	.190 (.140-.310)	284
Female	13-14	*	<LOD	<LOD	.160 (.130-.250)	.260 (.160-.390)	241
All Hispanic	13-14	*	<LOD	.100 (<LOD-.130)	.170 (.110-.230)	.200 (.170-.250)	186
Other	13-14	*	<LOD	<LOD	.150 (.100-.250)	.230 (.150-.390)	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluorohexane sulfonic acid (PFHxS) (1999-2000, 2003-2010)

CAS Number 355-46-4

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	99-00	2.15 (1.92-2.41)	2.10 (1.80-2.30)	3.40 (3.10-4.10)	5.90 (5.20-7.00)	8.80 (7.00-10.0)	1432
Total population	03-04	1.93 (1.73-2.16)	1.90 (1.70-2.10)	3.30 (2.80-3.90)	5.90 (4.80-7.20)	8.30 (7.10-9.70)	2094
Total population	05-06	1.67 (1.42-1.98)	1.80 (1.50-2.10)	3.20 (2.60-4.00)	5.40 (4.40-7.10)	8.30 (5.80-11.9)	2120
Total population	07-08	1.95 (1.76-2.17)	2.00 (1.80-2.10)	3.50 (3.10-4.00)	5.90 (4.90-8.30)	9.80 (6.10-15.2)	2100
Total population	09-10	1.66 (1.51-1.82)	1.70 (1.50-1.90)	3.00 (2.60-3.30)	4.80 (4.40-5.30)	6.90 (5.90-7.60)	2233
Age 12-19 years	99-00	2.67 (2.11-3.39)	2.50 (2.00-3.70)	5.00 (3.40-6.60)	8.00 (5.70-13.2)	12.9 (6.60-15.6)	497
Age 12-19 years	03-04	2.44 (2.05-2.90)	2.40 (1.80-3.20)	4.90 (4.00-6.30)	9.50 (6.80-12.5)	13.3 (9.90-19.6)	640
Age 12-19 years	05-06	2.09 (1.74-2.52)	2.40 (2.00-2.90)	4.30 (3.70-5.40)	9.50 (6.40-13.1)	14.1 (9.80-17.8)	640
Age 12-19 years	07-08	2.40 (2.09-2.75)	2.30 (1.80-2.70)	4.30 (3.70-5.70)	9.90 (6.50-12.5)	15.9 (11.1-21.5)	357
Age 12-19 years	09-10	2.03 (1.77-2.33)	1.90 (1.60-2.10)	3.80 (3.20-4.20)	8.10 (6.30-9.70)	12.3 (8.60-19.0)	364
Age 20+ years	99-00	2.07 (1.86-2.32)	2.00 (1.80-2.30)	3.30 (3.00-3.80)	5.50 (5.00-5.90)	8.40 (6.70-9.60)	935
Age 20+ years	03-04	1.86 (1.67-2.08)	1.80 (1.60-2.10)	3.00 (2.60-3.60)	5.50 (4.50-6.70)	7.60 (6.30-9.40)	1454
Age 20+ years	05-06	1.62 (1.37-1.92)	1.70 (1.50-2.10)	3.10 (2.50-3.80)	5.20 (4.20-6.50)	7.20 (5.10-11.6)	1480
Age 20+ years	07-08	1.90 (1.69-2.13)	1.90 (1.70-2.10)	3.30 (2.90-3.90)	5.80 (4.50-8.00)	9.00 (5.60-15.0)	1743
Age 20+ years	09-10	1.61 (1.45-1.79)	1.70 (1.50-1.90)	2.90 (2.50-3.30)	4.50 (4.00-5.20)	6.00 (5.40-7.10)	1869
Male	99-00	2.66 (2.29-3.08)	2.60 (2.30-3.10)	4.10 (3.50-4.90)	6.70 (5.40-9.40)	10.5 (6.90-14.7)	684
Male	03-04	2.17 (1.87-2.51)	2.10 (1.80-2.40)	3.40 (2.80-4.50)	6.10 (4.60-8.10)	8.50 (6.50-10.5)	1053
Male	05-06	2.08 (1.76-2.45)	2.20 (1.80-2.70)	3.70 (3.20-4.60)	6.40 (4.80-9.30)	9.50 (6.70-13.7)	1048
Male	07-08	2.63 (2.36-2.94)	2.60 (2.40-2.80)	4.20 (3.80-4.90)	7.30 (5.50-11.0)	11.4 (7.10-18.1)	1059
Male	09-10	2.21 (1.99-2.46)	2.20 (1.90-2.50)	3.40 (3.00-4.00)	5.50 (5.00-6.40)	7.80 (6.50-9.90)	1075
Female	99-00	1.79 (1.55-2.07)	1.70 (1.40-2.10)	2.70 (2.30-3.70)	5.10 (4.10-6.70)	8.00 (5.70-9.50)	748
Female	03-04	1.72 (1.56-1.91)	1.60 (1.40-1.80)	2.90 (2.50-3.50)	5.80 (4.60-7.10)	8.20 (6.70-10.0)	1041
Female	05-06	1.37 (1.15-1.63)	1.50 (1.20-1.70)	2.80 (2.20-3.30)	4.60 (3.90-5.80)	6.60 (5.60-9.30)	1072
Female	07-08	1.46 (1.30-1.64)	1.40 (1.30-1.50)	2.60 (2.20-3.10)	4.70 (3.80-6.10)	7.50 (5.00-12.5)	1041
Female	09-10	1.26 (1.14-1.40)	1.30 (1.20-1.40)	2.20 (2.00-2.60)	4.00 (3.50-4.50)	5.40 (4.70-6.50)	1158
Mexican American	99-00	1.49 (1.12-1.97)	1.50 (1.00-2.00)	2.90 (1.80-3.90)	4.50 (3.20-9.30)	7.00 (4.50-9.50)	521
Mexican American	03-04	1.42 (1.17-1.72)	1.50 (1.20-1.70)	2.30 (1.90-2.90)	4.30 (3.10-5.10)	5.50 (4.00-8.90)	485
Mexican American	05-06	1.25 (.884-1.76)	1.60 (1.20-2.10)	2.80 (2.50-3.40)	4.30 (3.60-5.20)	6.00 (4.60-7.20)	499
Mexican American	07-08	1.65 (1.46-1.86)	1.70 (1.40-1.90)	3.00 (2.70-3.40)	5.00 (3.70-6.10)	6.70 (5.20-10.7)	391
Mexican American	09-10	1.01 (.835-1.22)	1.10 (.800-1.30)	1.80 (1.50-2.20)	3.10 (2.50-3.70)	4.00 (3.20-5.30)	461
Non-Hispanic Black	99-00	2.16 (1.65-2.83)	2.20 (1.40-2.90)	3.40 (2.60-4.80)	6.60 (4.10-11.0)	10.8 (5.80-14.7)	269
Non-Hispanic Black	03-04	1.92 (1.62-2.26)	1.90 (1.60-2.20)	3.50 (2.80-4.60)	6.00 (5.00-7.10)	8.30 (6.30-12.0)	538
Non-Hispanic Black	05-06	1.53 (1.13-2.07)	1.70 (1.40-2.20)	3.30 (2.50-4.10)	5.40 (3.90-7.50)	7.50 (5.30-11.0)	544
Non-Hispanic Black	07-08	1.98 (1.55-2.52)	2.10 (1.80-2.50)	3.90 (2.80-5.40)	7.90 (4.20-12.5)	11.1 (5.90-17.2)	419
Non-Hispanic Black	09-10	1.44 (1.26-1.64)	1.40 (1.20-1.70)	2.60 (2.10-3.00)	4.40 (3.80-5.20)	6.50 (4.60-8.20)	391
Non-Hispanic White	99-00	2.32 (2.08-2.59)	2.30 (1.90-2.60)	3.70 (3.20-4.30)	6.00 (5.40-7.00)	8.40 (7.00-9.70)	491
Non-Hispanic White	03-04	2.01 (1.77-2.27)	1.90 (1.70-2.20)	3.30 (2.80-4.10)	6.10 (4.70-7.80)	8.20 (6.90-10.1)	962
Non-Hispanic White	05-06	1.79 (1.48-2.17)	1.80 (1.50-2.20)	3.30 (2.70-4.30)	5.60 (4.60-8.20)	9.40 (6.10-13.1)	935
Non-Hispanic White	07-08	2.13 (1.89-2.41)	2.10 (1.80-2.40)	3.70 (3.20-4.20)	6.40 (5.30-9.00)	10.5 (6.50-15.6)	931
Non-Hispanic White	09-10	1.93 (1.77-2.10)	2.00 (1.80-2.20)	3.30 (2.90-3.70)	5.30 (4.80-5.60)	7.30 (6.20-8.80)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.1, 0.3, 0.1, 0.1, and 0.1 respectively.

## Serum Perfluorohexane sulfonic acid (PFHxS) (2011 - 2018)

CAS Number 355-46-4

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	11-12	1.28 (1.15-1.43)	1.27 (1.11-1.45)	2.26 (2.01-2.61)	3.85 (3.28-4.61)	5.44 (4.61-6.82)	1904
Total population	13-14	1.35 (1.20-1.52)	1.40 (1.20-1.60)	2.40 (2.20-2.70)	4.10 (3.60-4.80)	5.60 (4.70-7.10)	2168
Total population	15-16	1.18 (1.08-1.30)	1.20 (1.10-1.40)	2.10 (1.80-2.30)	3.40 (3.00-3.90)	4.90 (4.10-5.80)	1993
Total population	17-18	1.08 (.996-1.18)	1.10 (1.00-1.20)	1.90 (1.70-2.00)	3.00 (2.60-3.30)	3.70 (3.30-5.60)	1929
Age 12-19 years	11-12	1.28 (1.08-1.51)	1.13 (.920-1.45)	2.17 (1.53-2.79)	4.53 (2.76-5.72)	6.45 (4.21-9.34)	344
Age 12-19 years	13-14	1.27 (1.06-1.53)	1.10 (.900-1.40)	2.10 (1.50-2.90)	4.10 (2.50-6.30)	6.30 (4.00-9.40)	402
Age 12-19 years	15-16	.918 (.778-1.08)	.900 (.700-1.20)	1.50 (1.20-1.70)	2.30 (1.80-2.60)	3.10 (2.30-5.80)	353
Age 12-19 years	17-18	.866 (.732-1.02)	.800 (.700-1.00)	1.40 (1.00-1.90)	2.30 (1.90-3.00)	3.40 (2.40-4.60)	313
Age 20+ years	11-12	1.28 (1.14-1.43)	1.28 (1.13-1.47)	2.29 (2.02-2.62)	3.76 (3.17-4.61)	5.05 (4.61-6.44)	1560
Age 20+ years	13-14	1.36 (1.21-1.53)	1.40 (1.30-1.60)	2.50 (2.20-2.80)	4.10 (3.60-4.80)	5.50 (4.80-7.10)	1766
Age 20+ years	15-16	1.22 (1.11-1.34)	1.30 (1.20-1.40)	2.10 (1.80-2.50)	3.50 (3.00-4.20)	5.00 (4.10-6.20)	1640
Age 20+ years	17-18	1.11 (1.03-1.21)	1.20 (1.10-1.20)	1.90 (1.80-2.10)	3.00 (2.60-3.40)	3.80 (3.30-5.90)	1616
Male	11-12	1.68 (1.50-1.89)	1.73 (1.46-2.03)	2.75 (2.37-3.28)	4.46 (3.76-5.09)	6.90 (4.99-8.59)	966
Male	13-14	1.84 (1.59-2.12)	1.90 (1.60-2.10)	3.00 (2.50-3.40)	4.60 (4.00-5.70)	6.30 (5.20-8.80)	1032
Male	15-16	1.61 (1.46-1.78)	1.60 (1.50-1.70)	2.50 (2.20-2.90)	3.90 (3.30-5.00)	5.80 (4.40-6.40)	964
Male	17-18	1.48 (1.32-1.67)	1.50 (1.30-1.70)	2.20 (1.90-2.60)	3.40 (2.90-4.00)	5.10 (3.40-8.00)	952
Female	11-12	.989 (.876-1.12)	.970 (.880-1.07)	1.71 (1.39-2.05)	2.96 (2.23-4.28)	4.61 (3.00-5.61)	938
Female	13-14	1.01 (.909-1.12)	1.00 (.900-1.10)	1.80 (1.60-2.10)	3.40 (2.80-4.10)	4.90 (3.80-5.90)	1136
Female	15-16	.876 (.775-.990)	.900 (.800-1.00)	1.50 (1.40-1.70)	2.50 (2.10-3.50)	3.80 (2.90-5.70)	1029
Female	17-18	.805 (.747-.868)	.800 (.700-.900)	1.40 (1.20-1.50)	2.20 (2.10-2.50)	3.10 (2.40-3.70)	977
Mexican American	11-12	.927 (.771-1.12)	.980 (.690-1.28)	1.56 (1.22-2.06)	2.26 (1.95-2.54)	2.78 (2.26-4.78)	211
Mexican American	13-14	.973 (.866-1.09)	1.10 (1.00-1.10)	1.60 (1.40-1.80)	2.40 (2.10-2.70)	2.90 (2.60-4.30)	332
Mexican American	15-16	.900 (.710-1.14)	1.00 (.700-1.20)	1.60 (1.30-1.90)	2.50 (1.90-3.30)	3.40 (2.40-4.30)	370
Mexican American	17-18	.825 (.681-1.00)	.900 (.600-1.10)	1.30 (1.10-1.70)	2.00 (1.80-2.60)	2.90 (2.00-5.10)	297
Non-Hispanic Black	11-12	1.13 (1.03-1.23)	1.10 (1.01-1.22)	2.10 (1.84-2.35)	3.44 (2.86-4.15)	4.97 (3.68-6.89)	485
Non-Hispanic Black	13-14	1.16 (1.00-1.33)	1.20 (1.00-1.40)	2.20 (1.80-2.70)	3.60 (2.90-5.10)	5.60 (3.80-9.80)	455
Non-Hispanic Black	15-16	.997 (.794-1.25)	1.20 (.900-1.40)	2.00 (1.70-2.40)	3.20 (2.40-4.50)	4.50 (3.20-6.20)	439
Non-Hispanic Black	17-18	.959 (.824-1.12)	1.00 (.800-1.20)	1.80 (1.50-2.00)	2.90 (2.30-3.50)	3.80 (3.10-5.50)	430
Non-Hispanic White	11-12	1.46 (1.28-1.66)	1.41 (1.20-1.69)	2.50 (2.10-3.00)	4.30 (3.47-4.99)	5.62 (4.70-7.60)	666
Non-Hispanic White	13-14	1.53 (1.28-1.83)	1.50 (1.30-1.90)	2.70 (2.20-3.30)	4.80 (3.80-5.70)	5.90 (4.80-9.30)	862
Non-Hispanic White	15-16	1.32 (1.19-1.46)	1.30 (1.20-1.50)	2.20 (1.80-2.60)	3.50 (3.00-4.80)	5.80 (4.20-6.40)	619
Non-Hispanic White	17-18	1.21 (1.11-1.32)	1.30 (1.10-1.40)	2.10 (1.90-2.20)	3.10 (2.60-3.50)	4.00 (3.40-5.80)	667
All Hispanic	11-12	.904 (.737-1.11)	.950 (.730-1.23)	1.66 (1.36-2.06)	2.54 (2.06-3.15)	3.59 (2.52-5.42)	406
All Hispanic	13-14	1.00 (.875-1.14)	1.10 (1.00-1.20)	1.80 (1.50-2.00)	2.70 (2.20-3.60)	3.90 (2.90-4.50)	537
All Hispanic	15-16	.908 (.741-1.11)	1.00 (.800-1.20)	1.60 (1.30-2.00)	2.60 (1.90-3.60)	3.50 (2.50-5.40)	629
All Hispanic	17-18	.856 (.740-.990)	.900 (.700-1.00)	1.40 (1.20-1.70)	2.20 (1.70-3.20)	3.20 (2.10-5.30)	473
Non-Hispanic Asian	11-12	.942 (.791-1.12)	.980 (.820-1.20)	1.69 (1.41-1.94)	2.62 (2.13-3.50)	3.72 (2.75-5.98)	291
Non-Hispanic Asian	13-14	1.15 (.948-1.40)	1.20 (.900-1.60)	2.20 (1.70-2.70)	3.30 (2.60-4.20)	4.40 (3.30-5.90)	236
Non-Hispanic Asian	15-16	.946 (.821-1.09)	1.00 (.800-1.20)	1.70 (1.50-2.30)	2.90 (2.30-3.80)	3.80 (2.80-4.40)	220
Non-Hispanic Asian	17-18	.973 (.652-1.45)	.900 (.600-1.20)	1.60 (1.10-2.50)	3.00 (1.50-19.3)	9.50 (1.50-48.8)	257

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, 15-16, and 17-18 are 0.100, 0.100, 0.100, and 0.100 respectively.

## Serum Perfluorohexane sulfonic acid (PFHxS) (Special Sample of Serum PFAS in Children, 2013-2014)

CAS Number 355-46-4

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	.831 (.739-.934)	.790 (.670-.890)	1.22 (1.01-1.51)	2.22 (1.59-3.02)	3.56 (2.32-5.16)	525
Age 3-5 years	13-14	.707 (.600-.832)	.700 (.550-.880)	.990 (.830-1.24)	1.55 (1.04-1.80)	1.61 (1.55-3.66)	149
Age 6-11 years	13-14	.898 (.784-1.03)	.810 (.690-.940)	1.36 (1.03-1.84)	2.63 (1.84-4.59)	4.59 (2.32-7.64)	376
Male	13-14	.916 (.780-1.08)	.870 (.710-.990)	1.42 (1.23-1.55)	2.32 (1.59-3.73)	4.59 (2.29-6.91)	284
Female	13-14	.744 (.655-.846)	.720 (.600-.820)	.980 (.870-1.18)	1.84 (1.28-2.68)	3.04 (1.65-4.28)	241
All Hispanic	13-14	.778 (.693-.874)	.720 (.630-.800)	1.10 (.970-1.31)	1.91 (1.31-2.94)	2.81 (1.79-6.52)	186
Other	13-14	.849 (.738-.975)	.810 (.640-.940)	1.23 (.990-1.55)	2.22 (1.59-3.04)	3.66 (2.24-5.97)	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

## Serum Perfluorohexanoic acid (PFHxA) (2017 - 2018)

CAS Number 307-24-4

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	17-18	*	<LOD	<LOD	<LOD	<LOD	1672
Age 12-19 years	17-18	*	<LOD	<LOD	<LOD	<LOD	268
Age 20+ years	17-18	*	<LOD	<LOD	<LOD	<LOD	1404
Male	17-18	*	<LOD	<LOD	<LOD	<LOD	843
Female	17-18	*	<LOD	<LOD	<LOD	<LOD	829
Mexican American	17-18	*	<LOD	<LOD	<LOD	<LOD	258
Non-Hispanic Black	17-18	*	<LOD	<LOD	<LOD	<LOD	344
Non-Hispanic White	17-18	*	<LOD	<LOD	<LOD	<LOD	617
All Hispanic	17-18	*	<LOD	<LOD	<LOD	<LOD	414
Non-Hispanic Asian	17-18	*	<LOD	<LOD	<LOD	<LOD	208

Limit of detection (LOD, see Data Analysis section) for Survey year 17-18 is 0.1.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluorononanoic acid (PFNA) (1999-2000, 2003-2010)

CAS Number 375-95-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	99-00	.548 (.453-.663)	.600 (.500-.700)	.900 (.700-1.00)	1.30 (1.00-1.80)	1.80 (1.30-2.40)	1432
Total population	03-04	.966 (.816-1.14)	1.00 (.900-1.10)	1.50 (1.20-1.80)	2.30 (1.60-4.30)	3.20 (1.80-7.70)	2094
Total population	05-06	1.09 (.909-1.29)	1.10 (.900-1.20)	1.70 (1.30-2.10)	2.60 (1.80-4.20)	3.60 (2.50-5.70)	2120
Total population	07-08	1.22 (1.12-1.32)	1.23 (1.15-1.31)	1.72 (1.56-1.89)	2.62 (2.30-2.87)	3.28 (2.95-3.77)	2100
Total population	09-10	1.26 (1.11-1.44)	1.23 (1.07-1.31)	1.80 (1.48-2.13)	2.71 (1.97-4.26)	3.77 (2.30-7.22)	2233
Age 12-19 years	99-00	.470 (.400-.552)	.500 (.400-.600)	.700 (.600-.900)	.900 (.800-1.20)	1.20 (.900-1.40)	497
Age 12-19 years	03-04	.852 (.697-1.04)	.800 (.700-1.00)	1.20 (1.00-1.60)	1.90 (1.20-3.70)	2.80 (1.30-6.30)	640
Age 12-19 years	05-06	.929 (.782-1.10)	.900 (.800-1.10)	1.40 (1.10-1.80)	2.00 (1.60-2.70)	2.70 (2.10-3.40)	640
Age 12-19 years	07-08	1.16 (1.04-1.30)	1.15 (.980-1.31)	1.56 (1.31-1.97)	2.05 (1.64-2.71)	2.54 (2.13-3.28)	357
Age 12-19 years	09-10	1.10 (.950-1.27)	1.07 (.900-1.23)	1.48 (1.31-1.80)	2.21 (1.48-2.95)	2.62 (1.89-4.84)	364
Age 20+ years	99-00	.563 (.462-.687)	.600 (.500-.700)	.900 (.700-1.20)	1.30 (1.00-1.90)	1.80 (1.30-2.60)	935
Age 20+ years	03-04	.984 (.835-1.16)	1.00 (.900-1.10)	1.50 (1.20-1.80)	2.40 (1.60-4.40)	3.40 (1.80-8.40)	1454
Age 20+ years	05-06	1.11 (.929-1.33)	1.10 (1.00-1.20)	1.70 (1.30-2.20)	2.60 (1.80-4.40)	3.90 (2.50-5.80)	1480
Age 20+ years	07-08	1.23 (1.13-1.33)	1.23 (1.15-1.31)	1.72 (1.64-1.89)	2.62 (2.38-2.95)	3.36 (3.03-3.77)	1743
Age 20+ years	09-10	1.29 (1.13-1.47)	1.23 (1.15-1.39)	1.80 (1.56-2.21)	2.71 (1.97-4.67)	3.94 (2.38-8.36)	1869
Male	99-00	.609 (.511-.724)	.600 (.500-.700)	.900 (.800-1.10)	1.30 (1.10-1.80)	1.70 (1.30-2.50)	684
Male	03-04	1.09 (.912-1.30)	1.10 (.900-1.20)	1.60 (1.40-1.90)	2.40 (1.70-5.00)	4.00 (1.80-8.70)	1053
Male	05-06	1.19 (.993-1.43)	1.20 (1.00-1.30)	1.80 (1.40-2.50)	2.90 (1.80-4.60)	3.90 (2.50-6.70)	1048
Male	07-08	1.36 (1.27-1.47)	1.31 (1.23-1.39)	1.89 (1.72-2.05)	2.87 (2.54-3.12)	3.53 (3.12-4.18)	1059
Male	09-10	1.37 (1.17-1.59)	1.31 (1.15-1.48)	1.80 (1.56-2.30)	2.79 (1.89-4.84)	4.10 (2.21-12.1)	1075
Female	99-00	.500 (.404-.618)	.500 (.400-.600)	.800 (.600-1.00)	1.30 (.900-1.90)	1.80 (1.20-2.40)	748
Female	03-04	.861 (.721-1.03)	.900 (.800-1.00)	1.30 (1.00-1.70)	2.20 (1.40-3.40)	3.00 (1.70-6.10)	1041
Female	05-06	.992 (.833-1.18)	.900 (.800-1.10)	1.50 (1.20-1.90)	2.40 (1.70-3.50)	3.10 (2.10-5.70)	1072
Female	07-08	1.09 (.985-1.21)	1.07 (.980-1.23)	1.56 (1.48-1.72)	2.21 (1.97-2.54)	2.79 (2.54-3.53)	1041
Female	09-10	1.17 (1.05-1.31)	1.15 (.980-1.23)	1.72 (1.39-2.05)	2.62 (1.97-3.77)	3.53 (2.30-6.15)	1158
Mexican American	99-00	.343 (.294-.400)	.400 (.300-.400)	.500 (.400-.700)	.700 (.600-1.00)	1.00 (.700-1.60)	521
Mexican American	03-04	.689 (.586-.809)	.700 (.600-.900)	1.10 (.900-1.40)	1.60 (1.30-2.00)	2.00 (1.60-2.80)	485
Mexican American	05-06	.821 (.710-.951)	.800 (.700-.900)	1.20 (1.10-1.40)	1.60 (1.30-2.30)	2.30 (1.50-3.20)	499
Mexican American	07-08	1.10 (.967-1.25)	1.15 (.980-1.31)	1.56 (1.39-1.80)	2.13 (1.80-2.71)	2.71 (2.13-3.28)	391
Mexican American	09-10	.993 (.906-1.09)	.980 (.900-1.07)	1.39 (1.31-1.56)	2.05 (1.80-2.38)	2.46 (2.21-3.03)	461
Non-Hispanic Black	99-00	.780 (.615-.990)	.700 (.600-1.10)	1.30 (.800-1.80)	1.90 (1.40-2.50)	2.40 (1.80-3.00)	269
Non-Hispanic Black	03-04	1.14 (.834-1.54)	1.10 (.900-1.40)	1.70 (1.20-2.90)	3.20 (1.50-6.50)	4.70 (2.10-9.30)	538
Non-Hispanic Black	05-06	1.17 (.916-1.50)	1.20 (.900-1.40)	1.60 (1.30-2.50)	2.60 (1.70-5.60)	4.40 (2.40-8.20)	544
Non-Hispanic Black	07-08	1.35 (1.23-1.48)	1.39 (1.23-1.48)	1.89 (1.72-2.13)	2.79 (2.30-3.36)	3.36 (2.79-4.67)	419
Non-Hispanic Black	09-10	1.42 (1.29-1.56)	1.39 (1.23-1.56)	1.97 (1.80-2.30)	2.79 (2.38-3.36)	3.36 (2.62-4.84)	391
Non-Hispanic White	99-00	.560 (.464-.675)	.600 (.500-.700)	.900 (.700-1.10)	1.30 (1.00-1.80)	1.50 (1.20-2.40)	491
Non-Hispanic White	03-04	.963 (.826-1.12)	.900 (.900-1.10)	1.50 (1.20-1.70)	2.30 (1.60-3.60)	3.00 (1.80-6.20)	962
Non-Hispanic White	05-06	1.10 (.914-1.31)	1.10 (.900-1.20)	1.70 (1.30-2.10)	2.60 (1.80-4.20)	3.50 (2.40-5.70)	935
Non-Hispanic White	07-08	1.22 (1.10-1.34)	1.23 (1.15-1.31)	1.72 (1.48-1.89)	2.54 (2.13-3.03)	3.20 (2.79-3.85)	931
Non-Hispanic White	09-10	1.28 (1.08-1.51)	1.23 (1.07-1.39)	1.80 (1.48-2.21)	2.62 (1.80-5.08)	3.85 (2.05-10.8)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.1, 0.1, 0.1, 0.082, and 0.082 respectively.

## Serum Perfluorononanoic acid (PFNA) (2011 - 2018)

CAS Number 375-95-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	11-12	.881 (.801-.968)	.860 (.750-.960)	1.30 (1.13-1.45)	1.96 (1.68-2.21)	2.54 (2.28-2.89)	1904
Total population	13-14	.675 (.613-.742)	.700 (.600-.800)	1.00 (.900-1.20)	1.60 (1.40-1.70)	2.00 (1.80-2.30)	2168
Total population	15-16	.577 (.535-.623)	.600 (.500-.600)	.900 (.800-1.00)	1.40 (1.20-1.50)	1.90 (1.50-2.20)	1993
Total population	17-18	.411 (.364-.464)	.400 (.400-.500)	.700 (.600-.800)	1.00 (.900-1.20)	1.40 (1.10-1.80)	1929
Age 12-19 years	11-12	.741 (.638-.861)	.680 (.620-.810)	1.00 (.800-1.33)	1.67 (1.12-2.06)	2.06 (1.51-3.07)	344
Age 12-19 years	13-14	.599 (.492-.730)	.500 (.500-.600)	.800 (.600-1.30)	1.50 (.800-2.80)	2.00 (1.00-3.40)	402
Age 12-19 years	15-16	.481 (.440-.526)	.500 (.400-.600)	.700 (.600-.800)	1.00 (.800-1.20)	1.20 (1.00-1.30)	353
Age 12-19 years	17-18	.348 (.286-.424)	.400 (.300-.500)	.600 (.500-.700)	.900 (.700-1.20)	1.20 (.900-1.50)	313
Age 20+ years	11-12	.903 (.823-.992)	.890 (.800-.980)	1.34 (1.16-1.48)	2.00 (1.71-2.33)	2.64 (2.37-3.03)	1560
Age 20+ years	13-14	.685 (.625-.752)	.700 (.600-.800)	1.00 (1.00-1.20)	1.60 (1.40-1.70)	2.00 (1.80-2.30)	1766
Age 20+ years	15-16	.591 (.546-.640)	.600 (.500-.600)	.900 (.800-1.00)	1.40 (1.20-1.60)	1.90 (1.60-2.30)	1640
Age 20+ years	17-18	.419 (.371-.474)	.400 (.400-.500)	.700 (.600-.800)	1.00 (.900-1.20)	1.40 (1.10-2.00)	1616
Male	11-12	.946 (.836-1.07)	.930 (.810-1.09)	1.36 (1.18-1.52)	1.89 (1.61-2.37)	2.57 (2.14-3.12)	966
Male	13-14	.763 (.682-.854)	.800 (.700-.800)	1.10 (1.00-1.30)	1.70 (1.50-1.80)	2.20 (1.80-2.40)	1032
Male	15-16	.633 (.577-.693)	.600 (.600-.700)	1.00 (.900-1.10)	1.40 (1.20-1.60)	1.90 (1.60-2.20)	964
Male	17-18	.442 (.407-.480)	.500 (.400-.500)	.700 (.600-.800)	1.00 (.900-1.10)	1.10 (1.10-1.30)	952
Female	11-12	.824 (.762-.890)	.770 (.700-.870)	1.19 (1.00-1.44)	2.00 (1.69-2.28)	2.52 (2.20-2.76)	938
Female	13-14	.600 (.549-.657)	.600 (.500-.700)	.900 (.900-1.00)	1.50 (1.30-1.60)	1.90 (1.70-2.10)	1136
Female	15-16	.529 (.489-.572)	.500 (.500-.600)	.900 (.800-1.00)	1.30 (1.10-1.50)	1.80 (1.40-2.50)	1029
Female	17-18	.384 (.324-.453)	.400 (.300-.500)	.700 (.600-.800)	1.10 (1.00-1.40)	1.70 (1.20-3.00)	977
Mexican American	11-12	.810 (.631-1.04)	.790 (.580-1.10)	1.17 (.840-1.66)	1.74 (1.19-2.47)	2.36 (1.66-2.85)	211
Mexican American	13-14	.538 (.452-.641)	.500 (.500-.600)	.800 (.600-.900)	1.10 (.800-1.70)	1.60 (1.10-2.10)	332
Mexican American	15-16	.479 (.392-.585)	.500 (.400-.600)	.700 (.500-1.00)	1.10 (.800-1.60)	1.50 (1.10-2.00)	370
Mexican American	17-18	.287 (.222-.370)	.300 (.200-.400)	.500 (.400-.600)	.700 (.600-.800)	1.00 (.700-1.20)	297
Non-Hispanic Black	11-12	.939 (.842-1.05)	.950 (.870-1.00)	1.35 (1.18-1.59)	2.03 (1.60-3.03)	3.12 (1.89-5.08)	485
Non-Hispanic Black	13-14	.665 (.564-.783)	.700 (.600-.800)	1.10 (.900-1.30)	1.70 (1.30-2.10)	2.20 (1.80-2.50)	455
Non-Hispanic Black	15-16	.572 (.505-.648)	.600 (.500-.700)	.900 (.800-1.20)	1.50 (1.30-1.60)	1.80 (1.50-2.00)	439
Non-Hispanic Black	17-18	.387 (.322-.464)	.400 (.400-.500)	.700 (.600-.800)	1.10 (.900-1.20)	1.50 (1.20-1.80)	430
Non-Hispanic White	11-12	.864 (.766-.975)	.850 (.710-.980)	1.26 (1.04-1.45)	1.83 (1.54-2.21)	2.37 (2.00-3.14)	666
Non-Hispanic White	13-14	.699 (.621-.786)	.700 (.600-.800)	1.10 (1.00-1.20)	1.60 (1.40-1.80)	2.00 (1.70-2.40)	862
Non-Hispanic White	15-16	.576 (.533-.623)	.600 (.500-.600)	.900 (.800-1.00)	1.30 (1.10-1.50)	1.90 (1.40-2.30)	619
Non-Hispanic White	17-18	.437 (.386-.496)	.500 (.400-.500)	.700 (.700-.800)	1.10 (1.00-1.20)	1.40 (1.10-2.50)	667
All Hispanic	11-12	.850 (.699-1.03)	.840 (.660-1.00)	1.21 (.970-1.67)	1.99 (1.51-2.53)	2.53 (2.07-2.85)	406
All Hispanic	13-14	.549 (.484-.622)	.600 (.500-.600)	.800 (.700-.900)	1.10 (.900-1.50)	1.60 (1.20-2.10)	537
All Hispanic	15-16	.520 (.452-.599)	.500 (.500-.600)	.800 (.700-1.00)	1.20 (1.00-1.50)	1.60 (1.40-1.80)	629
All Hispanic	17-18	.325 (.265-.398)	.400 (.300-.400)	.500 (.500-.700)	.800 (.700-.900)	1.00 (.800-1.20)	473
Non-Hispanic Asian	11-12	1.18 (.996-1.40)	1.18 (.970-1.49)	1.94 (1.56-2.38)	2.96 (2.52-3.50)	3.72 (3.04-4.31)	291
Non-Hispanic Asian	13-14	.893 (.789-1.01)	.900 (.800-1.10)	1.50 (1.20-1.60)	2.20 (1.80-2.80)	3.10 (2.40-4.20)	236
Non-Hispanic Asian	15-16	.771 (.681-.873)	.800 (.700-.900)	1.30 (1.20-1.50)	2.10 (1.60-2.50)	2.60 (2.20-3.20)	220
Non-Hispanic Asian	17-18	.526 (.445-.621)	.500 (.400-.600)	1.00 (.800-1.20)	1.70 (1.20-2.20)	2.10 (1.80-2.40)	257

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, 15-16, and 17-18 are 0.082, 0.100, 0.100, and 0.100 respectively.

## Serum Perfluorononanoic acid (PFNA) (Special Sample of Serum PFAS in Children, 2013-2014)

CAS Number 375-95-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	.814 (.699-.949)	.720 (.620-.850)	1.11 (.930-1.41)	2.05 (1.34-3.74)	3.42 (1.92-5.35)	525
Age 3-5 years	13-14	.805 (.651-.996)	.680 (.540-.890)	1.18 (.890-1.69)	2.05 (1.36-5.35)	5.03 (1.41-8.09)	149
Age 6-11 years	13-14	.819 (.692-.969)	.770 (.640-.870)	1.07 (.920-1.34)	1.98 (1.13-3.85)	3.42 (1.50-5.58)	376
Male	13-14	.836 (.686-1.02)	.750 (.600-.870)	1.11 (.900-1.69)	2.47 (1.17-5.35)	4.72 (1.71-7.95)	284
Female	13-14	.791 (.667-.937)	.700 (.590-.890)	1.11 (.900-1.41)	1.98 (1.25-3.06)	2.66 (1.66-4.09)	241
All Hispanic	13-14	.751 (.633-.892)	.650 (.540-.760)	1.01 (.790-1.48)	1.98 (1.21-3.00)	2.71 (1.72-4.86)	186
Other	13-14	.836 (.700-.999)	.780 (.610-.900)	1.11 (.930-1.42)	2.13 (1.29-4.05)	3.47 (1.87-5.35)	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.



## Serum Perfluorooctanoic acid (PFOA) (1999-2000, 2003-2010)

CAS Number 335-67-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	99-00	5.22 (4.72-5.78)	5.20 (4.80-5.90)	7.00 (6.30-7.80)	9.60 (8.20-11.2)	11.9 (11.0-13.5)	1432
Total population	03-04	3.95 (3.65-4.27)	4.10 (3.80-4.40)	5.80 (5.30-6.40)	7.80 (6.70-9.60)	9.80 (7.40-14.1)	2094
Total population	05-06	3.92 (3.48-4.42)	4.20 (3.80-4.50)	6.20 (5.40-7.20)	9.00 (7.40-11.2)	11.3 (8.80-14.5)	2120
Total population	07-08	4.12 (4.01-4.24)	4.30 (4.20-4.50)	5.90 (5.70-6.20)	7.90 (7.50-8.30)	9.60 (8.90-10.1)	2100
Total population	09-10	3.07 (2.81-3.36)	3.20 (2.90-3.50)	4.60 (4.10-5.10)	6.00 (5.30-7.20)	7.50 (6.20-9.70)	2233
Age 12-19 years	99-00	5.50 (5.00-6.05)	5.60 (4.80-6.20)	6.90 (6.20-7.90)	9.50 (7.70-11.1)	11.6 (10.0-12.5)	497
Age 12-19 years	03-04	3.89 (3.47-4.35)	4.00 (3.50-4.50)	5.40 (4.60-6.10)	7.00 (5.60-9.20)	8.60 (5.90-12.6)	640
Age 12-19 years	05-06	3.59 (3.26-3.96)	3.80 (3.30-4.20)	5.40 (4.60-5.90)	6.90 (6.30-7.90)	8.40 (7.30-10.1)	640
Age 12-19 years	07-08	3.91 (3.71-4.12)	4.00 (3.70-4.40)	5.00 (4.70-5.50)	6.10 (5.70-6.70)	7.30 (6.20-8.00)	357
Age 12-19 years	09-10	2.74 (2.46-3.05)	2.90 (2.60-3.10)	3.80 (3.30-4.20)	4.80 (4.10-5.30)	5.00 (4.40-7.20)	364
Age 20+ years	99-00	5.18 (4.66-5.75)	5.20 (4.70-5.80)	7.00 (6.30-7.80)	9.60 (8.20-11.3)	12.1 (10.6-14.4)	935
Age 20+ years	03-04	3.96 (3.67-4.27)	4.10 (3.90-4.40)	5.90 (5.40-6.50)	7.80 (6.80-9.60)	9.90 (7.60-14.2)	1454
Age 20+ years	05-06	3.97 (3.51-4.49)	4.20 (3.80-4.60)	6.40 (5.40-7.50)	9.30 (7.40-11.9)	11.6 (9.00-14.8)	1480
Age 20+ years	07-08	4.15 (4.02-4.30)	4.30 (4.20-4.60)	6.10 (5.80-6.50)	8.10 (7.70-8.70)	9.80 (9.00-10.4)	1743
Age 20+ years	09-10	3.12 (2.84-3.43)	3.30 (3.00-3.60)	4.70 (4.20-5.30)	6.40 (5.40-7.50)	7.70 (6.30-10.2)	1869
Male	99-00	5.75 (5.20-6.36)	6.00 (5.40-6.50)	7.80 (6.90-8.70)	10.6 (8.80-11.9)	12.3 (11.2-13.2)	684
Male	03-04	4.47 (4.07-4.91)	4.60 (4.30-5.00)	6.30 (5.70-7.20)	8.40 (6.80-12.5)	10.7 (7.40-17.5)	1053
Male	05-06	4.69 (4.23-5.20)	4.90 (4.40-5.40)	7.20 (6.10-8.00)	9.90 (8.00-12.2)	12.2 (9.60-15.2)	1048
Male	07-08	4.80 (4.55-5.06)	4.90 (4.60-5.20)	6.70 (6.30-7.10)	8.70 (8.10-9.30)	10.1 (9.50-11.1)	1059
Male	09-10	3.53 (3.22-3.87)	3.70 (3.40-4.00)	4.90 (4.50-5.40)	6.80 (5.40-8.00)	7.90 (6.40-10.2)	1075
Female	99-00	4.80 (4.29-5.37)	4.70 (4.40-5.10)	6.30 (5.60-7.10)	8.30 (7.40-10.0)	11.3 (9.20-14.4)	748
Female	03-04	3.50 (3.21-3.82)	3.60 (3.30-3.90)	5.20 (4.70-5.80)	7.10 (6.30-8.20)	8.60 (7.40-10.6)	1041
Female	05-06	3.31 (2.89-3.79)	3.50 (3.10-4.00)	5.20 (4.40-6.00)	7.90 (6.10-9.70)	10.1 (7.50-14.2)	1072
Female	07-08	3.55 (3.38-3.73)	3.70 (3.50-3.90)	5.20 (4.80-5.60)	7.00 (6.50-7.50)	8.30 (7.20-9.90)	1041
Female	09-10	2.69 (2.45-2.96)	2.70 (2.50-3.00)	4.10 (3.60-4.70)	5.60 (5.10-6.50)	6.90 (5.80-8.40)	1158
Mexican American	99-00	3.87 (3.55-4.23)	4.20 (3.80-4.60)	5.90 (5.20-6.40)	7.70 (6.30-8.20)	8.20 (7.80-9.20)	521
Mexican American	03-04	3.11 (2.84-3.40)	3.30 (3.10-3.70)	4.50 (4.20-5.20)	6.70 (5.70-7.30)	7.60 (6.70-10.5)	485
Mexican American	05-06	2.62 (2.33-2.95)	2.80 (2.50-3.30)	4.30 (3.80-4.70)	5.80 (5.30-6.70)	7.40 (5.90-8.10)	499
Mexican American	07-08	3.54 (3.35-3.75)	3.80 (3.50-4.00)	5.20 (4.90-5.60)	6.60 (6.20-7.10)	7.60 (6.80-9.00)	391
Mexican American	09-10	2.26 (2.00-2.54)	2.40 (2.10-2.60)	3.60 (3.10-3.80)	4.60 (4.00-5.30)	5.40 (4.50-6.60)	461
Non-Hispanic Black	99-00	4.85 (4.20-5.59)	4.90 (4.10-5.90)	6.40 (5.90-7.50)	9.00 (7.30-11.5)	11.1 (9.20-13.5)	269
Non-Hispanic Black	03-04	3.37 (2.99-3.79)	3.70 (3.20-4.20)	5.20 (4.40-6.30)	7.70 (5.30-11.6)	9.60 (6.50-13.9)	538
Non-Hispanic Black	05-06	3.27 (2.61-4.08)	3.70 (3.00-4.20)	5.50 (4.40-6.80)	8.10 (6.00-11.3)	10.4 (7.80-12.3)	544
Non-Hispanic Black	07-08	3.86 (3.57-4.16)	4.00 (3.50-4.30)	5.90 (5.20-6.50)	7.80 (7.10-8.70)	9.20 (8.50-10.1)	419
Non-Hispanic Black	09-10	2.74 (2.47-3.04)	2.80 (2.60-3.00)	4.00 (3.70-4.40)	5.50 (5.00-6.20)	6.70 (5.60-9.40)	391
Non-Hispanic White	99-00	5.62 (5.04-6.27)	5.60 (4.90-6.20)	7.30 (6.50-8.30)	10.5 (8.30-12.9)	13.1 (11.0-15.6)	491
Non-Hispanic White	03-04	4.18 (3.85-4.53)	4.30 (3.90-4.70)	6.00 (5.50-6.70)	7.90 (7.20-9.20)	9.90 (7.60-13.3)	962
Non-Hispanic White	05-06	4.27 (3.80-4.81)	4.40 (4.00-5.00)	6.60 (5.60-7.80)	9.60 (7.40-12.2)	11.6 (8.80-14.8)	935
Non-Hispanic White	07-08	4.38 (4.20-4.56)	4.60 (4.30-4.70)	6.10 (5.80-6.60)	8.20 (7.80-8.80)	9.90 (9.30-10.6)	931
Non-Hispanic White	09-10	3.36 (3.06-3.69)	3.50 (3.20-3.90)	4.80 (4.40-5.40)	6.60 (5.40-7.80)	7.80 (6.20-10.5)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.1, 0.1, 0.1, 0.1, and 0.1 respectively.

## Serum Perfluorooctanoic acid (PFOA) (2011 - 2018)

### Sum of linear and branched PFOA isomers

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	11-12	2.08 (1.95-2.22)	2.08 (1.96-2.26)	3.03 (2.76-3.27)	4.35 (3.82-4.85)	5.68 (5.02-6.49)	1904
Total population	13-14	1.94 (1.76-2.15)	2.07 (1.87-2.20)	3.07 (2.67-3.37)	4.27 (3.57-5.17)	5.57 (4.60-6.27)	1954
Total population	15-16	1.56 (1.47-1.66)	1.57 (1.47-1.77)	2.47 (2.27-2.57)	3.37 (3.07-3.57)	4.17 (3.87-4.67)	1993
Total population	17-18	1.42 (1.33-1.52)	1.47 (1.37-1.57)	2.07 (1.97-2.30)	2.97 (2.77-3.37)	3.77 (3.17-5.07)	1929
Age 12-19 years	11-12	1.80 (1.71-1.91)	1.74 (1.67-1.89)	2.41 (2.17-2.62)	2.93 (2.68-3.19)	3.59 (2.93-4.25)	344
Age 12-19 years	13-14	1.67 (1.51-1.86)	1.67 (1.40-1.97)	2.20 (2.00-2.57)	2.87 (2.57-3.40)	3.47 (2.80-3.77)	348
Age 12-19 years	15-16	1.25 (1.14-1.37)	1.27 (1.17-1.47)	1.67 (1.47-1.87)	2.07 (1.77-2.57)	2.47 (2.07-2.97)	353
Age 12-19 years	17-18	1.18 (1.06-1.31)	1.17 (1.00-1.37)	1.67 (1.37-1.97)	2.07 (1.77-2.37)	2.37 (2.00-2.97)	313
Age 20+ years	11-12	2.12 (1.98-2.28)	2.16 (2.01-2.33)	3.15 (2.90-3.36)	4.64 (3.93-5.25)	5.94 (5.34-7.45)	1560
Age 20+ years	13-14	1.98 (1.79-2.20)	2.07 (1.97-2.27)	3.17 (2.77-3.47)	4.50 (3.70-5.37)	5.67 (4.70-6.40)	1606
Age 20+ years	15-16	1.60 (1.51-1.71)	1.67 (1.57-1.87)	2.47 (2.37-2.67)	3.47 (3.17-3.67)	4.27 (4.07-4.97)	1640
Age 20+ years	17-18	1.45 (1.35-1.56)	1.47 (1.37-1.57)	2.17 (1.97-2.37)	3.17 (2.77-3.57)	3.87 (3.27-5.17)	1616
Male	11-12	2.37 (2.22-2.53)	2.38 (2.26-2.56)	3.25 (3.00-3.56)	4.61 (4.11-5.02)	5.62 (4.85-6.20)	966
Male	13-14	2.28 (2.08-2.50)	2.30 (2.10-2.57)	3.27 (2.87-3.60)	4.67 (3.77-5.60)	5.67 (4.67-6.27)	931
Male	15-16	1.80 (1.66-1.94)	1.87 (1.67-2.07)	2.57 (2.40-2.67)	3.37 (3.07-3.67)	4.07 (3.67-4.87)	964
Male	17-18	1.61 (1.50-1.73)	1.57 (1.47-1.77)	2.17 (2.07-2.37)	3.17 (2.77-3.50)	3.77 (3.27-5.17)	952
Female	11-12	1.84 (1.68-2.01)	1.78 (1.62-1.98)	2.65 (2.34-3.14)	3.91 (3.36-4.99)	5.68 (4.33-8.45)	938
Female	13-14	1.67 (1.48-1.88)	1.67 (1.47-1.90)	2.67 (2.30-3.07)	3.77 (3.37-4.80)	5.07 (4.17-6.47)	1023
Female	15-16	1.36 (1.29-1.45)	1.37 (1.27-1.47)	2.17 (1.97-2.47)	3.37 (2.87-3.67)	4.17 (3.67-4.97)	1029
Female	17-18	1.26 (1.17-1.36)	1.27 (1.17-1.37)	1.97 (1.77-2.20)	2.97 (2.57-3.37)	3.77 (2.97-5.07)	977
Mexican American	11-12	1.66 (1.37-2.02)	1.71 (1.32-2.23)	2.43 (1.98-2.98)	3.38 (2.43-4.48)	4.08 (2.98-6.15)	211
Mexican American	13-14	1.37 (1.25-1.50)	1.37 (1.27-1.47)	1.97 (1.80-2.20)	2.70 (2.40-3.17)	3.17 (2.60-3.97)	297
Mexican American	15-16	1.14 (1.01-1.28)	1.17 (1.07-1.27)	1.67 (1.47-1.87)	2.47 (1.87-2.97)	2.77 (2.20-4.67)	370
Mexican American	17-18	1.11 (.967-1.27)	1.17 (.870-1.37)	1.57 (1.37-1.87)	2.17 (1.87-2.37)	2.80 (2.37-4.20)	297
Non-Hispanic Black	11-12	1.80 (1.71-1.90)	1.94 (1.76-2.09)	2.82 (2.65-2.95)	3.94 (3.51-4.40)	5.11 (4.40-5.79)	485
Non-Hispanic Black	13-14	1.50 (1.31-1.73)	1.67 (1.27-1.97)	2.57 (2.07-2.97)	3.60 (3.07-4.47)	4.60 (3.30-5.90)	389
Non-Hispanic Black	15-16	1.36 (1.21-1.53)	1.37 (1.27-1.57)	2.17 (1.97-2.57)	3.37 (2.77-3.77)	4.07 (3.57-5.27)	439
Non-Hispanic Black	17-18	1.18 (1.08-1.30)	1.27 (1.07-1.47)	1.77 (1.67-1.97)	2.70 (2.27-2.97)	3.37 (2.77-4.27)	430
Non-Hispanic White	11-12	2.25 (2.05-2.47)	2.25 (1.98-2.48)	3.21 (2.90-3.50)	4.68 (3.95-5.35)	6.20 (5.34-7.74)	666
Non-Hispanic White	13-14	2.20 (1.91-2.53)	2.27 (1.97-2.67)	3.37 (2.77-3.77)	4.77 (3.77-5.70)	5.77 (4.80-6.80)	805
Non-Hispanic White	15-16	1.69 (1.57-1.82)	1.77 (1.57-1.97)	2.57 (2.47-2.67)	3.47 (3.17-3.67)	4.47 (3.87-5.17)	619
Non-Hispanic White	17-18	1.54 (1.41-1.69)	1.57 (1.37-1.77)	2.27 (2.07-2.47)	3.17 (2.77-3.67)	3.77 (3.07-5.47)	667
All Hispanic	11-12	1.70 (1.48-1.95)	1.79 (1.59-1.95)	2.46 (2.15-2.91)	3.60 (2.95-4.48)	4.70 (3.87-5.94)	406
All Hispanic	13-14	1.46 (1.33-1.61)	1.47 (1.37-1.67)	2.10 (1.90-2.47)	3.07 (2.60-3.17)	3.57 (3.17-3.97)	488
All Hispanic	15-16	1.25 (1.14-1.36)	1.27 (1.17-1.47)	1.87 (1.67-2.20)	2.67 (2.37-3.07)	3.17 (2.77-4.17)	629
All Hispanic	17-18	1.19 (1.07-1.32)	1.27 (1.07-1.37)	1.67 (1.47-1.87)	2.37 (2.07-2.67)	2.97 (2.50-4.37)	473
Non-Hispanic Asian	11-12	2.08 (1.83-2.36)	2.21 (2.04-2.27)	2.92 (2.55-3.45)	4.66 (3.42-5.79)	5.79 (4.93-8.91)	291
Non-Hispanic Asian	13-14	2.03 (1.77-2.33)	1.97 (1.70-2.37)	3.07 (2.57-4.07)	4.77 (4.17-5.77)	5.90 (5.00-6.40)	203
Non-Hispanic Asian	15-16	1.66 (1.42-1.94)	1.77 (1.37-2.07)	2.37 (2.17-2.87)	3.77 (2.97-4.47)	4.77 (3.87-7.57)	220
Non-Hispanic Asian	17-18	1.65 (1.38-1.97)	1.50 (1.37-1.77)	2.67 (2.07-3.40)	4.67 (2.57-9.87)	6.77 (3.40-17.0)	257

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.1.

‡See Calculation of PFOS and PFOA as the Sum of Isomers for additional information about Survey years 2013-2014, 2015-2016, and 2017-2018.

## Serum estimated PFOA (total) (Special Sample of Serum PFAS in Children, 2013-2014)

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	1.96 (1.76-2.17)	1.95 (1.67-2.23)	2.70 (2.42-3.10)	3.69 (3.27-4.14)	4.23 (3.84-5.47)	525
Age 3-5 years	13-14	2.04 (1.77-2.36)	1.82 (1.64-2.40)	3.23 (2.70-3.52)	4.22 (2.88-5.86)	5.86 (3.28-7.02)	149
Age 6-11 years	13-14	1.92 (1.73-2.12)	1.97 (1.69-2.18)	2.56 (2.25-2.91)	3.38 (2.97-3.84)	3.99 (3.53-4.14)	376
Male	13-14	1.94 (1.74-2.17)	1.88 (1.62-2.19)	2.71 (2.19-3.38)	3.72 (3.28-4.14)	4.14 (3.46-5.86)	284
Female	13-14	1.97 (1.74-2.24)	2.00 (1.71-2.27)	2.68 (2.35-2.97)	3.60 (2.88-4.22)	4.24 (3.17-7.02)	241
All Hispanic	13-14	1.73 (1.56-1.92)	1.69 (1.55-1.94)	2.32 (2.05-2.67)	2.95 (2.52-3.41)	3.41 (2.83-4.01)	186
Other	13-14	2.04 (1.80-2.30)	2.04 (1.71-2.42)	2.87 (2.51-3.28)	3.99 (3.28-5.15)	5.15 (3.72-5.86)	339

\* See Calculation of PFOS and PFOA as the Sum of Isomers for additional information about Survey years 2013-2014.

## Serum n-Perfluorooctanoic acid (n-PFOA) (2013 - 2018)

CAS Number 335-67-1

Linear PFOA isomer

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	1.83 (1.65-2.03)	1.90 (1.80-2.10)	2.90 (2.60-3.30)	4.10 (3.40-5.10)	5.40 (4.60-6.00)	1954
Total population	15-16	1.46 (1.37-1.56)	1.50 (1.40-1.70)	2.40 (2.20-2.50)	3.30 (3.00-3.50)	4.10 (3.80-4.60)	1993
Total population	17-18	1.32 (1.23-1.42)	1.40 (1.30-1.50)	2.00 (1.90-2.20)	2.90 (2.70-3.30)	3.70 (3.10-5.00)	1929
Age 12-19 years	13-14	1.58 (1.42-1.76)	1.60 (1.30-1.90)	2.10 (1.90-2.50)	2.70 (2.30-3.40)	3.40 (2.70-4.80)	348
Age 12-19 years	15-16	1.17 (1.06-1.28)	1.20 (1.10-1.40)	1.60 (1.40-1.80)	2.00 (1.70-2.50)	2.40 (2.00-2.90)	353
Age 12-19 years	17-18	1.09 (.976-1.22)	1.10 (.900-1.30)	1.60 (1.30-1.80)	2.00 (1.70-2.30)	2.30 (1.90-2.90)	313
Age 20+ years	13-14	1.87 (1.67-2.08)	2.00 (1.80-2.20)	3.00 (2.70-3.30)	4.40 (3.60-5.10)	5.40 (4.60-6.20)	1606
Age 20+ years	15-16	1.50 (1.41-1.61)	1.60 (1.50-1.80)	2.40 (2.30-2.60)	3.40 (3.10-3.60)	4.20 (4.00-4.90)	1640
Age 20+ years	17-18	1.36 (1.26-1.46)	1.40 (1.30-1.50)	2.10 (1.90-2.30)	3.10 (2.70-3.50)	3.80 (3.20-5.10)	1616
Male	13-14	2.17 (1.97-2.39)	2.20 (2.00-2.50)	3.20 (2.80-3.50)	4.60 (3.60-5.40)	5.50 (4.60-6.00)	931
Male	15-16	1.70 (1.56-1.86)	1.80 (1.60-2.00)	2.50 (2.30-2.60)	3.30 (3.00-3.60)	4.00 (3.60-4.80)	964
Male	17-18	1.51 (1.40-1.63)	1.50 (1.40-1.70)	2.10 (2.00-2.30)	3.00 (2.70-3.40)	3.70 (3.20-5.10)	952
Female	13-14	1.56 (1.37-1.76)	1.60 (1.40-1.80)	2.60 (2.20-2.90)	3.70 (3.30-4.70)	4.80 (3.90-6.70)	1023
Female	15-16	1.26 (1.18-1.35)	1.30 (1.20-1.40)	2.10 (1.90-2.40)	3.30 (2.80-3.60)	4.10 (3.60-4.90)	1029
Female	17-18	1.17 (1.08-1.26)	1.20 (1.10-1.30)	1.90 (1.70-2.10)	2.80 (2.50-3.30)	3.70 (2.90-5.00)	977
Mexican American	13-14	1.28 (1.16-1.41)	1.30 (1.20-1.40)	1.90 (1.80-2.10)	2.60 (2.30-3.10)	3.10 (2.50-3.80)	297
Mexican American	15-16	1.04 (.918-1.19)	1.10 (1.00-1.20)	1.60 (1.40-1.80)	2.40 (1.80-2.90)	2.70 (2.10-4.60)	370
Mexican American	17-18	1.01 (.869-1.18)	1.10 (.800-1.30)	1.50 (1.20-1.80)	2.10 (1.80-2.30)	2.50 (2.20-4.30)	297
Non-Hispanic Black	13-14	1.39 (1.19-1.61)	1.60 (1.20-1.90)	2.50 (2.00-2.80)	3.50 (2.90-4.40)	4.40 (3.20-5.70)	389
Non-Hispanic Black	15-16	1.26 (1.11-1.43)	1.30 (1.20-1.50)	2.10 (1.90-2.50)	3.30 (2.70-3.70)	3.90 (3.40-5.20)	439
Non-Hispanic Black	17-18	1.08 (.974-1.20)	1.20 (1.00-1.30)	1.70 (1.60-1.90)	2.60 (2.20-2.90)	3.30 (2.70-4.20)	430
Non-Hispanic White	13-14	2.08 (1.80-2.41)	2.20 (1.90-2.60)	3.20 (2.70-3.60)	4.60 (3.60-5.60)	5.60 (4.60-6.70)	805
Non-Hispanic White	15-16	1.59 (1.46-1.73)	1.70 (1.50-1.90)	2.50 (2.40-2.60)	3.40 (3.10-3.60)	4.40 (3.80-5.10)	619
Non-Hispanic White	17-18	1.45 (1.32-1.59)	1.50 (1.30-1.70)	2.20 (2.00-2.40)	3.10 (2.70-3.60)	3.70 (3.00-5.40)	667
All Hispanic	13-14	1.37 (1.23-1.52)	1.40 (1.30-1.60)	2.00 (1.80-2.30)	2.90 (2.50-3.20)	3.40 (3.10-3.80)	488
All Hispanic	15-16	1.15 (1.05-1.27)	1.20 (1.10-1.40)	1.80 (1.60-2.10)	2.60 (2.30-3.00)	3.10 (2.70-4.10)	629
All Hispanic	17-18	1.09 (.970-1.24)	1.20 (1.00-1.30)	1.60 (1.40-1.80)	2.30 (2.00-2.60)	2.90 (2.40-4.30)	473
Non-Hispanic Asian	13-14	1.92 (1.67-2.22)	1.90 (1.60-2.30)	3.00 (2.50-3.90)	4.70 (4.10-5.70)	5.70 (4.70-6.30)	203
Non-Hispanic Asian	15-16	1.57 (1.32-1.85)	1.70 (1.30-2.00)	2.30 (2.10-2.80)	3.70 (2.90-4.40)	4.70 (3.80-7.50)	220
Non-Hispanic Asian	17-18	1.54 (1.29-1.85)	1.40 (1.30-1.80)	2.60 (1.90-3.20)	4.60 (2.50-9.80)	6.70 (3.20-16.9)	257

Limit of detection (LOD, see Data Analysis section) for Survey years 13-14, 15-16, and 17-18 are 0.1, 0.1, and 0.1, respectively.

## Serum n-Perfluorooctanoic acid (n-PFOA) (Special Sample of Serum PFAS in Children, 2013-2014)

CAS Number 335-67-1

Linear PFOA isomer

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	1.85 (1.66-2.06)	1.83 (1.57-2.13)	2.60 (2.34-2.92)	3.61 (3.13-4.07)	4.15 (3.62-5.32)	525
Age 3-5 years	13-14	1.91 (1.64-2.24)	1.72 (1.53-2.25)	3.05 (2.50-3.53)	4.15 (2.81-5.79)	5.79 (3.21-6.51)	149
Age 6-11 years	13-14	1.81 (1.63-2.02)	1.84 (1.60-2.11)	2.49 (2.19-2.80)	3.25 (2.84-3.72)	3.77 (3.46-3.97)	376
Male	13-14	1.83 (1.63-2.05)	1.76 (1.49-2.11)	2.64 (2.12-3.30)	3.64 (3.21-4.07)	4.07 (3.39-5.79)	284
Female	13-14	1.87 (1.64-2.13)	1.91 (1.63-2.18)	2.58 (2.23-2.81)	3.53 (2.81-4.12)	4.15 (2.92-6.51)	241
All Hispanic	13-14	1.63 (1.47-1.82)	1.61 (1.45-1.84)	2.25 (1.95-2.59)	2.88 (2.41-3.34)	3.34 (2.76-3.94)	186
Other	13-14	1.92 (1.69-2.18)	1.96 (1.63-2.31)	2.77 (2.35-3.21)	3.77 (3.21-4.15)	4.80 (3.64-5.79)	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

## Serum branched Perfluorooctanoic acid (Sb-PFOA) (2013 - 2018)

### Branched isomers of PFOA

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	*	<LOD	<LOD	.100 (.100-.200)	.200 (.200-.300)	1954
Total population	15-16	*	<LOD	<LOD	<LOD	<LOD	1993
Total population	17-18	*	<LOD	<LOD	<LOD	.200 (<LOD-.200)	1929
Age 12-19 years	13-14	*	<LOD	.100 (<LOD-.100)	.200 (.100-.200)	.200 (.100-.400)	348
Age 12-19 years	15-16	*	<LOD	<LOD	<LOD	<LOD	353
Age 12-19 years	17-18	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (<LOD-.300)	313
Age 20+ years	13-14	*	<LOD	<LOD	.100 (.100-.200)	.200 (.200-.300)	1606
Age 20+ years	15-16	*	<LOD	<LOD	<LOD	<LOD	1640
Age 20+ years	17-18	*	<LOD	<LOD	<LOD	.200 (<LOD-.200)	1616
Male	13-14	*	<LOD	<LOD	.200 (.100-.200)	.200 (.200-.400)	931
Male	15-16	*	<LOD	<LOD	<LOD	<LOD	964
Male	17-18	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (<LOD-.300)	952
Female	13-14	*	<LOD	<LOD	.100 (.100-.200)	.200 (.200-.300)	1023
Female	15-16	*	<LOD	<LOD	<LOD	<LOD	1029
Female	17-18	*	<LOD	<LOD	<LOD	.100 (<LOD-.200)	977
Mexican American	13-14	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (<LOD-.200)	297
Mexican American	15-16	*	<LOD	<LOD	<LOD	<LOD	370
Mexican American	17-18	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (<LOD-.200)	297
Non-Hispanic Black	13-14	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (.100-.300)	389
Non-Hispanic Black	15-16	*	<LOD	<LOD	<LOD	<LOD	439
Non-Hispanic Black	17-18	*	<LOD	<LOD	<LOD	.100 (<LOD-.200)	430
Non-Hispanic White	13-14	*	<LOD	<LOD	.200 (.100-.200)	.200 (.200-.500)	805
Non-Hispanic White	15-16	*	<LOD	<LOD	<LOD	<LOD	619
Non-Hispanic White	17-18	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (<LOD-.300)	667
All Hispanic	13-14	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (.100-.300)	488
All Hispanic	15-16	*	<LOD	<LOD	<LOD	<LOD	629
All Hispanic	17-18	*	<LOD	<LOD	<LOD	.100 (<LOD-.200)	473
Non-Hispanic Asian	13-14	*	<LOD	<LOD	.200 (<LOD-.300)	.200 (<LOD-.300)	203
Non-Hispanic Asian	15-16	*	<LOD	<LOD	<LOD	<LOD	220
Non-Hispanic Asian	17-18	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (<LOD-.600)	257

Limit of detection (LOD, see Data Analysis section) for Survey years 13-14, 15-16, and 17-18 are 0.1, 0.1, and 0.1, respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum branched Perfluorooctanoic acid (Sb-PFOA) (Special Sample of Serum PFAS in Children, 2013-2014)

### Branched PFOA isomers

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	*	<LOD	.100 (<LOD-.140)	.170 (.150-.220)	.230 (.180-.360)	525
Age 3-5 years	13-14	*	<LOD	.100 (<LOD-.160)	.200 (.120-.320)	.280 (.200-.510)	149
Age 6-11 years	13-14	*	<LOD	.100 (<LOD-.120)	.160 (.130-.220)	.230 (.160-.340)	376
Male	13-14	*	<LOD	.110 (<LOD-.130)	.200 (.160-.200)	.220 (.200-.310)	284
Female	13-14	*	<LOD	.100 (<LOD-.150)	.160 (.110-.340)	.230 (.150-.510)	241
All Hispanic	13-14	*	<LOD	.100 (<LOD-.110)	.150 (.120-.170)	.200 (.150-.220)	186
Other	13-14	*	<LOD	.100 (<LOD-.160)	.190 (.150-.230)	.250 (.180-.470)	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluorooctane sulfonic acid (PFOS) (1999-2000, 2003-2010)

CAS Number 1763-23-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	99-00	30.3 (27.1-33.9)	30.2 (27.8-33.9)	43.8 (37.5-47.6)	56.8 (50.2-70.0)	75.7 (58.9-97.5)	1432
Total population	03-04	20.7 (19.2-22.3)	21.2 (19.8-22.4)	30.0 (27.5-33.0)	41.3 (35.6-50.0)	54.6 (44.0-66.5)	2094
Total population	05-06	17.1 (16.0-18.2)	17.5 (16.8-18.6)	27.2 (24.9-29.6)	39.4 (34.9-43.1)	47.5 (42.7-56.8)	2120
Total population	07-08	13.2 (12.2-14.2)	13.6 (12.8-14.7)	21.0 (18.9-23.3)	32.6 (29.4-36.3)	40.5 (35.4-47.4)	2100
Total population	09-10	9.32 (8.13-10.7)	9.70 (8.50-10.8)	14.8 (12.9-17.3)	23.7 (18.3-30.2)	32.0 (22.6-48.5)	2233
Age 12-19 years	99-00	29.0 (26.1-32.3)	29.5 (26.9-34.2)	38.1 (35.9-43.8)	52.7 (45.3-56.6)	57.6 (52.7-70.0)	497
Age 12-19 years	03-04	19.3 (17.5-21.4)	19.9 (17.8-22.0)	27.1 (23.7-30.2)	36.5 (28.6-45.6)	42.6 (35.1-52.1)	640
Age 12-19 years	05-06	15.0 (14.3-15.7)	14.9 (13.6-16.6)	22.7 (19.7-24.9)	30.6 (27.8-34.1)	38.5 (33.0-44.6)	640
Age 12-19 years	07-08	11.3 (10.3-12.3)	11.3 (10.3-13.0)	15.9 (15.1-17.7)	21.7 (17.7-28.2)	28.0 (22.0-32.2)	357
Age 12-19 years	09-10	6.84 (5.81-8.06)	6.90 (6.00-8.40)	10.7 (8.90-12.5)	14.4 (12.4-18.1)	18.1 (13.5-26.0)	364
Age 20+ years	99-00	30.6 (27.1-34.4)	30.3 (27.9-33.9)	44.7 (38.1-48.4)	57.5 (50.4-75.5)	78.0 (60.4-108)	935
Age 20+ years	03-04	20.9 (19.3-22.5)	21.4 (19.8-22.8)	30.4 (28.1-33.0)	42.7 (35.7-53.3)	57.8 (45.7-69.4)	1454
Age 20+ years	05-06	17.4 (16.2-18.7)	18.0 (17.1-19.4)	27.8 (25.3-30.8)	40.2 (35.6-44.5)	49.6 (42.8-60.7)	1480
Age 20+ years	07-08	13.5 (12.4-14.6)	14.0 (13.0-15.5)	21.7 (19.5-24.6)	33.9 (29.9-39.0)	42.8 (37.3-50.3)	1743
Age 20+ years	09-10	9.72 (8.45-11.2)	10.1 (8.90-11.2)	15.7 (13.4-18.4)	25.3 (19.3-32.9)	34.1 (23.4-52.7)	1869
Male	99-00	33.5 (29.7-37.7)	35.0 (31.5-38.1)	46.4 (41.0-51.9)	58.4 (50.2-76.5)	75.3 (56.9-108)	684
Male	03-04	23.2 (21.1-25.6)	23.9 (22.4-25.5)	32.2 (28.8-35.9)	45.3 (35.5-62.7)	62.7 (43.8-81.8)	1053
Male	05-06	20.5 (19.4-21.8)	21.3 (20.0-22.5)	31.4 (27.9-33.7)	43.3 (38.7-49.7)	54.3 (43.5-80.7)	1048
Male	07-08	16.3 (15.0-17.7)	17.0 (15.7-17.8)	23.9 (21.6-26.9)	36.4 (33.5-41.1)	45.3 (40.4-53.1)	1059
Male	09-10	11.5 (9.93-13.3)	11.8 (10.6-12.9)	16.8 (14.3-20.4)	25.7 (19.4-39.7)	37.4 (22.5-72.3)	1075
Female	99-00	27.8 (24.4-31.7)	27.8 (24.1-30.2)	38.7 (32.3-46.3)	55.4 (46.5-72.6)	75.7 (55.5-98.4)	748
Female	03-04	18.4 (17.0-20.0)	18.2 (16.9-19.8)	27.4 (23.8-30.2)	39.8 (34.4-42.6)	46.6 (42.3-61.5)	1041
Female	05-06	14.4 (13.3-15.4)	14.6 (13.5-15.9)	23.3 (21.1-25.3)	34.2 (30.6-37.7)	42.8 (38.0-46.5)	1072
Female	07-08	10.7 (9.70-11.7)	10.7 (9.80-11.7)	17.2 (15.4-19.1)	28.7 (21.7-32.5)	33.6 (29.9-41.6)	1041
Female	09-10	7.65 (6.73-8.71)	7.80 (6.70-9.00)	12.0 (10.8-14.4)	21.1 (16.4-26.9)	28.8 (22.3-34.1)	1158
Mexican American	99-00	22.7 (19.6-26.3)	24.1 (20.4-27.8)	33.1 (27.8-39.7)	43.5 (36.1-57.5)	56.6 (40.5-81.5)	521
Mexican American	03-04	14.7 (13.0-16.6)	15.9 (13.4-17.9)	21.2 (18.7-23.5)	28.1 (24.1-35.0)	35.5 (28.9-38.5)	485
Mexican American	05-06	11.2 (10.3-12.2)	11.6 (9.90-13.3)	17.2 (15.4-19.3)	24.9 (22.0-30.3)	31.9 (26.4-40.6)	499
Mexican American	07-08	10.6 (9.47-11.9)	10.8 (9.70-12.2)	17.1 (14.9-19.2)	26.3 (20.7-30.4)	31.5 (25.7-36.1)	391
Mexican American	09-10	6.23 (5.28-7.36)	6.10 (5.10-8.10)	11.2 (8.50-14.1)	16.8 (14.9-18.8)	20.4 (17.5-22.7)	461
Non-Hispanic Black	99-00	33.1 (26.5-41.5)	32.0 (24.9-46.7)	51.4 (37.4-62.9)	68.7 (60.4-74.0)	78.3 (70.7-108)	269
Non-Hispanic Black	03-04	21.6 (19.1-24.4)	22.1 (19.6-24.9)	32.3 (28.1-36.2)	43.8 (37.2-57.3)	57.7 (43.8-78.4)	538
Non-Hispanic Black	05-06	18.4 (15.6-21.8)	19.0 (16.7-22.3)	27.6 (24.3-35.5)	45.9 (34.4-58.1)	57.9 (45.0-84.4)	544
Non-Hispanic Black	07-08	15.0 (12.6-17.8)	15.2 (12.9-17.7)	25.8 (21.0-33.3)	42.7 (31.5-57.3)	57.3 (43.4-79.2)	419
Non-Hispanic Black	09-10	9.11 (7.93-10.5)	9.50 (8.20-11.2)	16.0 (13.4-17.4)	23.0 (20.5-26.1)	28.7 (25.7-39.7)	391
Non-Hispanic White	99-00	32.1 (29.4-35.1)	32.7 (29.5-35.8)	45.3 (40.4-47.6)	56.3 (51.7-67.0)	75.7 (57.1-98.4)	491
Non-Hispanic White	03-04	21.4 (19.9-23.1)	22.0 (20.5-23.0)	30.2 (27.7-33.3)	41.7 (35.7-49.6)	56.3 (44.0-70.0)	962
Non-Hispanic White	05-06	18.1 (17.1-19.1)	18.6 (17.3-19.8)	28.3 (26.1-30.8)	39.7 (35.6-43.3)	46.6 (42.7-54.3)	935
Non-Hispanic White	07-08	13.7 (12.7-14.8)	14.3 (13.2-15.5)	21.1 (18.7-23.7)	32.9 (29.7-36.0)	40.4 (36.1-44.9)	931
Non-Hispanic White	09-10	10.2 (8.69-11.9)	10.4 (9.20-11.5)	15.6 (13.0-18.7)	24.7 (17.5-35.1)	33.1 (20.7-56.7)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.4, 0.2, 0.2, and 0.2 respectively.



## Serum Perfluorooctane sulfonic acid (PFOS) (2011 - 2018)

### Sum of linear and branched PFOS isomers

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	11-12	6.31 (5.84-6.82)	6.53 (5.99-7.13)	10.5 (9.78-11.1)	15.7 (14.7-17.5)	21.7 (19.3-23.9)	1904
Total population	13-14	5.01 (4.53-5.54)	5.30 (4.90-5.70)	8.70 (7.90-9.50)	14.0 (11.9-15.5)	18.5 (15.5-21.6)	1954
Total population	15-16	4.72 (4.40-5.07)	4.80 (4.40-5.30)	8.10 (7.30-9.40)	13.2 (11.4-15.6)	18.3 (15.5-22.7)	1993
Total population	17-18	4.25 (3.90-4.62)	4.30 (3.80-4.90)	7.50 (6.80-8.20)	11.5 (10.0-13.1)	14.6 (13.1-16.5)	1929
Age 12-19 years	11-12	4.16 (3.70-4.68)	4.11 (3.48-4.65)	5.90 (5.14-7.25)	9.05 (6.49-10.8)	10.8 (8.52-14.2)	344
Age 12-19 years	13-14	3.60 (3.24-3.99)	3.60 (3.20-4.20)	5.20 (4.60-6.60)	7.90 (7.10-8.90)	9.00 (8.10-10.8)	348
Age 12-19 years	15-16	2.94 (2.70-3.19)	2.90 (2.70-3.30)	4.30 (3.70-5.00)	6.00 (5.50-6.60)	6.60 (6.10-7.70)	353
Age 12-19 years	17-18	2.68 (2.31-3.12)	2.60 (2.20-3.00)	3.70 (3.10-4.50)	5.70 (4.50-7.30)	7.30 (5.70-10.9)	313
Age 20+ years	11-12	6.71 (6.24-7.20)	7.07 (6.65-7.52)	11.0 (10.4-11.9)	17.0 (15.3-18.5)	22.7 (20.4-24.8)	1560
Age 20+ years	13-14	5.24 (4.72-5.83)	5.60 (5.10-6.00)	9.10 (8.20-10.2)	14.6 (12.9-16.1)	19.3 (16.1-22.7)	1606
Age 20+ years	15-16	5.02 (4.64-5.43)	5.20 (4.80-5.70)	8.80 (7.80-10.2)	14.0 (12.2-16.4)	19.1 (15.8-24.4)	1640
Age 20+ years	17-18	4.50 (4.15-4.89)	4.70 (4.20-5.20)	8.00 (7.20-8.70)	12.2 (10.2-13.4)	15.1 (13.5-17.0)	1616
Male	11-12	7.91 (7.19-8.70)	8.31 (7.35-9.15)	12.5 (11.4-13.5)	19.3 (15.7-21.4)	24.1 (22.2-28.5)	966
Male	13-14	6.37 (5.65-7.17)	6.40 (5.60-7.30)	10.2 (8.80-11.6)	15.4 (13.5-19.1)	21.4 (17.0-26.0)	931
Male	15-16	6.16 (5.66-6.70)	6.40 (5.60-6.70)	10.1 (8.90-11.0)	15.6 (13.2-18.8)	21.3 (17.4-24.4)	964
Male	17-18	5.36 (4.82-5.97)	5.50 (4.90-6.30)	8.80 (7.90-9.80)	12.6 (11.4-14.6)	15.8 (13.6-18.4)	952
Female	11-12	5.10 (4.70-5.53)	5.27 (4.67-5.64)	8.57 (7.87-9.30)	12.5 (11.0-14.9)	17.5 (14.9-20.5)	938
Female	13-14	3.99 (3.62-4.40)	4.10 (3.60-4.60)	7.20 (6.40-7.80)	11.9 (9.60-13.9)	15.1 (14.0-17.4)	1023
Female	15-16	3.67 (3.34-4.03)	3.60 (3.30-3.90)	6.30 (5.50-7.10)	10.9 (9.10-12.7)	14.6 (12.2-18.3)	1029
Female	17-18	3.42 (3.08-3.78)	3.30 (2.90-3.70)	5.70 (5.00-6.70)	9.50 (8.20-11.2)	13.1 (9.80-16.7)	977
Mexican American	11-12	4.79 (4.07-5.64)	5.18 (3.92-6.33)	7.91 (6.18-9.48)	10.5 (8.50-12.6)	12.1 (10.0-14.4)	211
Mexican American	13-14	3.47 (2.95-4.09)	3.70 (3.00-4.30)	5.20 (4.60-6.20)	8.60 (6.20-10.6)	10.8 (8.80-12.1)	297
Mexican American	15-16	3.36 (2.97-3.81)	3.40 (2.80-3.90)	5.80 (4.80-6.60)	8.80 (7.30-9.90)	12.5 (9.50-14.2)	370
Mexican American	17-18	2.89 (2.46-3.41)	2.70 (2.30-3.30)	4.90 (3.80-6.20)	7.80 (6.20-9.30)	9.30 (7.80-15.0)	297
Non-Hispanic Black	11-12	6.35 (5.41-7.46)	6.57 (5.71-7.65)	11.3 (9.74-13.9)	21.8 (13.9-31.3)	30.7 (21.6-45.1)	485
Non-Hispanic Black	13-14	5.40 (4.11-7.10)	5.50 (4.40-7.20)	10.4 (7.60-14.4)	19.1 (12.9-24.9)	24.6 (17.2-39.7)	389
Non-Hispanic Black	15-16	4.81 (4.06-5.69)	4.80 (3.90-6.50)	9.70 (8.10-11.2)	17.7 (13.1-22.0)	23.8 (21.8-34.0)	439
Non-Hispanic Black	17-18	4.23 (3.60-4.98)	4.00 (3.40-4.90)	7.80 (6.10-9.80)	15.3 (10.5-19.3)	21.9 (17.2-32.2)	430
Non-Hispanic White	11-12	6.71 (6.15-7.32)	6.83 (6.07-7.73)	10.7 (9.89-12.2)	15.7 (14.8-18.1)	21.3 (18.7-23.5)	666
Non-Hispanic White	13-14	5.32 (4.75-5.97)	5.70 (5.10-6.40)	9.00 (8.10-9.90)	14.1 (12.2-15.5)	17.9 (15.4-20.3)	805
Non-Hispanic White	15-16	4.97 (4.67-5.29)	5.10 (4.60-5.60)	8.30 (7.40-9.90)	13.2 (11.3-15.5)	17.4 (14.2-21.3)	619
Non-Hispanic White	17-18	4.65 (4.32-5.01)	4.90 (4.30-5.30)	8.10 (7.20-9.00)	11.5 (10.1-13.1)	13.9 (13.0-15.7)	667
All Hispanic	11-12	4.63 (3.86-5.55)	5.18 (4.41-6.19)	8.10 (6.64-9.78)	11.0 (9.96-12.6)	13.4 (11.5-16.1)	406
All Hispanic	13-14	3.52 (3.12-3.96)	3.70 (3.20-4.30)	5.50 (5.00-6.40)	8.80 (7.90-9.50)	10.9 (9.60-12.1)	488
All Hispanic	15-16	3.57 (3.14-4.06)	3.60 (3.00-4.30)	6.30 (5.40-7.10)	9.50 (8.00-11.8)	13.0 (10.5-15.2)	629
All Hispanic	17-18	3.18 (2.75-3.67)	3.10 (2.70-3.70)	5.40 (4.40-6.40)	8.20 (7.40-8.80)	10.0 (8.40-13.2)	473
Non-Hispanic Asian	11-12	7.10 (5.80-8.68)	7.53 (5.96-9.25)	12.6 (10.8-17.0)	24.6 (19.1-33.3)	35.1 (26.4-42.3)	291
Non-Hispanic Asian	13-14	6.30 (5.18-7.66)	6.30 (5.00-7.90)	13.2 (9.40-15.2)	24.3 (14.2-36.5)	33.6 (19.0-78.2)	203
Non-Hispanic Asian	15-16	5.75 (4.37-7.58)	5.30 (4.20-7.00)	10.5 (7.40-17.6)	25.2 (10.4-52.3)	34.8 (13.9-84.3)	220
Non-Hispanic Asian	17-18	4.36 (3.40-5.59)	4.20 (3.20-6.10)	8.20 (6.20-12.2)	17.3 (10.8-26.2)	25.5 (16.0-32.0)	257

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.2.

‡See Calculation of PFOS and PFOA as the Sum of Isomers for additional information about Survey years 2013-2014, 2015-2016, and 2017-2018.

## Serum estimated PFOS (total) (Special Sample of Serum PFAS in Children, 2013-2014)

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	3.90 (3.49-4.35)	3.84 (3.39-4.26)	5.77 (4.88-6.43)	8.37 (6.98-11.0)	11.8 (9.03-13.1)	525
Age 3-5 years	13-14	3.37 (2.99-3.79)	3.39 (2.64-3.98)	4.78 (3.98-6.32)	7.18 (4.78-8.66)	9.10 (7.18-11.3)	149
Age 6-11 years	13-14	4.18 (3.70-4.72)	4.00 (3.44-4.57)	5.91 (5.02-6.75)	9.32 (6.75-12.4)	12.4 (9.38-14.4)	376
Male	13-14	4.05 (3.45-4.74)	4.07 (3.25-4.88)	6.32 (5.09-7.18)	9.03 (6.93-12.8)	12.4 (8.66-17.3)	284
Female	13-14	3.73 (3.36-4.15)	3.53 (3.09-4.03)	5.01 (4.30-6.19)	7.37 (6.39-9.24)	9.61 (7.17-12.4)	241
All Hispanic	13-14	3.52 (3.08-4.02)	3.41 (2.89-3.93)	4.74 (4.13-5.67)	7.61 (5.29-9.54)	9.32 (6.25-11.0)	186
Other	13-14	4.03 (3.58-4.54)	3.98 (3.40-4.57)	6.19 (5.02-6.75)	9.03 (6.98-12.0)	12.4 (9.17-14.6)	339

\* See Calculation of PFOS and PFOA as the Sum of Isomers for additional information about Survey years 2013-2014.

## Serum n-Perfluorooctane sulfonic acid (n-PFOS) (2013 - 2018)

CAS Number 1763-23-1

Linear PFOS isomer

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	3.47 (3.12-3.86)	3.50 (3.20-3.90)	6.00 (5.20-6.70)	10.0 (8.60-11.3)	14.0 (11.2-16.3)	1954
Total population	15-16	3.20 (2.93-3.49)	3.20 (2.80-3.60)	5.60 (4.90-6.40)	8.90 (7.70-10.4)	12.8 (10.1-17.9)	1993
Total population	17-18	2.94 (2.70-3.21)	3.00 (2.60-3.30)	5.10 (4.60-5.70)	7.80 (6.70-9.30)	10.4 (9.40-12.0)	1929
Age 12-19 years	13-14	2.64 (2.34-2.96)	2.70 (2.30-2.90)	3.90 (3.30-5.00)	6.20 (5.00-7.00)	7.00 (6.30-8.40)	348
Age 12-19 years	15-16	2.07 (1.90-2.26)	2.00 (1.80-2.40)	3.10 (2.60-3.50)	4.40 (3.80-4.90)	5.10 (4.40-6.60)	353
Age 12-19 years	17-18	1.92 (1.66-2.23)	1.90 (1.60-2.10)	2.80 (2.20-3.30)	4.10 (3.30-5.70)	5.70 (4.00-7.70)	313
Age 20+ years	13-14	3.61 (3.22-4.04)	3.70 (3.40-4.10)	6.30 (5.50-7.20)	10.3 (9.10-12.3)	14.9 (12.1-17.7)	1606
Age 20+ years	15-16	3.38 (3.07-3.73)	3.50 (3.00-3.90)	5.90 (5.20-6.80)	9.20 (8.10-11.1)	13.9 (10.0-19.7)	1640
Age 20+ years	17-18	3.11 (2.86-3.38)	3.20 (2.90-3.50)	5.40 (4.80-5.90)	8.50 (7.00-9.40)	11.0 (9.50-12.4)	1616
Male	13-14	4.27 (3.76-4.84)	4.20 (3.70-4.80)	6.70 (6.10-7.90)	10.9 (9.40-14.6)	15.1 (12.1-19.9)	931
Male	15-16	4.10 (3.70-4.53)	4.00 (3.50-4.70)	6.80 (5.70-7.60)	10.4 (8.60-12.9)	14.7 (10.5-20.4)	964
Male	17-18	3.67 (3.32-4.06)	3.70 (3.30-4.20)	5.90 (5.10-6.80)	9.10 (7.80-10.0)	11.3 (9.80-13.2)	952
Female	13-14	2.85 (2.57-3.17)	2.90 (2.60-3.20)	4.90 (4.50-5.60)	8.50 (7.20-9.90)	11.6 (9.90-13.6)	1023
Female	15-16	2.53 (2.28-2.80)	2.50 (2.30-2.70)	4.30 (3.80-5.00)	7.50 (6.00-8.50)	10.1 (8.10-14.2)	1029
Female	17-18	2.40 (2.14-2.68)	2.30 (2.00-2.60)	3.90 (3.40-4.80)	6.50 (5.80-7.50)	9.30 (6.50-11.8)	977
Mexican American	13-14	2.37 (2.00-2.80)	2.40 (2.10-2.70)	3.50 (3.00-3.90)	5.40 (3.90-8.30)	7.60 (5.00-9.80)	297
Mexican American	15-16	2.31 (2.01-2.65)	2.30 (2.00-2.60)	3.70 (3.00-4.80)	6.10 (5.10-7.70)	8.20 (6.80-9.40)	370
Mexican American	17-18	2.01 (1.71-2.37)	1.90 (1.60-2.20)	3.30 (2.70-4.20)	5.30 (4.60-6.30)	6.70 (5.80-9.00)	297
Non-Hispanic Black	13-14	4.10 (3.02-5.55)	4.10 (3.20-5.60)	8.00 (5.30-12.5)	14.9 (9.30-20.7)	19.6 (14.4-32.6)	389
Non-Hispanic Black	15-16	3.47 (2.87-4.19)	3.40 (2.70-4.60)	6.70 (5.30-8.70)	12.3 (9.20-16.5)	19.4 (14.4-27.0)	439
Non-Hispanic Black	17-18	3.10 (2.60-3.70)	3.00 (2.40-3.60)	5.40 (4.40-7.10)	11.8 (8.20-14.8)	16.6 (12.6-27.2)	430
Non-Hispanic White	13-14	3.59 (3.19-4.04)	3.70 (3.40-4.20)	6.10 (5.40-6.70)	9.90 (8.60-10.7)	13.0 (10.7-15.1)	805
Non-Hispanic White	15-16	3.29 (3.04-3.55)	3.40 (2.90-3.70)	5.70 (4.90-6.50)	8.60 (7.60-10.1)	11.4 (9.20-14.7)	619
Non-Hispanic White	17-18	3.18 (2.95-3.42)	3.30 (3.00-3.60)	5.50 (4.70-6.00)	7.80 (6.70-9.30)	9.60 (9.30-10.7)	667
All Hispanic	13-14	2.43 (2.14-2.76)	2.50 (2.10-2.80)	3.90 (3.30-4.50)	6.10 (4.90-7.50)	8.30 (7.00-9.30)	488
All Hispanic	15-16	2.47 (2.15-2.84)	2.50 (2.10-2.90)	4.20 (3.50-5.00)	6.80 (5.30-8.50)	9.20 (7.60-10.3)	629
All Hispanic	17-18	2.23 (1.92-2.59)	2.20 (1.80-2.60)	3.80 (3.00-4.60)	5.70 (5.00-6.30)	7.50 (5.90-9.80)	473
Non-Hispanic Asian	13-14	4.89 (3.95-6.06)	4.60 (4.10-6.00)	9.80 (8.10-12.5)	19.9 (11.7-35.2)	31.1 (13.7-71.0)	203
Non-Hispanic Asian	15-16	4.26 (3.15-5.77)	3.80 (2.80-5.30)	8.70 (5.30-15.6)	21.1 (8.60-47.5)	31.1 (10.9-77.9)	220
Non-Hispanic Asian	17-18	3.16 (2.37-4.22)	3.10 (2.30-4.60)	6.30 (4.60-10.5)	14.5 (7.80-22.2)	19.9 (12.1-29.1)	257

Limit of detection (LOD, see Data Analysis section) for Survey years 13-14, 15-16, and 17-18 are 0.1, 0.1, and 0.1, respectively.

## Serum n-Perfluorooctane sulfonic acid (n-PFOS) (Special Sample of Serum PFAS in Children, 2013-2014)

CAS Number 1763-23-1

*Linear PFOS isomer*

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	2.53 (2.28-2.80)	2.45 (2.11-2.74)	3.88 (3.22-4.18)	5.71 (4.80-6.72)	7.78 (5.74-9.04)	525
Age 3-5 years	13-14	2.22 (1.98-2.51)	2.11 (1.74-2.24)	3.53 (2.69-4.18)	5.74 (4.04-7.17)	6.19 (5.72-7.72)	149
Age 6-11 years	13-14	2.69 (2.41-3.00)	2.59 (2.26-2.80)	3.88 (3.18-4.29)	5.70 (4.52-8.37)	8.83 (5.91-10.3)	376
Male	13-14	2.67 (2.27-3.13)	2.67 (2.11-3.10)	4.17 (3.43-5.00)	5.91 (4.60-8.83)	8.83 (5.74-10.3)	284
Female	13-14	2.38 (2.18-2.59)	2.17 (1.97-2.48)	3.12 (2.80-3.51)	5.13 (4.04-5.67)	6.98 (5.51-7.77)	241
All Hispanic	13-14	2.28 (1.97-2.64)	2.17 (1.90-2.55)	3.10 (2.76-3.65)	5.03 (3.49-7.77)	6.51 (4.29-9.62)	186
Other	13-14	2.61 (2.33-2.93)	2.53 (2.11-2.86)	4.06 (3.22-4.33)	5.74 (4.52-7.72)	8.00 (5.74-9.92)	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

## Serum branched Perfluoromethylheptane sulfonic acid (Sm-PFOS) (2013 - 2018)

### Perfluoromethylheptane sulfonic acid isomers

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	1.39 (1.25-1.55)	1.50 (1.40-1.60)	2.70 (2.50-2.90)	4.00 (3.60-4.60)	5.10 (4.60-5.80)	1954
Total population	15-16	1.42 (1.32-1.52)	1.50 (1.40-1.60)	2.60 (2.40-2.90)	4.40 (4.00-4.90)	5.70 (5.10-6.30)	1993
Total population	17-18	1.22 (1.10-1.35)	1.20 (1.10-1.40)	2.30 (2.00-2.50)	3.50 (3.20-3.90)	4.50 (3.80-5.40)	1929
Age 12-19 years	13-14	.906 (.811-1.01)	1.00 (.800-1.10)	1.40 (1.20-1.50)	1.90 (1.50-2.30)	2.30 (1.80-3.00)	348
Age 12-19 years	15-16	.819 (.715-.939)	.900 (.700-1.00)	1.20 (1.00-1.40)	1.60 (1.30-2.00)	2.00 (1.50-2.40)	353
Age 12-19 years	17-18	.722 (.609-.856)	.700 (.600-.800)	1.10 (.800-1.40)	1.70 (1.10-2.20)	2.00 (1.60-4.50)	313
Age 20+ years	13-14	1.48 (1.32-1.65)	1.70 (1.50-1.80)	2.90 (2.60-3.10)	4.20 (3.70-4.70)	5.30 (4.70-5.90)	1606
Age 20+ years	15-16	1.52 (1.42-1.62)	1.60 (1.50-1.80)	2.90 (2.60-3.10)	4.70 (4.20-5.10)	5.90 (5.30-6.70)	1640
Age 20+ years	17-18	1.31 (1.18-1.44)	1.40 (1.20-1.60)	2.40 (2.10-2.80)	3.60 (3.30-4.10)	4.60 (4.10-5.60)	1616
Male	13-14	1.93 (1.71-2.18)	2.10 (1.80-2.40)	3.20 (2.90-3.50)	4.60 (4.00-5.50)	5.90 (5.00-6.70)	931
Male	15-16	1.94 (1.77-2.12)	2.00 (1.80-2.20)	3.30 (3.10-3.60)	5.10 (4.40-5.40)	6.30 (5.40-7.10)	964
Male	17-18	1.61 (1.40-1.84)	1.70 (1.40-1.90)	2.90 (2.30-3.20)	3.90 (3.40-4.60)	5.30 (4.40-6.00)	952
Female	13-14	1.02 (.921-1.14)	1.10 (.900-1.30)	1.90 (1.70-2.10)	3.30 (3.00-3.60)	4.30 (3.80-4.70)	1023
Female	15-16	1.05 (.967-1.14)	1.00 (.900-1.10)	1.90 (1.70-2.10)	3.50 (2.70-4.30)	4.80 (3.90-5.90)	1029
Female	17-18	.944 (.854-1.05)	.900 (.800-1.00)	1.80 (1.50-2.00)	2.80 (2.30-3.60)	3.80 (3.30-4.60)	977
Mexican American	13-14	1.01 (.853-1.20)	1.10 (.900-1.30)	1.70 (1.50-2.20)	2.70 (2.40-3.00)	3.60 (2.90-4.30)	297
Mexican American	15-16	1.00 (.892-1.13)	1.00 (.900-1.20)	1.80 (1.50-2.00)	2.80 (2.40-3.20)	3.70 (3.10-4.40)	370
Mexican American	17-18	.834 (.696-1.00)	.800 (.600-1.00)	1.40 (1.10-1.80)	2.40 (1.90-3.00)	3.30 (2.40-4.80)	297
Non-Hispanic Black	13-14	1.15 (.934-1.40)	1.20 (1.00-1.50)	2.40 (1.90-3.10)	4.50 (3.30-5.30)	5.60 (4.50-7.30)	389
Non-Hispanic Black	15-16	1.23 (1.06-1.42)	1.30 (1.10-1.70)	2.80 (2.30-3.30)	4.60 (3.80-5.40)	6.10 (5.40-7.10)	439
Non-Hispanic Black	17-18	1.04 (.891-1.22)	1.00 (.800-1.30)	2.10 (1.80-2.50)	3.80 (3.00-4.60)	5.60 (4.20-6.60)	430
Non-Hispanic White	13-14	1.62 (1.42-1.83)	1.70 (1.50-2.00)	3.00 (2.70-3.20)	4.20 (3.80-4.80)	5.40 (4.80-5.90)	805
Non-Hispanic White	15-16	1.59 (1.47-1.71)	1.60 (1.50-1.80)	3.00 (2.60-3.20)	4.80 (4.30-5.20)	6.00 (5.20-6.90)	619
Non-Hispanic White	17-18	1.40 (1.27-1.54)	1.50 (1.30-1.70)	2.60 (2.20-2.90)	3.60 (3.20-4.50)	4.60 (3.90-5.80)	667
All Hispanic	13-14	.997 (.881-1.13)	1.10 (.900-1.20)	1.80 (1.60-2.10)	2.70 (2.40-3.10)	3.40 (2.90-4.00)	488
All Hispanic	15-16	1.05 (.930-1.18)	1.10 (1.00-1.20)	2.00 (1.60-2.30)	3.00 (2.70-3.30)	3.80 (3.30-4.40)	629
All Hispanic	17-18	.893 (.775-1.03)	.900 (.700-1.10)	1.60 (1.30-1.90)	2.60 (2.10-3.00)	3.20 (2.80-3.50)	473
Non-Hispanic Asian	13-14	1.12 (.937-1.35)	1.20 (1.00-1.50)	2.30 (1.60-3.20)	3.50 (2.50-5.00)	4.50 (3.50-7.20)	203
Non-Hispanic Asian	15-16	1.23 (1.03-1.47)	1.30 (1.10-1.40)	2.20 (1.60-3.00)	3.90 (2.60-5.80)	5.10 (3.10-9.80)	220
Non-Hispanic Asian	17-18	1.06 (.887-1.27)	1.10 (.800-1.40)	2.10 (1.50-2.70)	3.70 (2.90-4.60)	4.80 (3.80-6.40)	257

Limit of detection (LOD, see Data Analysis section) for Survey years 13-14, 15-16, and 17-18 are 0.1, 0.1, and 0.1, respectively.

## Serum branched Perfluoromethylheptane sulfonic acid (Sm-PFOS) (Special Sample of Serum PFAS in Children, 2013-2014)

### *Perfluoromethylheptane sulfonic acid isomers*

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	1.24 (1.07-1.43)	1.28 (1.03-1.48)	1.92 (1.62-2.29)	3.05 (2.57-3.99)	4.10 (3.14-5.28)	525
Age 3-5 years	13-14	1.02 (.863-1.20)	1.00 (.820-1.36)	1.67 (1.44-1.95)	2.38 (2.07-3.11)	3.14 (2.21-4.23)	149
Age 6-11 years	13-14	1.36 (1.17-1.57)	1.41 (1.16-1.57)	2.13 (1.66-2.68)	3.41 (2.59-4.57)	4.45 (3.23-6.75)	376
Male	13-14	1.26 (1.03-1.52)	1.28 (1.00-1.51)	2.07 (1.64-2.59)	3.41 (2.33-4.49)	4.25 (2.90-8.43)	284
Female	13-14	1.22 (1.03-1.44)	1.29 (.970-1.52)	1.82 (1.55-2.45)	2.90 (2.20-3.92)	3.92 (2.89-5.81)	241
All Hispanic	13-14	1.12 (.973-1.28)	1.08 (.960-1.35)	1.68 (1.40-1.95)	2.34 (1.93-3.08)	3.14 (2.21-3.63)	186
Other	13-14	1.28 (1.09-1.50)	1.37 (1.04-1.52)	2.07 (1.65-2.63)	3.41 (2.65-4.25)	4.25 (3.11-6.00)	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

## Serum Perfluorooctane sulfonamide (FOSA) (1999-2000, 2003-2010)

CAS Number 754-91-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	99-00	.356 (.296-.429)	.400 (.300-.400)	.700 (.500-.800)	1.00 (.900-1.40)	1.40 (1.00-2.00)	1432
Total population	03-04	*	<LOD	<LOD	.300 (.200-.300)	.300 (.300-.400)	2094
Total population	05-06	*	<LOD	.100 (<LOD-.200)	.200 (.200-.300)	.300 (.200-.500)	2120
Total population	07-08	*	<LOD	<LOD	<LOD	<LOD	2100
Total population	09-10	*	<LOD	<LOD	<LOD	<LOD	2233
Age 12-19 years	99-00	.426 (.369-.491)	.400 (.400-.500)	.700 (.700-.900)	1.10 (.900-1.50)	1.60 (1.10-2.90)	497
Age 12-19 years	03-04	*	<LOD	<LOD	.300 (.200-.300)	.300 (.200-.500)	640
Age 12-19 years	05-06	*	<LOD	<LOD	.200 (.100-.300)	.300 (.200-.500)	640
Age 12-19 years	07-08	*	<LOD	<LOD	<LOD	<LOD	357
Age 12-19 years	09-10	*	<LOD	<LOD	<LOD	<LOD	364
Age 20+ years	99-00	.345 (.282-.422)	.300 (.300-.400)	.600 (.500-.800)	1.00 (.800-1.30)	1.40 (1.00-2.00)	935
Age 20+ years	03-04	*	<LOD	<LOD	.300 (.200-.300)	.300 (.300-.400)	1454
Age 20+ years	05-06	*	<LOD	.100 (<LOD-.200)	.200 (.200-.300)	.300 (.200-.500)	1480
Age 20+ years	07-08	*	<LOD	<LOD	<LOD	<LOD	1743
Age 20+ years	09-10	*	<LOD	<LOD	<LOD	<LOD	1869
Male	99-00	.353 (.290-.431)	.400 (.300-.400)	.600 (.500-.700)	.900 (.700-1.30)	1.30 (.900-2.00)	684
Male	03-04	*	<LOD	<LOD	.300 (.200-.300)	.300 (.200-.500)	1053
Male	05-06	*	<LOD	.100 (.100-.200)	.200 (.200-.300)	.300 (.200-.600)	1048
Male	07-08	*	<LOD	<LOD	<LOD	<LOD	1059
Male	09-10	*	<LOD	<LOD	<LOD	<LOD	1075
Female	99-00	.359 (.297-.432)	.300 (.300-.500)	.700 (.500-.900)	1.10 (1.00-1.40)	1.50 (1.10-2.10)	748
Female	03-04	*	<LOD	<LOD	.300 (.200-.300)	.300 (.300-.500)	1041
Female	05-06	*	<LOD	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.200-.400)	1072
Female	07-08	*	<LOD	<LOD	<LOD	<LOD	1041
Female	09-10	*	<LOD	<LOD	<LOD	<LOD	1158
Mexican American	99-00	.285 (.245-.331)	.300 (.200-.400)	.500 (.400-.600)	.800 (.700-.900)	1.10 (.800-1.60)	521
Mexican American	03-04	*	<LOD	<LOD	<LOD	.200 (<LOD-.300)	485
Mexican American	05-06	*	<LOD	<LOD	.200 (<LOD-.300)	.200 (<LOD-.500)	499
Mexican American	07-08	*	<LOD	<LOD	<LOD	<LOD	391
Mexican American	09-10	*	<LOD	<LOD	<LOD	<LOD	461
Non-Hispanic Black	99-00	.350 (.296-.413)	.400 (.300-.400)	.600 (.500-.700)	.900 (.700-1.80)	1.50 (.800-3.80)	269
Non-Hispanic Black	03-04	*	<LOD	<LOD	.300 (.200-.300)	.300 (.200-.500)	538
Non-Hispanic Black	05-06	*	<LOD	<LOD	.200 (.100-.200)	.200 (.200-.400)	544
Non-Hispanic Black	07-08	*	<LOD	<LOD	<LOD	<LOD	419
Non-Hispanic Black	09-10	*	<LOD	<LOD	<LOD	<LOD	391
Non-Hispanic White	99-00	.384 (.306-.482)	.400 (.300-.500)	.700 (.600-.900)	1.10 (.900-1.40)	1.50 (1.10-2.10)	491
Non-Hispanic White	03-04	*	<LOD	<LOD	.300 (.200-.300)	.300 (.300-.500)	962
Non-Hispanic White	05-06	*	<LOD	.100 (.100-.200)	.200 (.200-.300)	.300 (.200-.500)	935
Non-Hispanic White	07-08	*	<LOD	<LOD	<LOD	<LOD	931
Non-Hispanic White	09-10	*	<LOD	<LOD	<LOD	<LOD	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.05, 0.2, 0.1, 0.1, and 0.1 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluorooctane sulfonamide (FOSA) (2011 - 2012)

CAS Number 754-91-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	11-12	*	<LOD	<LOD	<LOD	<LOD	1904
Age 12-19 years	11-12	*	<LOD	<LOD	<LOD	<LOD	344
Age 20+ years	11-12	*	<LOD	<LOD	<LOD	<LOD	1560
Male	11-12	*	<LOD	<LOD	<LOD	<LOD	966
Female	11-12	*	<LOD	<LOD	<LOD	<LOD	938
Mexican American	11-12	*	<LOD	<LOD	<LOD	<LOD	211
Non-Hispanic Black	11-12	*	<LOD	<LOD	<LOD	<LOD	485
Non-Hispanic White	11-12	*	<LOD	<LOD	<LOD	<LOD	666
All Hispanic	11-12	*	<LOD	<LOD	<LOD	<LOD	406
Non-Hispanic Asian	11-12	*	<LOD	<LOD	<LOD	<LOD	291

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.10.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.



## Serum Perfluorooctane sulfonamide (FOSA) (Special Sample of Serum PFAS in Children, 2013-2014)

CAS Number 754-91-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	*	<LOD	<LOD	<LOD	<LOD	525
Age 3-5 years	13-14	*	<LOD	<LOD	<LOD	<LOD	149
Age 6-11 years	13-14	*	<LOD	<LOD	<LOD	<LOD	376
Male	13-14	*	<LOD	<LOD	<LOD	<LOD	284
Female	13-14	*	<LOD	<LOD	<LOD	<LOD	241
All Hispanic	13-14	*	<LOD	<LOD	<LOD	<LOD	186
Other	13-14	*	<LOD	<LOD	<LOD	<LOD	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum 2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid (EtFOSAA) (1999-2000, 2003-2010)

CAS Number 2991-50-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	99-00	.643 (.597-.694)	.600 (.600-.700)	1.10 (1.00-1.20)	1.60 (1.50-1.80)	2.40 (1.90-2.70)	1432
Total population	03-04	*	<LOD	<LOD	<LOD	<LOD	2094
Total population	05-06	*	<LOD	<LOD	<LOD	.300 (<LOD-.300)	2120
Total population	07-08	*	<LOD	<LOD	<LOD	<LOD	2100
Total population	09-10	*	<LOD	<LOD	<LOD	.100 (<LOD-.100)	2233
Age 12-19 years	99-00	.834 (.767-.907)	.800 (.700-.900)	1.20 (1.10-1.40)	1.70 (1.50-2.20)	2.50 (1.80-4.00)	497
Age 12-19 years	03-04	*	<LOD	<LOD	<LOD	<LOD	640
Age 12-19 years	05-06	*	<LOD	<LOD	<LOD	.200 (<LOD-.400)	640
Age 12-19 years	07-08	*	<LOD	<LOD	<LOD	<LOD	357
Age 12-19 years	09-10	*	<LOD	<LOD	<LOD	<LOD	364
Age 20+ years	99-00	.615 (.570-.663)	.600 (.500-.700)	1.00 (.900-1.10)	1.60 (1.50-1.80)	2.30 (1.80-2.80)	935
Age 20+ years	03-04	*	<LOD	<LOD	<LOD	<LOD	1454
Age 20+ years	05-06	*	<LOD	<LOD	<LOD	.300 (<LOD-.300)	1480
Age 20+ years	07-08	*	<LOD	<LOD	<LOD	<LOD	1743
Age 20+ years	09-10	*	<LOD	<LOD	<LOD	.100 (<LOD-.100)	1869
Male	99-00	.628 (.575-.686)	.600 (.600-.700)	1.00 (.900-1.10)	1.60 (1.40-1.70)	1.90 (1.60-2.90)	684
Male	03-04	*	<LOD	<LOD	<LOD	<LOD	1053
Male	05-06	*	<LOD	<LOD	<LOD	.300 (.200-.300)	1048
Male	07-08	*	<LOD	<LOD	<LOD	<LOD	1059
Male	09-10	*	<LOD	<LOD	<LOD	.100 (<LOD-.100)	1075
Female	99-00	.657 (.594-.726)	.700 (.500-.700)	1.10 (1.00-1.20)	1.70 (1.50-2.20)	2.50 (2.00-2.80)	748
Female	03-04	*	<LOD	<LOD	<LOD	<LOD	1041
Female	05-06	*	<LOD	<LOD	<LOD	.300 (<LOD-.300)	1072
Female	07-08	*	<LOD	<LOD	<LOD	<LOD	1041
Female	09-10	*	<LOD	<LOD	<LOD	.100 (<LOD-.100)	1158
Mexican American	99-00	.578 (.472-.707)	.600 (.500-.700)	1.00 (.800-1.20)	1.70 (1.40-2.00)	2.50 (1.90-3.00)	521
Mexican American	03-04	*	<LOD	<LOD	<LOD	<LOD	485
Mexican American	05-06	*	<LOD	<LOD	<LOD	<LOD	499
Mexican American	07-08	*	<LOD	<LOD	<LOD	<LOD	391
Mexican American	09-10	*	<LOD	<LOD	<LOD	<LOD	461
Non-Hispanic Black	99-00	.531 (.450-.626)	.500 (.500-.600)	.900 (.700-1.00)	1.30 (1.10-1.50)	1.60 (1.40-2.70)	269
Non-Hispanic Black	03-04	*	<LOD	<LOD	<LOD	.400 (<LOD-.500)	538
Non-Hispanic Black	05-06	*	<LOD	<LOD	<LOD	<LOD	544
Non-Hispanic Black	07-08	*	<LOD	<LOD	<LOD	<LOD	419
Non-Hispanic Black	09-10	*	<LOD	<LOD	<LOD	<LOD	391
Non-Hispanic White	99-00	.664 (.611-.722)	.700 (.600-.700)	1.10 (1.00-1.20)	1.70 (1.50-1.90)	2.50 (1.90-3.20)	491
Non-Hispanic White	03-04	*	<LOD	<LOD	<LOD	<LOD	962
Non-Hispanic White	05-06	*	<LOD	<LOD	<LOD	.300 (.200-.400)	935
Non-Hispanic White	07-08	*	<LOD	<LOD	<LOD	<LOD	931
Non-Hispanic White	09-10	*	<LOD	<LOD	<LOD	.100 (<LOD-.200)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.4, 0.2, 0.2, and 0.1 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum 2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid (EtFOSAA) (2011 - 2012)

CAS Number 2991-50-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	11-12	*	<LOD	<LOD	<LOD	.110 (<LOD-.130)	1904
Age 12-19 years	11-12	*	<LOD	<LOD	<LOD	<LOD	344
Age 20+ years	11-12	*	<LOD	<LOD	<LOD	.110 (<LOD-.150)	1560
Male	11-12	*	<LOD	<LOD	<LOD	.110 (<LOD-.140)	966
Female	11-12	*	<LOD	<LOD	<LOD	.100 (<LOD-.130)	938
Mexican American	11-12	*	<LOD	<LOD	<LOD	.100 (<LOD-.160)	211
Non-Hispanic Black	11-12	*	<LOD	<LOD	<LOD	<LOD	485
Non-Hispanic White	11-12	*	<LOD	<LOD	<LOD	.120 (<LOD-.140)	666
All Hispanic	11-12	*	<LOD	<LOD	<LOD	<LOD	406
Non-Hispanic Asian	11-12	*	<LOD	<LOD	<LOD	.110 (<LOD-.200)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.100.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum 2-(N-ethyl-perfluorooctane sulfonamido) acetic acid (EtFOSAA) (Special Sample of Serum PFAS in Children, 2013-2014)

CAS Number 2991-50-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	*	<LOD	<LOD	<LOD	<LOD	525
Age 3-5 years	13-14	*	<LOD	<LOD	<LOD	<LOD	149
Age 6-11 years	13-14	*	<LOD	<LOD	<LOD	<LOD	376
Male	13-14	*	<LOD	<LOD	<LOD	<LOD	284
Female	13-14	*	<LOD	<LOD	<LOD	<LOD	241
All Hispanic	13-14	*	<LOD	<LOD	<LOD	<LOD	186
Other	13-14	*	<LOD	<LOD	<LOD	<LOD	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum 2-(N-Methyl-perfluorooctane sulfonamido) acetic acid (MeFOSAA) (1999-2000, 2003-2010)

CAS Number 2355-31-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	99-00	.839 (.732-.963)	.900 (.800-1.00)	1.40 (1.10-1.70)	2.20 (1.90-2.50)	2.80 (2.40-3.20)	1432
Total population	03-04	*	<LOD	.600 (<LOD-.600)	.900 (.800-1.00)	1.10 (1.00-1.30)	2094
Total population	05-06	.410 (.372-.451)	.440 (.350-.440)	.700 (.610-.780)	1.22 (1.13-1.22)	1.57 (1.48-1.74)	2120
Total population	07-08	.303 (.277-.330)	.300 (.300-.300)	.500 (.400-.600)	1.00 (.800-1.00)	1.30 (1.20-1.40)	2100
Total population	09-10	.198 (.184-.213)	.200 (.200-.200)	.300 (.300-.300)	.700 (.600-.700)	1.00 (.900-1.00)	2233
Age 12-19 years	99-00	1.15 (.997-1.32)	1.20 (1.00-1.30)	1.80 (1.30-2.20)	2.60 (2.10-3.10)	3.20 (2.80-3.80)	497
Age 12-19 years	03-04	*	<LOD	.600 (<LOD-.700)	1.00 (.800-1.10)	1.30 (1.00-1.60)	640
Age 12-19 years	05-06	.432 (.380-.490)	.440 (.350-.520)	.780 (.610-.870)	1.13 (.960-1.31)	1.48 (1.13-1.66)	640
Age 12-19 years	07-08	.340 (.305-.379)	.300 (.300-.400)	.600 (.500-.600)	1.00 (.800-1.50)	1.60 (1.00-2.00)	357
Age 12-19 years	09-10	.235 (.203-.273)	.300 (.200-.300)	.400 (.300-.500)	.700 (.500-.900)	.900 (.600-1.70)	364
Age 20+ years	99-00	.795 (.689-.918)	.800 (.700-1.00)	1.30 (1.10-1.60)	2.10 (1.70-2.40)	2.70 (2.30-3.10)	935
Age 20+ years	03-04	*	<LOD	.600 (<LOD-.600)	.900 (.800-1.00)	1.00 (.900-1.50)	1454
Age 20+ years	05-06	.406 (.369-.448)	.440 (.350-.440)	.700 (.610-.780)	1.22 (1.13-1.31)	1.66 (1.48-1.74)	1480
Age 20+ years	07-08	.297 (.270-.327)	.300 (.300-.300)	.500 (.400-.600)	1.00 (.800-1.00)	1.20 (1.10-1.40)	1743
Age 20+ years	09-10	.193 (.178-.210)	.200 (.200-.200)	.300 (.300-.300)	.700 (.600-.800)	1.00 (.900-1.00)	1869
Male	99-00	.874 (.746-1.02)	.900 (.800-1.00)	1.40 (1.10-1.70)	2.20 (1.90-2.80)	2.80 (2.20-3.70)	684
Male	03-04	*	<LOD	.600 (<LOD-.600)	1.00 (.800-1.00)	1.10 (1.00-1.50)	1053
Male	05-06	.435 (.400-.472)	.440 (.350-.440)	.780 (.700-.870)	1.22 (1.13-1.31)	1.66 (1.40-1.74)	1048
Male	07-08	.307 (.281-.334)	.300 (.300-.300)	.500 (.400-.600)	.900 (.800-1.00)	1.30 (1.10-1.40)	1059
Male	09-10	.200 (.187-.214)	.200 (.200-.200)	.300 (.300-.400)	.700 (.600-.800)	1.00 (.800-1.10)	1075
Female	99-00	.810 (.712-.922)	.800 (.700-1.00)	1.30 (1.10-1.70)	2.00 (1.70-2.40)	2.60 (2.40-3.10)	748
Female	03-04	*	<LOD	<LOD	.900 (.800-1.00)	1.00 (.900-1.60)	1041
Female	05-06	.387 (.342-.438)	.350 (.350-.440)	.700 (.610-.780)	1.13 (1.05-1.31)	1.57 (1.40-1.83)	1072
Female	07-08	.299 (.267-.334)	.300 (.300-.300)	.500 (.400-.600)	1.00 (.800-1.10)	1.30 (1.10-1.70)	1041
Female	09-10	.196 (.178-.216)	.200 (.200-.200)	.300 (.300-.300)	.600 (.500-.800)	1.00 (.800-1.00)	1158
Mexican American	99-00	.659 (.536-.809)	.700 (.500-.800)	1.10 (.900-1.40)	1.80 (1.30-2.50)	2.50 (1.80-3.50)	521
Mexican American	03-04	*	<LOD	<LOD	.600 (<LOD-.800)	.800 (<LOD-1.10)	485
Mexican American	05-06	.292 (.245-.348)	.260 (.260-.350)	.440 (.350-.700)	.780 (.610-1.05)	1.05 (.870-1.22)	499
Mexican American	07-08	*	.200 (<LOD-.200)	.300 (.300-.300)	.500 (.400-.800)	.800 (.500-1.10)	391
Mexican American	09-10	.139 (.118-.163)	.100 (.100-.200)	.300 (.200-.300)	.500 (.400-.600)	.700 (.500-1.00)	461
Non-Hispanic Black	99-00	.992 (.871-1.13)	1.00 (.800-1.30)	1.70 (1.30-1.90)	2.40 (2.00-2.60)	2.80 (2.40-3.60)	269
Non-Hispanic Black	03-04	*	<LOD	.700 (<LOD-.800)	1.00 (.800-1.20)	1.30 (1.00-1.60)	538
Non-Hispanic Black	05-06	.418 (.361-.486)	.440 (.350-.520)	.700 (.610-.870)	1.22 (1.05-1.48)	1.66 (1.48-2.01)	544
Non-Hispanic Black	07-08	.330 (.304-.357)	.300 (.300-.300)	.500 (.500-.700)	1.00 (.800-1.20)	1.40 (1.20-1.70)	419
Non-Hispanic Black	09-10	.193 (.166-.225)	.200 (.200-.200)	.300 (.300-.400)	.600 (.400-.800)	.900 (.600-1.10)	391
Non-Hispanic White	99-00	.877 (.752-1.02)	.900 (.800-1.00)	1.50 (1.20-1.70)	2.20 (1.90-2.60)	2.80 (2.40-3.70)	491
Non-Hispanic White	03-04	*	<LOD	.600 (<LOD-.700)	.900 (.800-1.00)	1.10 (1.00-1.40)	962
Non-Hispanic White	05-06	.428 (.380-.483)	.440 (.350-.520)	.780 (.700-.870)	1.22 (1.13-1.31)	1.66 (1.40-1.83)	935
Non-Hispanic White	07-08	.332 (.296-.372)	.300 (.300-.300)	.600 (.500-.700)	1.00 (.800-1.10)	1.30 (1.10-1.60)	931
Non-Hispanic White	09-10	.216 (.201-.232)	.200 (.200-.300)	.300 (.300-.400)	.700 (.600-.800)	1.00 (.900-1.10)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.17, 0.52, 0.174, 0.174, and 0.087 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum 2-(N-Methyl-perfluorooctane sulfonamido) acetic acid (Me-PFOSA-AcOH or Me-FOSA-A) (2011 - 2018)

CAS Number 2355-31-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	11-12	*	.100 (<LOD-.160)	.250 (.200-.310)	.500 (.440-.530)	.690 (.580-.850)	1904
Total population	13-14	*	<LOD	.200 (.200-.200)	.400 (.300-.500)	.600 (.500-.900)	2168
Total population	15-16	*	<LOD	.200 (.100-.200)	.400 (.300-.400)	.600 (.500-.800)	1993
Total population	17-18	.130 (.121-.140)	.100 (.100-.100)	.200 (.200-.200)	.400 (.400-.400)	.600 (.500-.700)	1929
Age 12-19 years	11-12	.134 (.110-.163)	.110 (.090-.170)	.260 (.170-.350)	.420 (.350-.480)	.510 (.420-.850)	344
Age 12-19 years	13-14	*	.100 (<LOD-.100)	.200 (.200-.300)	.500 (.400-.500)	.600 (.500-.900)	402
Age 12-19 years	15-16	*	<LOD	.200 (.100-.300)	.300 (.200-.600)	.600 (.300-1.30)	353
Age 12-19 years	17-18	.137 (.122-.154)	.100 (.100-.100)	.200 (.200-.300)	.400 (.300-.500)	.500 (.400-1.20)	313
Age 20+ years	11-12	*	.100 (<LOD-.160)	.250 (.200-.310)	.510 (.460-.550)	.700 (.640-.840)	1560
Age 20+ years	13-14	*	<LOD	.200 (.200-.200)	.400 (.300-.500)	.600 (.500-1.00)	1766
Age 20+ years	15-16	*	<LOD	.200 (.100-.200)	.400 (.300-.500)	.600 (.500-.700)	1640
Age 20+ years	17-18	.129 (.119-.140)	.100 (.100-.100)	.200 (.200-.200)	.400 (.400-.500)	.600 (.500-.800)	1616
Male	11-12	*	.110 (<LOD-.160)	.270 (.190-.350)	.490 (.390-.660)	.720 (.510-1.06)	966
Male	13-14	*	<LOD	.200 (.200-.200)	.400 (.300-.500)	.600 (.400-.900)	1032
Male	15-16	*	<LOD	.200 (.100-.200)	.400 (.300-.500)	.600 (.500-.800)	964
Male	17-18	.133 (.121-.147)	.100 (.100-.100)	.200 (.200-.300)	.400 (.300-.500)	.500 (.400-.800)	952
Female	11-12	*	.100 (<LOD-.160)	.250 (.200-.300)	.510 (.410-.540)	.690 (.560-.810)	938
Female	13-14	*	<LOD	.200 (.200-.200)	.400 (.300-.600)	.700 (.500-1.10)	1136
Female	15-16	*	<LOD	.200 (.100-.200)	.400 (.300-.400)	.500 (.400-.800)	1029
Female	17-18	.128 (.117-.140)	.100 (.100-.100)	.200 (.200-.200)	.400 (.300-.400)	.700 (.400-.800)	977
Mexican American	11-12	*	<LOD	.220 (.160-.310)	.440 (.310-.590)	.590 (.390-.970)	211
Mexican American	13-14	*	<LOD	.100 (<LOD-.100)	.200 (.100-.500)	.500 (.300-.500)	332
Mexican American	15-16	*	<LOD	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.200-.400)	370
Mexican American	17-18	*	<LOD	.100 (<LOD-.100)	.200 (.100-.300)	.400 (.200-.500)	297
Non-Hispanic Black	11-12	*	.100 (<LOD-.150)	.240 (.170-.340)	.520 (.390-.660)	.780 (.580-1.06)	485
Non-Hispanic Black	13-14	*	<LOD	.200 (.100-.300)	.400 (.200-1.00)	.800 (.400-1.60)	455
Non-Hispanic Black	15-16	*	<LOD	.200 (.100-.200)	.300 (.200-.400)	.600 (.400-.700)	439
Non-Hispanic Black	17-18	*	.100 (<LOD-.100)	.200 (.100-.200)	.400 (.300-.400)	.500 (.400-.700)	430
Non-Hispanic White	11-12	*	.120 (<LOD-.170)	.280 (.230-.340)	.510 (.460-.580)	.700 (.600-.990)	666
Non-Hispanic White	13-14	*	.100 (<LOD-.100)	.200 (.200-.300)	.500 (.400-.500)	.700 (.500-1.00)	862
Non-Hispanic White	15-16	*	<LOD	.200 (.200-.200)	.400 (.400-.600)	.700 (.600-.800)	619
Non-Hispanic White	17-18	.146 (.131-.162)	.100 (.100-.200)	.200 (.200-.300)	.500 (.400-.500)	.700 (.500-.800)	667
All Hispanic	11-12	*	<LOD	.170 (.130-.230)	.350 (.260-.450)	.510 (.380-.740)	406
All Hispanic	13-14	*	<LOD	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.200-.500)	537
All Hispanic	15-16	*	<LOD	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.200-.400)	629
All Hispanic	17-18	*	<LOD	.100 (.100-.100)	.200 (.200-.300)	.300 (.200-.500)	473
Non-Hispanic Asian	11-12	*	<LOD	.170 (.130-.260)	.370 (.300-.520)	.580 (.420-.860)	291
Non-Hispanic Asian	13-14	*	<LOD	.100 (<LOD-.200)	.200 (.100-.400)	.400 (.200-.600)	236
Non-Hispanic Asian	15-16	*	<LOD	.100 (<LOD-.200)	.200 (.100-.400)	.400 (.200-.600)	220
Non-Hispanic Asian	17-18	*	<LOD	.100 (.100-.300)	.400 (.200-.500)	.800 (.300-1.30)	257

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, 15-16, and 17-18 are 0.087, 0.100, 0.100, and 0.100 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum 2-(N-Methyl-perfluorooctane sulfonamido) acetic acid (MeFOSAA) (Special Sample of Serum PFAS in Children, 2013-2014)

CAS Number 2355-31-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	*	.110 (<LOD-.160)	.270 (.180-.470)	.810 (.400-1.09)	1.09 (.810-2.60)	525
Age 3-5 years	13-14	*	.120 (<LOD-.210)	.250 (.200-.550)	.880 (.240-2.60)	1.02 (.520-3.15)	149
Age 6-11 years	13-14	*	.100 (<LOD-.160)	.280 (.180-.390)	.650 (.360-1.14)	1.14 (.570-2.38)	376
Male	13-14	*	<LOD	.290 (.200-.550)	.940 (.440-1.37)	1.37 (.880-2.38)	284
Female	13-14	*	.120 (<LOD-.150)	.260 (.160-.380)	.630 (.360-.860)	.860 (.650-1.16)	241
All Hispanic	13-14	*	<LOD	.150 (<LOD-.300)	.460 (.250-.690)	.690 (.440-1.02)	186
Other	13-14	*	.130 (<LOD-.200)	.300 (.230-.490)	.860 (.400-1.40)	1.37 (.910-2.38)	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluoroundecanoic acid (PFUnDA) (1999-2000, 2003-2010)

CAS Number 2058-94-8

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	99-00	*	<LOD	<LOD	.300 (<LOD-.400)	.400 (.300-.600)	1432
Total population	03-04	*	<LOD	<LOD	<LOD	.600 (<LOD-1.30)	2094
Total population	05-06	*	<LOD	.300 (.200-.400)	.500 (.400-.800)	.700 (.600-1.20)	2120
Total population	07-08	*	<LOD	.200 (<LOD-.300)	.400 (.300-.500)	.600 (.500-.800)	2100
Total population	09-10	.172 (.151-.196)	.200 (.100-.200)	.300 (.200-.400)	.600 (.400-.800)	.900 (.600-1.10)	2233
Age 12-19 years	99-00	*	<LOD	<LOD	<LOD	.200 (<LOD-.300)	497
Age 12-19 years	03-04	*	<LOD	<LOD	<LOD	.300 (<LOD-1.10)	640
Age 12-19 years	05-06	*	<LOD	<LOD	.300 (.200-.500)	.500 (.300-.900)	640
Age 12-19 years	07-08	*	<LOD	<LOD	.200 (<LOD-.200)	.300 (.200-.300)	357
Age 12-19 years	09-10	*	.100 (<LOD-.100)	.200 (.100-.200)	.300 (.200-.600)	.400 (.200-.900)	364
Age 20+ years	99-00	*	<LOD	<LOD	.300 (<LOD-.500)	.400 (.300-.700)	935
Age 20+ years	03-04	*	<LOD	<LOD	.300 (<LOD-.600)	.600 (<LOD-1.40)	1454
Age 20+ years	05-06	*	<LOD	.300 (.200-.400)	.500 (.400-.800)	.800 (.600-1.10)	1480
Age 20+ years	07-08	*	<LOD	.200 (.200-.300)	.400 (.300-.600)	.600 (.500-.900)	1743
Age 20+ years	09-10	.182 (.160-.207)	.200 (.200-.200)	.300 (.300-.400)	.600 (.400-.800)	.900 (.700-1.20)	1869
Male	99-00	*	<LOD	<LOD	.300 (<LOD-.500)	.500 (.300-.600)	684
Male	03-04	*	<LOD	<LOD	.400 (<LOD-1.00)	.700 (<LOD-2.30)	1053
Male	05-06	*	<LOD	.300 (.200-.400)	.600 (.400-.700)	.800 (.600-1.10)	1048
Male	07-08	*	<LOD	.200 (<LOD-.300)	.400 (.300-.500)	.700 (.500-1.00)	1059
Male	09-10	.170 (.147-.196)	.200 (.100-.200)	.300 (.200-.400)	.500 (.400-.900)	.800 (.500-1.20)	1075
Female	99-00	*	<LOD	<LOD	.200 (<LOD-.400)	.300 (<LOD-1.60)	748
Female	03-04	*	<LOD	<LOD	<LOD	.400 (<LOD-.700)	1041
Female	05-06	*	<LOD	.300 (<LOD-.400)	.500 (.400-.700)	.700 (.500-1.10)	1072
Female	07-08	*	<LOD	.200 (<LOD-.200)	.400 (.300-.500)	.600 (.400-.700)	1041
Female	09-10	.175 (.153-.199)	.200 (.100-.200)	.300 (.200-.400)	.600 (.400-.800)	.900 (.700-1.20)	1158
Mexican American	99-00	*	<LOD	<LOD	<LOD	<LOD	521
Mexican American	03-04	*	<LOD	<LOD	<LOD	<LOD	485
Mexican American	05-06	*	<LOD	<LOD	.300 (<LOD-.700)	.500 (.300-1.00)	499
Mexican American	07-08	*	<LOD	<LOD	.300 (<LOD-.400)	.300 (<LOD-1.40)	391
Mexican American	09-10	*	.100 (.100-.100)	.200 (.200-.200)	.300 (.300-.400)	.400 (.300-.600)	461
Non-Hispanic Black	99-00	*	<LOD	.300 (<LOD-.500)	.600 (.300-1.20)	.900 (.500-1.80)	269
Non-Hispanic Black	03-04	*	<LOD	<LOD	.600 (<LOD-1.40)	.900 (.300-2.90)	538
Non-Hispanic Black	05-06	*	<LOD	.300 (<LOD-.500)	.600 (.400-1.50)	1.20 (.600-2.70)	544
Non-Hispanic Black	07-08	*	<LOD	.300 (.200-.400)	.500 (.400-.700)	.800 (.600-1.20)	419
Non-Hispanic Black	09-10	.237 (.199-.283)	.200 (.200-.200)	.400 (.300-.500)	.800 (.500-1.10)	1.30 (.800-1.80)	391
Non-Hispanic White	99-00	*	<LOD	<LOD	.200 (<LOD-.300)	.300 (.200-.600)	491
Non-Hispanic White	03-04	*	<LOD	<LOD	<LOD	.500 (<LOD-.900)	962
Non-Hispanic White	05-06	*	<LOD	.300 (.200-.400)	.500 (.400-.700)	.600 (.400-1.50)	935
Non-Hispanic White	07-08	*	<LOD	.200 (<LOD-.200)	.300 (.300-.500)	.500 (.400-.600)	931
Non-Hispanic White	09-10	.162 (.136-.193)	.200 (.100-.200)	.300 (.200-.400)	.500 (.300-.800)	.800 (.500-1.00)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.3, 0.2, 0.2, and 0.1 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.



## Serum Perfluoroundecanoic acid (PFUnDA) (2011 - 2018)

CAS Number 2058-94-8

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	11-12	*	.120 (.100-.140)	.220 (.180-.250)	.380 (.310-.520)	.620 (.440-.790)	1904
Total population	13-14	*	<LOD	.200 (.100-.200)	.300 (.200-.400)	.500 (.400-.600)	2168
Total population	15-16	*	<LOD	.100 (.100-.200)	.200 (.200-.500)	.400 (.300-.500)	1993
Total population	17-18	.125 (.115-.135)	.100 (.100-.100)	.200 (.200-.200)	.300 (.200-.300)	.400 (.300-.500)	1929
Age 12-19 years	11-12	*	<LOD	.110 (<LOD-.140)	.180 (.140-.220)	.250 (.190-.390)	344
Age 12-19 years	13-14	*	<LOD	<LOD	.200 (.100-.200)	.200 (.200-.300)	402
Age 12-19 years	15-16	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (.100-.400)	353
Age 12-19 years	17-18	*	.100 (<LOD-.100)	.100 (.100-.200)	.200 (.100-.200)	.200 (.100-.500)	313
Age 20+ years	11-12	.146 (.129-.165)	.130 (.110-.150)	.230 (.190-.280)	.420 (.330-.530)	.660 (.490-.840)	1560
Age 20+ years	13-14	*	<LOD	.200 (.100-.200)	.300 (.300-.500)	.500 (.400-.700)	1766
Age 20+ years	15-16	*	<LOD	.100 (.100-.200)	.300 (.200-.300)	.400 (.300-.500)	1640
Age 20+ years	17-18	.129 (.119-.140)	.100 (.100-.100)	.200 (.200-.200)	.300 (.200-.400)	.400 (.300-.600)	1616
Male	11-12	*	.120 (.100-.150)	.220 (.180-.260)	.340 (.290-.480)	.590 (.390-.820)	966
Male	13-14	*	<LOD	.200 (.100-.200)	.300 (.200-.500)	.500 (.400-.700)	1032
Male	15-16	*	<LOD	.100 (.100-.200)	.200 (.200-.500)	.400 (.300-.500)	964
Male	17-18	.121 (.114-.129)	.100 (.100-.100)	.200 (.200-.200)	.300 (.200-.300)	.300 (.300-.400)	952
Female	11-12	*	.120 (.100-.140)	.210 (.180-.270)	.420 (.320-.540)	.650 (.520-.740)	938
Female	13-14	*	<LOD	.200 (.100-.200)	.300 (.200-.400)	.500 (.400-.600)	1136
Female	15-16	*	<LOD	.100 (.100-.200)	.200 (.200-.500)	.400 (.300-.500)	1029
Female	17-18	.128 (.115-.143)	.100 (.100-.100)	.200 (.200-.200)	.300 (.200-.400)	.400 (.300-.800)	977
Mexican American	11-12	*	<LOD	.150 (.130-.180)	.230 (.190-.300)	.310 (.230-.330)	211
Mexican American	13-14	*	<LOD	<LOD	.200 (.100-.300)	.200 (.100-.600)	332
Mexican American	15-16	*	<LOD	<LOD	.100 (<LOD-.200)	.200 (.100-.400)	370
Mexican American	17-18	*	.100 (<LOD-.100)	.100 (.100-.200)	.200 (.100-.300)	.200 (.100-.400)	297
Non-Hispanic Black	11-12	.164 (.135-.199)	.140 (.110-.190)	.260 (.200-.390)	.530 (.350-.840)	.840 (.520-1.26)	485
Non-Hispanic Black	13-14	*	.100 (<LOD-.200)	.200 (.100-.400)	.500 (.300-.700)	.700 (.500-.900)	455
Non-Hispanic Black	15-16	*	<LOD	.200 (.100-.200)	.300 (.200-.400)	.400 (.300-.700)	439
Non-Hispanic Black	17-18	.144 (.124-.168)	.100 (.100-.200)	.200 (.200-.300)	.400 (.300-.500)	.600 (.400-.900)	430
Non-Hispanic White	11-12	*	.110 (<LOD-.140)	.200 (.160-.240)	.330 (.280-.410)	.450 (.330-.690)	666
Non-Hispanic White	13-14	*	<LOD	.200 (.100-.200)	.300 (.200-.400)	.400 (.300-.600)	862
Non-Hispanic White	15-16	*	<LOD	.100 (.100-.200)	.200 (.100-.300)	.300 (.200-.500)	619
Non-Hispanic White	17-18	.120 (.111-.130)	.100 (.100-.100)	.200 (.200-.200)	.300 (.200-.300)	.400 (.300-.400)	667
All Hispanic	11-12	*	.110 (<LOD-.130)	.180 (.160-.210)	.310 (.230-.390)	.420 (.300-.630)	406
All Hispanic	13-14	*	<LOD	.100 (<LOD-.100)	.200 (.100-.200)	.200 (.100-.600)	537
All Hispanic	15-16	*	<LOD	<LOD	.200 (.100-.200)	.300 (.200-.300)	629
All Hispanic	17-18	.111 (.100-.123)	.100 (.100-.100)	.200 (.100-.200)	.200 (.200-.300)	.300 (.200-.300)	473
Non-Hispanic Asian	11-12	.338 (.277-.412)	.330 (.220-.510)	.840 (.630-1.01)	1.38 (1.02-2.33)	2.40 (1.33-3.41)	291
Non-Hispanic Asian	13-14	.274 (.231-.326)	.300 (.200-.400)	.600 (.400-.800)	1.00 (.900-1.20)	1.50 (1.00-2.40)	236
Non-Hispanic Asian	15-16	.233 (.189-.287)	.300 (.200-.300)	.500 (.400-.600)	1.00 (.600-1.40)	1.50 (.800-2.20)	220
Non-Hispanic Asian	17-18	.210 (.162-.273)	.200 (.100-.300)	.400 (.300-.600)	.800 (.500-1.60)	1.10 (.600-2.50)	257

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, 15-16, and 17-18 are 0.10, 0.10, 0.10, and 0.10 respectively.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

## Serum Perfluoroundecanoic acid (PFUnDA) (Special Sample of Serum PFAS in Children, 2013-2014)

CAS Number 2058-94-8

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Demographic Categories	Survey (Years)	Geometric Mean (95% CI)	50th Percentile (95% CI)	75th Percentile (95% CI)	90th Percentile (95% CI)	95th Percentile (95% CI)	Sample Size
Total population	13-14	*	<LOD	.100 (<LOD-.140)	.200 (.150-.270)	.300 (.200-.480)	525
Age 3-5 years	13-14	*	<LOD	.100 (<LOD-.140)	.300 (<LOD-.480)	.480 (.130-1.54)	149
Age 6-11 years	13-14	*	<LOD	.110 (<LOD-.140)	.190 (.170-.220)	.250 (.200-.280)	376
Male	13-14	*	<LOD	.100 (<LOD-.150)	.200 (.150-.300)	.300 (.170-.530)	284
Female	13-14	*	<LOD	.110 (<LOD-.140)	.210 (.140-.320)	.310 (.210-.370)	241
All Hispanic	13-14	*	<LOD	.100 (<LOD-.150)	.190 (.150-.250)	.270 (.190-.370)	186
Other	13-14	*	<LOD	.110 (<LOD-.140)	.200 (.140-.300)	.320 (.200-.480)	339

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

<LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

\* Not calculated: proportion of results below limit of detection was too high to provide a valid result.