

Flame Retardant Metabolites

Urinary Bis(1-chloro-2-propyl) phosphate (BCPP) (2011 - 2018)†

Metabolite of Tris(1-chloro-2-propyl) phosphate (TCPP)

Geometric mean and selected percentiles of urine concentrations of (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	*	.121 (<LOD-.151)	.265 (.226-.297)	.520 (.422-.664)	.952 (.718-1.15)	2038
Total population	13-14	.186 (.173-.199)	.160 (.140-.180)	.370 (.330-.400)	.760 (.680-.840)	1.25 (1.07-1.36)	2316
Total population	15-16	*	.147 (<LOD-.228)	.405 (.320-.505)	.866 (.682-1.05)	1.50 (1.11-1.81)	2430
Total population	17-18	*	<LOD	.237 (.210-.263)	.594 (.526-.663)	1.11 (.889-1.34)	2801
Age 3-5 years	15-16	.242 (.196-.298)	.237 (.150-.359)	.535 (.414-.641)	1.16 (.815-1.37)	1.76 (1.20-2.63)	352
Age 3-5 years	17-18	*	.125 (<LOD-.159)	.349 (.252-.448)	.753 (.544-.852)	1.06 (.753-1.40)	418
Age 6-11 years	11-12	.177 (.153-.204)	.154 (.116-.193)	.289 (.265-.354)	.636 (.463-.783)	.977 (.680-1.27)	311
Age 6-11 years	13-14	.263 (.233-.296)	.250 (.210-.300)	.470 (.390-.610)	1.06 (.600-1.84)	2.08 (1.25-2.46)	337
Age 6-11 years	15-16	.233 (.183-.297)	.205 (.123-.312)	.554 (.398-.707)	1.11 (.763-1.96)	2.02 (1.01-2.92)	324
Age 6-11 years	17-18	*	.118 (<LOD-.159)	.322 (.212-.434)	.651 (.434-1.43)	1.43 (.614-2.50)	331
Age 12-19 years	11-12	.157 (.138-.180)	.148 (.103-.191)	.259 (.217-.341)	.470 (.367-.576)	.656 (.470-.763)	304
Age 12-19 years	13-14	.186 (.157-.222)	.150 (.120-.220)	.410 (.280-.520)	.660 (.560-.890)	1.03 (.670-1.32)	349
Age 12-19 years	15-16	*	.141 (<LOD-.322)	.449 (.320-.617)	.742 (.586-1.04)	1.06 (.702-1.64)	307
Age 12-19 years	17-18	*	.106 (<LOD-.133)	.264 (.214-.355)	.661 (.479-.826)	.922 (.688-1.30)	353
Age 20+ years	11-12	*	.114 (<LOD-.144)	.261 (.219-.300)	.520 (.394-.771)	.971 (.665-1.38)	1423
Age 20+ years	13-14	*	.140 (.120-.180)	.340 (.310-.390)	.750 (.650-.840)	1.24 (1.03-1.55)	1630
Age 20+ years	15-16	*	.137 (<LOD-.222)	.376 (.302-.479)	.830 (.635-1.05)	1.42 (1.06-1.91)	1447
Age 20+ years	17-18	*	<LOD	.218 (.192-.249)	.572 (.477-.648)	1.11 (.840-1.34)	1699
Male	11-12	*	.122 (<LOD-.154)	.266 (.211-.306)	.473 (.394-.592)	.846 (.494-1.40)	1021
Male	13-14	.196 (.180-.213)	.160 (.130-.190)	.420 (.360-.480)	.860 (.760-.940)	1.34 (1.13-1.70)	1157
Male	15-16	.203 (.165-.249)	.184 (<LOD-.278)	.428 (.355-.530)	.895 (.710-1.08)	1.40 (1.08-1.76)	1207
Male	17-18	*	<LOD	.248 (.216-.296)	.561 (.431-.691)	1.11 (.645-1.76)	1386
Female	11-12	*	.121 (<LOD-.154)	.263 (.226-.321)	.572 (.474-.756)	1.06 (.756-1.25)	1017
Female	13-14	*	.150 (.130-.180)	.330 (.270-.380)	.690 (.540-.810)	1.06 (.810-1.42)	1159
Female	15-16	*	.118 (<LOD-.198)	.370 (.262-.492)	.855 (.630-1.06)	1.64 (1.01-2.25)	1223
Female	17-18	*	<LOD	.218 (.193-.247)	.615 (.509-.716)	1.07 (.801-1.54)	1415
Mexican American	11-12	.161 (.135-.191)	.133 (<LOD-.171)	.247 (.185-.388)	.560 (.419-.792)	.912 (.709-1.70)	252
Mexican American	13-14	*	.140 (<LOD-.160)	.320 (.290-.380)	.670 (.480-.960)	1.11 (.810-1.78)	384
Mexican American	15-16	*	.149 (<LOD-.225)	.399 (.314-.497)	.804 (.662-1.00)	1.45 (.959-1.85)	492
Mexican American	17-18	*	<LOD	.212 (.174-.239)	.465 (.366-.560)	.649 (.544-.898)	423
Non-Hispanic Black	11-12	.180 (.164-.198)	.156 (.130-.176)	.307 (.261-.347)	.636 (.508-.864)	1.12 (.851-1.57)	513
Non-Hispanic Black	13-14	.186 (.171-.203)	.170 (.140-.200)	.340 (.290-.410)	.680 (.550-.810)	1.01 (.820-1.23)	466
Non-Hispanic Black	15-16	*	.157 (<LOD-.223)	.366 (.283-.512)	.844 (.715-1.01)	1.55 (1.01-2.09)	524
Non-Hispanic Black	17-18	*	<LOD	.235 (.170-.327)	.628 (.404-.969)	1.28 (.692-2.23)	654
Non-Hispanic White	11-12	*	.111 (<LOD-.154)	.259 (.216-.306)	.482 (.362-.772)	.958 (.592-1.39)	709
Non-Hispanic White	13-14	.186 (.171-.204)	.150 (.130-.180)	.380 (.330-.440)	.800 (.680-.910)	1.28 (1.05-1.67)	930
Non-Hispanic White	15-16	*	.146 (<LOD-.248)	.398 (.302-.519)	.865 (.580-1.08)	1.37 (.930-2.00)	758
Non-Hispanic White	17-18	*	<LOD	.236 (.194-.264)	.615 (.490-.801)	1.16 (.871-1.54)	923
All Hispanic	11-12	.160 (.144-.177)	.138 (.107-.174)	.261 (.219-.308)	.500 (.416-.659)	.792 (.650-1.00)	480
All Hispanic	13-14	*	.150 (.110-.180)	.320 (.300-.370)	.670 (.530-.840)	1.13 (.840-1.70)	589
All Hispanic	15-16	*	.126 (<LOD-.197)	.401 (.319-.523)	.900 (.732-1.15)	1.51 (1.04-1.89)	804
All Hispanic	17-18	*	<LOD	.227 (.204-.279)	.497 (.412-.584)	.776 (.621-1.02)	668
Non-Hispanic Asian	11-12	*	.116 (<LOD-.172)	.294 (.232-.435)	.674 (.502-.947)	1.15 (.668-2.25)	266
Non-Hispanic Asian	13-14	*	.160 (.110-.200)	.360 (.240-.660)	.770 (.520-1.28)	1.28 (.750-2.38)	238
Non-Hispanic Asian	15-16	*	.116 (<LOD-.371)	.424 (.184-.685)	.783 (.483-1.45)	1.30 (.735-2.30)	220
Non-Hispanic Asian	17-18	*	<LOD	.239 (.188-.316)	.752 (.368-1.24)	1.24 (.599-1.84)	369

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, 15-16, and 17-18 are 0.1, 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.

† Participants are age 6+ years in Surveys 11-12 and 13-14; beginning with Survey 15-16, participants include those age 3+ years.

Urinary Bis(1-chloro-2-propyl) phosphate (BCPP) (creatinine corrected) (2011 - 2018)†

Metabolite of Tris(1-chloro-2-propyl) phosphate (TCPP)

Geometric mean and selected percentiles of urine concentrations of (in µg/g of creatinine) 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	*	.148 (<LOD-.167)	.274 (.246-.317)	.546 (.444-.662)	.873 (.776-1.05)	2038
Total population	13-14	.200 (.184-.216)	.188 (.174-.203)	.348 (.315-.379)	.694 (.632-.777)	1.17 (1.03-1.38)	2315
Total population	15-16	*	.187 (<LOD-.231)	.395 (.335-.477)	.806 (.685-.963)	1.26 (1.04-1.60)	2429
Total population	17-18	*	<LOD	.273 (.257-.296)	.579 (.492-.655)	.980 (.786-1.16)	2801
Age 3-5 years	15-16	.543 (.441-.670)	.569 (.389-.743)	1.21 (.970-1.47)	2.20 (1.77-2.63)	2.89 (2.44-3.64)	351
Age 3-5 years	17-18	*	.338 (<LOD-.413)	.596 (.483-.786)	1.05 (.859-1.36)	1.54 (1.09-1.86)	418
Age 6-11 years	11-12	.251 (.218-.290)	.240 (.203-.273)	.411 (.340-.608)	.837 (.710-1.33)	1.61 (.917-3.26)	311
Age 6-11 years	13-14	.334 (.286-.389)	.340 (.290-.372)	.603 (.467-.744)	1.22 (.875-2.22)	2.38 (1.17-3.01)	337
Age 6-11 years	15-16	.293 (.234-.367)	.256 (.199-.411)	.690 (.437-.989)	1.28 (.871-1.90)	1.90 (1.16-2.42)	324
Age 6-11 years	17-18	*	.172 (<LOD-.196)	.322 (.227-.442)	.771 (.442-1.17)	1.17 (.700-2.08)	331
Age 12-19 years	11-12	.142 (.122-.164)	.136 (.117-.173)	.237 (.209-.303)	.444 (.308-.709)	.691 (.444-.872)	304
Age 12-19 years	13-14	.160 (.132-.195)	.159 (.129-.189)	.330 (.218-.412)	.500 (.410-.667)	.753 (.496-1.34)	349
Age 12-19 years	15-16	*	.158 (<LOD-.240)	.324 (.240-.396)	.491 (.396-.613)	.646 (.533-.877)	307
Age 12-19 years	17-18	*	.129 (<LOD-.148)	.262 (.208-.337)	.476 (.321-.922)	1.09 (.443-1.52)	353
Age 20+ years	11-12	*	.145 (<LOD-.161)	.261 (.229-.309)	.505 (.415-.662)	.858 (.699-1.12)	1423
Age 20+ years	13-14	*	.184 (.168-.200)	.322 (.284-.368)	.665 (.573-.777)	1.13 (.910-1.49)	1629
Age 20+ years	15-16	*	.173 (<LOD-.216)	.371 (.315-.439)	.751 (.604-.858)	1.14 (.885-1.46)	1447
Age 20+ years	17-18	*	<LOD	.261 (.235-.283)	.524 (.418-.643)	.881 (.707-1.12)	1699
Male	11-12	*	.134 (<LOD-.147)	.223 (.203-.252)	.436 (.355-.577)	.831 (.546-1.05)	1021
Male	13-14	.181 (.164-.198)	.167 (.149-.177)	.333 (.284-.384)	.722 (.619-.878)	1.21 (1.02-1.42)	1156
Male	15-16	.184 (.155-.218)	.170 (<LOD-.237)	.379 (.323-.449)	.752 (.617-.920)	1.21 (.981-1.38)	1207
Male	17-18	*	<LOD	.237 (.217-.262)	.478 (.383-.643)	.827 (.643-1.16)	1386
Female	11-12	*	.173 (<LOD-.201)	.323 (.284-.375)	.620 (.497-.771)	1.03 (.776-1.53)	1017
Female	13-14	*	.212 (.189-.233)	.352 (.315-.395)	.684 (.563-.843)	1.14 (.867-1.53)	1159
Female	15-16	*	.197 (<LOD-.229)	.412 (.338-.535)	.858 (.687-1.11)	1.46 (1.04-2.22)	1222
Female	17-18	*	<LOD	.313 (.283-.357)	.643 (.516-.801)	1.07 (.738-1.61)	1415
Mexican American	11-12	.161 (.136-.191)	.139 (<LOD-.169)	.271 (.215-.303)	.606 (.369-.888)	.971 (.556-1.85)	252
Mexican American	13-14	*	.159 (<LOD-.203)	.319 (.275-.362)	.556 (.429-.775)	.962 (.556-1.41)	383
Mexican American	15-16	*	.197 (<LOD-.250)	.410 (.350-.530)	.825 (.704-.919)	1.40 (.973-1.66)	492
Mexican American	17-18	*	<LOD	.264 (.228-.295)	.439 (.337-.555)	.696 (.529-.801)	423
Non-Hispanic Black	11-12	.135 (.119-.152)	.116 (.106-.132)	.230 (.197-.275)	.540 (.385-.727)	.855 (.643-1.32)	513
Non-Hispanic Black	13-14	.146 (.126-.169)	.136 (.114-.158)	.248 (.231-.291)	.455 (.379-.560)	.758 (.574-.963)	466
Non-Hispanic Black	15-16	*	.143 (<LOD-.182)	.331 (.263-.446)	.719 (.565-.864)	.978 (.858-1.37)	523
Non-Hispanic Black	17-18	*	<LOD	.196 (.156-.229)	.457 (.326-.653)	.725 (.502-1.30)	654
Non-Hispanic White	11-12	*	.156 (<LOD-.179)	.291 (.240-.325)	.542 (.415-.742)	.872 (.660-1.31)	709
Non-Hispanic White	13-14	.213 (.196-.232)	.200 (.180-.219)	.358 (.325-.386)	.769 (.649-.889)	1.42 (1.04-1.80)	930
Non-Hispanic White	15-16	*	.194 (<LOD-.245)	.400 (.322-.500)	.802 (.621-1.00)	1.25 (.899-2.06)	758
Non-Hispanic White	17-18	*	<LOD	.283 (.247-.321)	.546 (.429-.766)	1.09 (.766-1.23)	923
All Hispanic	11-12	.160 (.143-.180)	.148 (.131-.163)	.255 (.223-.302)	.525 (.436-.661)	.808 (.602-1.47)	480
All Hispanic	13-14	*	.172 (.152-.191)	.333 (.304-.363)	.556 (.468-.736)	.974 (.635-1.23)	588
All Hispanic	15-16	*	.190 (<LOD-.227)	.397 (.344-.486)	.825 (.704-.961)	1.33 (1.05-1.58)	804
All Hispanic	17-18	*	<LOD	.272 (.232-.308)	.555 (.431-.685)	.786 (.699-.930)	668
Non-Hispanic Asian	11-12	*	.200 (<LOD-.232)	.376 (.323-.444)	.731 (.538-1.14)	1.22 (.688-5.70)	266
Non-Hispanic Asian	13-14	*	.233 (.202-.261)	.412 (.320-.563)	.667 (.524-1.09)	1.09 (.639-1.84)	238
Non-Hispanic Asian	15-16	*	.203 (<LOD-.309)	.450 (.296-.651)	1.09 (.593-1.50)	1.83 (1.10-2.23)	220
Non-Hispanic Asian	17-18	*	<LOD	.393 (.299-.488)	.884 (.589-1.07)	1.16 (.869-2.85)	369

<LOD means less than the limit of detection for the urine levels not corrected for creatinine.

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

† Participants are age 6+ years in Surveys 11-12 and 13-14; beginning with Survey 15-16, participants include those age 3+ years.

Urinary Bis(2-chloroethyl) phosphate (BCEtP) (2011 - 2018)†

Metabolite of Tris(2-chloroethyl) phosphate (TCETP)

Geometric mean and selected percentiles of urine concentrations of (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	.476 (.418-.543)	.457 (.389-.541)	1.05 (.911-1.26)	2.38 (2.00-2.90)	4.43 (3.45-4.98)	2036
Total population	13-14	.413 (.368-.463)	.380 (.340-.410)	.920 (.820-1.12)	2.31 (1.87-2.82)	3.95 (3.06-5.41)	2303
Total population	15-16	.450 (.374-.541)	.436 (.368-.544)	.989 (.813-1.22)	2.22 (1.66-2.81)	3.87 (2.97-5.22)	2430
Total population	17-18	.355 (.313-.402)	.336 (.291-.381)	.812 (.672-.951)	1.84 (1.52-2.26)	3.04 (2.33-3.93)	2803
Age 3-5 years	15-16	.616 (.503-.755)	.601 (.463-.778)	1.23 (.951-1.50)	2.72 (1.69-5.22)	6.08 (2.98-10.9)	352
Age 3-5 years	17-18	.488 (.399-.597)	.467 (.370-.558)	.908 (.693-1.16)	3.10 (1.47-4.42)	5.50 (3.73-9.02)	418
Age 6-11 years	11-12	.689 (.580-.820)	.625 (.541-.750)	1.58 (1.10-1.96)	3.13 (2.31-3.97)	7.14 (3.17-17.5)	311
Age 6-11 years	13-14	.630 (.500-.794)	.640 (.400-.840)	1.35 (.940-1.87)	2.91 (1.69-5.63)	5.63 (2.83-7.34)	334
Age 6-11 years	15-16	.648 (.499-.842)	.644 (.440-.841)	1.34 (.966-2.16)	3.53 (2.25-4.90)	4.94 (3.53-10.9)	324
Age 6-11 years	17-18	.478 (.365-.626)	.490 (.351-.637)	1.12 (.802-1.64)	2.37 (1.66-3.37)	3.37 (2.37-6.69)	330
Age 12-19 years	11-12	.677 (.510-.898)	.665 (.494-.904)	1.34 (1.07-2.09)	2.66 (2.26-4.99)	7.10 (2.66-12.7)	304
Age 12-19 years	13-14	.619 (.517-.741)	.600 (.440-.800)	1.57 (.970-2.28)	3.25 (2.70-3.94)	4.25 (3.80-7.69)	345
Age 12-19 years	15-16	.631 (.475-.837)	.621 (.458-.891)	1.22 (.937-2.21)	2.61 (2.00-4.82)	4.87 (2.75-11.6)	307
Age 12-19 years	17-18	.406 (.354-.465)	.394 (.354-.487)	.992 (.742-1.15)	2.22 (1.70-2.38)	3.02 (2.28-4.53)	353
Age 20+ years	11-12	.434 (.369-.511)	.409 (.329-.526)	.964 (.823-1.15)	2.22 (1.77-2.81)	3.91 (3.00-4.75)	1421
Age 20+ years	13-14	.372 (.333-.416)	.340 (.300-.390)	.830 (.710-.950)	2.00 (1.67-2.64)	3.53 (2.64-5.37)	1624
Age 20+ years	15-16	.406 (.335-.492)	.394 (.339-.486)	.907 (.724-1.15)	1.88 (1.53-2.57)	3.55 (2.24-5.93)	1447
Age 20+ years	17-18	.332 (.290-.380)	.301 (.271-.351)	.757 (.610-.921)	1.72 (1.42-2.20)	2.63 (2.20-3.72)	1702
Male	11-12	.502 (.452-.557)	.505 (.423-.550)	1.09 (.911-1.36)	2.43 (2.15-3.10)	4.47 (3.70-5.36)	1018
Male	13-14	.457 (.397-.525)	.410 (.380-.470)	1.06 (.880-1.30)	2.46 (1.85-3.07)	4.00 (3.00-7.34)	1151
Male	15-16	.482 (.383-.607)	.457 (.381-.574)	1.04 (.863-1.34)	2.61 (1.69-3.77)	4.87 (2.85-6.99)	1207
Male	17-18	.360 (.313-.413)	.346 (.294-.394)	.855 (.664-1.06)	1.82 (1.48-2.26)	3.04 (2.22-4.55)	1386
Female	11-12	.454 (.371-.555)	.431 (.329-.577)	1.01 (.880-1.22)	2.27 (1.93-2.90)	3.74 (3.00-5.00)	1018
Female	13-14	.375 (.324-.433)	.340 (.310-.380)	.830 (.710-1.00)	2.24 (1.74-2.75)	3.94 (2.91-4.64)	1152
Female	15-16	.421 (.360-.492)	.416 (.351-.503)	.959 (.772-1.18)	1.97 (1.61-2.35)	3.22 (2.56-4.46)	1223
Female	17-18	.351 (.298-.412)	.324 (.278-.382)	.764 (.649-.922)	1.88 (1.40-2.37)	3.08 (2.22-4.19)	1417
Mexican American	11-12	.471 (.331-.670)	.423 (.313-.624)	.975 (.624-1.74)	3.03 (1.34-6.35)	5.70 (2.08-12.0)	251
Mexican American	13-14	.507 (.400-.642)	.490 (.370-.670)	1.21 (.760-1.90)	2.84 (1.67-4.00)	4.47 (3.30-8.87)	384
Mexican American	15-16	.421 (.337-.526)	.403 (.323-.574)	.946 (.695-1.13)	1.94 (1.35-2.61)	3.14 (2.38-3.87)	492
Mexican American	17-18	.316 (.236-.423)	.309 (.213-.445)	.648 (.490-.907)	1.53 (1.05-2.60)	2.90 (1.71-3.92)	423
Non-Hispanic Black	11-12	.722 (.650-.803)	.752 (.652-.847)	1.48 (1.29-1.84)	2.95 (2.41-3.45)	5.40 (3.45-9.22)	510
Non-Hispanic Black	13-14	.477 (.426-.534)	.400 (.380-.480)	1.03 (.790-1.26)	2.31 (1.83-2.97)	4.26 (2.77-5.95)	457
Non-Hispanic Black	15-16	.492 (.410-.590)	.470 (.393-.549)	.982 (.789-1.19)	1.97 (1.54-2.50)	3.52 (2.08-7.83)	524
Non-Hispanic Black	17-18	.434 (.354-.534)	.440 (.349-.538)	.974 (.774-1.18)	2.20 (1.49-3.12)	4.32 (2.40-8.54)	653
Non-Hispanic White	11-12	.425 (.363-.498)	.398 (.315-.512)	.952 (.818-1.14)	2.10 (1.72-2.66)	3.81 (2.70-4.75)	708
Non-Hispanic White	13-14	.386 (.344-.434)	.350 (.310-.390)	.880 (.790-1.05)	2.21 (1.82-2.75)	3.80 (2.81-5.63)	928
Non-Hispanic White	15-16	.442 (.346-.565)	.437 (.360-.573)	.959 (.726-1.35)	2.35 (1.61-3.31)	4.02 (2.74-5.93)	758
Non-Hispanic White	17-18	.349 (.301-.405)	.310 (.278-.370)	.837 (.645-1.01)	1.97 (1.44-2.37)	3.09 (2.26-3.93)	926
All Hispanic	11-12	.525 (.417-.661)	.502 (.395-.610)	1.15 (.894-1.58)	2.95 (1.80-4.44)	5.14 (3.13-6.52)	481
All Hispanic	13-14	.484 (.402-.583)	.470 (.390-.580)	1.11 (.800-1.51)	2.59 (1.64-3.85)	4.00 (2.96-6.42)	587
All Hispanic	15-16	.443 (.381-.515)	.427 (.356-.549)	1.00 (.840-1.15)	2.11 (1.63-2.56)	3.39 (2.65-4.29)	804
All Hispanic	17-18	.330 (.274-.396)	.349 (.268-.418)	.703 (.571-.851)	1.55 (1.22-1.87)	2.70 (1.79-3.32)	669
Non-Hispanic Asian	11-12	.481 (.383-.604)	.464 (.327-.574)	1.01 (.725-1.46)	2.78 (1.52-4.77)	4.99 (2.78-9.02)	266
Non-Hispanic Asian	13-14	.351 (.299-.411)	.330 (.270-.390)	.690 (.550-1.14)	1.92 (1.20-2.79)	3.42 (2.20-6.43)	238
Non-Hispanic Asian	15-16	.321 (.248-.415)	.302 (.246-.434)	.702 (.434-1.02)	1.35 (.964-2.40)	2.18 (1.35-3.42)	220
Non-Hispanic Asian	17-18	.287 (.231-.356)	.262 (.199-.326)	.529 (.414-.764)	1.61 (1.20-2.02)	2.44 (1.82-2.93)	369

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, 15-16, and 17-18 are 0.1, 0.08, 0.1, and 0.1, respectively.

† Participants are age 6+ years in Surveys 11-12 and 13-14; beginning with Survey 15-16, participants include those age 3+ years.

Urinary Bis(2-chloroethyl) phosphate (BCEtP) (creatinine corrected) (2011 - 2018)†

Metabolite of Tris(2-chloroethyl) phosphate (TCETP)

Geometric mean and selected percentiles of urine concentrations of (in µg/g of creatinine) 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	.502 (.452-.559)	.504 (.446-.558)	.980 (.818-1.14)	2.14 (1.94-2.41)	3.44 (2.96-4.00)	2036
Total population	13-14	.445 (.389-.508)	.387 (.333-.444)	.835 (.725-1.00)	2.03 (1.71-2.40)	3.87 (2.53-5.13)	2302
Total population	15-16	.474 (.405-.554)	.468 (.389-.546)	.967 (.795-1.18)	2.26 (1.64-2.82)	4.01 (2.88-5.40)	2429
Total population	17-18	.371 (.330-.416)	.372 (.315-.452)	.842 (.744-.988)	1.63 (1.45-1.86)	2.49 (2.13-3.00)	2803
Age 3-5 years	15-16	1.38 (1.13-1.68)	1.32 (1.03-1.61)	2.66 (2.11-3.38)	7.16 (4.98-8.77)	10.5 (7.28-15.8)	351
Age 3-5 years	17-18	.992 (.783-1.26)	.879 (.715-1.24)	2.12 (1.47-2.75)	4.55 (3.03-5.97)	7.84 (5.17-13.0)	418
Age 6-11 years	11-12	.982 (.802-1.20)	.892 (.687-1.15)	1.88 (1.42-2.48)	4.22 (2.66-6.23)	8.96 (3.74-16.2)	311
Age 6-11 years	13-14	.803 (.645-1.00)	.787 (.595-.972)	1.60 (1.11-2.17)	3.46 (2.23-4.97)	4.97 (3.39-7.66)	334
Age 6-11 years	15-16	.815 (.634-1.05)	.738 (.572-.908)	1.78 (1.24-2.60)	4.49 (2.75-8.43)	8.45 (4.72-12.7)	324
Age 6-11 years	17-18	.555 (.421-.732)	.586 (.463-.707)	1.31 (.841-1.59)	2.28 (1.51-4.55)	4.55 (1.80-7.14)	330
Age 12-19 years	11-12	.610 (.451-.826)	.543 (.418-.767)	1.25 (.776-1.97)	3.34 (1.90-5.17)	5.17 (2.71-11.5)	304
Age 12-19 years	13-14	.535 (.443-.646)	.448 (.365-.585)	1.16 (.803-1.40)	2.43 (1.75-3.55)	4.48 (2.33-6.77)	345
Age 12-19 years	15-16	.491 (.395-.610)	.499 (.367-.612)	.943 (.677-1.18)	1.73 (1.24-4.15)	4.19 (1.60-6.94)	307
Age 12-19 years	17-18	.351 (.303-.406)	.328 (.294-.480)	.889 (.600-1.08)	1.52 (1.18-1.92)	2.13 (1.52-3.18)	353
Age 20+ years	11-12	.453 (.403-.510)	.457 (.399-.528)	.855 (.749-1.02)	1.91 (1.61-2.12)	2.89 (2.27-3.44)	1421
Age 20+ years	13-14	.407 (.359-.461)	.349 (.308-.394)	.731 (.627-.874)	1.87 (1.43-2.33)	3.14 (2.38-4.86)	1623
Age 20+ years	15-16	.422 (.358-.497)	.419 (.341-.493)	.867 (.699-1.06)	1.74 (1.31-2.55)	2.96 (2.39-4.65)	1447
Age 20+ years	17-18	.340 (.301-.384)	.337 (.290-.414)	.778 (.670-.912)	1.54 (1.20-1.86)	2.15 (1.86-2.63)	1702
Male	11-12	.465 (.429-.504)	.449 (.401-.507)	.869 (.791-1.03)	2.12 (1.88-2.43)	3.41 (2.89-4.22)	1018
Male	13-14	.422 (.368-.483)	.375 (.317-.429)	.822 (.706-1.00)	2.02 (1.49-2.44)	3.47 (2.44-5.50)	1150
Male	15-16	.438 (.356-.538)	.424 (.342-.528)	.889 (.741-1.15)	2.04 (1.35-2.98)	4.15 (2.76-7.31)	1207
Male	17-18	.320 (.276-.372)	.322 (.279-.397)	.758 (.660-.934)	1.48 (1.17-1.83)	2.00 (1.76-2.63)	1386
Female	11-12	.540 (.469-.623)	.540 (.470-.621)	1.05 (.874-1.25)	2.23 (1.92-2.53)	3.49 (2.74-4.63)	1018
Female	13-14	.468 (.402-.546)	.396 (.333-.467)	.874 (.722-1.05)	2.05 (1.75-2.46)	3.99 (2.46-5.41)	1152
Female	15-16	.511 (.450-.579)	.499 (.425-.598)	1.03 (.826-1.24)	2.35 (1.79-2.69)	3.98 (2.92-5.24)	1222
Female	17-18	.427 (.372-.490)	.430 (.337-.526)	.912 (.792-1.08)	1.81 (1.51-2.30)	3.02 (2.22-4.55)	1417
Mexican American	11-12	.472 (.324-.686)	.501 (.352-.644)	.959 (.654-1.77)	2.18 (1.32-3.12)	2.71 (1.90-6.77)	251
Mexican American	13-14	.529 (.399-.703)	.481 (.353-.656)	1.13 (.677-1.57)	2.35 (1.57-3.03)	3.27 (2.53-8.25)	383
Mexican American	15-16	.470 (.372-.592)	.455 (.354-.554)	1.00 (.778-1.28)	2.14 (1.53-2.93)	3.61 (2.00-6.94)	492
Mexican American	17-18	.341 (.269-.433)	.337 (.272-.463)	.786 (.600-.975)	1.56 (1.28-2.04)	2.51 (1.60-4.17)	423
Non-Hispanic Black	11-12	.541 (.489-.599)	.517 (.471-.587)	1.09 (.889-1.28)	2.43 (1.95-3.02)	3.78 (3.02-6.18)	510
Non-Hispanic Black	13-14	.377 (.316-.450)	.328 (.258-.473)	.739 (.620-.907)	1.68 (1.12-2.15)	2.61 (1.88-3.51)	457
Non-Hispanic Black	15-16	.411 (.356-.473)	.388 (.313-.470)	.763 (.643-.923)	1.87 (1.57-2.49)	3.34 (2.51-4.62)	523
Non-Hispanic Black	17-18	.327 (.277-.387)	.345 (.301-.399)	.707 (.621-.830)	1.47 (1.11-2.14)	2.61 (1.83-4.22)	653
Non-Hispanic White	11-12	.478 (.413-.552)	.485 (.401-.563)	.905 (.764-1.13)	2.00 (1.73-2.39)	2.99 (2.53-3.74)	708
Non-Hispanic White	13-14	.442 (.385-.507)	.375 (.329-.436)	.806 (.696-1.00)	2.03 (1.59-2.46)	4.68 (2.42-5.58)	928
Non-Hispanic White	15-16	.482 (.388-.598)	.485 (.386-.594)	1.01 (.777-1.26)	2.34 (1.41-3.28)	4.19 (2.79-7.24)	758
Non-Hispanic White	17-18	.373 (.319-.436)	.363 (.293-.505)	.889 (.740-1.07)	1.64 (1.38-1.92)	2.22 (1.92-2.80)	926
All Hispanic	11-12	.529 (.430-.651)	.523 (.443-.622)	1.08 (.796-1.54)	2.43 (1.77-3.00)	3.41 (2.46-5.41)	481
All Hispanic	13-14	.505 (.406-.630)	.481 (.380-.594)	1.04 (.759-1.47)	2.35 (1.69-2.80)	3.14 (2.49-3.94)	586
All Hispanic	15-16	.474 (.402-.559)	.471 (.394-.542)	.976 (.831-1.19)	2.16 (1.76-2.57)	3.32 (2.43-4.83)	804
All Hispanic	17-18	.354 (.301-.416)	.367 (.303-.480)	.777 (.663-.912)	1.51 (1.30-1.78)	2.62 (2.04-3.54)	669
Non-Hispanic Asian	11-12	.641 (.532-.771)	.642 (.492-.764)	1.43 (1.09-1.68)	2.77 (2.05-3.62)	4.49 (2.68-13.3)	266
Non-Hispanic Asian	13-14	.442 (.384-.508)	.423 (.346-.479)	.714 (.596-.966)	2.03 (1.22-2.93)	3.23 (2.03-7.66)	238
Non-Hispanic Asian	15-16	.405 (.335-.489)	.355 (.297-.460)	.768 (.570-.977)	1.53 (.982-2.63)	2.63 (1.51-3.37)	220
Non-Hispanic Asian	17-18	.422 (.345-.516)	.431 (.324-.570)	.914 (.658-1.10)	1.74 (1.26-2.53)	3.30 (1.87-4.92)	369

† Participants are age 6+ years in Surveys 11-12 and 13-14; beginning with Survey 15-16, participants include those age 3+ years.

Urinary Bis(1,3-dichloro-2-propyl) phosphate (BDCPP) (2011 - 2018)†

Metabolite *Tris(1,3-dichloro-2-propyl) phosphate (TDCPP)*

Geometric mean and selected percentiles of urine concentrations of (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	*	.873 (.715-1.06)	2.16 (1.74-2.49)	4.26 (3.48-5.21)	6.97 (5.84-8.32)	2045
Total population	13-14	.846 (.739-.969)	.880 (.790-.980)	2.20 (1.87-2.57)	4.70 (3.78-5.70)	7.15 (5.70-8.61)	2299
Total population	15-16	*	1.24 (1.07-1.49)	2.96 (2.43-3.54)	5.96 (4.88-7.55)	9.38 (7.87-10.6)	2430
Total population	17-18	1.21 (1.09-1.35)	1.24 (1.07-1.44)	2.83 (2.47-3.34)	5.61 (4.83-7.00)	9.49 (7.23-11.8)	2800
Age 3-5 years	15-16	*	3.07 (2.05-3.94)	6.65 (5.07-7.81)	10.6 (8.30-16.8)	18.3 (11.0-25.8)	352
Age 3-5 years	17-18	2.67 (2.18-3.26)	2.44 (2.13-2.94)	6.34 (5.17-7.85)	12.7 (10.2-15.0)	18.6 (14.8-25.1)	418
Age 6-11 years	11-12	*	2.19 (1.63-2.64)	4.02 (3.23-5.18)	8.08 (5.78-9.65)	11.5 (9.19-15.6)	314
Age 6-11 years	13-14	2.22 (1.81-2.72)	2.44 (1.57-2.86)	5.13 (3.42-7.33)	9.44 (7.33-14.5)	14.9 (10.8-19.2)	337
Age 6-11 years	15-16	*	2.83 (2.04-3.68)	6.26 (4.71-8.09)	11.3 (9.43-16.4)	18.4 (11.0-26.4)	324
Age 6-11 years	17-18	3.30 (2.59-4.20)	3.28 (2.05-4.37)	7.30 (4.89-10.9)	17.2 (10.9-26.5)	30.6 (14.9-46.0)	331
Age 12-19 years	11-12	*	1.15 (.929-1.45)	2.34 (2.04-3.13)	4.98 (3.42-5.99)	6.91 (5.21-9.22)	305
Age 12-19 years	13-14	1.35 (1.10-1.66)	1.47 (1.23-1.87)	3.17 (2.39-4.01)	5.58 (4.00-8.60)	8.61 (5.55-9.89)	349
Age 12-19 years	15-16	*	1.83 (1.57-2.30)	3.51 (2.70-3.79)	6.08 (4.21-9.03)	10.4 (5.92-17.5)	307
Age 12-19 years	17-18	1.69 (1.46-1.94)	1.91 (1.51-2.20)	3.51 (2.81-4.13)	6.74 (5.43-8.15)	9.54 (7.19-12.2)	353
Age 20+ years	11-12	*	.742 (.632-.902)	1.85 (1.49-2.23)	3.61 (3.01-4.69)	6.35 (4.63-7.95)	1426
Age 20+ years	13-14	.711 (.624-.810)	.710 (.630-.830)	1.82 (1.61-2.05)	3.96 (3.11-4.79)	6.07 (4.83-7.16)	1613
Age 20+ years	15-16	*	1.07 (.827-1.24)	2.40 (1.93-2.89)	4.73 (4.09-5.92)	7.87 (6.14-9.38)	1447
Age 20+ years	17-18	.998 (.891-1.12)	.972 (.852-1.14)	2.35 (1.96-2.74)	4.61 (4.26-5.09)	6.94 (5.40-8.26)	1698
Male	11-12	*	.895 (.742-1.07)	2.12 (1.66-2.32)	3.82 (3.13-4.62)	6.73 (5.01-8.21)	1023
Male	13-14	.910 (.793-1.04)	.950 (.830-1.08)	2.20 (1.87-2.61)	4.38 (3.30-5.84)	7.02 (4.87-9.41)	1146
Male	15-16	*	1.31 (1.09-1.60)	2.99 (2.48-3.37)	5.53 (4.79-6.64)	8.84 (7.40-9.77)	1207
Male	17-18	1.25 (1.12-1.39)	1.27 (1.09-1.50)	2.82 (2.43-3.37)	5.43 (4.81-6.94)	8.92 (6.94-11.8)	1386
Female	11-12	*	.829 (.630-1.08)	2.27 (1.76-2.92)	4.42 (3.59-6.37)	7.58 (5.93-10.5)	1022
Female	13-14	.790 (.668-.935)	.820 (.680-.970)	2.20 (1.80-2.61)	4.95 (3.93-6.07)	7.24 (5.66-8.83)	1153
Female	15-16	*	1.20 (.989-1.44)	2.94 (2.21-3.68)	6.40 (4.44-8.71)	9.94 (7.85-12.9)	1223
Female	17-18	1.18 (1.00-1.39)	1.24 (.901-1.54)	2.84 (2.27-3.64)	5.81 (4.64-7.43)	9.78 (7.81-14.1)	1414
Mexican American	11-12	*	.921 (.718-1.32)	2.06 (1.66-2.50)	3.99 (2.70-5.11)	5.41 (4.57-6.78)	251
Mexican American	13-14	1.08 (.920-1.26)	1.23 (.950-1.54)	2.50 (1.93-3.03)	4.95 (3.30-6.40)	7.72 (5.36-9.07)	380
Mexican American	15-16	*	1.35 (1.20-1.51)	2.43 (2.12-3.05)	4.98 (4.16-5.47)	7.64 (5.03-12.6)	492
Mexican American	17-18	1.18 (.931-1.50)	1.19 (.883-1.56)	2.44 (1.74-3.70)	5.14 (3.71-7.64)	7.90 (5.06-12.7)	423
Non-Hispanic Black	11-12	*	1.28 (1.07-1.39)	2.72 (2.30-3.14)	5.31 (4.27-7.39)	10.5 (5.65-13.6)	513
Non-Hispanic Black	13-14	.937 (.824-1.07)	.910 (.790-1.08)	2.04 (1.82-2.44)	4.21 (3.35-4.95)	6.18 (4.95-7.18)	464
Non-Hispanic Black	15-16	*	1.73 (1.21-2.38)	4.02 (3.04-5.26)	7.93 (6.09-11.3)	12.9 (8.13-20.1)	524
Non-Hispanic Black	17-18	1.73 (1.46-2.05)	1.90 (1.50-2.16)	4.30 (3.30-5.39)	8.68 (6.87-11.2)	14.1 (10.0-25.5)	653
Non-Hispanic White	11-12	*	.826 (.630-1.08)	2.17 (1.59-2.72)	4.18 (3.34-5.93)	7.21 (5.15-10.1)	713
Non-Hispanic White	13-14	.816 (.690-.964)	.850 (.700-.990)	2.26 (1.92-2.64)	4.82 (3.92-6.44)	7.24 (6.05-8.91)	921
Non-Hispanic White	15-16	*	1.22 (.968-1.56)	2.97 (2.21-3.68)	5.92 (4.44-8.07)	9.53 (7.55-10.7)	758
Non-Hispanic White	17-18	1.18 (1.01-1.36)	1.16 (.943-1.49)	2.78 (2.27-3.55)	5.27 (4.51-6.94)	9.48 (6.44-12.2)	925
All Hispanic	11-12	*	.893 (.715-1.14)	2.06 (1.62-2.44)	3.87 (3.10-4.76)	5.26 (4.68-6.57)	480
All Hispanic	13-14	.994 (.858-1.15)	1.06 (.900-1.23)	2.20 (1.78-2.60)	4.39 (3.34-5.09)	6.81 (4.87-8.53)	584
All Hispanic	15-16	*	1.31 (1.15-1.48)	2.63 (2.27-3.13)	5.29 (4.91-5.92)	7.64 (5.91-11.4)	804
All Hispanic	17-18	1.21 (1.03-1.42)	1.25 (1.02-1.56)	2.56 (2.26-3.16)	5.14 (3.91-7.19)	7.81 (5.29-12.1)	667
Non-Hispanic Asian	11-12	*	.518 (.384-.704)	1.29 (.862-1.77)	2.79 (1.56-3.95)	3.91 (2.38-10.4)	268
Non-Hispanic Asian	13-14	.520 (.447-.605)	.480 (.400-.650)	1.24 (.880-1.51)	3.01 (1.95-4.23)	4.54 (3.37-6.20)	237
Non-Hispanic Asian	15-16	*	.633 (.428-.939)	1.36 (.910-1.95)	3.45 (1.69-5.30)	5.30 (3.28-8.06)	220
Non-Hispanic Asian	17-18	.628 (.511-.773)	.573 (.451-.694)	1.71 (1.18-2.11)	3.28 (2.28-4.60)	4.48 (3.09-7.27)	368

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, 15-16, and 17-18 are 0.1, 0.11, 0.1, and 0.1, respectively.

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

† Participants are age 6+ years in Surveys 11-12 and 13-14; beginning with Survey 15-16, participants include those age 3+ years.

Urinary Bis(1,3-dichloro-2-propyl) phosphate (BDCPP) (creatinine corrected) (2011 - 2018)†

Metabolite *Tris(1,3-dichloro-2-propyl) phosphate (TDCPP)*

Geometric mean and selected percentiles of urine concentrations of (in µg/g of creatinine) 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	*	.838 (.728-.988)	1.79 (1.52-2.11)	3.48 (3.14-4.26)	5.97 (4.78-7.18)	2045
Total population	13-14	.912 (.787-1.06)	.874 (.733-1.05)	1.90 (1.57-2.26)	3.76 (2.86-5.05)	6.14 (4.66-8.26)	2298
Total population	15-16	*	1.24 (1.05-1.40)	2.52 (2.07-3.02)	5.32 (4.51-6.31)	9.34 (7.13-10.4)	2429
Total population	17-18	1.27 (1.14-1.40)	1.22 (1.11-1.35)	2.29 (2.09-2.57)	4.84 (4.21-5.63)	7.99 (6.58-9.37)	2800
Age 3-5 years	15-16	*	6.63 (5.02-8.33)	11.8 (9.15-15.0)	19.3 (16.1-24.1)	25.4 (19.5-39.0)	351
Age 3-5 years	17-18	5.42 (4.60-6.38)	5.53 (4.56-6.27)	9.78 (8.02-11.7)	19.6 (14.3-22.0)	25.8 (20.3-36.4)	418
Age 6-11 years	11-12	*	2.81 (2.00-3.49)	5.53 (4.31-6.72)	8.24 (6.91-11.5)	12.3 (8.24-18.7)	314
Age 6-11 years	13-14	2.81 (2.32-3.42)	2.70 (2.21-3.60)	5.94 (3.95-8.05)	10.0 (7.84-14.8)	14.8 (10.8-21.1)	337
Age 6-11 years	15-16	*	3.43 (2.69-4.56)	7.21 (4.97-9.12)	13.6 (10.1-19.0)	19.8 (15.8-26.0)	324
Age 6-11 years	17-18	3.82 (3.03-4.82)	3.62 (2.54-4.83)	9.00 (5.00-11.3)	15.3 (10.3-23.7)	23.7 (12.0-31.1)	331
Age 12-19 years	11-12	*	1.05 (.927-1.30)	2.04 (1.49-2.33)	3.56 (2.81-4.92)	6.81 (3.35-11.3)	305
Age 12-19 years	13-14	1.16 (.931-1.44)	1.11 (.887-1.54)	2.34 (1.79-2.82)	4.30 (2.97-6.82)	6.82 (3.48-10.5)	349
Age 12-19 years	15-16	*	1.42 (1.13-1.66)	2.26 (1.89-3.01)	4.14 (3.05-4.71)	5.85 (4.04-8.99)	307
Age 12-19 years	17-18	1.46 (1.22-1.74)	1.44 (1.21-1.72)	2.66 (2.17-3.64)	5.24 (3.65-6.20)	6.20 (5.03-10.7)	353
Age 20+ years	11-12	*	.742 (.635-.850)	1.49 (1.29-1.73)	2.97 (2.47-3.41)	4.33 (3.42-5.32)	1426
Age 20+ years	13-14	.778 (.679-.892)	.737 (.622-.878)	1.54 (1.35-1.82)	2.87 (2.44-3.69)	4.33 (3.24-5.44)	1612
Age 20+ years	15-16	*	1.07 (.881-1.23)	1.95 (1.58-2.48)	3.97 (3.24-4.40)	5.83 (4.56-7.87)	1447
Age 20+ years	17-18	1.02 (.926-1.13)	1.05 (.943-1.15)	1.81 (1.59-2.10)	3.18 (2.74-3.57)	4.48 (3.62-5.51)	1698
Male	11-12	*	.794 (.645-.921)	1.58 (1.38-1.91)	2.97 (2.46-3.42)	4.78 (3.40-6.16)	1023
Male	13-14	.839 (.719-.980)	.833 (.696-1.01)	1.71 (1.42-2.10)	3.08 (2.49-4.35)	5.03 (3.71-7.66)	1145
Male	15-16	*	1.13 (.926-1.32)	2.23 (1.85-2.67)	4.71 (4.07-5.37)	8.06 (6.42-10.2)	1207
Male	17-18	1.11 (1.01-1.23)	1.09 (.976-1.21)	2.06 (1.81-2.33)	4.26 (3.58-4.84)	5.71 (5.22-7.13)	1386
Female	11-12	*	.908 (.751-1.11)	2.01 (1.62-2.61)	4.20 (3.37-5.22)	7.14 (4.92-9.63)	1022
Female	13-14	.986 (.840-1.16)	.917 (.738-1.15)	2.07 (1.73-2.49)	4.26 (3.15-5.67)	6.77 (5.11-8.71)	1153
Female	15-16	*	1.34 (1.15-1.51)	2.87 (2.23-3.63)	5.97 (4.61-7.94)	9.83 (8.15-11.4)	1222
Female	17-18	1.44 (1.24-1.67)	1.37 (1.17-1.55)	2.47 (2.21-3.01)	5.66 (4.39-7.50)	9.59 (8.02-10.7)	1414
Mexican American	11-12	*	.877 (.730-1.08)	1.75 (1.24-2.52)	2.96 (2.58-3.28)	4.15 (3.07-5.62)	251
Mexican American	13-14	1.14 (.934-1.39)	1.16 (.886-1.37)	2.17 (1.67-2.87)	4.14 (3.01-5.73)	6.06 (4.21-8.31)	379
Mexican American	15-16	*	1.34 (1.15-1.44)	2.60 (2.04-3.02)	4.84 (4.13-5.87)	7.52 (5.87-9.51)	492
Mexican American	17-18	1.28 (1.06-1.54)	1.14 (.945-1.32)	2.18 (1.61-2.76)	4.33 (3.07-7.13)	7.75 (5.27-9.96)	423
Non-Hispanic Black	11-12	*	.875 (.788-.941)	1.76 (1.36-2.05)	3.63 (2.41-5.46)	6.55 (4.14-9.86)	513
Non-Hispanic Black	13-14	.735 (.651-.830)	.722 (.605-.816)	1.40 (1.25-1.60)	2.81 (2.20-3.75)	4.35 (3.25-5.99)	464
Non-Hispanic Black	15-16	*	1.38 (1.03-1.67)	2.87 (2.28-3.44)	6.06 (5.14-7.87)	9.83 (8.00-12.0)	523
Non-Hispanic Black	17-18	1.30 (1.13-1.50)	1.25 (1.16-1.43)	2.34 (2.07-3.03)	5.70 (4.31-7.50)	10.1 (7.40-11.8)	653
Non-Hispanic White	11-12	*	.891 (.659-1.14)	1.89 (1.50-2.31)	3.90 (3.27-4.59)	6.72 (4.90-7.58)	713
Non-Hispanic White	13-14	.933 (.787-1.11)	.889 (.682-1.09)	1.96 (1.62-2.46)	3.88 (2.94-5.18)	6.67 (4.42-9.33)	921
Non-Hispanic White	15-16	*	1.24 (.983-1.49)	2.59 (2.00-3.36)	5.40 (4.19-7.06)	9.87 (7.06-11.4)	758
Non-Hispanic White	17-18	1.26 (1.11-1.43)	1.23 (1.08-1.39)	2.24 (1.94-2.59)	4.72 (3.81-5.71)	7.18 (5.84-9.46)	925
All Hispanic	11-12	*	.857 (.720-1.07)	1.75 (1.35-2.23)	3.07 (2.77-3.40)	4.15 (3.40-5.62)	480
All Hispanic	13-14	1.04 (.874-1.25)	1.02 (.833-1.30)	1.97 (1.64-2.34)	3.97 (2.87-4.69)	5.67 (4.16-7.84)	583
All Hispanic	15-16	*	1.28 (1.11-1.38)	2.50 (2.31-2.80)	4.63 (4.13-5.50)	7.07 (6.29-9.00)	804
All Hispanic	17-18	1.30 (1.14-1.49)	1.21 (1.07-1.35)	2.21 (1.85-2.75)	4.56 (3.51-6.41)	7.80 (5.03-11.7)	667
Non-Hispanic Asian	11-12	*	.623 (.464-.848)	1.52 (.959-2.26)	2.97 (2.16-4.44)	4.52 (2.89-7.93)	268
Non-Hispanic Asian	13-14	.657 (.576-.749)	.583 (.524-.727)	1.30 (1.04-1.67)	2.55 (1.88-3.85)	4.97 (2.69-6.74)	237
Non-Hispanic Asian	15-16	*	.743 (.539-1.12)	1.71 (1.09-2.35)	3.25 (2.11-5.22)	5.22 (3.58-9.87)	220
Non-Hispanic Asian	17-18	.923 (.776-1.10)	.865 (.690-1.08)	1.75 (1.33-2.33)	3.45 (2.30-5.17)	5.44 (3.69-8.59)	368

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

† Participants are age 6+ years in Surveys 11-12 and 13-14; beginning with Survey 15-16, participants include those age 3+ years.

Urinary Dibenzyl phosphate (DBzP) (2011 - 2016)†

CAS Number 1623-08-1

Metabolite Tribenzyl phosphate (TBzP)

Geometric mean and selected percentiles of urine concentrations of (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	2052
Total population	13-14	*	<LOD	<LOD	<LOD	<LOD	2316
Total population	15-16	*	<LOD	<LOD	<LOD	<LOD	2430
Age 3-5 years	15-16	*	<LOD	<LOD	<LOD	<LOD	352
Age 6-11 years	11-12	*	<LOD	<LOD	<LOD	<LOD	314
Age 6-11 years	13-14	*	<LOD	<LOD	<LOD	<LOD	337
Age 6-11 years	15-16	*	<LOD	<LOD	<LOD	<LOD	324
Age 12-19 years	11-12	*	<LOD	<LOD	<LOD	<LOD	304
Age 12-19 years	13-14	*	<LOD	<LOD	<LOD	<LOD	349
Age 12-19 years	15-16	*	<LOD	<LOD	<LOD	<LOD	307
Age 20+ years	11-12	*	<LOD	<LOD	<LOD	<LOD	1434
Age 20+ years	13-14	*	<LOD	<LOD	<LOD	<LOD	1630
Age 20+ years	15-16	*	<LOD	<LOD	<LOD	<LOD	1447
Male	11-12	*	<LOD	<LOD	<LOD	<LOD	1027
Male	13-14	*	<LOD	<LOD	<LOD	<LOD	1157
Male	15-16	*	<LOD	<LOD	<LOD	<LOD	1207
Female	11-12	*	<LOD	<LOD	<LOD	<LOD	1025
Female	13-14	*	<LOD	<LOD	<LOD	<LOD	1159
Female	15-16	*	<LOD	<LOD	<LOD	<LOD	1223
Mexican American	11-12	*	<LOD	<LOD	<LOD	<LOD	252
Mexican American	13-14	*	<LOD	<LOD	<LOD	<LOD	384
Mexican American	15-16	*	<LOD	<LOD	<LOD	<LOD	492
Non-Hispanic Black	11-12	*	<LOD	<LOD	<LOD	<LOD	514
Non-Hispanic Black	13-14	*	<LOD	<LOD	<LOD	<LOD	466
Non-Hispanic Black	15-16	*	<LOD	<LOD	<LOD	<LOD	524
Non-Hispanic White	11-12	*	<LOD	<LOD	<LOD	<LOD	716
Non-Hispanic White	13-14	*	<LOD	<LOD	<LOD	<LOD	930
Non-Hispanic White	15-16	*	<LOD	<LOD	<LOD	<LOD	758
All Hispanic	11-12	*	<LOD	<LOD	<LOD	<LOD	483
All Hispanic	13-14	*	<LOD	<LOD	<LOD	<LOD	589
All Hispanic	15-16	*	<LOD	<LOD	<LOD	<LOD	804
Non-Hispanic Asian	11-12	*	<LOD	<LOD	<LOD	<LOD	268
Non-Hispanic Asian	13-14	*	<LOD	<LOD	<LOD	<LOD	238
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 0.05, 0.05, and 0.05, 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.

† Participants are age 6+ in Surveys 11-12 and 13-14, while participants are 3+ in Survey 15-16.

Urinary Dibenzyl phosphate (DBzP) (creatinine corrected) (2011 - 2016)†

CAS Number 1623-08-1

Metabolite Tribenzyl phosphate (TBzP)

Geometric mean and selected percentiles of urine concentrations of (in µg/g of creatinine) 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	2052
Total population	13-14	*	<LOD	<LOD	<LOD	<LOD	2315
Total population	15-16	*	<LOD	<LOD	<LOD	<LOD	2429
Age 3-5 years	15-16	*	<LOD	<LOD	<LOD	<LOD	351
Age 6-11 years	11-12	*	<LOD	<LOD	<LOD	<LOD	314
Age 6-11 years	13-14	*	<LOD	<LOD	<LOD	<LOD	337
Age 6-11 years	15-16	*	<LOD	<LOD	<LOD	<LOD	324
Age 12-19 years	11-12	*	<LOD	<LOD	<LOD	<LOD	304
Age 12-19 years	13-14	*	<LOD	<LOD	<LOD	<LOD	349
Age 12-19 years	15-16	*	<LOD	<LOD	<LOD	<LOD	307
Age 20+ years	11-12	*	<LOD	<LOD	<LOD	<LOD	1434
Age 20+ years	13-14	*	<LOD	<LOD	<LOD	<LOD	1629
Age 20+ years	15-16	*	<LOD	<LOD	<LOD	<LOD	1447
Male	11-12	*	<LOD	<LOD	<LOD	<LOD	1027
Male	13-14	*	<LOD	<LOD	<LOD	<LOD	1156
Male	15-16	*	<LOD	<LOD	<LOD	<LOD	1207
Female	11-12	*	<LOD	<LOD	<LOD	<LOD	1025
Female	13-14	*	<LOD	<LOD	<LOD	<LOD	1159
Female	15-16	*	<LOD	<LOD	<LOD	<LOD	1222
Mexican American	11-12	*	<LOD	<LOD	<LOD	<LOD	252
Mexican American	13-14	*	<LOD	<LOD	<LOD	<LOD	383
Mexican American	15-16	*	<LOD	<LOD	<LOD	<LOD	492
Non-Hispanic Black	11-12	*	<LOD	<LOD	<LOD	<LOD	514
Non-Hispanic Black	13-14	*	<LOD	<LOD	<LOD	<LOD	466
Non-Hispanic Black	15-16	*	<LOD	<LOD	<LOD	<LOD	523
Non-Hispanic White	11-12	*	<LOD	<LOD	<LOD	<LOD	716
Non-Hispanic White	13-14	*	<LOD	<LOD	<LOD	<LOD	930
Non-Hispanic White	15-16	*	<LOD	<LOD	<LOD	<LOD	758
All Hispanic	11-12	*	<LOD	<LOD	<LOD	<LOD	483
All Hispanic	13-14	*	<LOD	<LOD	<LOD	<LOD	588
All Hispanic	15-16	*	<LOD	<LOD	<LOD	<LOD	804
Non-Hispanic Asian	11-12	*	<LOD	<LOD	<LOD	<LOD	268
Non-Hispanic Asian	13-14	*	<LOD	<LOD	<LOD	<LOD	238
Non-Hispanic Asian	15-16	*	<LOD	<LOD	<LOD	<LOD	220

<LOD means less than the limit of detection for the urine levels not corrected for creatinine.

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

† Participants are age 6+ in Surveys 11-12 and 13-14, while participants are 3+ in Survey 15-16.

Urinary Dibutyl phosphate (DBuP) (2011 - 2018)†

Metabolite Tri-n-butyl phosphate (TBU P)

Geometric mean and selected percentiles of urine concentrations of (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	.165 (.140-.191)	.327 (.267-.383)	.543 (.398-.663)	2031
Total population	13-14	.186 (.160-.215)	.250 (.210-.280)	.370 (.340-.400)	.520 (.490-.570)	.670 (.600-.760)	2314
Total population	15-16	*	<LOD	.154 (.136-.175)	.301 (.270-.353)	.508 (.412-.590)	2430
Total population	17-18	*	<LOD	.226 (.198-.255)	.544 (.475-.622)	.946 (.781-1.14)	2799
Age 3-5 years	15-16	.210 (.188-.234)	.184 (.153-.198)	.357 (.314-.440)	.838 (.647-1.23)	1.35 (.867-2.06)	352
Age 3-5 years	17-18	.267 (.211-.338)	.240 (.167-.298)	.514 (.381-.699)	1.39 (.959-2.05)	2.33 (1.39-4.71)	417
Age 6-11 years	11-12	*	<LOD	.199 (.140-.292)	.442 (.314-.778)	.851 (.407-1.81)	313
Age 6-11 years	13-14	.273 (.218-.343)	.350 (.300-.400)	.500 (.450-.610)	.760 (.670-.890)	1.04 (.790-1.94)	337
Age 6-11 years	15-16	.163 (.142-.187)	.141 (.112-.172)	.267 (.224-.327)	.526 (.379-.756)	.817 (.508-1.57)	324
Age 6-11 years	17-18	*	.124 (.101-.153)	.324 (.248-.363)	.623 (.419-1.04)	1.07 (.665-5.04)	331
Age 12-19 years	11-12	*	<LOD	.145 (<LOD-.218)	.282 (.205-.383)	.405 (.293-1.45)	303
Age 12-19 years	13-14	.204 (.173-.241)	.270 (.230-.310)	.380 (.340-.430)	.560 (.430-.790)	.780 (.550-1.19)	349
Age 12-19 years	15-16	*	<LOD	.167 (.134-.220)	.356 (.276-.479)	.552 (.356-.835)	307
Age 12-19 years	17-18	*	.100 (<LOD-.119)	.190 (.150-.250)	.428 (.255-.646)	.704 (.570-.947)	352
Age 20+ years	11-12	*	<LOD	.163 (.142-.186)	.319 (.261-.370)	.543 (.375-.656)	1415
Age 20+ years	13-14	.176 (.150-.205)	.230 (.190-.270)	.350 (.330-.380)	.500 (.450-.530)	.600 (.560-.660)	1628
Age 20+ years	15-16	*	<LOD	.135 (.120-.151)	.250 (.219-.289)	.389 (.350-.448)	1447
Age 20+ years	17-18	*	<LOD	.206 (.167-.249)	.526 (.392-.642)	.858 (.680-1.32)	1699
Male	11-12	*	<LOD	.160 (.130-.175)	.339 (.265-.402)	.595 (.402-.706)	1019
Male	13-14	.188 (.162-.219)	.250 (.210-.290)	.370 (.340-.410)	.530 (.490-.570)	.660 (.560-.870)	1155
Male	15-16	*	<LOD	.148 (.133-.179)	.289 (.253-.323)	.479 (.380-.636)	1207
Male	17-18	*	<LOD	.204 (.164-.241)	.462 (.363-.551)	.656 (.526-.989)	1384
Female	11-12	*	<LOD	.174 (.141-.206)	.315 (.240-.420)	.535 (.361-.668)	1012
Female	13-14	.183 (.157-.213)	.240 (.210-.270)	.360 (.330-.410)	.510 (.460-.590)	.670 (.590-.760)	1159
Female	15-16	*	<LOD	.159 (.135-.187)	.324 (.270-.369)	.512 (.389-.676)	1223
Female	17-18	*	<LOD	.262 (.210-.311)	.677 (.531-.818)	1.16 (.859-1.92)	1415
Mexican American	11-12	*	<LOD	.169 (.115-.202)	.323 (.196-.605)	.489 (.259-1.22)	247
Mexican American	13-14	.187 (.145-.241)	.240 (.160-.310)	.370 (.330-.420)	.520 (.460-.590)	.700 (.570-.870)	384
Mexican American	15-16	*	<LOD	.185 (.154-.203)	.361 (.300-.425)	.581 (.425-.720)	492
Mexican American	17-18	*	.109 (<LOD-.132)	.265 (.201-.311)	.623 (.490-.799)	1.14 (.799-2.32)	420
Non-Hispanic Black	11-12	*	<LOD	.197 (.141-.245)	.319 (.261-.441)	.491 (.331-.720)	511
Non-Hispanic Black	13-14	.229 (.197-.265)	.290 (.260-.320)	.420 (.360-.490)	.640 (.520-.760)	.840 (.670-1.03)	466
Non-Hispanic Black	15-16	*	<LOD	.179 (.148-.223)	.326 (.278-.412)	.454 (.389-.566)	524
Non-Hispanic Black	17-18	*	.110 (<LOD-.131)	.229 (.192-.293)	.552 (.470-.680)	1.02 (.684-1.57)	653
Non-Hispanic White	11-12	*	<LOD	.168 (.148-.190)	.339 (.264-.398)	.593 (.420-.668)	708
Non-Hispanic White	13-14	.186 (.159-.218)	.250 (.210-.280)	.370 (.340-.400)	.510 (.460-.560)	.630 (.570-.730)	928
Non-Hispanic White	15-16	*	<LOD	.146 (.130-.163)	.289 (.243-.348)	.499 (.360-.625)	758
Non-Hispanic White	17-18	*	<LOD	.241 (.183-.295)	.544 (.428-.677)	.938 (.687-1.59)	925
All Hispanic	11-12	*	<LOD	.165 (.104-.224)	.323 (.226-.453)	.489 (.323-.973)	478
All Hispanic	13-14	.184 (.151-.225)	.230 (.190-.280)	.360 (.330-.410)	.510 (.450-.590)	.710 (.570-.900)	589
All Hispanic	15-16	*	<LOD	.177 (.145-.204)	.356 (.291-.419)	.631 (.454-.782)	804
All Hispanic	17-18	*	.105 (<LOD-.114)	.247 (.187-.301)	.588 (.487-.743)	.989 (.787-1.56)	665
Non-Hispanic Asian	11-12	*	<LOD	<LOD	.269 (.177-.387)	.458 (.292-.559)	265
Non-Hispanic Asian	13-14	.110 (.093-.131)	.090 (.060-.140)	.280 (.200-.330)	.400 (.340-.500)	.530 (.430-.680)	238
Non-Hispanic Asian	15-16	*	<LOD	<LOD	.149 (.124-.259)	.282 (.169-.449)	220
Non-Hispanic Asian	17-18	*	<LOD	.135 (.112-.140)	.265 (.200-.320)	.345 (.302-.518)	369

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, 15-16, and 17-18 are 0.1, 0.05, 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.

† Participants are age 6+ years in Surveys 11-12 and 13-14; beginning with Survey 15-16, participants include those age 3+ years.

Urinary Dibutyl phosphate (DBuP) (creatinine corrected) (2011 - 2018)†

Metabolite Tri-n-butyl phosphate (TBU_P)

Geometric mean and selected percentiles of urine concentrations of (in µg/g of creatinine) 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	.197 (.178-.222)	.345 (.311-.422)	.540 (.462-.685)	2031
Total population	13-14	.200 (.170-.234)	.217 (.189-.249)	.357 (.320-.394)	.545 (.500-.582)	.708 (.595-.810)	2313
Total population	15-16	*	<LOD	.192 (.181-.203)	.342 (.309-.378)	.507 (.457-.571)	2429
Total population	17-18	*	<LOD	.251 (.226-.283)	.544 (.472-.620)	.863 (.737-1.03)	2799
Age 3-5 years	15-16	.472 (.417-.534)	.398 (.342-.446)	.800 (.700-.935)	1.92 (1.21-2.64)	3.18 (1.98-3.83)	351
Age 3-5 years	17-18	.545 (.443-.670)	.472 (.391-.553)	.958 (.750-1.23)	2.24 (1.39-4.72)	5.11 (2.55-10.9)	417
Age 6-11 years	11-12	*	<LOD	.304 (.263-.347)	.645 (.425-.992)	.992 (.645-1.93)	313
Age 6-11 years	13-14	.347 (.287-.419)	.383 (.319-.434)	.543 (.484-.638)	.862 (.660-1.24)	1.36 (.881-1.81)	337
Age 6-11 years	15-16	.205 (.181-.232)	.190 (.158-.215)	.324 (.273-.418)	.633 (.446-.829)	.936 (.695-.996)	324
Age 6-11 years	17-18	*	.166 (.146-.185)	.340 (.253-.444)	.667 (.522-.871)	1.09 (.667-2.27)	331
Age 12-19 years	11-12	*	<LOD	.173 (<LOD-.203)	.263 (.197-.338)	.355 (.263-.594)	303
Age 12-19 years	13-14	.176 (.151-.205)	.190 (.157-.221)	.286 (.253-.325)	.434 (.364-.528)	.563 (.459-.600)	349
Age 12-19 years	15-16	*	<LOD	.152 (.127-.173)	.245 (.192-.309)	.328 (.261-.366)	307
Age 12-19 years	17-18	*	.104 (<LOD-.114)	.195 (.157-.228)	.337 (.236-.589)	.589 (.321-1.59)	352
Age 20+ years	11-12	*	<LOD	.193 (.169-.220)	.338 (.301-.410)	.507 (.429-.645)	1415
Age 20+ years	13-14	.192 (.162-.227)	.211 (.180-.243)	.342 (.310-.378)	.526 (.462-.566)	.641 (.566-.763)	1627
Age 20+ years	15-16	*	<LOD	.174 (.154-.191)	.284 (.255-.323)	.386 (.355-.444)	1447
Age 20+ years	17-18	*	<LOD	.234 (.205-.262)	.469 (.393-.591)	.729 (.643-.893)	1699
Male	11-12	*	<LOD	.173 (.146-.204)	.308 (.245-.394)	.507 (.374-.813)	1019
Male	13-14	.174 (.149-.203)	.195 (.160-.229)	.308 (.278-.340)	.467 (.403-.519)	.570 (.528-.617)	1154
Male	15-16	*	<LOD	.160 (.140-.191)	.284 (.255-.323)	.444 (.355-.546)	1207
Male	17-18	*	<LOD	.202 (.174-.226)	.337 (.304-.393)	.542 (.472-.630)	1384
Female	11-12	*	<LOD	.229 (.193-.263)	.375 (.323-.473)	.542 (.473-.693)	1012
Female	13-14	.228 (.191-.272)	.243 (.207-.291)	.407 (.361-.445)	.583 (.541-.702)	.762 (.674-.864)	1159
Female	15-16	*	<LOD	.213 (.196-.233)	.374 (.347-.444)	.563 (.473-.710)	1222
Female	17-18	*	<LOD	.337 (.283-.393)	.692 (.643-.786)	1.62 (1.03-2.50)	1415
Mexican American	11-12	*	<LOD	.187 (.146-.245)	.374 (.273-.645)	.645 (.338-2.46)	247
Mexican American	13-14	.197 (.157-.246)	.209 (.168-.263)	.333 (.283-.389)	.530 (.452-.593)	.702 (.543-.921)	383
Mexican American	15-16	*	<LOD	.221 (.192-.259)	.429 (.342-.547)	.678 (.546-.865)	492
Mexican American	17-18	*	.144 (<LOD-.165)	.283 (.242-.355)	.583 (.491-.800)	1.25 (.707-3.36)	420
Non-Hispanic Black	11-12	*	<LOD	.142 (.116-.169)	.246 (.192-.366)	.457 (.301-.563)	511
Non-Hispanic Black	13-14	.180 (.151-.214)	.190 (.159-.224)	.322 (.266-.379)	.476 (.419-.564)	.630 (.513-.758)	466
Non-Hispanic Black	15-16	*	<LOD	.160 (.145-.182)	.306 (.261-.391)	.477 (.346-.593)	523
Non-Hispanic Black	17-18	*	.092 (<LOD-.107)	.199 (.160-.235)	.436 (.348-.533)	.707 (.522-.958)	653
Non-Hispanic White	11-12	*	<LOD	.215 (.187-.243)	.355 (.309-.444)	.567 (.444-.786)	708
Non-Hispanic White	13-14	.213 (.178-.256)	.235 (.203-.267)	.376 (.330-.417)	.552 (.509-.608)	.733 (.600-.861)	928
Non-Hispanic White	15-16	*	<LOD	.192 (.178-.215)	.338 (.273-.418)	.477 (.418-.577)	758
Non-Hispanic White	17-18	*	<LOD	.247 (.211-.291)	.549 (.442-.660)	.893 (.729-1.39)	925
All Hispanic	11-12	*	<LOD	.182 (.154-.209)	.355 (.296-.488)	.567 (.363-1.34)	478
All Hispanic	13-14	.193 (.160-.233)	.200 (.175-.246)	.326 (.286-.370)	.528 (.448-.585)	.702 (.560-.909)	588
All Hispanic	15-16	*	<LOD	.215 (.197-.237)	.404 (.355-.508)	.694 (.556-.822)	804
All Hispanic	17-18	*	.133 (<LOD-.161)	.280 (.235-.342)	.630 (.494-.707)	1.06 (.776-1.73)	665
Non-Hispanic Asian	11-12	*	<LOD	<LOD	.382 (.309-.447)	.520 (.385-.827)	265
Non-Hispanic Asian	13-14	.139 (.115-.167)	.138 (.112-.168)	.280 (.214-.340)	.508 (.342-.588)	.595 (.487-.960)	238
Non-Hispanic Asian	15-16	*	<LOD	<LOD	.296 (.245-.355)	.355 (.296-.507)	220
Non-Hispanic Asian	17-18	*	<LOD	.261 (.214-.307)	.426 (.337-.643)	.671 (.558-.884)	369

<LOD means less than the limit of detection for the urine levels not corrected for creatinine.

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

† Participants are age 6+ years in Surveys 11-12 and 13-14; beginning with Survey 15-16, participants include those age 3+ years.

Urinary Di-o-cresylphosphate (DoCP) (2013 - 2014)†

CAS Number 35787-74-7

Metabolite of Tri-o-cresylphosphate (ToCP)

Geometric mean and selected percentiles of urine concentrations of (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	2316
Age 6-11 years	13-14	*	<LOD	<LOD	<LOD	<LOD	337
Age 12-19 years	13-14	*	<LOD	<LOD	<LOD	<LOD	349
Age 20+ years	13-14	*	<LOD	<LOD	<LOD	<LOD	1630
Male	13-14	*	<LOD	<LOD	<LOD	<LOD	1157
Female	13-14	*	<LOD	<LOD	<LOD	<LOD	1159
Mexican American	13-14	*	<LOD	<LOD	<LOD	<LOD	384
Non-Hispanic Black	13-14	*	<LOD	<LOD	<LOD	<LOD	466
Non-Hispanic White	13-14	*	<LOD	<LOD	<LOD	<LOD	930
All Hispanic	13-14	*	<LOD	<LOD	<LOD	<LOD	589
Non-Hispanic Asian	13-14	*	<LOD	<LOD	<LOD	<LOD	238

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.05.

<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.

Urinary Di-o-cresylphosphate (DoCP) (creatinine corrected) (2013 - 2014)†

CAS Number 35787-74-7

Metabolite of Tri-o-cresylphosphate (ToCP)

Geometric mean and selected percentiles of urine concentrations of (in µg/g of creatinine) 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	2315
Age 6-11 years	13-14	*	<LOD	<LOD	<LOD	<LOD	337
Age 12-19 years	13-14	*	<LOD	<LOD	<LOD	<LOD	349
Age 20+ years	13-14	*	<LOD	<LOD	<LOD	<LOD	1629
Male	13-14	*	<LOD	<LOD	<LOD	<LOD	1156
Female	13-14	*	<LOD	<LOD	<LOD	<LOD	1159
Mexican American	13-14	*	<LOD	<LOD	<LOD	<LOD	383
Non-Hispanic Black	13-14	*	<LOD	<LOD	<LOD	<LOD	466
Non-Hispanic White	13-14	*	<LOD	<LOD	<LOD	<LOD	930
All Hispanic	13-14	*	<LOD	<LOD	<LOD	<LOD	588
Non-Hispanic Asian	13-14	*	<LOD	<LOD	<LOD	<LOD	238

<LOD means less than the limit of detection for the urine levels not corrected for creatinine.

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

Urinary Di-p-cresylphosphate (DpCP) (2013 - 2014)†

CAS Number 843-24-3

Metabolite of Tri-o-cresylphosphate (ToCP)

Geometric mean and selected percentiles of urine concentrations of (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	.070 (.050-.080)	.110 (.090-.160)	2316
Age 6-11 years	13-14	*	<LOD	.060 (<LOD-.080)	.160 (.090-.200)	.220 (.160-.440)	337
Age 12-19 years	13-14	*	<LOD	<LOD	.090 (.050-.130)	.140 (.080-.260)	349
Age 20+ years	13-14	*	<LOD	<LOD	.050 (<LOD-.060)	.090 (.080-.130)	1630
Male	13-14	*	<LOD	<LOD	.070 (.050-.090)	.140 (.100-.200)	1157
Female	13-14	*	<LOD	<LOD	.060 (.050-.080)	.100 (.080-.140)	1159
Mexican American	13-14	*	<LOD	<LOD	.060 (<LOD-.090)	.110 (.060-.190)	384
Non-Hispanic Black	13-14	*	<LOD	<LOD	.060 (<LOD-.080)	.080 (.070-.120)	466
Non-Hispanic White	13-14	*	<LOD	<LOD	.070 (.050-.090)	.130 (.090-.200)	930
All Hispanic	13-14	*	<LOD	<LOD	.050 (<LOD-.070)	.090 (.070-.120)	589
Non-Hispanic Asian	13-14	*	<LOD	<LOD	<LOD	.080 (.050-.140)	238

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.05.

<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.

Urinary Di-p-cresylphosphate (DpCP) (creatinine corrected) (2013 - 2014)†

CAS Number 843-24-3

Metabolite of Tri-o-cresylphosphate (ToCP)

Geometric mean and selected percentiles of urine concentrations of (in µg/g of creatinine) 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	.134 (.125-.154)	.200 (.174-.219)	2315
Age 6-11 years	13-14	*	<LOD	.118 (<LOD-.167)	.250 (.174-.298)	.367 (.247-.512)	337
Age 12-19 years	13-14	*	<LOD	<LOD	.111 (.089-.200)	.211 (.108-.267)	349
Age 20+ years	13-14	*	<LOD	<LOD	.133 (<LOD-.143)	.182 (.154-.200)	1629
Male	13-14	*	<LOD	<LOD	.121 (.103-.138)	.182 (.133-.247)	1156
Female	13-14	*	<LOD	<LOD	.148 (.133-.174)	.211 (.182-.223)	1159
Mexican American	13-14	*	<LOD	<LOD	.143 (<LOD-.182)	.192 (.174-.236)	383
Non-Hispanic Black	13-14	*	<LOD	<LOD	.082 (<LOD-.100)	.108 (.087-.138)	466
Non-Hispanic White	13-14	*	<LOD	<LOD	.138 (.129-.167)	.211 (.182-.235)	930
All Hispanic	13-14	*	<LOD	<LOD	.143 (<LOD-.170)	.190 (.170-.222)	588
Non-Hispanic Asian	13-14	*	<LOD	<LOD	<LOD	.196 (.154-.364)	238

<LOD means less than the limit of detection for the urine levels not corrected for creatinine.

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

Urinary Dicresyl phosphates (DCP) (2011-2012, 2015-2016)†

Metabolite of Tricresyl phosphate (TCP) mixed isomers

Geometric mean and selected percentiles of urine concentrations of (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	2049
Total population	15-16	*	<LOD	<LOD	<LOD	<LOD	2430
Age 3-5 years	15-16	*	<LOD	<LOD	<LOD	<LOD	352
Age 6-11 years	11-12	*	<LOD	<LOD	<LOD	<LOD	311
Age 6-11 years	15-16	*	<LOD	<LOD	<LOD	<LOD	324
Age 12-19 years	11-12	*	<LOD	<LOD	<LOD	<LOD	305
Age 12-19 years	15-16	*	<LOD	<LOD	<LOD	<LOD	307
Age 20+ years	11-12	*	<LOD	<LOD	<LOD	<LOD	1433
Age 20+ years	15-16	*	<LOD	<LOD	<LOD	<LOD	1447
Male	11-12	*	<LOD	<LOD	<LOD	<LOD	1025
Male	15-16	*	<LOD	<LOD	<LOD	<LOD	1207
Female	11-12	*	<LOD	<LOD	<LOD	<LOD	1024
Female	15-16	*	<LOD	<LOD	<LOD	<LOD	1223
Mexican American	11-12	*	<LOD	<LOD	<LOD	<LOD	249
Mexican American	15-16	*	<LOD	<LOD	<LOD	<LOD	492
Non-Hispanic Black	11-12	*	<LOD	<LOD	<LOD	<LOD	515
Non-Hispanic Black	15-16	*	<LOD	<LOD	<LOD	<LOD	524
Non-Hispanic White	11-12	*	<LOD	<LOD	<LOD	<LOD	715
Non-Hispanic White	15-16	*	<LOD	<LOD	<LOD	<LOD	758
All Hispanic	11-12	*	<LOD	<LOD	<LOD	<LOD	480
All Hispanic	15-16	*	<LOD	<LOD	<LOD	<LOD	804
Non-Hispanic Asian	11-12	*	<LOD	<LOD	<LOD	<LOD	268
Non-Hispanic Asian	15-16	*	<LOD	<LOD	<LOD	<LOD	220

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12 and 15-16 are 0.5 and 0.5, 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.

† Participants are age 6+ in Survey 11-12, while participants are 3+ in Survey 15-16.

Urinary Dicresyl phosphates (DCP) (creatinine corrected) (2011-2012, 2015-2016)†

Metabolite of Tricresyl phosphate (TCP) mixed isomers

Geometric mean and selected percentiles of urine concentrations of (in µg/g of creatinine) 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	2049
Total population	15-16	*	<LOD	<LOD	<LOD	<LOD	2429
Age 3-5 years	15-16	*	<LOD	<LOD	<LOD	<LOD	351
Age 6-11 years	11-12	*	<LOD	<LOD	<LOD	<LOD	311
Age 6-11 years	15-16	*	<LOD	<LOD	<LOD	<LOD	324
Age 12-19 years	11-12	*	<LOD	<LOD	<LOD	<LOD	305
Age 12-19 years	15-16	*	<LOD	<LOD	<LOD	<LOD	307
Age 20+ years	11-12	*	<LOD	<LOD	<LOD	<LOD	1433
Age 20+ years	15-16	*	<LOD	<LOD	<LOD	<LOD	1447
Male	11-12	*	<LOD	<LOD	<LOD	<LOD	1025
Male	15-16	*	<LOD	<LOD	<LOD	<LOD	1207
Female	11-12	*	<LOD	<LOD	<LOD	<LOD	1024
Female	15-16	*	<LOD	<LOD	<LOD	<LOD	1222
Mexican American	11-12	*	<LOD	<LOD	<LOD	<LOD	249
Mexican American	15-16	*	<LOD	<LOD	<LOD	<LOD	492
Non-Hispanic Black	11-12	*	<LOD	<LOD	<LOD	<LOD	515
Non-Hispanic Black	15-16	*	<LOD	<LOD	<LOD	<LOD	523
Non-Hispanic White	11-12	*	<LOD	<LOD	<LOD	<LOD	715
Non-Hispanic White	15-16	*	<LOD	<LOD	<LOD	<LOD	758
All Hispanic	11-12	*	<LOD	<LOD	<LOD	<LOD	480
All Hispanic	15-16	*	<LOD	<LOD	<LOD	<LOD	804
Non-Hispanic Asian	11-12	*	<LOD	<LOD	<LOD	<LOD	268
Non-Hispanic Asian	15-16	*	<LOD	<LOD	<LOD	<LOD	220

<LOD means less than the limit of detection for the urine levels not corrected for creatinine.

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

† Participants are age 6+ in Survey 11-12, while participants are 3+ in Survey 15-16.

Urinary Diphenyl phosphate (DPHP) (2011 - 2018)†

Metabolite of Triphenyl phosphate (TPHP), Isopropylphenyl diphenyl phosphate (IPDPP), t-butylphenyl diphenyl phosphate (tBPDPP), and 2-ethylhexyl diphenyl phosphate (EHDPP)

Geometric mean and selected percentiles of urine concentrations of (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	.876 (.786-.975)	.908 (.788-.996)	2.03 (1.84-2.34)	4.54 (4.10-5.03)	7.91 (6.90-9.54)	2051
Total population	13-14	.830 (.764-.901)	.800 (.740-.870)	1.71 (1.56-1.87)	3.73 (3.12-4.66)	6.23 (5.11-7.96)	2312
Total population	15-16	1.06 (.956-1.16)	1.01 (.880-1.13)	2.30 (2.04-2.47)	4.86 (4.39-5.48)	8.80 (7.17-10.7)	2430
Total population	17-18	.914 (.831-1.01)	.912 (.832-.996)	1.95 (1.73-2.23)	3.95 (3.17-5.12)	6.58 (5.56-7.91)	2805
Age 3-5 years	15-16	1.83 (1.60-2.11)	1.51 (1.31-1.82)	3.69 (2.78-4.69)	9.13 (5.97-12.5)	14.3 (9.17-23.8)	352
Age 3-5 years	17-18	1.70 (1.45-2.00)	1.61 (1.32-1.92)	3.38 (2.82-3.71)	6.76 (5.08-10.0)	12.6 (7.31-18.6)	418
Age 6-11 years	11-12	1.55 (1.24-1.94)	1.58 (1.32-2.01)	3.28 (2.67-4.57)	6.24 (4.98-8.20)	10.1 (5.60-18.3)	314
Age 6-11 years	13-14	1.70 (1.34-2.15)	1.70 (1.24-2.13)	3.55 (2.49-4.66)	8.03 (5.16-12.8)	13.0 (6.66-17.8)	336
Age 6-11 years	15-16	1.99 (1.64-2.42)	2.09 (1.60-2.66)	4.06 (3.06-5.43)	8.00 (5.72-10.3)	12.3 (7.88-17.8)	324
Age 6-11 years	17-18	1.84 (1.59-2.13)	1.80 (1.35-2.15)	3.89 (3.08-4.38)	7.61 (5.63-8.63)	11.2 (7.61-17.9)	331
Age 12-19 years	11-12	1.57 (1.33-1.85)	1.53 (1.09-1.88)	3.36 (2.48-4.10)	7.17 (4.69-11.2)	17.8 (9.19-20.9)	304
Age 12-19 years	13-14	1.43 (1.19-1.71)	1.53 (1.23-1.83)	3.06 (2.20-3.73)	5.31 (4.50-6.68)	7.07 (5.36-11.3)	349
Age 12-19 years	15-16	1.94 (1.54-2.44)	1.98 (1.52-2.80)	4.35 (3.28-5.48)	7.44 (5.48-10.7)	11.2 (7.44-14.9)	307
Age 12-19 years	17-18	1.57 (1.34-1.83)	1.42 (1.18-1.92)	2.97 (2.60-3.86)	7.39 (5.06-8.96)	11.3 (7.47-21.5)	353
Age 20+ years	11-12	.755 (.664-.858)	.765 (.685-.857)	1.74 (1.53-2.02)	4.02 (3.55-4.44)	7.05 (5.19-9.20)	1433
Age 20+ years	13-14	.710 (.659-.764)	.690 (.630-.750)	1.40 (1.32-1.50)	2.99 (2.59-3.43)	5.50 (3.98-6.23)	1627
Age 20+ years	15-16	.881 (.791-.981)	.837 (.730-.970)	1.81 (1.53-2.09)	3.77 (3.07-4.39)	7.03 (4.64-10.0)	1447
Age 20+ years	17-18	.761 (.682-.850)	.799 (.732-.871)	1.57 (1.34-1.83)	3.24 (2.39-3.97)	4.99 (3.52-6.77)	1703
Male	11-12	.741 (.673-.817)	.831 (.732-.931)	1.71 (1.56-1.91)	3.37 (3.06-3.84)	5.05 (4.33-7.01)	1026
Male	13-14	.772 (.696-.855)	.780 (.680-.880)	1.53 (1.38-1.69)	3.12 (2.46-3.73)	4.91 (3.71-6.38)	1155
Male	15-16	.985 (.884-1.10)	.950 (.815-1.06)	2.01 (1.75-2.40)	4.03 (3.45-4.92)	6.29 (5.48-8.51)	1207
Male	17-18	.895 (.782-1.02)	.858 (.762-.953)	1.97 (1.72-2.22)	3.94 (2.83-6.08)	7.22 (5.19-9.06)	1387
Female	11-12	1.03 (.870-1.21)	.998 (.828-1.19)	2.48 (1.98-3.20)	5.60 (4.62-7.31)	10.9 (7.74-12.8)	1025
Female	13-14	.889 (.801-.987)	.840 (.730-.970)	1.94 (1.74-2.20)	4.64 (3.45-5.75)	7.94 (5.58-11.4)	1157
Female	15-16	1.13 (.999-1.27)	1.04 (.926-1.22)	2.51 (2.28-2.87)	6.21 (4.71-7.44)	10.1 (8.00-13.1)	1223
Female	17-18	.932 (.857-1.02)	.987 (.881-1.07)	1.91 (1.62-2.39)	3.95 (3.17-5.06)	6.41 (4.99-7.64)	1418
Mexican American	11-12	.891 (.728-1.09)	.983 (.680-1.16)	2.12 (1.32-3.33)	4.19 (3.33-8.16)	8.74 (4.45-11.4)	252
Mexican American	13-14	.889 (.767-1.03)	.840 (.710-1.08)	1.82 (1.51-2.31)	3.91 (2.88-5.44)	5.98 (4.19-8.57)	383
Mexican American	15-16	1.09 (.869-1.36)	1.02 (.790-1.31)	2.27 (1.70-2.92)	5.23 (3.54-7.73)	8.70 (5.92-16.1)	492
Mexican American	17-18	.797 (.642-.990)	.787 (.653-.920)	1.48 (1.15-2.16)	3.86 (2.24-5.46)	5.67 (4.38-8.85)	423
Non-Hispanic Black	11-12	1.29 (1.13-1.47)	1.22 (1.06-1.41)	2.95 (2.26-3.58)	6.81 (5.60-8.20)	11.9 (7.74-14.6)	515
Non-Hispanic Black	13-14	1.08 (.927-1.26)	1.01 (.850-1.13)	2.16 (1.78-2.72)	5.57 (3.13-9.68)	9.68 (5.35-16.0)	465
Non-Hispanic Black	15-16	1.22 (.904-1.65)	1.19 (.884-1.65)	2.38 (1.79-3.72)	6.07 (3.64-9.91)	10.3 (7.34-14.4)	524
Non-Hispanic Black	17-18	1.20 (1.09-1.32)	1.22 (1.00-1.43)	2.61 (2.31-2.88)	4.64 (3.62-5.83)	6.78 (5.66-8.83)	654
Non-Hispanic White	11-12	.830 (.704-.977)	.845 (.722-.993)	1.98 (1.65-2.42)	4.31 (3.81-4.84)	7.30 (5.05-9.85)	716
Non-Hispanic White	13-14	.803 (.722-.893)	.760 (.680-.870)	1.64 (1.44-1.85)	3.54 (2.86-4.84)	6.04 (4.76-8.17)	928
Non-Hispanic White	15-16	1.06 (.953-1.19)	1.02 (.851-1.15)	2.38 (2.05-2.54)	4.72 (4.03-5.96)	8.85 (6.52-10.9)	758
Non-Hispanic White	17-18	.919 (.799-1.06)	.931 (.824-1.07)	2.01 (1.66-2.39)	3.92 (2.75-6.47)	6.47 (3.98-8.41)	926
All Hispanic	11-12	.939 (.774-1.14)	.985 (.778-1.16)	2.06 (1.68-2.61)	4.45 (3.64-7.05)	9.12 (4.94-12.7)	483
All Hispanic	13-14	.864 (.753-.992)	.820 (.720-.980)	1.73 (1.48-2.17)	3.68 (2.89-4.34)	5.51 (4.19-6.89)	588
All Hispanic	15-16	1.12 (.976-1.28)	1.08 (.964-1.20)	2.27 (1.94-2.63)	5.40 (4.18-6.66)	9.65 (6.66-14.3)	804
All Hispanic	17-18	.904 (.771-1.06)	.862 (.744-.989)	1.75 (1.48-2.11)	4.16 (2.84-5.46)	6.76 (5.25-10.0)	669
Non-Hispanic Asian	11-12	.574 (.449-.734)	.537 (.419-.761)	1.50 (1.01-2.16)	3.06 (2.42-5.96)	6.52 (3.88-10.5)	266
Non-Hispanic Asian	13-14	.540 (.460-.633)	.530 (.370-.730)	1.24 (1.04-1.40)	2.65 (1.64-3.85)	4.11 (2.65-5.74)	238
Non-Hispanic Asian	15-16	.598 (.472-.757)	.555 (.389-.778)	1.21 (.962-1.49)	3.88 (2.15-4.72)	5.00 (3.50-10.7)	220
Non-Hispanic Asian	17-18	.484 (.437-.536)	.481 (.416-.562)	1.03 (.910-1.17)	1.89 (1.62-2.23)	3.64 (1.97-5.89)	369

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, 15-16, and 17-18 are 0.1, 0.16, 0.1, and 0.1, respectively.

† Participants are age 6+ years in Surveys 11-12 and 13-14; beginning with Survey 15-16, participants include those age 3+ years.

Urinary Diphenyl phosphate (DPHP) (creatinine corrected) (2011 - 2018)†

Metabolite of Triphenyl phosphate (TPHP), Isopropylphenyl diphenyl phosphate (IPDPP), t-butylphenyl diphenyl phosphate (tBDPP), and 2-ethylhexyl diphenyl phosphate (EHDPP)

Geometric mean and selected percentiles of urine concentrations of (in µg/g of creatinine) 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	.921 (.843-1.01)	.851 (.762-.938)	1.73 (1.60-1.91)	4.12 (3.32-4.69)	6.59 (5.68-7.85)	2051
Total population	13-14	.895 (.841-.952)	.789 (.757-.833)	1.57 (1.41-1.76)	3.28 (2.71-4.13)	5.41 (4.68-6.54)	2311
Total population	15-16	1.11 (1.04-1.19)	.965 (.912-1.04)	1.99 (1.76-2.18)	4.65 (4.08-5.08)	7.68 (6.37-9.48)	2429
Total population	17-18	.954 (.883-1.03)	.822 (.755-.883)	1.63 (1.42-1.89)	3.50 (3.03-4.09)	5.60 (4.84-7.66)	2805
Age 3-5 years	15-16	4.14 (3.65-4.71)	3.46 (3.07-3.97)	6.23 (5.03-7.58)	14.4 (11.3-17.0)	27.6 (16.8-37.5)	351
Age 3-5 years	17-18	3.46 (2.97-4.03)	2.93 (2.63-3.35)	5.46 (4.54-6.41)	12.4 (7.88-17.0)	25.6 (13.8-34.7)	418
Age 6-11 years	11-12	2.21 (1.80-2.72)	1.97 (1.54-2.44)	3.85 (2.52-4.82)	8.05 (5.84-10.0)	10.1 (8.94-16.9)	314
Age 6-11 years	13-14	2.16 (1.83-2.54)	1.85 (1.60-2.08)	3.78 (2.38-4.66)	7.06 (4.66-14.2)	12.2 (6.32-17.8)	336
Age 6-11 years	15-16	2.50 (2.16-2.91)	2.49 (2.08-2.76)	4.07 (3.42-5.37)	8.88 (6.20-11.1)	11.9 (8.86-16.9)	324
Age 6-11 years	17-18	2.13 (1.85-2.45)	1.83 (1.52-2.34)	3.67 (2.82-4.40)	6.95 (5.05-11.7)	13.8 (9.07-21.3)	331
Age 12-19 years	11-12	1.41 (1.23-1.61)	1.19 (1.01-1.38)	2.91 (2.07-3.56)	6.54 (4.86-8.81)	10.5 (6.50-16.6)	304
Age 12-19 years	13-14	1.23 (1.08-1.39)	1.13 (.940-1.33)	2.25 (1.65-2.83)	3.77 (3.00-5.46)	6.74 (4.28-8.47)	349
Age 12-19 years	15-16	1.51 (1.25-1.82)	1.37 (1.17-1.65)	2.41 (2.11-3.24)	5.01 (3.43-6.30)	6.32 (4.92-12.7)	307
Age 12-19 years	17-18	1.35 (1.11-1.65)	1.10 (.924-1.33)	2.40 (1.84-2.96)	5.06 (3.49-8.64)	9.56 (4.33-29.6)	353
Age 20+ years	11-12	.785 (.708-.871)	.750 (.643-.842)	1.53 (1.33-1.62)	2.92 (2.56-3.54)	5.68 (4.48-6.31)	1433
Age 20+ years	13-14	.778 (.741-.816)	.689 (.643-.739)	1.28 (1.15-1.38)	2.61 (2.26-3.09)	4.83 (3.70-5.52)	1626
Age 20+ years	15-16	.915 (.835-1.00)	.820 (.752-.882)	1.47 (1.25-1.69)	3.43 (2.56-4.63)	6.11 (5.02-7.87)	1447
Age 20+ years	17-18	.780 (.715-.852)	.683 (.643-.729)	1.25 (1.11-1.40)	2.54 (2.16-3.01)	4.08 (3.20-4.84)	1703
Male	11-12	.684 (.632-.740)	.659 (.582-.730)	1.27 (1.14-1.41)	2.47 (2.16-3.10)	4.28 (3.18-5.32)	1026
Male	13-14	.713 (.675-.754)	.643 (.604-.695)	1.15 (1.07-1.28)	2.26 (1.97-2.70)	3.93 (2.58-4.95)	1154
Male	15-16	.894 (.823-.972)	.785 (.721-.831)	1.50 (1.33-1.69)	3.68 (3.07-4.54)	5.71 (4.95-7.01)	1207
Male	17-18	.797 (.722-.880)	.674 (.624-.730)	1.40 (1.20-1.63)	2.96 (2.42-3.35)	4.79 (3.92-6.45)	1387
Female	11-12	1.22 (1.08-1.37)	1.10 (.963-1.31)	2.31 (1.85-2.76)	5.68 (4.48-6.76)	8.81 (6.76-12.2)	1025
Female	13-14	1.11 (1.02-1.21)	.995 (.881-1.10)	1.95 (1.72-2.23)	4.60 (3.34-5.41)	6.84 (5.70-8.47)	1157
Female	15-16	1.37 (1.27-1.48)	1.16 (1.04-1.30)	2.37 (2.14-2.70)	5.56 (4.72-6.75)	9.48 (7.67-12.7)	1222
Female	17-18	1.14 (1.06-1.22)	.937 (.886-1.01)	1.97 (1.57-2.44)	4.08 (3.41-4.84)	7.29 (5.50-10.0)	1418
Mexican American	11-12	.894 (.724-1.11)	.831 (.664-.983)	1.92 (1.53-2.37)	3.39 (2.51-6.50)	7.79 (3.85-9.64)	252
Mexican American	13-14	.939 (.816-1.08)	.831 (.658-1.04)	1.55 (1.32-1.95)	3.33 (2.76-4.13)	5.39 (3.77-7.43)	382
Mexican American	15-16	1.21 (.999-1.47)	1.04 (.789-1.28)	2.20 (1.65-2.98)	5.26 (3.42-9.20)	10.9 (6.21-15.8)	492
Mexican American	17-18	.863 (.717-1.04)	.729 (.679-.807)	1.54 (1.12-2.11)	3.39 (2.53-5.06)	5.86 (4.37-7.74)	423
Non-Hispanic Black	11-12	.965 (.863-1.08)	.868 (.780-.954)	1.86 (1.59-2.26)	4.12 (3.50-4.67)	6.21 (4.41-9.30)	515
Non-Hispanic Black	13-14	.847 (.688-1.04)	.700 (.583-.808)	1.56 (1.09-2.26)	4.12 (2.37-6.26)	6.40 (4.12-10.4)	465
Non-Hispanic Black	15-16	1.02 (.818-1.28)	.902 (.756-1.09)	1.93 (1.51-2.59)	5.20 (2.99-6.77)	7.89 (5.79-11.0)	523
Non-Hispanic Black	17-18	.902 (.826-.985)	.802 (.715-.882)	1.56 (1.36-1.76)	3.28 (2.48-4.11)	4.89 (4.11-6.24)	654
Non-Hispanic White	11-12	.927 (.810-1.06)	.847 (.737-.991)	1.70 (1.54-1.94)	4.30 (2.91-5.40)	6.59 (5.40-8.64)	716
Non-Hispanic White	13-14	.920 (.859-.986)	.808 (.764-.898)	1.61 (1.43-1.79)	3.34 (2.53-4.56)	5.52 (4.54-6.94)	928
Non-Hispanic White	15-16	1.16 (1.06-1.27)	1.00 (.930-1.07)	2.04 (1.75-2.33)	4.82 (3.83-5.43)	7.67 (5.39-10.9)	758
Non-Hispanic White	17-18	.982 (.879-1.10)	.876 (.783-.948)	1.67 (1.29-2.20)	3.67 (3.01-4.35)	5.50 (4.33-9.07)	926
All Hispanic	11-12	.946 (.812-1.10)	.831 (.722-.969)	1.89 (1.54-2.26)	3.85 (2.96-5.92)	7.79 (5.08-9.64)	483
All Hispanic	13-14	.907 (.795-1.03)	.796 (.659-.977)	1.52 (1.28-1.92)	3.15 (2.76-3.71)	4.89 (3.85-6.44)	587
All Hispanic	15-16	1.20 (1.07-1.33)	1.04 (.907-1.17)	2.13 (1.88-2.55)	5.11 (3.91-7.51)	10.9 (7.45-13.0)	804
All Hispanic	17-18	.969 (.860-1.09)	.794 (.710-.938)	1.64 (1.48-1.90)	3.91 (3.00-4.43)	7.00 (5.06-8.48)	669
Non-Hispanic Asian	11-12	.760 (.637-.906)	.668 (.476-.964)	1.53 (1.22-1.96)	3.73 (2.46-5.87)	6.74 (4.46-8.28)	266
Non-Hispanic Asian	13-14	.679 (.607-.761)	.636 (.526-.735)	1.15 (.917-1.40)	2.17 (1.65-3.38)	4.24 (2.25-6.50)	238
Non-Hispanic Asian	15-16	.754 (.656-.867)	.672 (.562-.800)	1.27 (1.12-1.57)	2.79 (1.71-3.88)	5.01 (2.95-7.99)	220
Non-Hispanic Asian	17-18	.711 (.646-.783)	.643 (.545-.704)	1.27 (.999-1.56)	2.60 (2.28-3.29)	3.88 (2.75-5.39)	369

† Participants are age 6+ years in Surveys 11-12 and 13-14; beginning with Survey 15-16, participants include those age 3+ years.

Urinary 2-((isopropyl)phenyl)phenyl phosphate (2015 - 2018)†

Metabolite of Bis(2-isopropylphenyl) phenyl phosphate and 2-isopropylphenyl diphenyl phosphate

Geometric mean and selected percentiles of urine 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	15-16	*	<LOD	<LOD	.091 (.080-.111)	.153 (.119-.218)	2416
Total population	17-18	*	<LOD	<LOD	.077 (.066-.089)	.126 (.106-.146)	2321
Age 3-5 years	15-16	*	<LOD	.066 (.053-.083)	.150 (.122-.225)	.284 (.199-.352)	349
Age 3-5 years	17-18	*	<LOD	.062 (.055-.077)	.150 (.099-.249)	.292 (.152-.612)	323
Age 6-11 years	15-16	*	<LOD	.084 (.060-.143)	.222 (.118-.357)	.342 (.238-.581)	321
Age 6-11 years	17-18	*	<LOD	.062 (<LOD-.092)	.136 (.092-.219)	.244 (.141-.382)	242
Age 12-19 years	15-16	*	<LOD	.079 (.054-.100)	.198 (.100-.267)	.267 (.201-.356)	305
Age 12-19 years	17-18	*	<LOD	<LOD	.108 (.062-.219)	.219 (.098-.499)	296
Age 20+ years	15-16	*	<LOD	<LOD	.078 (.059-.087)	.119 (.089-.142)	1441
Age 20+ years	17-18	*	<LOD	<LOD	.065 (.056-.071)	.103 (.083-.126)	1460
Males	15-16	*	<LOD	<LOD	.101 (.081-.125)	.170 (.120-.227)	1201
Males	17-18	*	<LOD	<LOD	.082 (.063-.102)	.126 (.103-.176)	1155
Females	15-16	*	<LOD	<LOD	.086 (.066-.119)	.141 (.106-.213)	1215
Females	17-18	*	<LOD	<LOD	.070 (.062-.089)	.125 (.083-.154)	1166
Mexican Americans	15-16	*	<LOD	<LOD	.090 (.070-.153)	.176 (.092-.291)	486
Mexican Americans	17-18	*	<LOD	<LOD	.071 (<LOD-.090)	.099 (.078-.136)	367
Non-Hispanic blacks	15-16	*	<LOD	<LOD	.112 (.060-.213)	.225 (.132-.302)	522
Non-Hispanic blacks	17-18	*	<LOD	<LOD	.079 (.062-.101)	.136 (.089-.188)	482
Non-Hispanic whites	15-16	*	<LOD	<LOD	.095 (.081-.110)	.142 (.108-.210)	757
Non-Hispanic whites	17-18	*	<LOD	<LOD	.083 (.067-.094)	.129 (.106-.165)	837
All Hispanics	15-16	*	<LOD	<LOD	.088 (.072-.122)	.171 (.119-.243)	795
All Hispanics	17-18	*	<LOD	<LOD	.064 (<LOD-.079)	.097 (.078-.136)	576
Asians	15-16	*	<LOD	<LOD	.052 (<LOD-.087)	.082 (<LOD-.145)	219
Asians	17-18	*	<LOD	<LOD	<LOD	.050 (<LOD-.060)	272

Limit of detection (LOD, see Data Analysis section) for Survey years 15-16 and 17-18 is 0.05 and 0.05, 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.

Urinary 2-((isopropyl)phenyl)phenyl phosphate (creatinine corrected) (2015 - 2018)†

Metabolite of Bis(2-isopropylphenyl) phenyl phosphate and 2-isopropylphenyl diphenyl phosphate

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) 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	15-16	*	<LOD	<LOD	.140 (.125-.156)	.191 (.175-.219)	2415
Total population	17-18	*	<LOD	<LOD	.146 (.125-.167)	.194 (.167-.233)	2321
Age 3-5 years	15-16	*	<LOD	.182 (.159-.221)	.360 (.269-.398)	.583 (.389-.739)	348
Age 3-5 years	17-18	*	<LOD	.167 (.140-.233)	.360 (.269-.492)	.573 (.389-.989)	323
Age 6-11 years	15-16	*	<LOD	.130 (.105-.157)	.245 (.159-.382)	.402 (.250-.649)	321
Age 6-11 years	17-18	*	<LOD	.095 (<LOD-.121)	.193 (.108-.230)	.215 (.184-.350)	242
Age 12-19 years	15-16	*	<LOD	.070 (.059-.085)	.138 (.095-.160)	.174 (.138-.255)	305
Age 12-19 years	17-18	*	<LOD	<LOD	.146 (.097-.222)	.222 (.116-1.10)	296
Age 20+ years	15-16	*	<LOD	<LOD	.119 (.103-.142)	.167 (.146-.175)	1441
Age 20+ years	17-18	*	<LOD	<LOD	.130 (.109-.148)	.177 (.159-.206)	1460
Males	15-16	*	<LOD	<LOD	.121 (.100-.146)	.164 (.146-.206)	1201
Males	17-18	*	<LOD	<LOD	.117 (.092-.142)	.167 (.135-.194)	1155
Females	15-16	*	<LOD	<LOD	.159 (.140-.167)	.219 (.183-.234)	1214
Females	17-18	*	<LOD	<LOD	.167 (.135-.198)	.230 (.194-.269)	1166
Mexican Americans	15-16	*	<LOD	<LOD	.152 (.122-.184)	.242 (.174-.318)	486
Mexican Americans	17-18	*	<LOD	<LOD	.140 (<LOD-.152)	.177 (.148-.206)	367
Non-Hispanic blacks	15-16	*	<LOD	<LOD	.140 (.106-.160)	.206 (.152-.291)	521
Non-Hispanic blacks	17-18	*	<LOD	<LOD	.103 (.074-.159)	.185 (.106-.292)	482
Non-Hispanic whites	15-16	*	<LOD	<LOD	.135 (.121-.159)	.184 (.167-.219)	757
Non-Hispanic whites	17-18	*	<LOD	<LOD	.146 (.117-.167)	.194 (.159-.233)	837
All Hispanics	15-16	*	<LOD	<LOD	.152 (.135-.174)	.233 (.175-.283)	795
All Hispanics	17-18	*	<LOD	<LOD	.146 (<LOD-.167)	.198 (.167-.318)	576
Asians	15-16	*	<LOD	<LOD	.140 (<LOD-.167)	.175 (<LOD-.219)	219
Asians	17-18	*	<LOD	<LOD	<LOD	.206 (<LOD-.318)	272

<LOD means less than the limit of detection for the urine levels not corrected for creatinine.

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

Urinary 4-((tert-butyl)phenyl)phenyl phosphate (2015 - 2018)†

Metabolite of Bis(4-tert-butylphenyl) phenyl phosphate and 4-tert-butylphenyl diphenyl phosphate

Geometric mean and selected percentiles of urine 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	15-16	*	<LOD	<LOD	.092 (.078-.110)	.164 (.141-.198)	2427
Total population	17-18	*	<LOD	<LOD	.088 (.075-.105)	.219 (.167-.290)	2331
Age 3-5 years	15-16	*	<LOD	.082 (.055-.107)	.233 (.133-.309)	.353 (.244-.647)	351
Age 3-5 years	17-18	*	<LOD	.088 (.071-.117)	.291 (.167-.383)	.514 (.274-1.03)	325
Age 6-11 years	15-16	*	.053 (<LOD-.065)	.111 (.082-.155)	.244 (.161-.588)	.660 (.366-.949)	324
Age 6-11 years	17-18	*	<LOD	.075 (.051-.123)	.316 (.198-.751)	.751 (.290-1.29)	245
Age 12-19 years	15-16	*	<LOD	.122 (.086-.163)	.236 (.159-.497)	.459 (.232-.786)	307
Age 12-19 years	17-18	*	<LOD	.063 (<LOD-.123)	.236 (.146-.376)	.435 (.254-.820)	297
Age 20+ years	15-16	*	<LOD	<LOD	.056 (.051-.067)	.083 (.067-.104)	1445
Age 20+ years	17-18	*	<LOD	<LOD	.059 (.052-.067)	.116 (.089-.161)	1464
Males	15-16	*	<LOD	<LOD	.093 (.078-.118)	.188 (.146-.240)	1206
Males	17-18	*	<LOD	<LOD	.095 (.075-.123)	.267 (.185-.384)	1161
Females	15-16	*	<LOD	<LOD	.090 (.071-.109)	.155 (.132-.174)	1221
Females	17-18	*	<LOD	<LOD	.080 (.064-.112)	.200 (.131-.273)	1170
Mexican Americans	15-16	*	<LOD	.050 (<LOD-.069)	.118 (.081-.185)	.261 (.151-.478)	491
Mexican Americans	17-18	*	<LOD	<LOD	.087 (.057-.226)	.236 (.086-.435)	367
Non-Hispanic blacks	15-16	*	<LOD	<LOD	.115 (.090-.160)	.198 (.118-.497)	523
Non-Hispanic blacks	17-18	*	<LOD	.057 (<LOD-.074)	.131 (.097-.218)	.301 (.177-.405)	485
Non-Hispanic whites	15-16	*	<LOD	<LOD	.083 (.058-.141)	.159 (.105-.199)	758
Non-Hispanic whites	17-18	*	<LOD	<LOD	.076 (.057-.112)	.206 (.151-.286)	840
All Hispanics	15-16	*	<LOD	.050 (<LOD-.064)	.119 (.084-.162)	.231 (.152-.393)	802
All Hispanics	17-18	*	<LOD	<LOD	.089 (.065-.128)	.233 (.096-.564)	577
Asians	15-16	*	<LOD	<LOD	.050 (<LOD-.073)	.079 (.051-.152)	220
Asians	17-18	*	<LOD	<LOD	.059 (<LOD-.071)	.084 (.060-.127)	272

Limit of detection (LOD, see Data Analysis section) for Survey years 15-16 and 17-18 is 0.05 and 0.05, 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.

Urinary 4-((tert-butyl)phenyl)phenyl phosphate (creatinine corrected) (2015 - 2018)†

Metabolite of Bis(4-tert-butylphenyl) phenyl phosphate and 4-tert-butylphenyl diphenyl phosphate

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) 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	15-16	*	<LOD	<LOD	.159 (.135-.175)	.239 (.206-.269)	2426
Total population	17-18	*	<LOD	<LOD	.160 (.146-.169)	.233 (.194-.292)	2331
Age 3-5 years	15-16	*	<LOD	.207 (.175-.248)	.447 (.297-.648)	.690 (.488-1.28)	350
Age 3-5 years	17-18	*	<LOD	.219 (.167-.292)	.438 (.318-.643)	.760 (.484-1.52)	325
Age 6-11 years	15-16	*	.078 (<LOD-.105)	.152 (.125-.190)	.354 (.221-.632)	.635 (.403-.832)	324
Age 6-11 years	17-18	*	<LOD	.109 (.088-.152)	.323 (.184-.697)	.758 (.408-1.93)	245
Age 12-19 years	15-16	*	<LOD	.097 (.067-.140)	.175 (.132-.241)	.268 (.194-.300)	307
Age 12-19 years	17-18	*	<LOD	.103 (<LOD-.130)	.167 (.130-.292)	.292 (.161-.463)	297
Age 20+ years	15-16	*	<LOD	<LOD	.117 (.101-.146)	.175 (.146-.219)	1445
Age 20+ years	17-18	*	<LOD	<LOD	.140 (.122-.159)	.186 (.159-.206)	1464
Males	15-16	*	<LOD	<LOD	.146 (.125-.159)	.241 (.184-.269)	1206
Males	17-18	*	<LOD	<LOD	.140 (.121-.167)	.190 (.169-.301)	1161
Females	15-16	*	<LOD	<LOD	.167 (.135-.176)	.237 (.184-.292)	1220
Females	17-18	*	<LOD	<LOD	.168 (.146-.206)	.269 (.206-.304)	1170
Mexican Americans	15-16	*	<LOD	.090 (<LOD-.109)	.184 (.140-.283)	.350 (.233-.492)	491
Mexican Americans	17-18	*	<LOD	<LOD	.152 (.135-.186)	.284 (.157-.520)	367
Non-Hispanic blacks	15-16	*	<LOD	<LOD	.146 (.113-.161)	.265 (.166-.329)	522
Non-Hispanic blacks	17-18	*	<LOD	.057 (<LOD-.073)	.143 (.106-.184)	.292 (.167-.350)	485
Non-Hispanic whites	15-16	*	<LOD	<LOD	.159 (.124-.176)	.233 (.179-.268)	758
Non-Hispanic whites	17-18	*	<LOD	<LOD	.159 (.139-.175)	.203 (.184-.250)	840
All Hispanics	15-16	*	<LOD	.088 (<LOD-.100)	.175 (.146-.211)	.298 (.207-.395)	802
All Hispanics	17-18	*	<LOD	<LOD	.158 (.135-.244)	.310 (.167-.484)	577
Asians	15-16	*	<LOD	<LOD	.146 (<LOD-.175)	.184 (.146-.276)	220
Asians	17-18	*	<LOD	<LOD	.175 (<LOD-.206)	.252 (.175-.350)	272

<LOD means less than the limit of detection for the urine levels not corrected for creatinine.

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

Urinary 2,3,4,5-Tetrabromobenzoic acid (TBBA) (2011 - 2018)†

Metabolite of 2-ethylhexyl-2,3,4,5-tetrabromobenzoate (EH-TBB)

Geometric mean and selected percentiles of urine concentrations of (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	.053 (<LOD-.076)	2053
Total population	13-14	*	<LOD	<LOD	<LOD	<LOD	2316
Total population	15-16	*	<LOD	<LOD	<LOD	.092 (.064-.126)	2430
Total population	17-18	*	<LOD	<LOD	<LOD	.070 (.051-.096)	2805
Age 3-5 years	15-16	*	<LOD	<LOD	.063 (<LOD-.118)	.140 (.055-.300)	352
Age 3-5 years	17-18	*	<LOD	<LOD	.079 (.054-.105)	.136 (.103-.168)	418
Age 6-11 years	11-12	*	<LOD	<LOD	.051 (<LOD-.084)	.114 (<LOD-.252)	314
Age 6-11 years	13-14	*	<LOD	<LOD	<LOD	.060 (<LOD-.090)	337
Age 6-11 years	15-16	*	<LOD	<LOD	.053 (<LOD-.076)	.086 (.053-.120)	324
Age 6-11 years	17-18	*	<LOD	<LOD	.067 (<LOD-.105)	.105 (.063-.139)	331
Age 12-19 years	11-12	*	<LOD	<LOD	<LOD	<LOD	305
Age 12-19 years	13-14	*	<LOD	<LOD	<LOD	<LOD	349
Age 12-19 years	15-16	*	<LOD	<LOD	<LOD	.080 (<LOD-.119)	307
Age 12-19 years	17-18	*	<LOD	<LOD	<LOD	.052 (<LOD-.078)	353
Age 20+ years	11-12	*	<LOD	<LOD	<LOD	.053 (<LOD-.083)	1434
Age 20+ years	13-14	*	<LOD	<LOD	<LOD	<LOD	1630
Age 20+ years	15-16	*	<LOD	<LOD	<LOD	.086 (.051-.151)	1447
Age 20+ years	17-18	*	<LOD	<LOD	<LOD	.063 (<LOD-.086)	1703
Male	11-12	*	<LOD	<LOD	<LOD	.050 (<LOD-.087)	1027
Male	13-14	*	<LOD	<LOD	<LOD	.060 (<LOD-.070)	1157
Male	15-16	*	<LOD	<LOD	<LOD	.086 (.059-.125)	1207
Male	17-18	*	<LOD	<LOD	<LOD	.078 (.052-.154)	1387
Female	11-12	*	<LOD	<LOD	<LOD	.054 (<LOD-.106)	1026
Female	13-14	*	<LOD	<LOD	<LOD	<LOD	1159
Female	15-16	*	<LOD	<LOD	<LOD	.098 (.053-.155)	1223
Female	17-18	*	<LOD	<LOD	<LOD	.057 (<LOD-.079)	1418
Mexican American	11-12	*	<LOD	<LOD	<LOD	<LOD	252
Mexican American	13-14	*	<LOD	<LOD	<LOD	<LOD	384
Mexican American	15-16	*	<LOD	<LOD	<LOD	.085 (.051-.109)	492
Mexican American	17-18	*	<LOD	<LOD	<LOD	<LOD	423
Non-Hispanic Black	11-12	*	<LOD	<LOD	<LOD	.071 (<LOD-.147)	515
Non-Hispanic Black	13-14	*	<LOD	<LOD	<LOD	.060 (<LOD-.100)	466
Non-Hispanic Black	15-16	*	<LOD	<LOD	.052 (<LOD-.080)	.099 (.070-.119)	524
Non-Hispanic Black	17-18	*	<LOD	<LOD	.050 (<LOD-.068)	.084 (.060-.140)	654
Non-Hispanic White	11-12	*	<LOD	<LOD	<LOD	.056 (<LOD-.091)	716
Non-Hispanic White	13-14	*	<LOD	<LOD	<LOD	<LOD	930
Non-Hispanic White	15-16	*	<LOD	<LOD	<LOD	.099 (.053-.238)	758
Non-Hispanic White	17-18	*	<LOD	<LOD	<LOD	.076 (<LOD-.161)	926
All Hispanic	11-12	*	<LOD	<LOD	<LOD	<LOD	483
All Hispanic	13-14	*	<LOD	<LOD	<LOD	<LOD	589
All Hispanic	15-16	*	<LOD	<LOD	<LOD	.072 (<LOD-.101)	804
All Hispanic	17-18	*	<LOD	<LOD	<LOD	<LOD	669
Non-Hispanic Asian	11-12	*	<LOD	<LOD	<LOD	<LOD	268
Non-Hispanic Asian	13-14	*	<LOD	<LOD	<LOD	<LOD	238
Non-Hispanic Asian	15-16	*	<LOD	<LOD	<LOD	<LOD	220
Non-Hispanic Asian	17-18	*	<LOD	<LOD	<LOD	.052 (<LOD-.082)	369

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, 15-16, and 17-18 are 0.05, 0.05, 0.05, and 0.05, 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.

† Participants are age 6+ years in Surveys 11-12 and 13-14; beginning with Survey 15-16, participants include those age 3+ years.

Urinary 2,3,4,5-Tetrabromobenzoic acid (TBBA) (creatinine corrected) (2011 - 2018)†

Metabolite of 2-ethylhexyl-2,3,4,5-tetrabromobenzoate (EH-TBB)

Geometric mean and selected percentiles of urine concentrations of (in µg/g of creatinine) 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	.167 (<LOD-.184)	2053
Total population	13-14	*	<LOD	<LOD	<LOD	<LOD	2315
Total population	15-16	*	<LOD	<LOD	<LOD	.175 (.159-.194)	2429
Total population	17-18	*	<LOD	<LOD	<LOD	.177 (.161-.206)	2805
Age 3-5 years	15-16	*	<LOD	<LOD	.250 (<LOD-.303)	.350 (.264-.500)	351
Age 3-5 years	17-18	*	<LOD	<LOD	.236 (.191-.295)	.322 (.253-.449)	418
Age 6-11 years	11-12	*	<LOD	<LOD	.219 (<LOD-.292)	.292 (<LOD-.350)	314
Age 6-11 years	13-14	*	<LOD	<LOD	<LOD	.211 (<LOD-.267)	337
Age 6-11 years	15-16	*	<LOD	<LOD	.135 (<LOD-.159)	.172 (.152-.250)	324
Age 6-11 years	17-18	*	<LOD	<LOD	.111 (<LOD-.154)	.186 (.114-.221)	331
Age 12-19 years	11-12	*	<LOD	<LOD	<LOD	<LOD	305
Age 12-19 years	13-14	*	<LOD	<LOD	<LOD	<LOD	349
Age 12-19 years	15-16	*	<LOD	<LOD	<LOD	.097 (<LOD-.135)	307
Age 12-19 years	17-18	*	<LOD	<LOD	<LOD	.148 (<LOD-.295)	353
Age 20+ years	11-12	*	<LOD	<LOD	<LOD	.167 (<LOD-.184)	1434
Age 20+ years	13-14	*	<LOD	<LOD	<LOD	<LOD	1629
Age 20+ years	15-16	*	<LOD	<LOD	<LOD	.175 (.146-.198)	1447
Age 20+ years	17-18	*	<LOD	<LOD	<LOD	.177 (<LOD-.208)	1703
Male	11-12	*	<LOD	<LOD	<LOD	.154 (<LOD-.184)	1027
Male	13-14	*	<LOD	<LOD	<LOD	.148 (<LOD-.182)	1156
Male	15-16	*	<LOD	<LOD	<LOD	.156 (.135-.182)	1207
Male	17-18	*	<LOD	<LOD	<LOD	.149 (.126-.169)	1387
Female	11-12	*	<LOD	<LOD	<LOD	.175 (<LOD-.219)	1026
Female	13-14	*	<LOD	<LOD	<LOD	<LOD	1159
Female	15-16	*	<LOD	<LOD	<LOD	.184 (.167-.240)	1222
Female	17-18	*	<LOD	<LOD	<LOD	.208 (<LOD-.253)	1418
Mexican American	11-12	*	<LOD	<LOD	<LOD	<LOD	252
Mexican American	13-14	*	<LOD	<LOD	<LOD	<LOD	383
Mexican American	15-16	*	<LOD	<LOD	<LOD	.167 (.146-.205)	492
Mexican American	17-18	*	<LOD	<LOD	<LOD	<LOD	423
Non-Hispanic Black	11-12	*	<LOD	<LOD	<LOD	.109 (<LOD-.154)	515
Non-Hispanic Black	13-14	*	<LOD	<LOD	<LOD	.119 (<LOD-.148)	466
Non-Hispanic Black	15-16	*	<LOD	<LOD	.100 (<LOD-.121)	.146 (.109-.240)	523
Non-Hispanic Black	17-18	*	<LOD	<LOD	.084 (<LOD-.114)	.148 (.104-.197)	654
Non-Hispanic White	11-12	*	<LOD	<LOD	<LOD	.167 (<LOD-.206)	716
Non-Hispanic White	13-14	*	<LOD	<LOD	<LOD	<LOD	930
Non-Hispanic White	15-16	*	<LOD	<LOD	<LOD	.176 (.159-.219)	758
Non-Hispanic White	17-18	*	<LOD	<LOD	<LOD	.177 (<LOD-.208)	926
All Hispanic	11-12	*	<LOD	<LOD	<LOD	<LOD	483
All Hispanic	13-14	*	<LOD	<LOD	<LOD	<LOD	588
All Hispanic	15-16	*	<LOD	<LOD	<LOD	.159 (<LOD-.184)	804
All Hispanic	17-18	*	<LOD	<LOD	<LOD	<LOD	669
Non-Hispanic Asian	11-12	*	<LOD	<LOD	<LOD	<LOD	268
Non-Hispanic Asian	13-14	*	<LOD	<LOD	<LOD	<LOD	238
Non-Hispanic Asian	15-16	*	<LOD	<LOD	<LOD	<LOD	220
Non-Hispanic Asian	17-18	*	<LOD	<LOD	<LOD	.236 (<LOD-.322)	369

<LOD means less than the limit of detection for the urine levels not corrected for creatinine.

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

† Participants are age 6+ years in Surveys 11-12 and 13-14; beginning with Survey 15-16, participants include those age 3+ years.