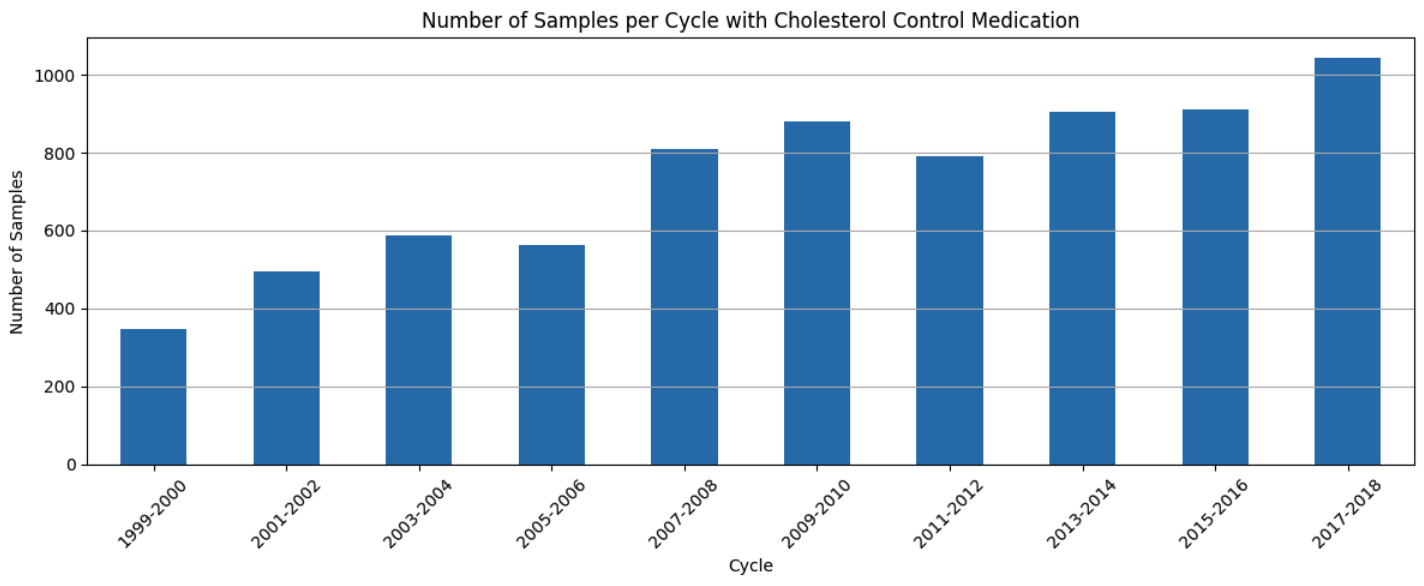
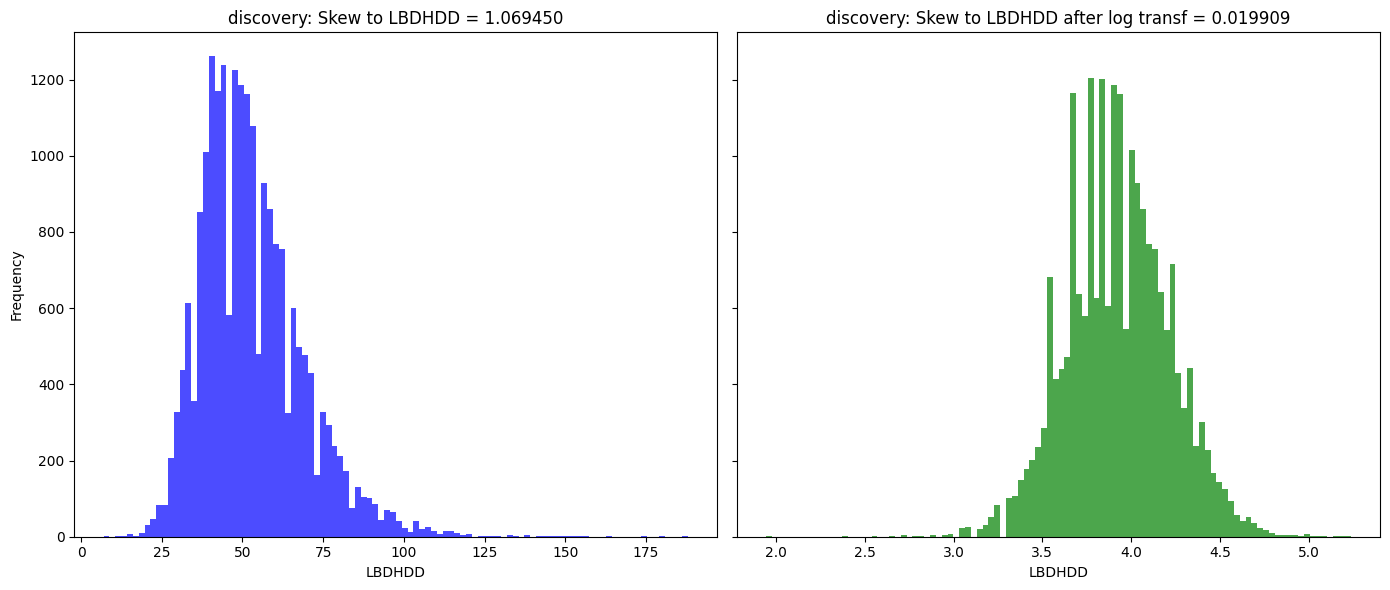
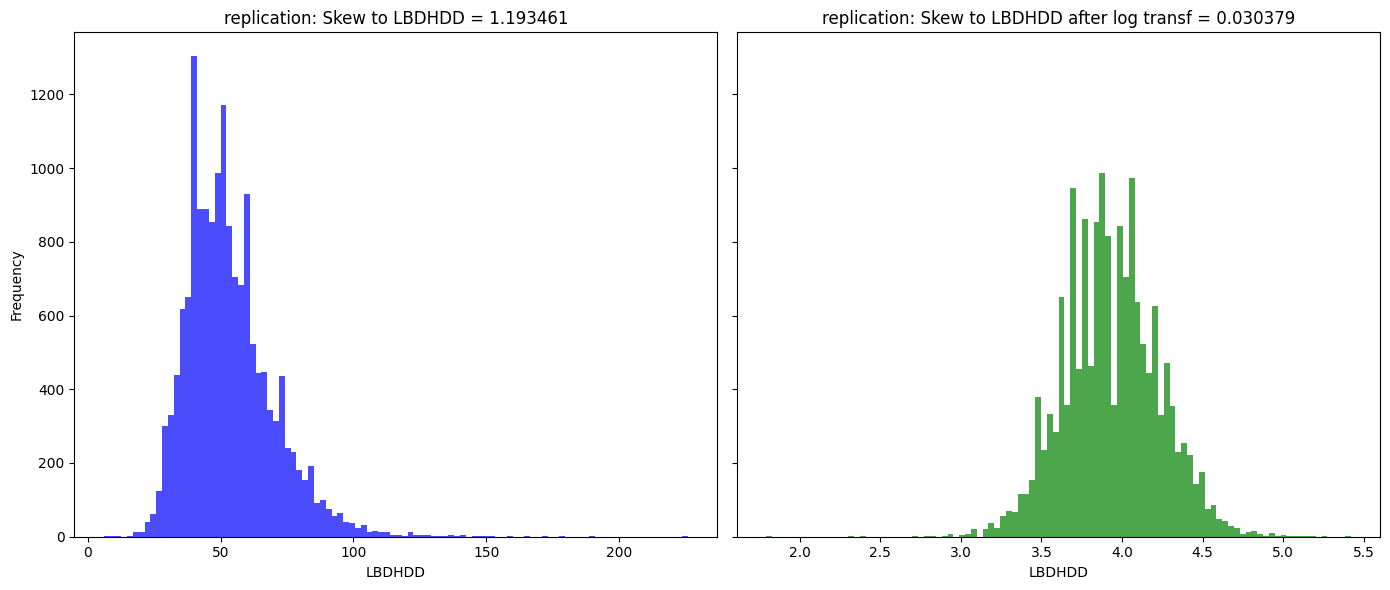
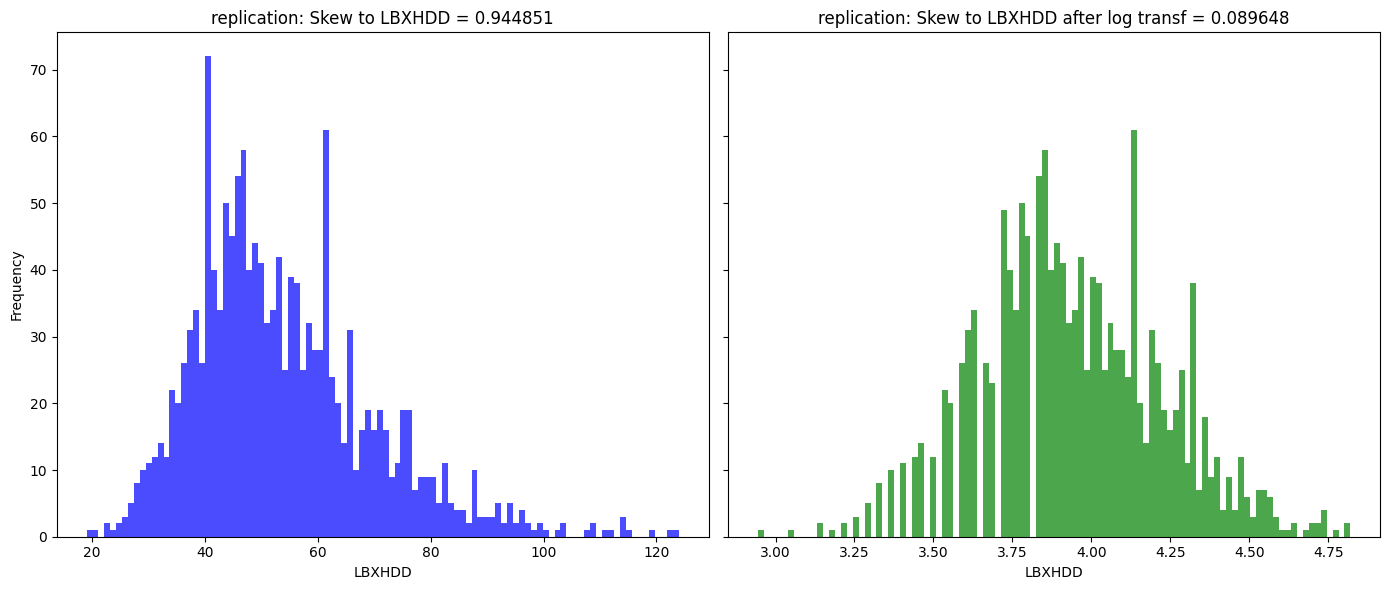
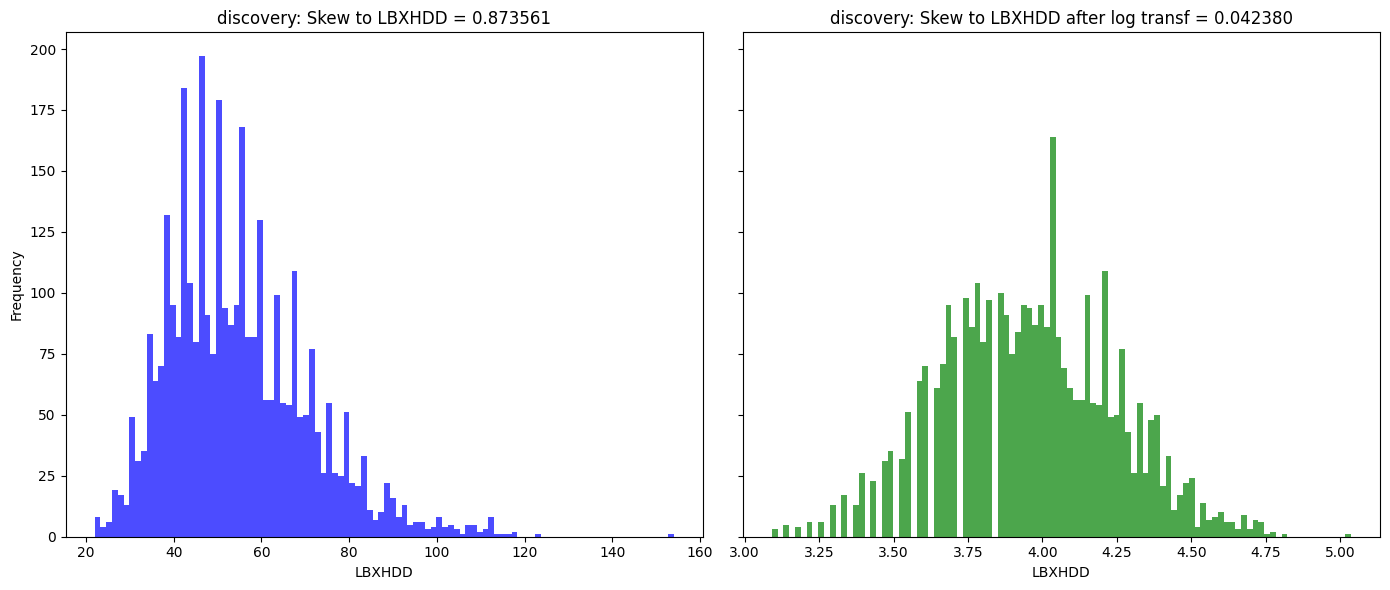
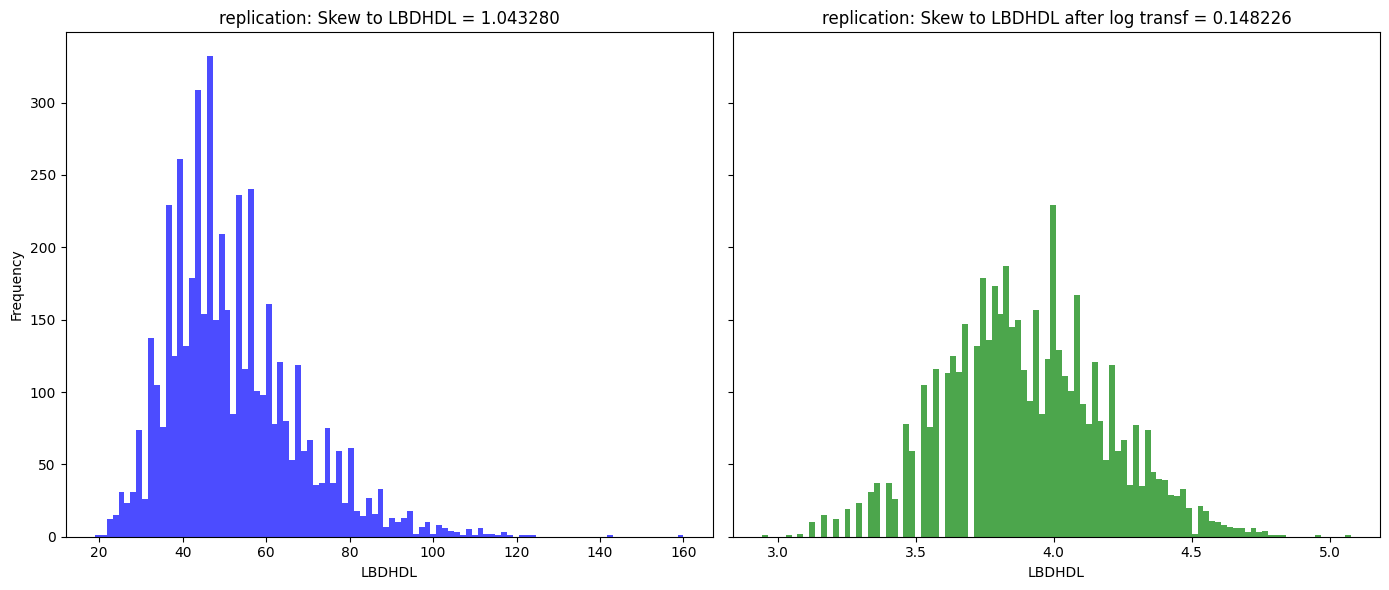
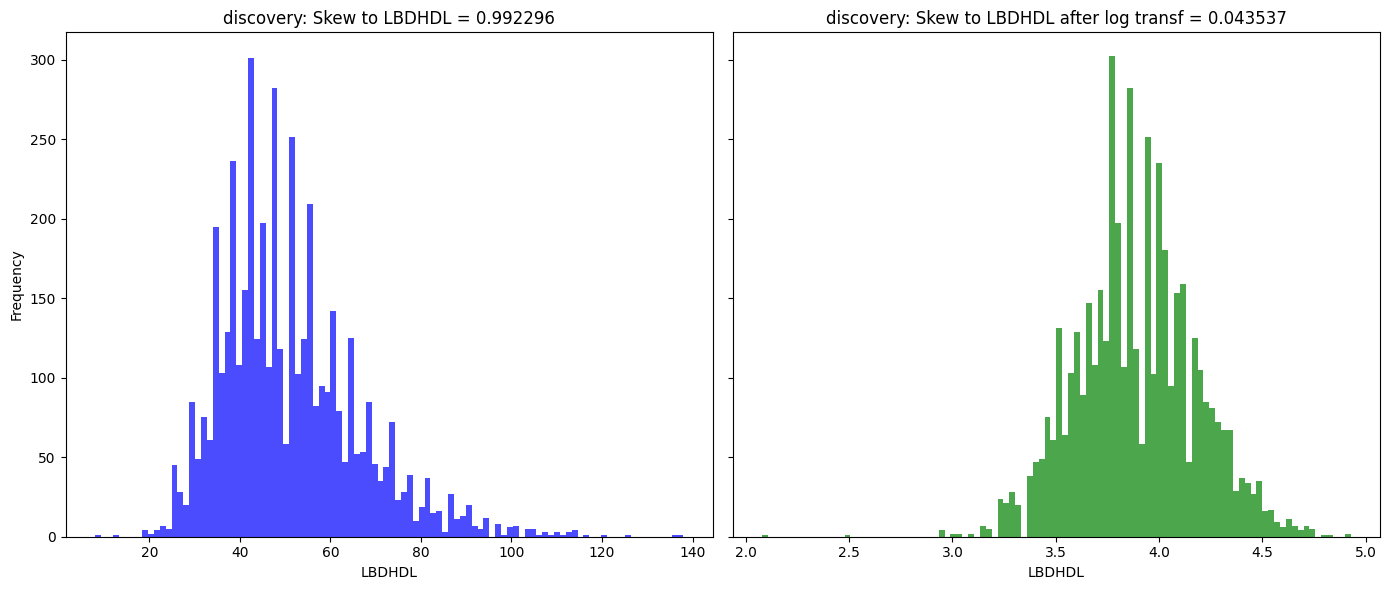
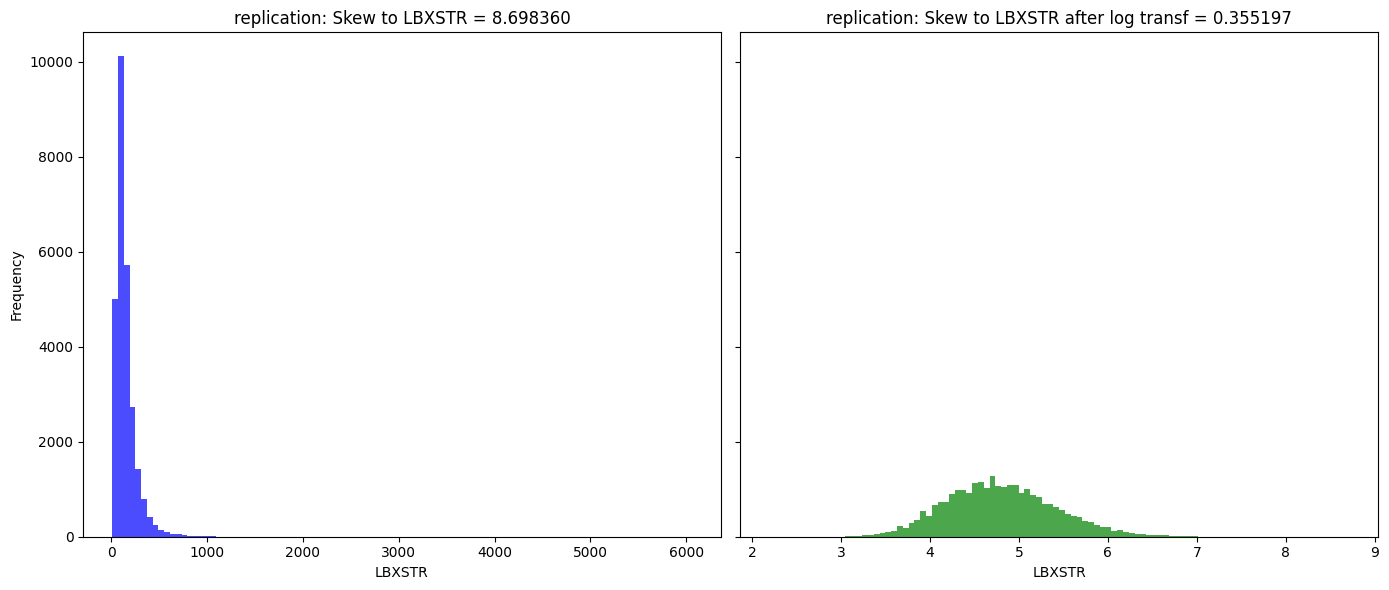
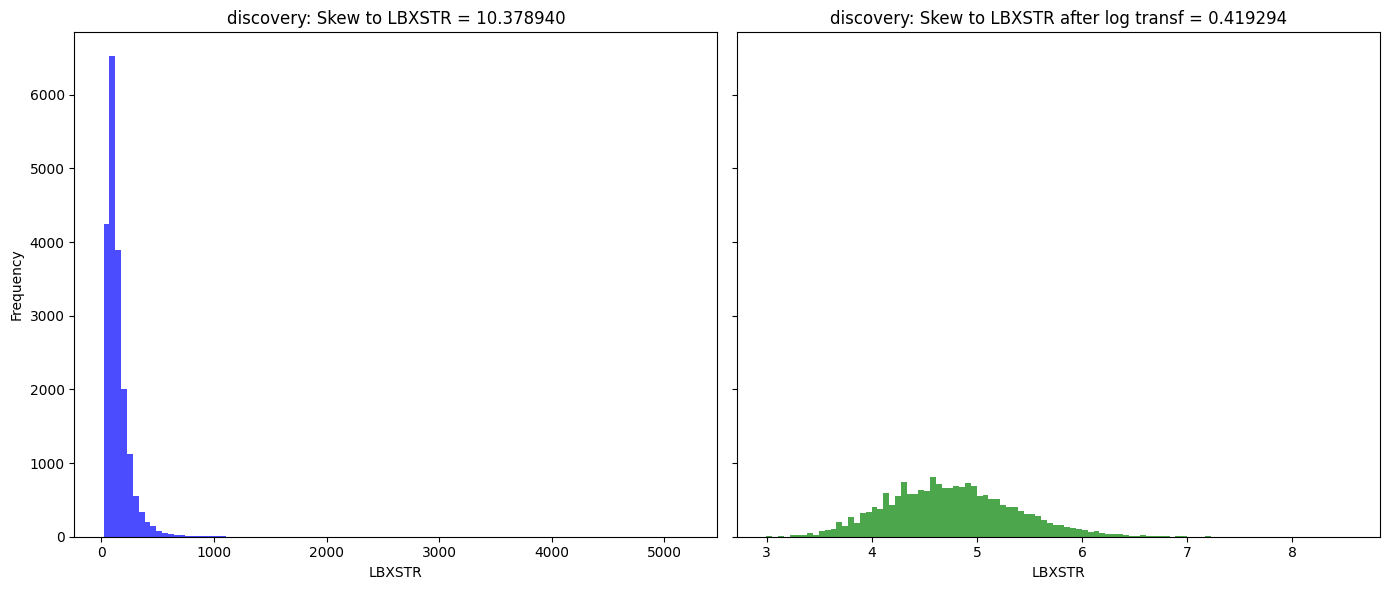
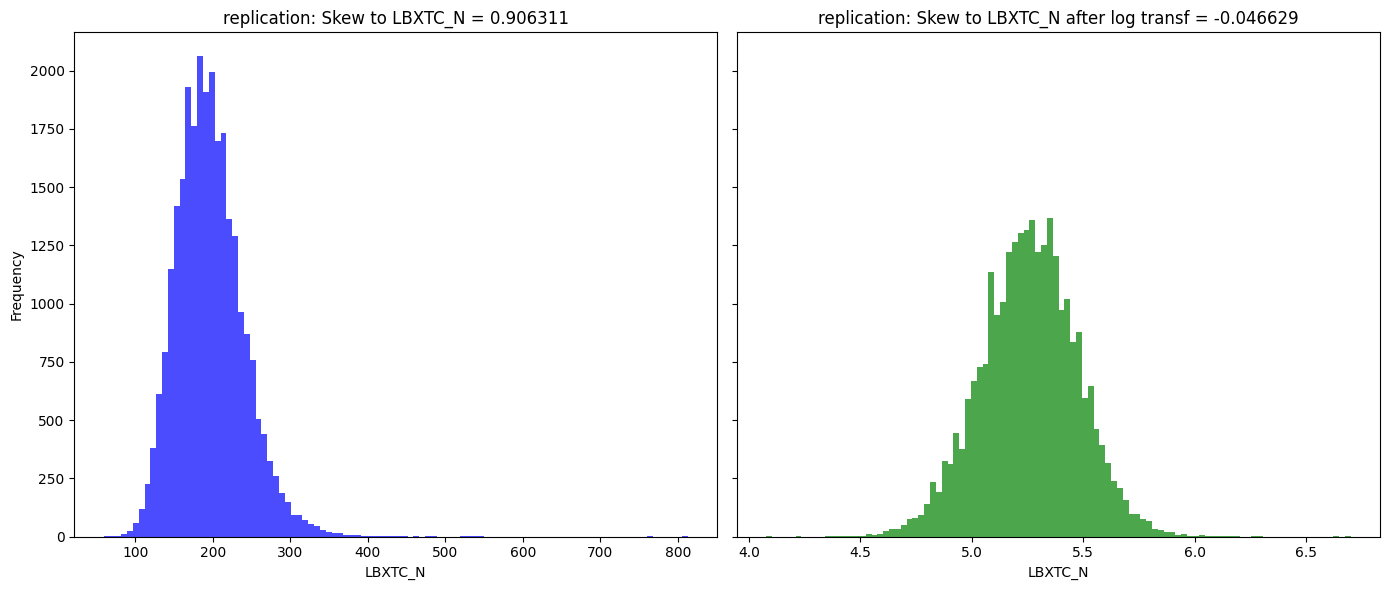
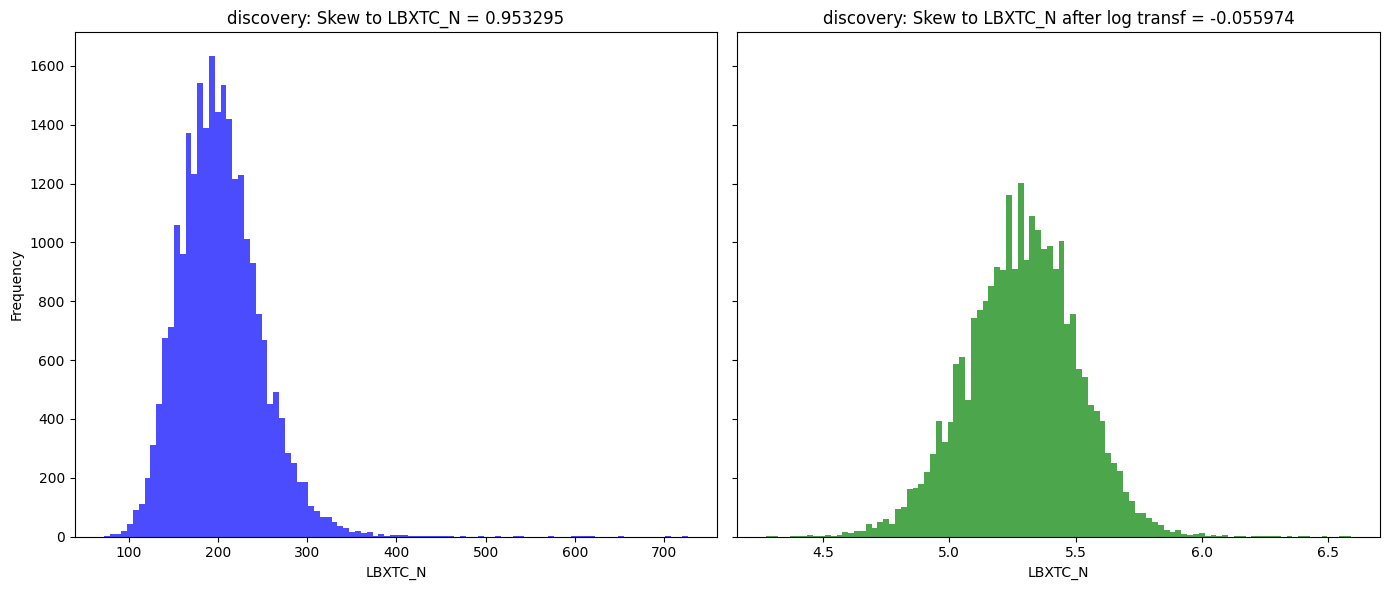
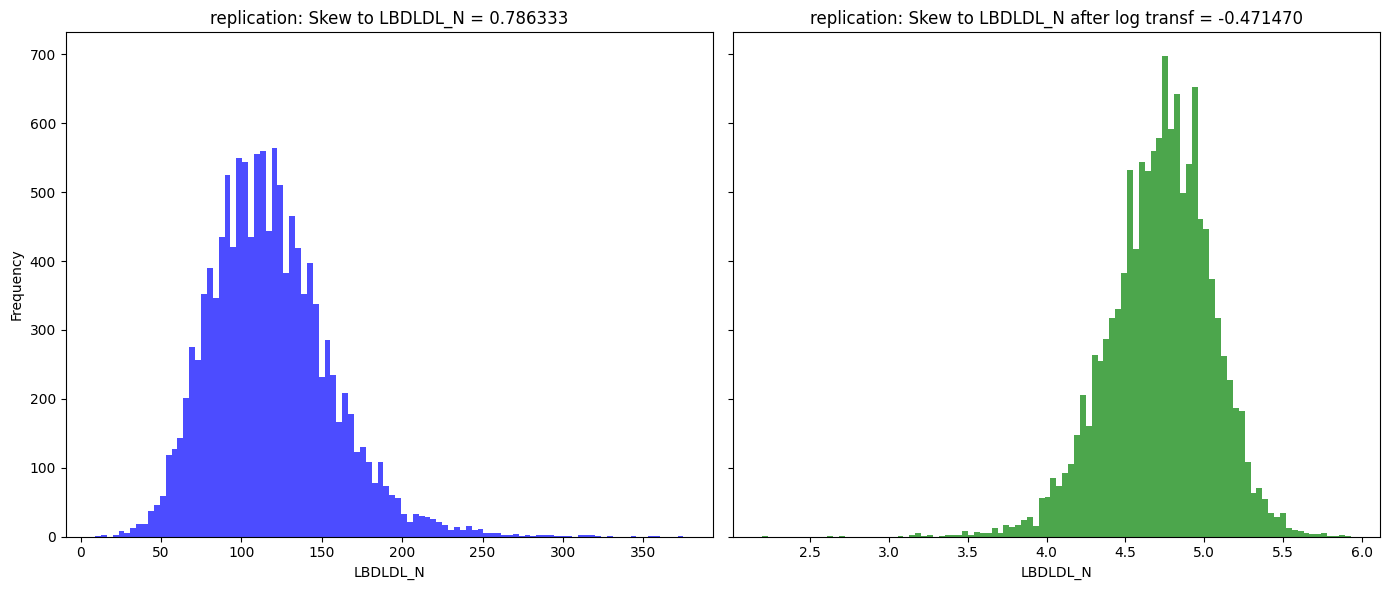
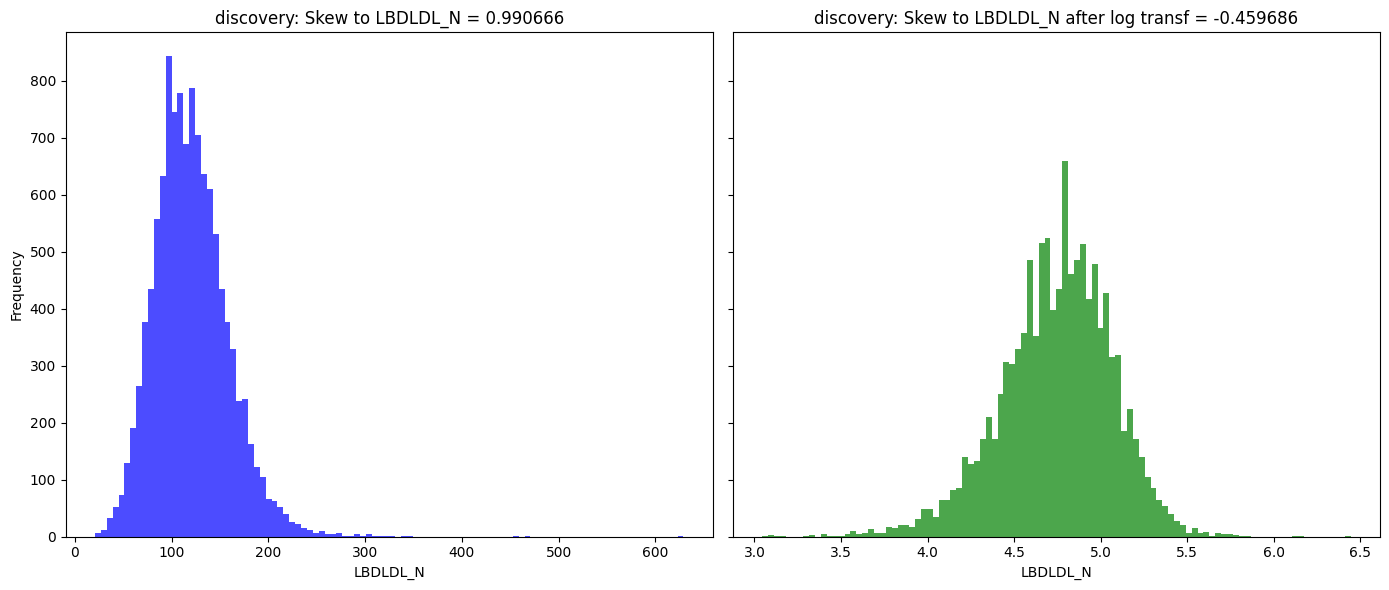


Supplementary Figure 1. Bar charts showing the sample counts by survey cycle of participants who either did or did not have cholesterol data and if they took cholesterol medications.



Supplementary Figure 2. Bar chart featuring only the samples who used cholesterol medication organized by survey cycle.

Supplementary Figure 3. Histograms displaying the frequencies before and after log transformation of the lipid phenotypes in the discovery and replication datasets.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Dataset** | **Outcome** | **Term 1** | **Term 2** | **N** | **p-value** | **p-value bonferroni** | **Full Var1 Var2 beta** | **Full Var1 beta** | **Full Var2 beta** |
| discovery | HDL-C | docosapentaenoic acid (22:5n-3) | arachidic acid (20:0) | 2377 | 1.28075E-16 | 8.43247E-13 | -0.000144898 | 0.002680318 | 0.014532194 |
| replicate | HDL-C | blood 2,5-dimethylfuran | blood benzene | 8398 | 3.17923E-14 | 4.48271E-12 | 0.781909446 | -0.586413251 | -0.033567756 |
| discovery | HDL-C | stearic acid (18:0) | arachidic acid (20:0) | 2415 | 1.34941E-15 | 8.8845E-12 | -7.79411E-06 | 9.92465E-06 | 0.015849325 |
| replicate | HDL-C | blood furan | blood benzene | 8385 | 9.62712E-11 | 1.35742E-08 | 1.420982688 | -1.323958524 | -0.007526433 |
| replicate | HDL-C | linoleic acid (18:2n-6) | arachidic acid (20:0) | 2395 | 1.96582E-10 | 2.7718E-08 | -3.57503E-06 | 3.46268E-05 | 0.021099434 |
| discovery | HDL-C | linoleic acid (18:2n-6) | arachidic acid (20:0) | 2411 | 7.39935E-12 | 4.87173E-08 | -1.41019E-06 | -9.71676E-06 | 0.015430215 |
| replicate | HDL-C | linoleic acid (18:2n-6) | eicosadienoic acid (20:2n-6) | 2369 | 1.06132E-09 | 1.49647E-07 | -2.1948E-06 | 6.64321E-05 | 0.004222916 |
| replicate | HDL-C | palmitic acid (16:0) | arachidic acid (20:0) | 2395 | 1.59601E-09 | 2.25037E-07 | -2.95707E-06 | -1.45341E-05 | 0.019949596 |
| discovery | HDL-C | blood 2,5-dimethylfuran | blood benzene | 9475 | 4.18242E-11 | 2.75371E-07 | 0.976923752 | -0.64427957 | -0.024175285 |
| discovery | HDL-C | docosapentaenoic acid (22:5n-3) | linoleic acid (18:2n-6) | 2467 | 4.25142E-11 | 2.79914E-07 | -7.3444E-07 | 0.003027217 | 3.64004E-05 |
| replicate | HDL-C | stearic acid (18:0) | arachidic acid (20:0) | 2380 | 2.46234E-09 | 3.47191E-07 | -1.25774E-05 | 1.72283E-05 | 0.018372048 |
| discovery | HDL-C | linoleic acid (18:2n-6) | arachidonic acid (20:4n-6) | 2522 | 2.60311E-10 | 1.71389E-06 | -6.93702E-08 | 3.24419E-05 | 0.000491034 |
| replicate | HDL-C | docosapentaenoic acid (22:5n-3) | eicosapentaenoic acid (20:5n-3) | 2404 | 1.82598E-08 | 2.57463E-06 | -1.1111E-05 | -0.002002029 | 0.002018101 |
| discovery | HDL-C | palmitic acid (16:0) | arachidic acid (20:0) | 2415 | 4.1245E-10 | 2.71557E-06 | -1.20948E-06 | -2.67145E-05 | 0.015212688 |
| discovery | HDL-C | arachidic acid (20:0) | eicosadienoic acid (20:2n-6) | 2231 | 6.89813E-10 | 4.54173E-06 | -0.000175853 | 0.012111312 | 0.000217524 |
| replicate | HDL-C | stearic acid (18:0) | eicosadienoic acid (20:2n-6) | 2353 | 5.97817E-08 | 8.42922E-06 | -6.60251E-06 | 0.000195983 | 0.000984914 |
| replicate | HDL-C | docosapentaenoic acid (22:5n-6) | linoleic acid (18:2n-6) | 2423 | 9.84717E-08 | 1.38845E-05 | -2.09496E-06 | 0.006502545 | 3.19393E-05 |
| replicate | HDL-C | linoleic acid (18:2n-6) | arachidonic acid (20:4n-6) | 2440 | 7.49201E-07 | 0.000105637 | -6.84412E-08 | 1.7679E-05 | 0.000438513 |
| replicate | HDL-C | docosapentaenoic acid (22:5n-3) | linoleic acid (18:2n-6) | 2415 | 7.75244E-07 | 0.000109309 | -6.25946E-07 | 0.001790377 | 2.19337E-05 |
| discovery | HDL-C | docosapentaenoic acid (22:5n-3) | arachidonic acid (20:4n-6) | 2471 | 2.0292E-08 | 0.000133603 | -2.99454E-06 | 0.000966904 | 0.000404193 |
| discovery | HDL-C | docosapentaenoic acid (22:5n-3) | docosahexaenoic acid (22:6n-3) | 2461 | 2.6022E-08 | 0.000171329 | -8.02995E-06 | 0.000252371 | 0.000954311 |
| replicate | HDL-C | docosapentaenoic acid (22:5n-3) | arachidic acid (20:0) | 2367 | 2.31352E-06 | 0.000326207 | -0.000129134 | 0.001472715 | 0.012442521 |
| replicate | HDL-C | docosapentaenoic acid (22:5n-6) | stearic acid (18:0) | 2407 | 3.51408E-06 | 0.000495485 | -7.12041E-06 | 0.004383999 | 8.95905E-05 |
| discovery | HDL-C | docosapentaenoic acid (22:5n-3) | eicosapentaenoic acid (20:5n-3) | 2471 | 9.57152E-08 | 0.000630189 | -1.13301E-05 | -0.000901038 | 0.001638041 |
| replicate | HDL-C | eicosapentaenoic acid (20:5n-3) | docosahexaenoic acid (22:6n-3) | 2431 | 5.88022E-06 | 0.000829111 | -2.1792E-06 | 0.001044047 | 0.000166351 |
| replicate | HDL-C | blood benzene | lead (ug/dl) | 7636 | 7.29013E-06 | 0.001027908 | 0.060487832 | -0.152786878 | -0.000918697 |
| replicate | HDL-C | arachidic acid (20:0) | eicosadienoic acid (20:2n-6) | 2321 | 1.13147E-05 | 0.001595377 | -0.00026477 | 0.013139333 | 0.000527346 |
| discovery | HDL-C | blood furan | blood benzene | 6815 | 2.55057E-07 | 0.001679298 | 1.713079939 | -1.735628183 | 0.064637015 |
| discovery | HDL-C | linoleic acid (18:2n-6) | eicosadienoic acid (20:2n-6) | 2254 | 3.76226E-07 | 0.002477071 | -1.00678E-06 | 3.95061E-05 | 0.001524265 |
| discovery | HDL-C | stearic acid (18:0) | eicosadienoic acid (20:2n-6) | 2258 | 4.25208E-07 | 0.002799567 | -3.89678E-06 | 0.000190283 | -0.000173272 |
| discovery | HDL-C | docosapentaenoic acid (22:5n-6) | stearic acid (18:0) | 2448 | 7.76617E-07 | 0.005113246 | -4.072E-06 | 0.002819707 | 5.4422E-05 |
| replicate | HDL-C | blood 2,5-dimethylfuran | cotinine | 8585 | 3.94045E-05 | 0.00555604 | 0.000249928 | -0.008133922 | -0.000304585 |
| discovery | HDL-C | stearic acid (18:0) | docosahexaenoic acid (22:6n-3) | 2516 | 1.16001E-06 | 0.007637476 | -7.26193E-07 | 4.04553E-05 | 0.000853798 |
| replicate | HDL-C | stearic acid (18:0) | docosahexaenoic acid (22:6n-3) | 2426 | 5.85865E-05 | 0.008260698 | -9.31559E-07 | -3.1578E-06 | 0.000970907 |
| discovery | HDL-C | blood benzene | lead (ug/dl) | 9746 | 1.41682E-06 | 0.009328359 | 0.047836334 | -0.194836053 | 0.005451476 |
| replicate | HDL-C | cadmium | lead (ug/dl) | 4945 | 0.003514931 | 0.014059726 | 0.009193112 | -0.040713526 | -0.003505994 |
| replicate | HDL-C | docosapentaenoic acid (22:5n-3) | docosahexaenoic acid (22:6n-3) | 2393 | 0.000118217 | 0.016668644 | -5.83236E-06 | -0.000815409 | 0.000824604 |
| discovery | HDL-C | cadmium | lead (ug/dl) | 4570 | 2.05225E-05 | 0.022903097 | 0.01305091 | -0.064211971 | -0.004896294 |
| discovery | HDL-C | eicosapentaenoic acid (20:5n-3) | docosahexaenoic acid (22:6n-3) | 2516 | 3.73808E-06 | 0.024611518 | -1.80857E-06 | 0.001080847 | 9.69117E-05 |
| discovery | HDL-C | docosapentaenoic acid (22:5n-6) | linoleic acid (18:2n-6) | 2444 | 4.0915E-06 | 0.02693845 | -1.04972E-06 | 0.003715053 | 1.49125E-05 |
| replicate | HDL-C | docosapentaenoic acid (22:5n-3) | arachidonic acid (20:4n-6) | 2402 | 0.000223822 | 0.03155897 | -2.45749E-06 | -0.0003768 | 0.000369318 |
| discovery | HDL-C | blood 2,5-dimethylfuran | cotinine | 10030 | 5.05096E-06 | 0.033255528 | 0.000270204 | -0.02241935 | -0.000329177 |

Supplementary Table 1. All twenty-one Bonferroni adjusted p < 0.05 significant interactions listing their p-values, sample sizes, full interaction betas, and full main-effect betas.