Optimization of the regression CpG

Guannan Shen

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Contents

```
## set up workspace
library(knitr)
library(tidyverse)
options(stringsAsFactors = F)
options(dplyr.width = Inf)
getwd()
```

```
## [1] "/home/guanshim/Documents/gitlab/ECCHO_github/Code"
```

```
"%nin%" <- Negate("%in%")
```

```
## [1] 588 320

## [1] 10002 10004 10010 10012 10014 10015

## [1] 10661 10696 10723 10791 11408

## [1] 583 320

## [1] 305 320

## [1] 278 320

## [1] "cg16884940"

## [1] "cg16884940 are not in the TOP300 M values CpG list"

## [1] 583 140

## [1] "now the CpGs are 120 and whole sample size is 583"

## [1] 305 140

## [1] 278 140
```

```
###################################################### fix the kable format with lapply ########## add the
###################################################### male/female tag ########## function for 1 out of 300
###################################################### and other covariates equal length of outcomes and
###################################################### covariates
cpg_reg <- function(outcome, data, name, Topn, Gender, ncpg) {

    ## outcome lm
    outcome_lm = lapply(21:(ncpg + 20), function(i) {
        lm = lm(outcome ~ data[, i] + maternal_age + race_4 +
            Bcell + CD4T + CD8T + Gran + Mono + NK + nRBC, data = data)
        coef = round(summary(lm)$coefficients[2, ], 4)
        return(coef)
    })
    outcome_lm = data.frame(matrix(unlist(outcome_lm), ncol = 4,
        byrow = TRUE, dimnames = list(c(colnames(data)[21:(ncpg +
            20)]), c("Estimate", "Std.Error", "t.statistic",
```

```r
            "p.value"))))

    # adjusted p-value
    outcome_lm = outcome_lm %>% mutate(FDR = p.adjust(p.value,
        "BH", ncpg), names = colnames(data)[21:(ncpg + 20)]) %>%
        select(names, everything())
    # sort by p.value
    outcome_lm = outcome_lm[order(outcome_lm$p.value), ]

    ## sample size
    size = length(outcome) - sum(is.na(outcome))

    ## summary table
    kable(head(outcome_lm, Topn), caption = paste("Top10 CpGs from ",
        ncpg, " for ", name, " of ", Gender, " by p.value", " (Sample Size = ",
        size, ") ", sep = "", collapse = ""))

}

## test with birthweight_ no log tran outcome, data, name,
## Topn cpg_reg(pfas_male$birth_weight, pfas_male,
## 'birth_weight', 10, 'Male')

## outcomes 'birth_weight', 'ipv3_pp_fm_pct', 'Chol_IPV3',
## 'FFA_IPV3', 'Gluc_IPV3', 'HDL_IPV3', 'Insu_IPV3'
## 'Trig_IPV3', 'Leptin_actual__ng_ml_'
Outcomes <- colnames(pfas_male)[5:13]

# the regression summary table for original outcomes
lapply(Outcomes, function(x) {
    cpg_reg(pfas_male[, x], pfas_male, x, 10, "Male", 300)
})
```

[[1]]

Table 1: Top10 CpGs from 300 for birth_weight of Male by p.value (Sample Size = 305)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
67	cg25195288	617.5309	178.8037	3.4537	0.0006	0.105
49	cg16725984	-214.4233	62.3691	-3.4380	0.0007	0.105
167	cg16495448	-322.2102	114.9889	-2.8021	0.0054	0.540
184	cg25137968	321.1630	121.5742	2.6417	0.0087	0.546
71	cg16672637	682.8201	260.0944	2.6253	0.0091	0.546
22	cg00784263	324.0121	130.1053	2.4904	0.0133	0.588
204	cg15045292	143.5404	58.8695	2.4383	0.0154	0.588
115	cg10436026	-315.9962	132.3827	-2.3870	0.0176	0.588
83	cg20741567	485.0189	205.0994	2.3648	0.0187	0.588
160	cg07338658	222.4751	94.8196	2.3463	0.0196	0.588

[[2]]

Table 2: Top10 CpGs from 300 for ipv3_pp_fm_pct of Male by p.value (Sample Size = 292)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
190	cg10832304	-1.3764	0.4887	-2.8164	0.0052	0.8300000
112	cg24366087	-2.8604	1.0272	-2.7846	0.0057	0.8300000
139	cg08743751	2.4044	0.9045	2.6583	0.0083	0.8300000
203	cg15066197	-2.7461	1.1057	-2.4836	0.0136	0.8577273
145	cg06404838	-3.2570	1.4188	-2.2956	0.0224	0.8577273
78	cg17878951	-2.7455	1.2236	-2.2438	0.0256	0.8577273
282	cg08732300	1.7152	0.7712	2.2242	0.0269	0.8577273
205	cg12149692	-1.6533	0.7551	-2.1895	0.0294	0.8577273
171	cg09461851	2.7168	1.2644	2.1488	0.0325	0.8577273
106	cg24833819	1.4435	0.6961	2.0738	0.0390	0.8577273

[[3]]

Table 3: Top10 CpGs from 300 for Chol_IPV3 of Male by p.value (Sample Size = 287)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
254	cg22692511	7.3339	2.3245	3.1551	0.0018	0.4500000
266	cg12857407	12.7608	4.3384	2.9414	0.0035	0.4500000
112	cg24366087	-13.4676	4.7067	-2.8614	0.0045	0.4500000
271	cg08162803	13.9785	5.2616	2.6567	0.0084	0.6300000
95	cg17850055	-25.2736	9.9181	-2.5482	0.0114	0.6550000
49	cg16725984	5.8155	2.3296	2.4964	0.0131	0.6550000
188	cg17500055	-7.5809	3.4673	-2.1864	0.0296	0.9558301
279	cg17132124	7.8791	3.6082	2.1837	0.0298	0.9558301
28	cg12872489	-6.6322	3.1104	-2.1323	0.0339	0.9558301
211	cg00893875	3.1589	1.5298	2.0648	0.0399	0.9558301

[[4]]

Table 4: Top10 CpGs from 300 for FFA_IPV3 of Male by p.value (Sample Size = 265)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
96	cg21215576	85.5313	31.5071	2.7147	0.0071	0.7233333
4	cg21853587	-169.4280	63.6719	-2.6610	0.0083	0.7233333
163	cg26074111	-137.5420	52.6373	-2.6130	0.0095	0.7233333
156	cg13858106	115.1969	47.6076	2.4197	0.0162	0.7233333
148	cg13598480	98.4861	41.4387	2.3767	0.0182	0.7233333
9	cg20510724	173.5722	73.2384	2.3700	0.0185	0.7233333
257	cg16529483	37.7580	15.9996	2.3599	0.0190	0.7233333
54	cg19529074	-97.7491	44.5172	-2.1958	0.0290	0.7233333
166	cg26275850	99.8055	46.0601	2.1669	0.0312	0.7233333
126	cg05390685	-69.1883	32.2068	-2.1483	0.0326	0.7233333

[[5]]

Table 5: Top10 CpGs from 300 for Gluc_IPV3 of Male by p.value (Sample Size = 295)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
145	cg06404838	27.8293	8.5762	3.2449	0.0013	0.390
248	cg11196848	-15.4932	5.6032	-2.7651	0.0061	0.915
27	cg17519749	11.9003	4.5717	2.6030	0.0097	0.957
59	cg20324199	11.7255	5.0620	2.3164	0.0213	0.957
150	cg14163408	11.2703	4.9082	2.2962	0.0224	0.957
16	cg06873590	-32.8116	14.6902	-2.2336	0.0263	0.957
217	cg01816336	-18.6640	8.3752	-2.2285	0.0266	0.957
135	cg17171260	-15.4994	6.9575	-2.2277	0.0267	0.957
77	cg23478547	8.0446	3.7237	2.1603	0.0316	0.957
287	cg26781129	11.1011	5.1475	2.1566	0.0319	0.957

[[6]]

Table 6: Top10 CpGs from 300 for HDL_IPV3 of Male by p.value (Sample Size = 261)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
49	cg16725984	3.1869	1.0240	3.1122	0.0021	0.420
42	cg15355952	-6.0829	2.0162	-3.0171	0.0028	0.420
236	cg04061372	1.8844	0.6629	2.8427	0.0048	0.480
271	cg08162803	5.7800	2.3310	2.4796	0.0138	0.624
52	cg19549232	5.4550	2.2171	2.4604	0.0146	0.624
290	cg00798281	-3.8588	1.5881	-2.4298	0.0158	0.624
211	cg00893875	1.6940	0.7023	2.4122	0.0166	0.624
26	cg03452190	6.7903	2.8704	2.3656	0.0188	0.624
145	cg06404838	-6.7840	2.8739	-2.3605	0.0190	0.624
281	cg22946159	-7.7197	3.3193	-2.3257	0.0208	0.624

[[7]]

Table 7: Top10 CpGs from 300 for Insu_IPV3 of Male by p.value (Sample Size = 282)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
169	cg17501712	9.4827	2.9603	3.2033	0.0015	0.45000
233	cg02887248	-12.1537	4.9282	-2.4662	0.0143	0.97275
61	cg04569429	5.2440	2.1851	2.3998	0.0171	0.97275
242	cg06922635	4.8725	2.0975	2.3230	0.0209	0.97275
141	cg04476891	5.8881	2.6196	2.2477	0.0254	0.97275
199	cg21261158	-9.0426	4.1281	-2.1905	0.0293	0.97275
195	cg23785275	-1.5089	0.7142	-2.1128	0.0355	0.97275
191	cg25138412	-3.3363	1.6094	-2.0730	0.0391	0.97275
20	cg00210042	7.8195	3.8186	2.0478	0.0416	0.97275
259	cg06407657	-4.7374	2.4084	-1.9670	0.0502	0.97275

[[8]]

Table 8: Top10 CpGs from 300 for Trig_IPV3 of Male by p.value (Sample Size = 284)

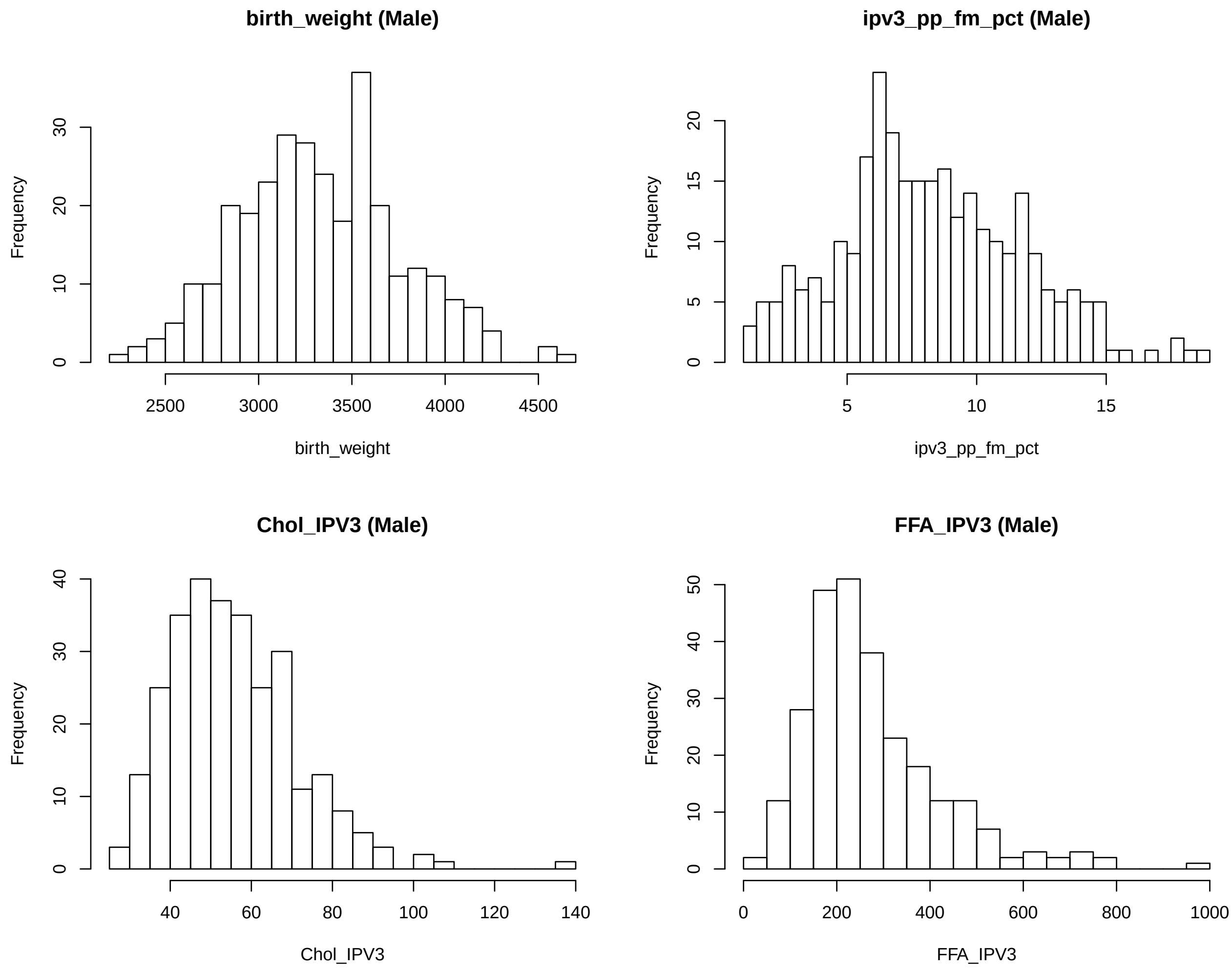
	names	Estimate	Std.Error	t.statistic	p.value	FDR
291	cg09630142	-28.5560	8.8703	-3.2193	0.0014	0.4200000
19	cg00128386	46.0613	19.1020	2.4113	0.0166	0.9601351
221	cg19682786	-34.4736	14.6589	-2.3517	0.0194	0.9601351
259	cg06407657	-23.2915	10.5568	-2.2063	0.0282	0.9601351
277	cg05227616	-27.5430	12.5315	-2.1979	0.0288	0.9601351
72	cg16659510	-34.0438	15.8133	-2.1529	0.0322	0.9601351
160	cg07338658	-20.5353	9.5978	-2.1396	0.0333	0.9601351
197	cg14349977	-13.9236	6.5433	-2.1279	0.0342	0.9601351
50	cg27124293	16.5983	7.8096	2.1254	0.0345	0.9601351
95	cg17850055	-51.3194	26.7983	-1.9150	0.0565	0.9601351

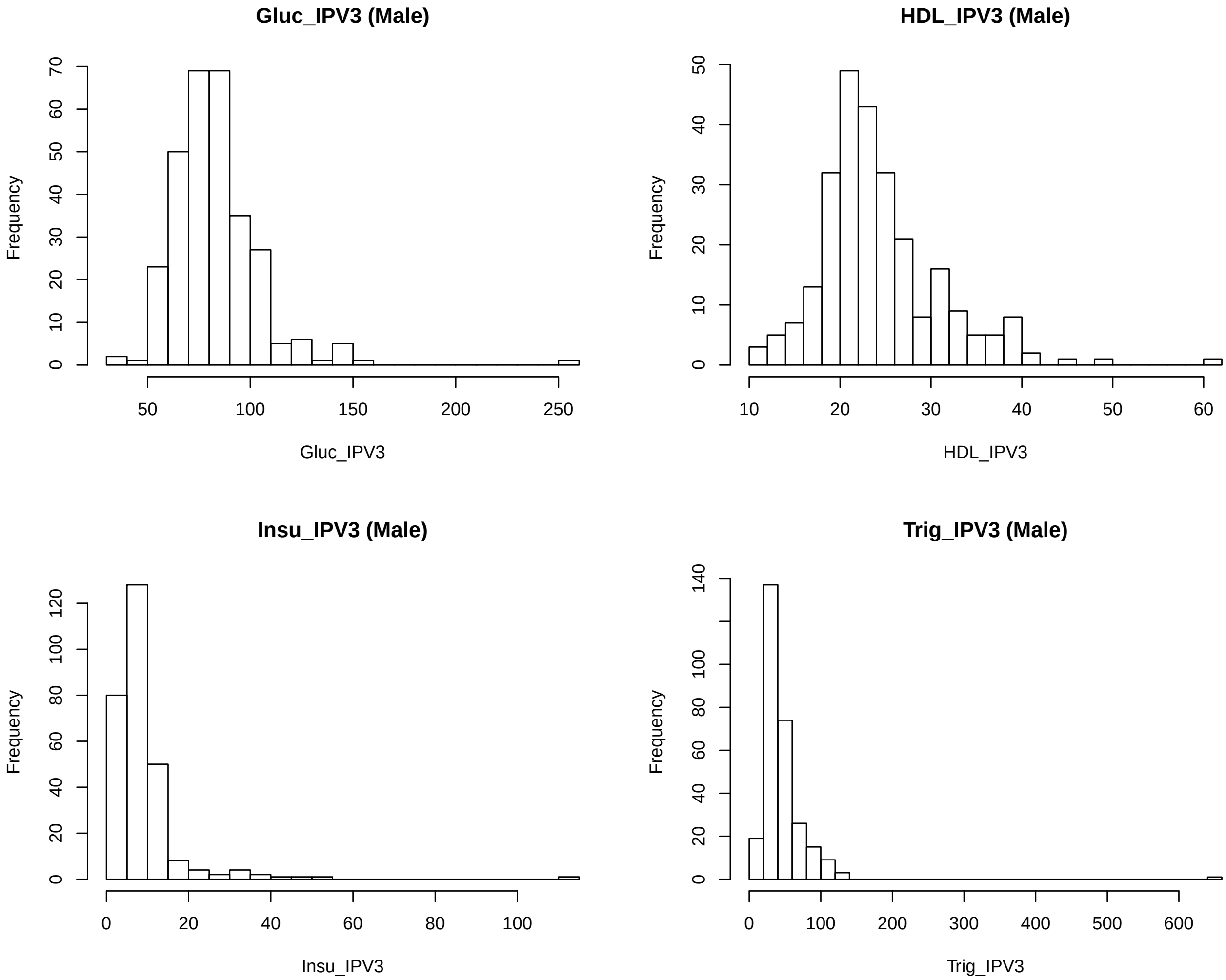
[[9]]

Table 9: Top10 CpGs from 300 for Leptin_actual_*ng*_*ml* of Male by p.value (Sample Size = 252)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
49	cg16725984	-6.7660	1.9892	-3.4013	0.0008	0.24
22	cg00784263	12.7822	4.0909	3.1245	0.0020	0.30
134	cg05906144	7.5689	2.8135	2.6903	0.0076	0.51
209	cg24280832	9.6746	3.6116	2.6787	0.0079	0.51
19	cg00128386	-16.7009	6.2969	-2.6523	0.0085	0.51
135	cg17171260	-11.0590	4.4405	-2.4905	0.0134	0.57
104	cg10119082	-5.4035	2.2213	-2.4325	0.0157	0.57
116	cg21183455	5.2068	2.1589	2.4117	0.0166	0.57
85	cg23572459	-15.4853	6.4529	-2.3997	0.0172	0.57
260	cg17284440	-18.8377	7.9789	-2.3609	0.0190	0.57

```
## raw outcomes
par(mfrow = c(2, 2))
lapply(Outcomes, function(x) {
    hist(pfas_male[, x], freq = TRUE, breaks = 30, main = paste(x,
        " (Male)", sep = ""), xlab = x)
})
```


birth_weight (Male)
Frequency
0
10
20
30
2500
3000
3500
4000
4500
birth_weight
ipv3_pp_fm_pct (Male)
Frequency
0
5
10
15
20
5
10
15
ipv3_pp_fm_pct
Chol_IPV3 (Male)
Frequency
0
10
20
30
40
40
60
80
100
120
140
Chol_IPV3
FFA_IPV3 (Male)
Frequency
0
10
20
30
40
50
0
200
400
600
800
1000
FFA_IPV3



[[1]] $breaks [1] 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 [15] 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700

$counts [1] 1 2 3 5 10 10 20 19 23 29 28 24 18 37 20 11 12 11 8 7 4 0 0 [24] 2 1

$density [1] 3.278689e-05 6.557377e-05 9.836066e-05 1.639344e-04 3.278689e-04 [6] 3.278689e-04 6.557377e-04 6.229508e-04 7.540984e-04 9.508197e-04 [11] 9.180328e-04 7.868852e-04 5.901639e-04 1.213115e-03 6.557377e-04 [16] 3.606557e-04 3.934426e-04 3.606557e-04 2.622951e-04 2.295082e-04 [21] 1.311475e-04 0.000000e+00 0.000000e+00 6.557377e-05 3.278689e-05

$mids [1] 2250 2350 2450 2550 2650 2750 2850 2950 3050 3150 3250 3350 3450 3550 [15] 3650 3750 3850 3950 4050 4150 4250 4350 4450 4550 4650

$xname [1] "pfas_male[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[2]] $breaks [1] 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 [15] 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 [29] 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0

$counts [1] 3 5 5 8 6 7 5 10 9 17 24 19 15 15 15 16 12 14 11 10 9 14 9 [24] 6 5 6 5 5 1 1 0 1 0 2 1 1

$density [1] 0.020547945 0.034246575 0.034246575 0.054794521 0.041095890 [6] 0.047945205 0.034246575 0.068493151 0.061643836 0.116438356 [11] 0.164383562 0.130136986 0.102739726 0.102739726 0.102739726 [16] 0.109589041 0.082191781 0.095890411 0.075342466 0.068493151 [21] 0.061643836 0.095890411 0.061643836

0.041095890 0.034246575 [26] 0.041095890 0.034246575 0.034246575 0.006849315 0.006849315 [31] 0.000000000 0.006849315 0.000000000 0.013698630 0.006849315 [36] 0.006849315

$mids [1] 1.25 1.75 2.25 2.75 3.25 3.75 4.25 4.75 5.25 5.75 6.25 [12] 6.75 7.25 7.75 8.25 8.75 9.25 9.75 10.25 10.75 11.25 11.75 [23] 12.25 12.75 13.25 13.75 14.25 14.75 15.25 15.75 16.25 16.75 17.25 [34] 17.75 18.25 18.75

$xname [1] "pfas_male[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[3]] $breaks [1] 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 [18] 110 115 120 125 130 135 140

$counts [1] 3 13 25 35 40 37 35 25 30 11 13 8 5 3 0 2 1 0 0 0 0 0 1

$density [1] 0.0020905923 0.0090592334 0.0174216028 0.0243902439 0.0278745645 [6] 0.0257839721 0.0243902439 0.0174216028 0.0209059233 0.0076655052 [11] 0.0090592334 0.0055749129 0.0034843206 0.0020905923 0.0000000000 [16] 0.0013937282 0.0006968641 0.0000000000 0.0000000000 0.0000000000 [21] 0.0000000000 0.0000000000 0.0006968641

$mids [1] 27.5 32.5 37.5 42.5 47.5 52.5 57.5 62.5 67.5 72.5 77.5 [12] 82.5 87.5 92.5 97.5 102.5 107.5 112.5 117.5 122.5 127.5 132.5 [23] 137.5

$xname [1] "pfas_male[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[4]] $breaks [1] 0 50 100 150 200 250 300 350 400 450 500 550 600 650 [15] 700 750 800 850 900 950 1000

$counts [1] 2 12 28 49 51 38 23 18 12 12 7 2 3 2 3 2 0 0 0 1

$density [1] 0.0001509434 0.0009056604 0.0021132075 0.0036981132 0.0038490566 [6] 0.0028679245 0.0017358491 0.0013584906 0.0009056604 0.0009056604 [11] 0.0005283019 0.0001509434 0.0002264151 0.0001509434 0.0002264151 [16] 0.0001509434 0.0000000000 0.0000000000 0.0000000000 0.0000754717

$mids [1] 25 75 125 175 225 275 325 375 425 475 525 575 625 675 725 775 825 [18] 875 925 975

$xname [1] "pfas_male[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[5]] $breaks [1] 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 [18] 200 210 220 230 240 250 260

$counts [1] 2 1 23 50 69 69 35 27 5 6 1 5 1 0 0 0 0 0 0 0 0 0 1

$density [1] 0.0006779661 0.0003389831 0.0077966102 0.0169491525 0.0233898305 [6] 0.0233898305 0.0118644068 0.0091525424 0.0016949153 0.0020338983 [11] 0.0003389831 0.0016949153 0.0003389831 0.0000000000 0.0000000000 [16] 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 [21] 0.0000000000 0.0000000000 0.0003389831

$mids [1] 35 45 55 65 75 85 95 105 115 125 135 145 155 165 175 185 195 [18] 205 215 225 235 245 255

$xname [1] "pfas_male[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[6]] $breaks [1] 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 [24] 56 58 60 62

$counts [1] 3 5 7 13 32 49 43 32 21 8 16 9 5 5 8 2 0 1 0 1 0 0 0 [24] 0 0 1

$density [1] 0.005747126 0.009578544 0.013409962 0.024904215 0.061302682 [6] 0.093869732 0.082375479 0.061302682 0.040229885 0.015325670 [11] 0.030651341 0.017241379 0.009578544 0.009578544 0.015325670 [16] 0.003831418 0.000000000 0.001915709 0.000000000 0.001915709 [21] 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 [26] 0.001915709

$mids [1] 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 [24] 57 59 61

$xname [1] "pfas_male[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[7]] $breaks [1] 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 [18] 85 90 95 100 105 110 115

$counts [1] 80 128 50 8 4 2 4 2 1 1 1 0 0 0 0 0 0 [18] 0 0 0 0 0 1

$density [1] 0.0567375887 0.0907801418 0.0354609929 0.0056737589 0.0028368794 [6] 0.0014184397 0.0028368794 0.0014184397 0.0007092199 0.0007092199 [11] 0.0007092199 0.0000000000 0.0000000000 0.0000000000 0.0000000000 [16] 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 [21] 0.0000000000 0.0000000000 0.0007092199

$mids [1] 2.5 7.5 12.5 17.5 22.5 27.5 32.5 37.5 42.5 47.5 52.5 [12] 57.5 62.5 67.5 72.5 77.5 82.5 87.5 92.5 97.5 102.5 107.5 [23] 112.5

$xname [1] "pfas_male[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[8]] $breaks [1] 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 [18] 340 360 380 400 420 440 460 480 500 520 540 560 580 600 620 640 660

$counts [1] 19 137 74 26 15 9 3 0 0 0 0 0 0 0 0 0 0 [18] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1

$density [1] 0.0033450704 0.0241197183 0.0130281690 0.0045774648 0.0026408451 [6] 0.0015845070 0.0005281690 0.0000000000 0.0000000000 0.0000000000 [11] 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 [16] 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 [21] 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 [26] 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 [31] 0.0000000000 0.0000000000 0.0001760563

$mids [1] 10 30 50 70 90 110 130 150 170 190 210 230 250 270 290 310 330 [18] 350 370 390 410 430 450 470 490 510 530 550 570 590 610 630 650

$xname [1] "pfas_male[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[9]] $breaks [1] 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 [18] 85 90 95 100 105 110 115 120 125 130

$counts [1] 60 79 38 21 18 16 10 4 1 3 0 1 0 0 0 0 0 0 0 0 0 0 0 [24] 0 0 1

$density [1] 0.0476190476 0.0626984127 0.0301587302 0.0166666667 0.0142857143 [6] 0.0126984127 0.0079365079 0.0031746032 0.0007936508 0.0023809524 [11] 0.0000000000 0.0007936508 0.0000000000 0.0000000000 0.0000000000 [16] 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 [21] 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 [26] 0.0007936508

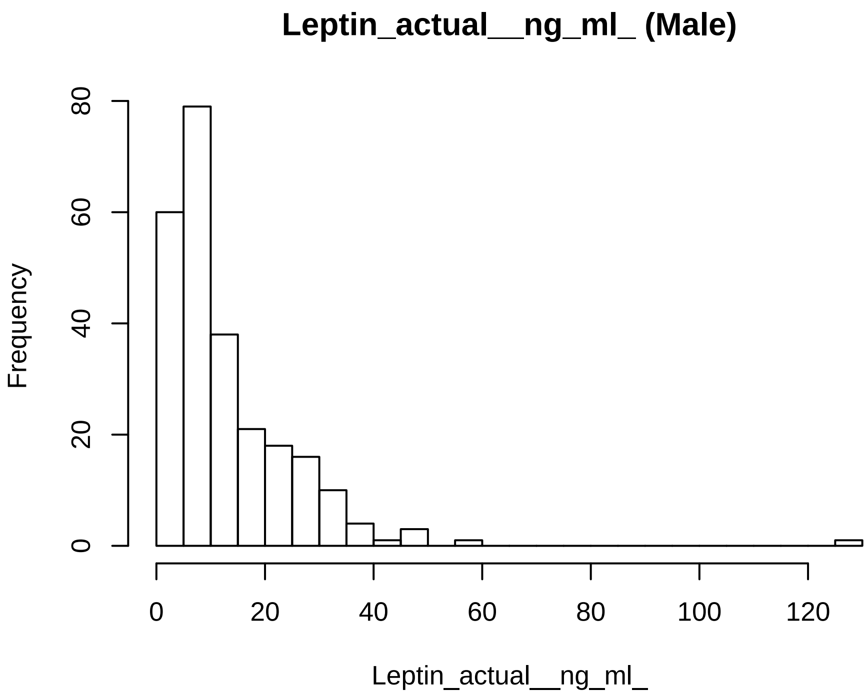
$mids [1] 2.5 7.5 12.5 17.5 22.5 27.5 32.5 37.5 42.5 47.5 52.5 [12] 57.5 62.5 67.5 72.5 77.5 82.5 87.5 92.5 97.5 102.5 107.5 [23] 112.5 117.5 122.5 127.5

$xname [1] "pfas_male[, x]"

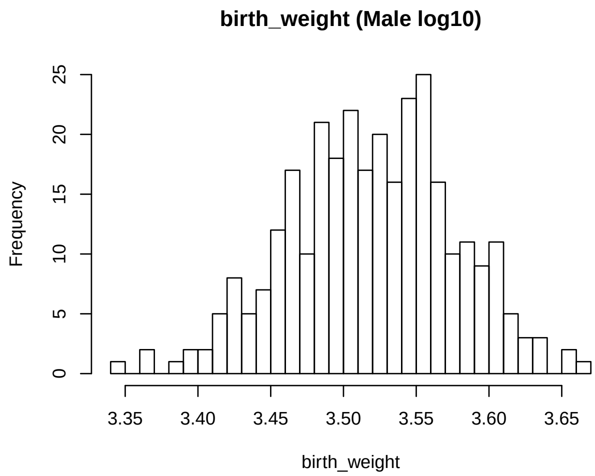
$equidist [1] TRUE

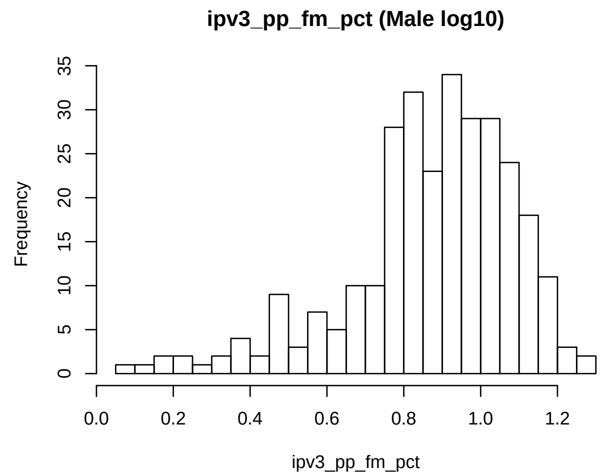
attr(,"class") [1] "histogram"

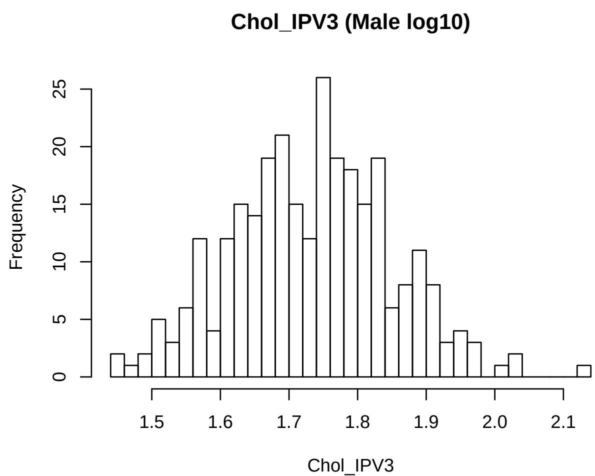
```
## log10
par(mfrow = c(2, 2))
```

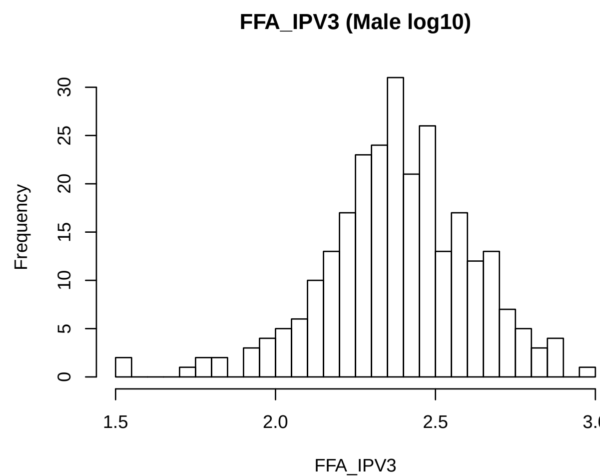


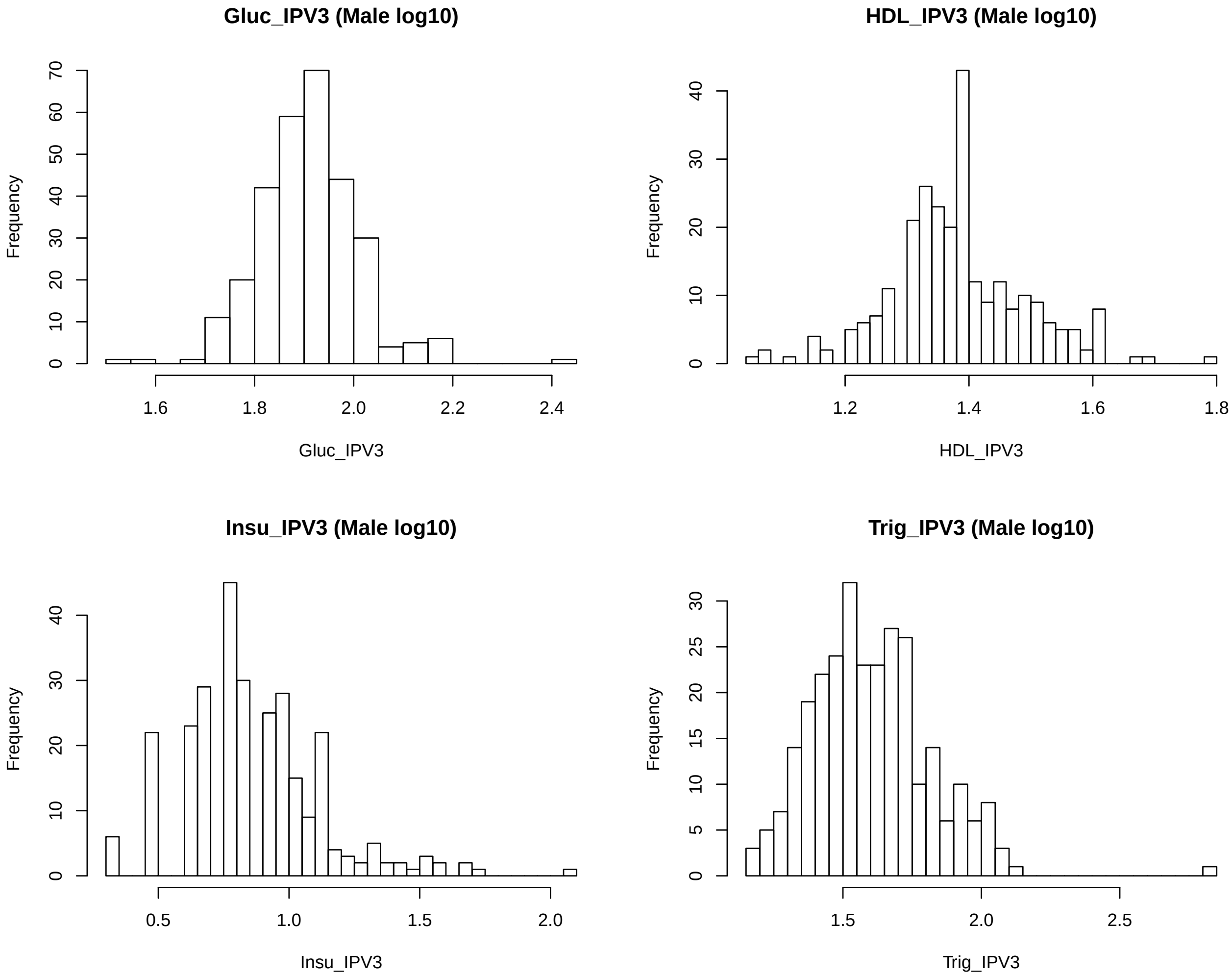

```
lapply(Outcomes, function(x) {
    hist(log10(pfas_male[, x]), freq = TRUE, breaks = 30, main = paste(x,
        " (Male log10)", sep = ""), xlab = x)
})
```


birth_weight (Male log10)
Frequency
0
5
10
15
20
25
3.35
3.40
3.45
3.50
3.55
3.60
3.65
birth_weight


ipv3_pp_fm_pct (Male log10)
Frequency
0
5
10
15
20
25
30
35
0.0
0.2
0.4
0.6
0.8
1.0
1.2
ipv3_pp_fm_pct


Chol_IPV3 (Male log10)
Frequency
0
5
10
15
20
25
1.5
1.6
1.7
1.8
1.9
2.0
2.1
Chol_IPV3


FFA_IPV3 (Male log10)
Frequency
0
5
10
15
20
25
30
1.5
2.0
2.5
3.0
FFA_IPV3



[[1]] $breaks [1] 3.34 3.35 3.36 3.37 3.38 3.39 3.40 3.41 3.42 3.43 3.44 3.45 3.46 3.47 [15] 3.48 3.49 3.50 3.51 3.52 3.53 3.54 3.55 3.56 3.57 3.58 3.59 3.60 3.61 [29] 3.62 3.63 3.64 3.65 3.66 3.67

$counts [1] 1 0 2 0 1 2 2 5 8 5 7 12 17 10 21 18 22 17 20 16 23 25 16 [24] 10 11 9 11 5 3 3 0 2 1

$density [1] 0.3278689 0.0000000 0.6557377 0.0000000 0.3278689 0.6557377 0.6557377 [8] 1.6393443 2.6229508 1.6393443 2.2950820 3.9344262 5.5737705 3.2786885 [15] 6.8852459 5.9016393 7.2131148 5.5737705 6.5573770 5.2459016 7.5409836 [22] 8.1967213 5.2459016 3.2786885 3.6065574 2.9508197 3.6065574 1.6393443 [29] 0.9836066 0.9836066 0.0000000 0.6557377 0.3278689

$mids [1] 3.345 3.355 3.365 3.375 3.385 3.395 3.405 3.415 3.425 3.435 3.445 [12] 3.455 3.465 3.475 3.485 3.495 3.505 3.515 3.525 3.535 3.545 3.555 [23] 3.565 3.575 3.585 3.595 3.605 3.615 3.625 3.635 3.645 3.655 3.665

$xname [1] “log10(pfas_male[, x])”

$equidist [1] TRUE

attr(,“class”) [1] “histogram”

[[2]] $breaks [1] 0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50 0.55 0.60 0.65 0.70 [15] 0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.10 1.15 1.20 1.25 1.30

$counts [1] 1 1 2 2 1 2 4 2 9 3 7 5 10 10 28 32 23 34 29 29 24 18 11 [24] 3 2

$density [1] 0.06849315 0.06849315 0.13698630 0.13698630 0.06849315 0.13698630 [7] 0.27397260 0.13698630 0.61643836 0.20547945 0.47945205 0.34246575 [13] 0.68493151 0.68493151 1.91780822 2.19178082 1.57534247 2.32876712 [19] 1.98630137 1.98630137 1.64383562 1.23287671 0.75342466 0.20547945 [25] 0.13698630

$mids [1] 0.075 0.125 0.175 0.225 0.275 0.325 0.375 0.425 0.475 0.525 0.575 [12] 0.625 0.675 0.725 0.775 0.825 0.875 0.925 0.975 1.025 1.075 1.125 [23] 1.175 1.225 1.275

$xname [1] "log10(pfas_male[, x])"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[3]] $breaks [1] 1.44 1.46 1.48 1.50 1.52 1.54 1.56 1.58 1.60 1.62 1.64 1.66 1.68 1.70 [15] 1.72 1.74 1.76 1.78 1.80 1.82 1.84 1.86 1.88 1.90 1.92 1.94 1.96 1.98 [29] 2.00 2.02 2.04 2.06 2.08 2.10 2.12 2.14

$counts [1] 2 1 2 5 3 6 12 4 12 15 14 19 21 15 12 26 19 18 15 19 6 8 11 [24] 8 3 4 3 0 1 2 0 0 0 0 1

$density [1] 0.3484321 0.1742160 0.3484321 0.8710801 0.5226481 1.0452962 2.0905923 [8] 0.6968641 2.0905923 2.6132404 2.4390244 3.3101045 3.6585366 2.6132404 [15] 2.0905923 4.5296167 3.3101045 3.1358885 2.6132404 3.3101045 1.0452962 [22] 1.3937282 1.9163763 1.3937282 0.5226481 0.6968641 0.5226481 0.0000000 [29] 0.1742160 0.3484321 0.0000000 0.0000000 0.0000000 0.0000000 0.1742160

$mids [1] 1.45 1.47 1.49 1.51 1.53 1.55 1.57 1.59 1.61 1.63 1.65 1.67 1.69 1.71 [15] 1.73 1.75 1.77 1.79 1.81 1.83 1.85 1.87 1.89 1.91 1.93 1.95 1.97 1.99 [29] 2.01 2.03 2.05 2.07 2.09 2.11 2.13

$xname [1] "log10(pfas_male[, x])"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[4]] $breaks [1] 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 [15] 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 [29] 2.90 2.95 3.00

$counts [1] 2 0 0 0 1 2 2 0 3 4 5 6 10 13 17 23 24 31 21 26 13 17 12 [24] 13 7 5 3 4 0 1

$density [1] 0.1509434 0.0000000 0.0000000 0.0000000 0.0754717 0.1509434 0.1509434 [8] 0.0000000 0.2264151 0.3018868 0.3773585 0.4528302 0.7547170 0.9811321 [15] 1.2830189 1.7358491 1.8113208 2.3396226 1.5849057 1.9622642 0.9811321 [22] 1.2830189 0.9056604 0.9811321 0.5283019 0.3773585 0.2264151 0.3018868 [29] 0.0000000 0.0754717

$mids [1] 1.525 1.575 1.625 1.675 1.725 1.775 1.825 1.875 1.925 1.975 2.025 [12] 2.075 2.125 2.175 2.225 2.275 2.325 2.375 2.425 2.475 2.525 2.575 [23] 2.625 2.675 2.725 2.775 2.825 2.875 2.925 2.975

$xname [1] "log10(pfas_male[, x])"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[5]] $breaks [1] 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 [15] 2.20 2.25 2.30 2.35 2.40 2.45

$counts [1] 1 1 0 1 11 20 42 59 70 44 30 4 5 6 0 0 0 0 1

$density [1] 0.06779661 0.06779661 0.00000000 0.06779661 0.74576271 1.35593220 [7] 2.84745763 4.00000000 4.74576271 2.98305085 2.03389831 0.27118644 [13] 0.33898305 0.40677966 0.00000000 0.00000000 0.00000000 0.00000000 [19] 0.06779661

$mids [1] 1.525 1.575 1.625 1.675 1.725 1.775 1.825 1.875 1.925 1.975 2.025 [12] 2.075 2.125 2.175 2.225 2.275 2.325 2.375 2.425

$xname [1] "log10(pfas_male[, x])"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[6]] $breaks [1] 1.04 1.06 1.08 1.10 1.12 1.14 1.16 1.18 1.20 1.22 1.24 1.26 1.28 1.30 [15] 1.32 1.34 1.36 1.38 1.40 1.42 1.44 1.46 1.48 1.50 1.52 1.54 1.56 1.58 [29] 1.60 1.62 1.64 1.66 1.68 1.70 1.72 1.74 1.76 1.78 1.80

$counts [1] 1 2 0 1 0 4 2 0 5 6 7 11 0 21 26 23 20 43 12 9 12 8 10 [24] 9 6 5 5 2 8 0 0 1 1 0 0 0 0 1

$density [1] 0.1915709 0.3831418 0.0000000 0.1915709 0.0000000 0.7662835 0.3831418 [8] 0.0000000 0.9578544 1.1494253 1.3409962 2.1072797 0.0000000 4.0229885 [15] 4.9808429 4.4061303 3.8314176 8.2375479 2.2988506 1.7241379 2.2988506 [22] 1.5325670 1.9157088 1.7241379 1.1494253 0.9578544 0.9578544 0.3831418 [29] 1.5325670 0.0000000 0.0000000 0.1915709 0.1915709 0.0000000 0.0000000 [36] 0.0000000 0.0000000 0.1915709

$mids [1] 1.05 1.07 1.09 1.11 1.13 1.15 1.17 1.19 1.21 1.23 1.25 1.27 1.29 1.31 [15] 1.33 1.35 1.37 1.39 1.41 1.43 1.45 1.47 1.49 1.51 1.53 1.55 1.57 1.59 [29] 1.61 1.63 1.65 1.67 1.69 1.71 1.73 1.75 1.77 1.79

$xname [1] "log10(pfas_male[, x])"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[7]] $breaks [1] 0.30 0.35 0.40 0.45 0.50 0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90 0.95 [15] 1.00 1.05 1.10 1.15 1.20 1.25 1.30 1.35 1.40 1.45 1.50 1.55 1.60 1.65 [29] 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10

$counts [1] 6 0 0 22 0 0 23 29 0 45 30 0 25 28 15 9 22 4 3 2 5 2 2 [24] 1 3 2 0 2 1 0 0 0 0 0 0 1

$density [1] 0.42553191 0.00000000 0.00000000 1.56028369 0.00000000 0.00000000 [7] 1.63120567 2.05673759 0.00000000 3.19148936 2.12765957 0.00000000 [13] 1.77304965 1.98581560 1.06382979 0.63829787 1.56028369 0.28368794 [19] 0.21276596 0.14184397 0.35460993 0.14184397 0.14184397 0.07092199 [25] 0.21276596 0.14184397 0.00000000 0.14184397 0.07092199 0.00000000 [31] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.07092199

$mids [1] 0.325 0.375 0.425 0.475 0.525 0.575 0.625 0.675 0.725 0.775 0.825 [12] 0.875 0.925 0.975 1.025 1.075 1.125 1.175 1.225 1.275 1.325 1.375 [23] 1.425 1.475 1.525 1.575 1.625 1.675 1.725 1.775 1.825 1.875 1.925 [34] 1.975 2.025 2.075

$xname [1] "log10(pfas_male[, x])"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[8]] $breaks [1] 1.15 1.20 1.25 1.30 1.35 1.40 1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 [15] 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 [29] 2.55 2.60 2.65 2.70 2.75 2.80 2.85

$counts [1] 3 5 7 14 19 22 24 32 23 23 27 26 10 14 6 10 6 8 3 1 0 0 0 [24] 0 0 0 0 0 0 0 0 0 0 1

$density [1] 0.21126761 0.35211268 0.49295775 0.98591549 1.33802817 1.54929577 [7] 1.69014085 2.25352113 1.61971831 1.61971831 1.90140845 1.83098592 [13] 0.70422535 0.98591549 0.42253521 0.70422535 0.42253521 0.56338028 [19] 0.21126761 0.07042254 0.00000000 0.00000000 0.00000000 0.00000000 [25] 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 [31] 0.00000000 0.00000000 0.00000000 0.07042254

$mids [1] 1.175 1.225 1.275 1.325 1.375 1.425 1.475 1.525 1.575 1.625 1.675 [12] 1.725 1.775 1.825 1.875 1.925 1.975 2.025 2.075 2.125 2.175 2.225 [23] 2.275 2.325 2.375 2.425 2.475 2.525 2.575 2.625 2.675 2.725 2.775 [34] 2.825

$xname [1] "log10(pfas_male[, x])"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[9]] $breaks [1] -0.5 -0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 [15] 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2

$counts [1] 1 0 0 2 2 3 2 4 8 10 13 16 27 20 31 25 18 16 18 19 10 5 1 [24] 0 0 0 1

$density [1] 0.03968254 0.00000000 0.00000000 0.07936508 0.07936508 0.11904762 [7] 0.07936508 0.15873016 0.31746032 0.39682540 0.51587302 0.63492063 [13] 1.07142857 0.79365079 1.23015873 0.99206349 0.71428571 0.63492063 [19] 0.71428571 0.75396825 0.39682540 0.19841270 0.03968254 0.00000000 [25] 0.00000000 0.00000000 0.03968254

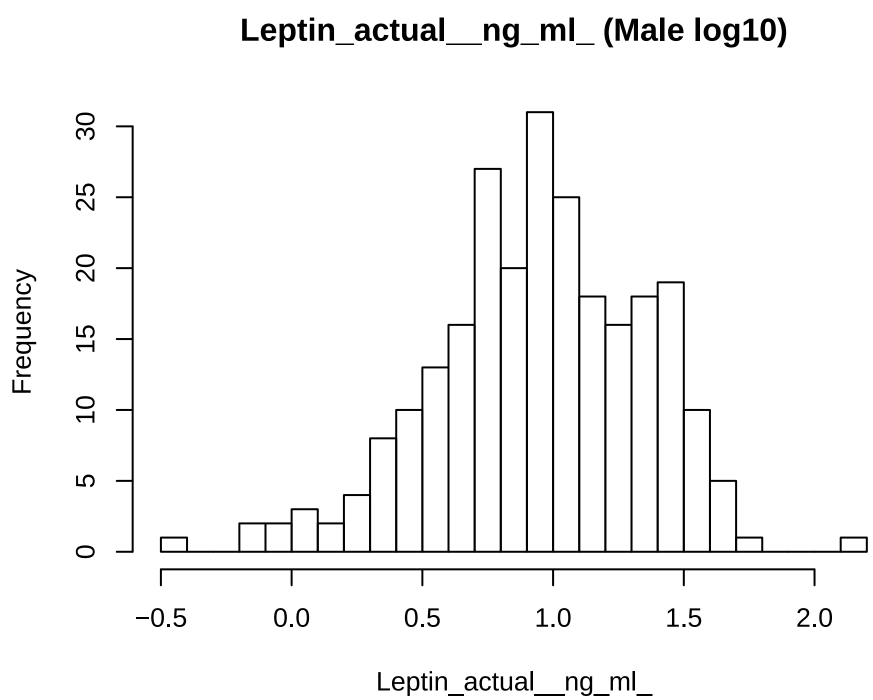
$mids [1] -0.45 -0.35 -0.25 -0.15 -0.05 0.05 0.15 0.25 0.35 0.45 0.55 [12] 0.65 0.75 0.85 0.95 1.05 1.15 1.25 1.35 1.45 1.55 1.65 [23] 1.75 1.85 1.95 2.05 2.15

$xname [1] "log10(pfas_male[, x])"

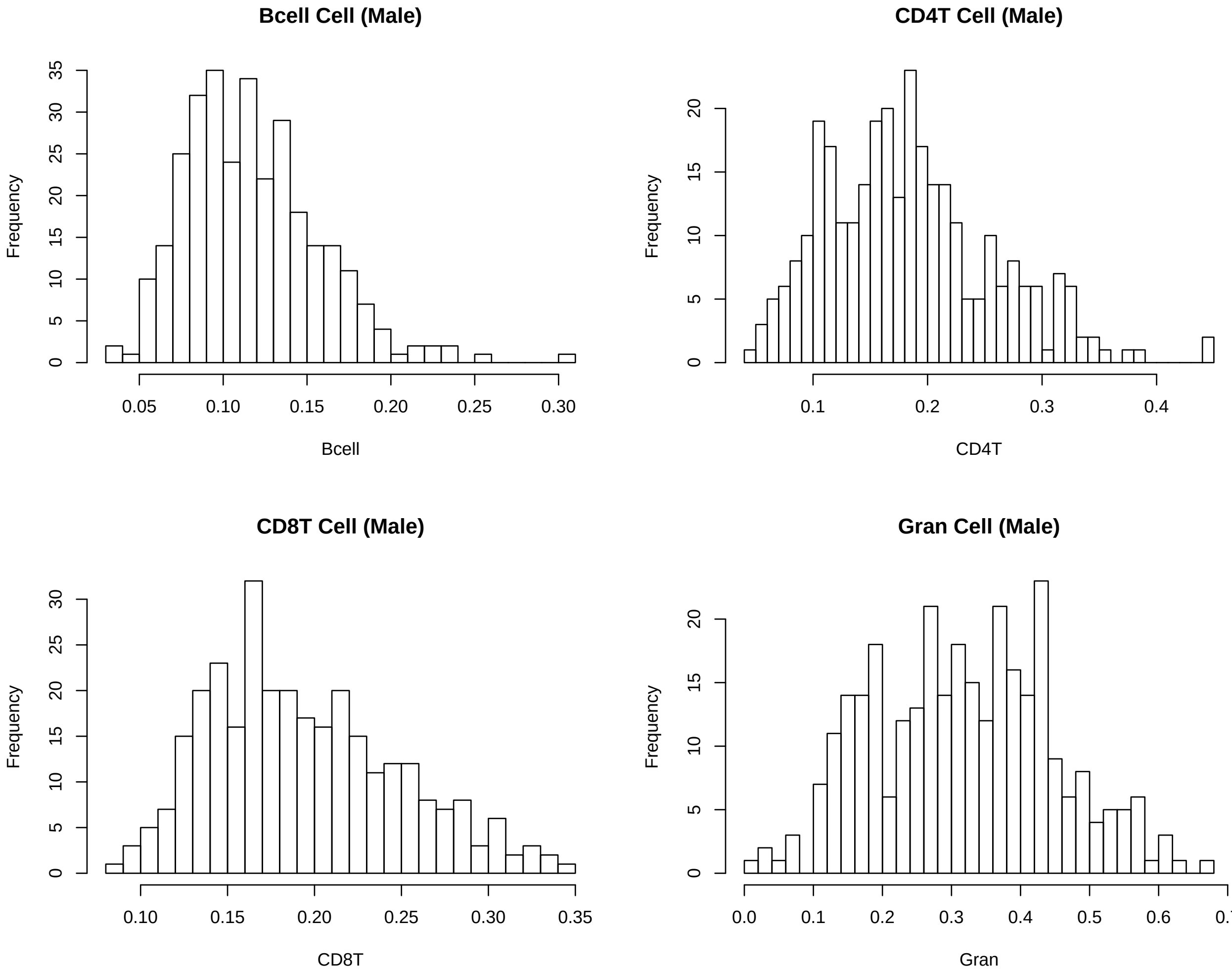
$equidist [1] TRUE

attr(,"class") [1] "histogram"

```
## check the distribution of cell types
cellnames <- colnames(pfas_male[, 14:20])
par(mfrow = c(2, 2))
```




```
lapply(cellnames, function(x) {
    hist(pfas_male[, x], freq = TRUE, breaks = 30, main = paste(x,
        " Cell (Male)", sep = ""), xlab = x)
})
```



[[1]] $breaks [1] 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.10 0.11 0.12 0.13 0.14 0.15 0.16 [15] 0.17 0.18 0.19 0.20 0.21 0.22 0.23 0.24 0.25 0.26 0.27 0.28 0.29 0.30 [29] 0.31

$counts [1] 2 1 10 14 25 32 35 24 34 22 29 18 14 14 11 7 4 1 2 2 2 0 1 [24] 0 0 0 0 1

$density [1] 0.6557377 0.3278689 3.2786885 4.5901639 8.1967213 10.4918033 [7] 11.4754098 7.8688525 11.1475410 7.2131148 9.5081967 5.9016393 [13] 4.5901639 4.5901639 3.6065574 2.2950820 1.3114754 0.3278689 [19] 0.6557377 0.6557377 0.6557377 0.0000000 0.3278689 0.0000000 [25] 0.0000000 0.0000000 0.0000000 0.3278689

$mids [1] 0.035 0.045 0.055 0.065 0.075 0.085 0.095 0.105 0.115 0.125 0.135 [12] 0.145 0.155 0.165 0.175 0.185 0.195 0.205 0.215 0.225 0.235 0.245 [23] 0.255 0.265 0.275 0.285 0.295 0.305

$xname [1] “pfas_male[, x]”

$equidist [1] TRUE

attr(,“class”) [1] “histogram”

[[2]] $breaks [1] 0.04 0.05 0.06 0.07 0.08 0.09 0.10 0.11 0.12 0.13 0.14 0.15 0.16 0.17 [15] 0.18 0.19 0.20 0.21 0.22 0.23 0.24 0.25 0.26 0.27 0.28 0.29 0.30 0.31 [29] 0.32 0.33 0.34 0.35 0.36 0.37 0.38 0.39 0.40 0.41 0.42 0.43 0.44 0.45

$counts [1] 1 3 5 6 8 10 19 17 11 11 14 19 20 13 23 17 14 14 11 5 5 10 6 [24] 8 6 6 1 7 6 2 2 1 0 1 1 0 0 0 0 0 2

$density [1] 0.3278689 0.9836066 1.6393443 1.9672131 2.6229508 3.2786885 6.2295082 [8] 5.5737705 3.6065574 3.6065574 4.5901639 6.2295082 6.5573770 4.2622951 [15] 7.5409836 5.5737705 4.5901639 4.5901639 3.6065574 1.6393443 1.6393443 [22] 3.2786885 1.9672131 2.6229508 1.9672131 1.9672131 0.3278689 2.2950820 [29]

1.9672131 0.6557377 0.6557377 0.3278689 0.0000000 0.3278689 0.3278689 [36] 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000 0.6557377

$mids [1] 0.045 0.055 0.065 0.075 0.085 0.095 0.105 0.115 0.125 0.135 0.145 [12] 0.155 0.165 0.175 0.185 0.195 0.205 0.215 0.225 0.235 0.245 0.255 [23] 0.265 0.275 0.285 0.295 0.305 0.315 0.325 0.335 0.345 0.355 0.365 [34] 0.375 0.385 0.395 0.405 0.415 0.425 0.435 0.445

$xname [1] "pfas_male[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[3]] $breaks [1] 0.08 0.09 0.10 0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19 0.20 0.21 [15] 0.22 0.23 0.24 0.25 0.26 0.27 0.28 0.29 0.30 0.31 0.32 0.33 0.34 0.35

$counts [1] 1 3 5 7 15 20 23 16 32 20 20 17 16 20 15 11 12 12 8 7 8 3 6 [24] 2 3 2 1

$density [1] 0.3278689 0.9836066 1.6393443 2.2950820 4.9180328 6.5573770 [7] 7.5409836 5.2459016 10.4918033 6.5573770 6.5573770 5.5737705 [13] 5.2459016 6.5573770 4.9180328 3.6065574 3.9344262 3.9344262 [19] 2.6229508 2.2950820 2.6229508 0.9836066 1.9672131 0.6557377 [25] 0.9836066 0.6557377 0.3278689

$mids [1] 0.085 0.095 0.105 0.115 0.125 0.135 0.145 0.155 0.165 0.175 0.185 [12] 0.195 0.205 0.215 0.225 0.235 0.245 0.255 0.265 0.275 0.285 0.295 [23] 0.305 0.315 0.325 0.335 0.345

$xname [1] "pfas_male[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[4]] $breaks [1] 0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 [15] 0.28 0.30 0.32 0.34 0.36 0.38 0.40 0.42 0.44 0.46 0.48 0.50 0.52 0.54 [29] 0.56 0.58 0.60 0.62 0.64 0.66 0.68

$counts [1] 1 2 1 3 0 7 11 14 14 18 6 12 13 21 14 18 15 12 21 16 14 23 9 [24] 6 8 4 5 5 6 1 3 1 0 1

$density [1] 0.1639344 0.3278689 0.1639344 0.4918033 0.0000000 1.1475410 1.8032787 [8] 2.2950820 2.2950820 2.9508197 0.9836066 1.9672131 2.1311475 3.4426230 [15] 2.2950820 2.9508197 2.4590164 1.9672131 3.4426230 2.6229508 2.2950820 [22] 3.7704918 1.4754098 0.9836066 1.3114754 0.6557377 0.8196721 0.8196721 [29] 0.9836066 0.1639344 0.4918033 0.1639344 0.0000000 0.1639344

$mids [1] 0.01 0.03 0.05 0.07 0.09 0.11 0.13 0.15 0.17 0.19 0.21 0.23 0.25 0.27 [15] 0.29 0.31 0.33 0.35 0.37 0.39 0.41 0.43 0.45 0.47 0.49 0.51 0.53 0.55 [29] 0.57 0.59 0.61 0.63 0.65 0.67

$xname [1] "pfas_male[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[5]] $breaks [1] 0.00 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.10 0.11 0.12 0.13 [15] 0.14 0.15 0.16 0.17 0.18 0.19 0.20 0.21 0.22

$counts [1] 1 1 1 1 8 16 25 36 50 32 46 25 14 12 6 16 2 6 3 2 1 1

$density [1] 0.3278689 0.3278689 0.3278689 0.3278689 2.6229508 5.2459016 [7] 8.1967213 11.8032787 16.3934426 10.4918033 15.0819672 8.1967213 [13] 4.5901639 3.9344262 1.9672131 5.2459016 0.6557377 1.9672131 [19] 0.9836066 0.6557377 0.3278689 0.3278689

$mids [1] 0.005 0.015 0.025 0.035 0.045 0.055 0.065 0.075 0.085 0.095 0.105 [12] 0.115 0.125 0.135 0.145 0.155 0.165 0.175 0.185 0.195 0.205 0.215

$xname [1] "pfas_male[, x]"

$equidist [1] TRUE

attr(,“class”) [1] “histogram”

[[6]] $breaks [1] 0.000 0.005 0.010 0.015 0.020 0.025 0.030 0.035 0.040 0.045 0.050 [12] 0.055 0.060 0.065 0.070 0.075 0.080 0.085 0.090 0.095 0.100 0.105 [23] 0.110 0.115 0.120 0.125 0.130 0.135 0.140 0.145 0.150 0.155 0.160 [34] 0.165 0.170 0.175 0.180 0.185 0.190

$counts [1] 174 12 15 11 19 8 6 10 4 5 4 4 2 3 1 5 0 [18] 1 6 1 1 2 0 0 3 0 1 0 0 1 2 0 1 0 [35] 1 0 0 2

$density [1] 114.0983607 7.8688525 9.8360656 7.2131148 12.4590164 [6] 5.2459016 3.9344262 6.5573770 2.6229508 3.2786885 [11] 2.6229508 2.6229508 1.3114754 1.9672131 0.6557377 [16] 3.2786885 0.0000000 0.6557377 3.9344262 0.6557377 [21] 0.6557377 1.3114754 0.0000000 0.0000000 1.9672131 [26] 0.0000000 0.6557377 0.0000000 0.0000000 0.6557377 [31] 1.3114754 0.0000000 0.6557377 0.0000000 0.6557377 [36] 0.0000000 0.0000000 1.3114754

$mids [1] 0.0025 0.0075 0.0125 0.0175 0.0225 0.0275 0.0325 0.0375 0.0425 0.0475 [11] 0.0525 0.0575 0.0625 0.0675 0.0725 0.0775 0.0825 0.0875 0.0925 0.0975 [21] 0.1025 0.1075 0.1125 0.1175 0.1225 0.1275 0.1325 0.1375 0.1425 0.1475 [31] 0.1525 0.1575 0.1625 0.1675 0.1725 0.1775 0.1825 0.1875

$xname [1] “pfas_male[, x]”

$equidist [1] TRUE

attr(,“class”) [1] “histogram”

[[7]] $breaks [1] 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 0.28 [15] 0.30 0.32 0.34 0.36 0.38 0.40 0.42 0.44 0.46

$counts [1] 10 64 68 45 25 18 11 21 9 14 5 2 4 2 1 4 0 1 0 0 0 1

$density [1] 1.6393443 10.4918033 11.1475410 7.3770492 4.0983607 2.9508197 [7] 1.8032787 3.4426230 1.4754098 2.2950820 0.8196721 0.3278689 [13] 0.6557377 0.3278689 0.1639344 0.6557377 0.0000000 0.1639344 [19] 0.0000000 0.0000000 0.0000000 0.1639344

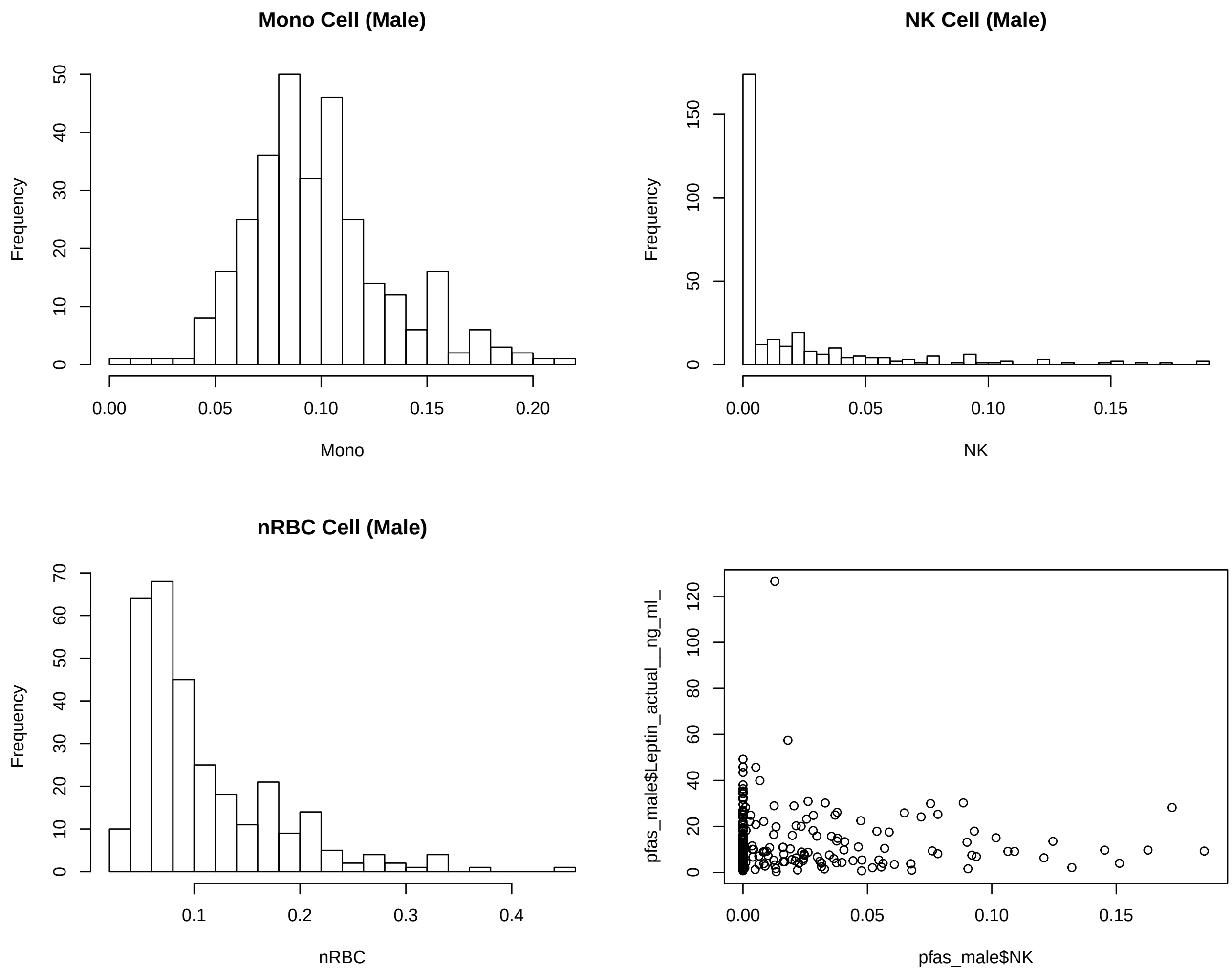
$mids [1] 0.03 0.05 0.07 0.09 0.11 0.13 0.15 0.17 0.19 0.21 0.23 0.25 0.27 0.29 [15] 0.31 0.33 0.35 0.37 0.39 0.41 0.43 0.45

$xname [1] “pfas_male[, x]”

$equidist [1] TRUE

attr(,“class”) [1] “histogram”

```
## check the NK vs outcome, whether there is a dichotomous
## pattern
plot(pfas_male$NK, pfas_male$Leptin_actual__ng_ml_)
```




```r
paste("It seems like the slope of this outcome vs NK is 0")
```

[1] "It seems like the slope of this outcome vs NK is 0"

```r
## Based on histograms
paste(Outcomes[-c(1, 2)], " should be log10 transformed. ", sep = "")
```

[1] "Chol_IPV3 should be log10 transformed."
[2] "FFA_IPV3 should be log10 transformed."
[3] "Gluc_IPV3 should be log10 transformed."
[4] "HDL_IPV3 should be log10 transformed."
[5] "Insu_IPV3 should be log10 transformed."
[6] "Trig_IPV3 should be log10 transformed."
[7] "Leptin_actual_*ng_ml* should be log10 transformed."

```r
## # the regression summary table for log10 outcomes
lapply(Outcomes[1:9], function(x) {
    cpg_reg(log10(pfas_male[, x]), pfas_male, x, 10, "Male log10",
        300)
})
```

[[1]]

Table 10: Top10 CpGs from 300 for birth_weight of Male log10 by p.value (Sample Size = 305)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
49	cg16725984	-0.0300	0.0081	-3.6868	0.0003	0.0900000
67	cg25195288	0.0795	0.0234	3.3957	0.0008	0.1200000
167	cg16495448	-0.0418	0.0150	-2.7791	0.0058	0.5800000
184	cg25137968	0.0424	0.0159	2.6660	0.0081	0.6000000
71	cg16672637	0.0882	0.0340	2.5920	0.0100	0.6000000
204	cg15045292	0.0191	0.0077	2.4795	0.0137	0.6085714
115	cg10436026	-0.0427	0.0173	-2.4677	0.0142	0.6085714
22	cg00784263	0.0410	0.0170	2.4058	0.0168	0.6300000
160	cg07338658	0.0288	0.0124	2.3225	0.0209	0.6966667
103	cg04029532	0.0524	0.0230	2.2728	0.0238	0.7140000

[[2]]

Table 11: Top10 CpGs from 300 for ipv3_pp_fm_pct of Male log10 by p.value (Sample Size = 292)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
203	cg15066197	-0.1946	0.0694	-2.8039	0.0054	0.8733333
190	cg10832304	-0.0821	0.0308	-2.6661	0.0081	0.8733333
112	cg24366087	-0.1595	0.0649	-2.4588	0.0145	0.8733333
282	cg08732300	0.1111	0.0485	2.2906	0.0227	0.8733333
292	cg04804814	0.1906	0.0861	2.2145	0.0276	0.8733333
4	cg21853587	0.2174	0.0995	2.1856	0.0297	0.8733333
255	cg00634984	-0.0695	0.0320	-2.1740	0.0305	0.8733333
184	cg25137968	0.1391	0.0645	2.1548	0.0320	0.8733333
139	cg08743751	0.1227	0.0572	2.1452	0.0328	0.8733333
23	cg22305268	-0.2074	0.0973	-2.1315	0.0339	0.8733333

[[3]]

Table 12: Top10 CpGs from 300 for Chol_IPV3 of Male log10 by p.value (Sample Size = 287)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
254	cg22692511	0.0529	0.0174	3.0363	0.0026	0.6500000
266	cg12857407	0.0930	0.0325	2.8605	0.0046	0.6500000
112	cg24366087	-0.0968	0.0353	-2.7448	0.0065	0.6500000
95	cg17850055	-0.1943	0.0742	-2.6196	0.0093	0.6540000
271	cg08162803	0.1011	0.0394	2.5642	0.0109	0.6540000
69	cg04168590	0.1527	0.0682	2.2407	0.0258	0.9564062
28	cg12872489	-0.0518	0.0233	-2.2281	0.0267	0.9564062
170	cg19554564	-0.0951	0.0433	-2.1995	0.0287	0.9564062
188	cg17500055	-0.0571	0.0259	-2.1994	0.0287	0.9564062
49	cg16725984	0.0371	0.0175	2.1206	0.0349	0.9564062

[[4]]

Table 13: Top10 CpGs from 300 for FFA_IPV3 of Male log10 by p.value (Sample Size = 265)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
96	cg21215576	0.1513	0.0501	3.0225	0.0028	0.730
166	cg26275850	0.1908	0.0731	2.6088	0.0096	0.730
156	cg13858106	0.1918	0.0758	2.5289	0.0121	0.730
163	cg26074111	-0.2042	0.0841	-2.4289	0.0158	0.730
4	cg21853587	-0.2415	0.1018	-2.3717	0.0185	0.730
162	cg18602114	-0.1153	0.0494	-2.3333	0.0204	0.730
126	cg05390685	-0.1193	0.0513	-2.3260	0.0208	0.730
148	cg13598480	0.1529	0.0661	2.3133	0.0215	0.730
257	cg16529483	0.0589	0.0255	2.3067	0.0219	0.730
240	cg16375541	0.2600	0.1176	2.2101	0.0280	0.732

[[5]]

Table 14: Top10 CpGs from 300 for Gluc_IPV3 of Male log10 by p.value (Sample Size = 295)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
145	cg06404838	0.1505	0.0404	3.7236	0.0002	0.0600000
27	cg17519749	0.0559	0.0217	2.5816	0.0103	0.8066667
16	cg06873590	-0.1788	0.0694	-2.5762	0.0105	0.8066667
248	cg11196848	-0.0679	0.0266	-2.5506	0.0113	0.8066667
217	cg01816336	-0.0981	0.0396	-2.4761	0.0139	0.8066667
150	cg14163408	0.0543	0.0233	2.3368	0.0202	0.8066667
283	cg11144990	0.0734	0.0318	2.3086	0.0217	0.8066667
153	cg01060409	0.1314	0.0575	2.2864	0.0230	0.8066667
278	cg15565231	-0.1014	0.0448	-2.2654	0.0242	0.8066667
189	cg13382072	0.0545	0.0247	2.2110	0.0278	0.8300000

[[6]]

Table 15: Top10 CpGs from 300 for HDL_IPV3 of Male log10 by p.value (Sample Size = 261)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
42	cg15355952	-0.1054	0.0333	-3.1646	0.0017	0.3750000
49	cg16725984	0.0517	0.0170	3.0489	0.0025	0.3750000
236	cg04061372	0.0308	0.0110	2.8043	0.0054	0.5345455
271	cg08162803	0.0993	0.0385	2.5761	0.0106	0.5345455
52	cg19549232	0.0924	0.0367	2.5191	0.0124	0.5345455
281	cg22946159	-0.1367	0.0548	-2.4925	0.0133	0.5345455
290	cg00798281	-0.0643	0.0263	-2.4463	0.0151	0.5345455
230	cg22950210	0.0676	0.0276	2.4450	0.0152	0.5345455
145	cg06404838	-0.1133	0.0475	-2.3822	0.0180	0.5345455
120	cg22700790	0.0501	0.0211	2.3702	0.0185	0.5345455

[[7]]

Table 16: Top10 CpGs from 300 for Insu_IPV3 of Male log10 by p.value (Sample Size = 282)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
195	cg23785275	-0.0578	0.0195	-2.9582	0.0034	0.7200000
36	cg11302884	-0.2738	0.1018	-2.6903	0.0076	0.7200000
169	cg17501712	0.2143	0.0822	2.6085	0.0096	0.7200000
278	cg15565231	-0.3015	0.1172	-2.5734	0.0106	0.7200000
86	cg02648057	-0.1231	0.0495	-2.4850	0.0136	0.7200000
191	cg25138412	-0.1090	0.0442	-2.4637	0.0144	0.7200000
19	cg00128386	-0.2743	0.1196	-2.2927	0.0226	0.8850000
291	cg09630142	0.1295	0.0569	2.2766	0.0236	0.8850000
223	cg03786743	-0.1304	0.0642	-2.0308	0.0433	0.9904068
61	cg04569429	0.1227	0.0605	2.0289	0.0434	0.9904068

[[8]]

Table 17: Top10 CpGs from 300 for Trig_IPV3 of Male log10 by p.value (Sample Size = 284)

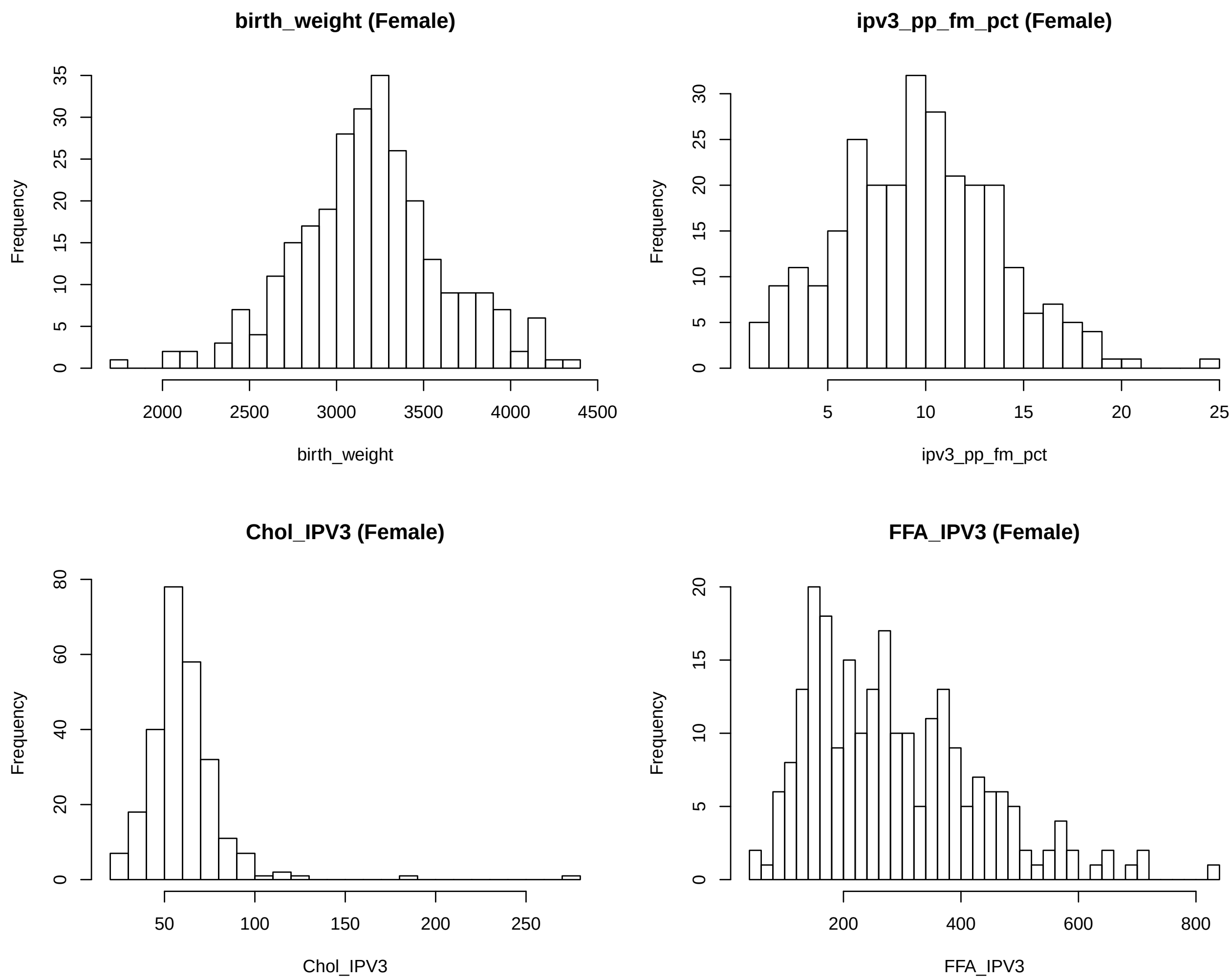
	names	Estimate	Std.Error	t.statistic	p.value	FDR
291	cg09630142	-0.1431	0.0443	-3.2318	0.0014	0.4200
237	cg21380181	-0.1309	0.0481	-2.7230	0.0069	0.5800
190	cg10832304	0.0798	0.0295	2.7086	0.0072	0.5800
121	cg23241335	0.1614	0.0627	2.5735	0.0106	0.5800
82	cg18373158	0.1295	0.0509	2.5434	0.0115	0.5800
197	cg14349977	-0.0827	0.0326	-2.5413	0.0116	0.5800
15	cg05564760	0.0927	0.0401	2.3141	0.0214	0.6075
77	cg23478547	0.0836	0.0364	2.2993	0.0222	0.6075
240	cg16375541	0.2456	0.1068	2.3001	0.0222	0.6075
16	cg06873590	-0.3326	0.1448	-2.2978	0.0223	0.6075

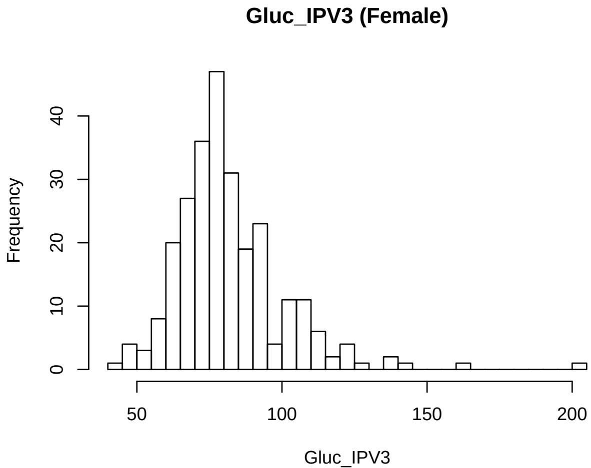
[[9]]

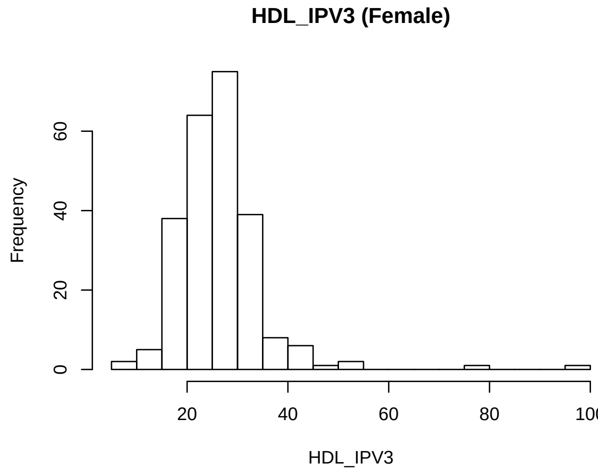
Table 18: Top10 CpGs from 300 for Leptin_actual_*ng_ml* of Male log10 by p.value (Sample Size = 252)

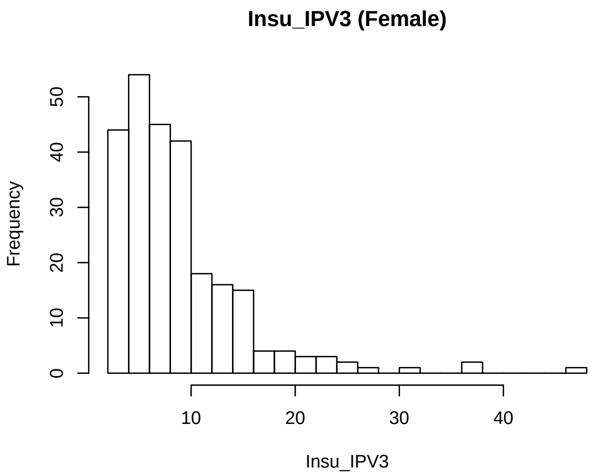
	names	Estimate	Std.Error	t.statistic	p.value	FDR
49	cg16725984	-0.2989	0.0619	-4.8256	0.0000	0.0000000
209	cg24280832	0.4147	0.1136	3.6493	0.0003	0.0450000
84	cg05524354	0.2988	0.1007	2.9680	0.0033	0.2940000
42	cg15355952	0.3546	0.1246	2.8472	0.0048	0.2940000
116	cg21183455	0.1943	0.0685	2.8374	0.0049	0.2940000
19	cg00128386	-0.5139	0.2008	-2.5594	0.0111	0.5550000
158	cg13973086	0.1845	0.0780	2.3656	0.0188	0.8057143
104	cg10119082	-0.1602	0.0709	-2.2598	0.0247	0.8142857
214	cg20505445	-0.1772	0.0821	-2.1582	0.0319	0.8142857
143	cg15486454	0.2045	0.0958	2.1338	0.0339	0.8142857

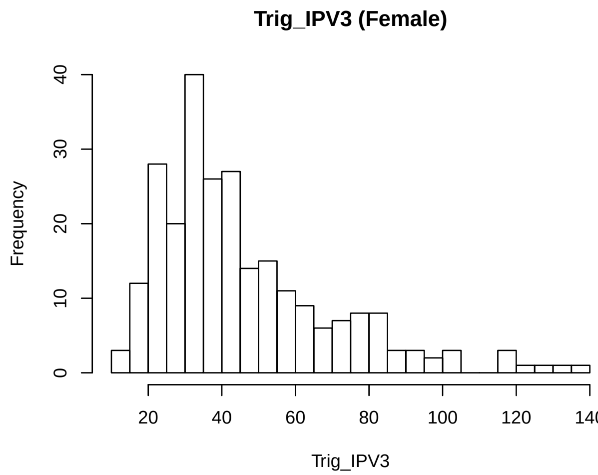
```r
## raw outcomes
par(mfrow = c(2, 2))
lapply(Outcomes, function(x) {
    hist(pfas_female[, x], freq = TRUE, breaks = 30, main = paste(x,
        " (Female)", sep = ""), xlab = x)
})
```











[[1]] $breaks [1] 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 [15] 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400

$counts [1] 1 0 0 2 2 0 3 7 4 11 15 17 19 28 31 35 26 20 13 9 9 9 7 [24] 2 6 1 1

$density [1] 3.597122e-05 0.000000e+00 0.000000e+00 7.194245e-05 7.194245e-05 [6] 0.000000e+00 1.079137e-04 2.517986e-04 1.438849e-04 3.956835e-04 [11] 5.395683e-04 6.115108e-04 6.834532e-04 1.007194e-03 1.115108e-03 [16] 1.258993e-03 9.352518e-04 7.194245e-04 4.676259e-04 3.237410e-04 [21] 3.237410e-04 3.237410e-04 2.517986e-04 7.194245e-05 2.158273e-04 [26] 3.597122e-05 3.597122e-05

$mids [1] 1750 1850 1950 2050 2150 2250 2350 2450 2550 2650 2750 2850 2950 3050 [15] 3150 3250 3350 3450 3550 3650 3750 3850 3950 4050 4150 4250 4350

$xname [1] "pfas_female[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[2]] $breaks [1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 [24] 24 25

$counts [1] 5 9 11 9 15 25 20 20 32 28 21 20 20 11 6 7 5 4 1 1 0 0 0 [24] 1

$density [1] 0.018450185 0.033210332 0.040590406 0.033210332 0.055350554 [6] 0.092250923 0.073800738 0.073800738 0.118081181 0.103321033 [11] 0.077490775 0.073800738 0.073800738 0.040590406 0.022140221 [16] 0.025830258 0.018450185 0.014760148 0.003690037 0.003690037 [21] 0.000000000 0.000000000 0.000000000 0.003690037

$mids [1] 1.5 2.5 3.5 4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 12.5 13.5 14.5 [15] 15.5 16.5 17.5 18.5 19.5 20.5 21.5 22.5 23.5 24.5

$xname [1] "pfas_female[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[3]] $breaks [1] 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 [18] 190 200 210 220 230 240 250 260 270 280

$counts [1] 7 18 40 78 58 32 11 7 1 2 1 0 0 0 0 0 1 0 0 0 0 0 0 [24] 0 0 1

$density [1] 0.0027237354 0.0070038911 0.0155642023 0.0303501946 0.0225680934 [6] 0.0124513619 0.0042801556 0.0027237354 0.0003891051 0.0007782101 [11] 0.0003891051 0.0000000000 0.0000000000 0.0000000000 0.0000000000 [16] 0.0000000000 0.0003891051 0.0000000000 0.0000000000 0.0000000000 [21] 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 [26] 0.0003891051

$mids [1] 25 35 45 55 65 75 85 95 105 115 125 135 145 155 165 175 185 [18] 195 205 215 225 235 245 255 265 275

$xname [1] "pfas_female[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[4]] $breaks [1] 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 [18] 380 400 420 440 460 480 500 520 540 560 580 600 620 640 660 680 700 [35] 720 740 760 780 800 820 840

$counts [1] 2 1 6 8 13 20 18 9 15 10 13 17 10 10 5 11 13 9 5 7 6 6 5 [24] 2 1 2 4 2 0 1 2 0 1 2 0 0 0 0 0 1

$density [1] 0.0004219409 0.0002109705 0.0012658228 0.0016877637 0.0027426160 [6] 0.0042194093 0.0037974684 0.0018987342 0.0031645570 0.0021097046 [11] 0.0027426160 0.0035864979 0.0021097046 0.0021097046 0.0010548523 [16] 0.0023206751 0.0027426160 0.0018987342 0.0010548523 0.0014767932 [21] 0.0012658228 0.0012658228 0.0010548523 0.0004219409 0.0002109705 [26] 0.0004219409 0.0008438819 0.0004219409 0.0000000000 0.0002109705 [31] 0.0004219409 0.0000000000 0.0002109705 0.0004219409 0.0000000000 [36] 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0002109705

$mids [1] 50 70 90 110 130 150 170 190 210 230 250 270 290 310 330 350 370 [18] 390 410 430 450 470 490 510 530 550 570 590 610 630 650 670 690 710 [35] 730 750 770 790 810 830

$xname [1] "pfas_female[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[5]] $breaks [1] 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 [18] 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205

$counts [1] 1 4 3 8 20 27 36 47 31 19 23 4 11 11 6 2 4 1 0 2 1 0 0 [24] 0 1 0 0 0 0 0 0 0 1

$density [1] 0.0007604563 0.0030418251 0.0022813688 0.0060836502 0.0152091255 [6] 0.0205323194 0.0273764259 0.0357414449 0.0235741445 0.0144486692 [11] 0.0174904943 0.0030418251 0.0083650190 0.0083650190 0.0045627376 [16] 0.0015209125 0.0030418251 0.0007604563 0.0000000000 0.0015209125 [21] 0.0007604563 0.0000000000 0.0000000000 0.0000000000 0.0007604563 [26] 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 [31] 0.0000000000 0.0000000000 0.0007604563

$mids [1] 42.5 47.5 52.5 57.5 62.5 67.5 72.5 77.5 82.5 87.5 92.5 [12] 97.5 102.5 107.5 112.5 117.5 122.5 127.5 132.5 137.5 142.5 147.5 [23] 152.5 157.5 162.5 167.5 172.5 177.5 182.5 187.5 192.5 197.5 202.5

$xname [1] "pfas_female[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[6]] $breaks [1] 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 [18] 90 95 100

$counts [1] 2 5 38 64 75 39 8 6 1 2 0 0 0 0 1 0 0 0 1

$density [1] 0.0016528926 0.0041322314 0.0314049587 0.0528925620 0.0619834711 [6] 0.0322314050 0.0066115702 0.0049586777 0.0008264463 0.0016528926 [11] 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0008264463 [16] 0.0000000000 0.0000000000 0.0000000000 0.0008264463

$mids [1] 7.5 12.5 17.5 22.5 27.5 32.5 37.5 42.5 47.5 52.5 57.5 62.5 67.5 72.5 [15] 77.5 82.5 87.5 92.5 97.5

$xname [1] "pfas_female[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[7]] $breaks [1] 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 [24] 48

$counts [1] 44 54 45 42 18 16 15 4 4 3 3 2 1 0 1 0 0 2 0 0 0 0 1

$density [1] 0.086274510 0.105882353 0.088235294 0.082352941 0.035294118 [6] 0.031372549 0.029411765 0.007843137 0.007843137 0.005882353 [11] 0.005882353 0.003921569 0.001960784 0.000000000 0.001960784 [16] 0.000000000 0.000000000 0.003921569 0.000000000 0.000000000 [21] 0.000000000 0.000000000 0.001960784

$mids [1] 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47

$xname [1] "pfas_female[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[8]] $breaks [1] 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 [18] 95 100 105 110 115 120 125 130 135 140

$counts [1] 3 12 28 20 40 26 27 14 15 11 9 6 7 8 8 3 3 2 3 0 0 3 1 [24] 1 1 1

$density [1] 0.0023809524 0.0095238095 0.0222222222 0.0158730159 0.0317460317 [6] 0.0206349206 0.0214285714 0.0111111111 0.0119047619 0.0087301587 [11] 0.0071428571 0.0047619048 0.0055555556 0.0063492063 0.0063492063 [16] 0.0023809524 0.0023809524 0.0015873016 0.0023809524 0.0000000000 [21] 0.0000000000 0.0023809524 0.0007936508 0.0007936508 0.0007936508 [26] 0.0007936508

$mids [1] 12.5 17.5 22.5 27.5 32.5 37.5 42.5 47.5 52.5 57.5 62.5 [12] 67.5 72.5 77.5 82.5 87.5 92.5 97.5 102.5 107.5 112.5 117.5 [23] 122.5 127.5 132.5 137.5

$xname [1] "pfas_female[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

[[9]] $breaks [1] 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 [18] 85 90 95 100 105 110 115 120 125 130

$counts [1] 25 49 39 31 20 19 7 14 2 4 5 2 2 0 1 0 2 0 0 1 1 0 1 [24] 0 0 1

$density [1] 0.0221238938 0.0433628319 0.0345132743 0.0274336283 0.0176991150 [6] 0.0168141593 0.0061946903 0.0123893805 0.0017699115 0.0035398230 [11] 0.0044247788 0.0017699115 0.0017699115 0.0000000000 0.0008849558 [16] 0.0000000000 0.0017699115 0.0000000000 0.0000000000 0.0008849558 [21] 0.0008849558 0.0000000000 0.0008849558 0.0000000000 0.0000000000 [26] 0.0008849558

$mids [1] 2.5 7.5 12.5 17.5 22.5 27.5 32.5 37.5 42.5 47.5 52.5 [12] 57.5 62.5 67.5 72.5 77.5 82.5 87.5 92.5 97.5 102.5 107.5 [23] 112.5 117.5 122.5 127.5

$xname [1] "pfas_female[, x]"

$equidist [1] TRUE

attr(,"class") [1] "histogram"

```
## log10 of feMale
lapply(Outcomes, function(x) {
    cpg_reg(log10(pfas_female[, x]), pfas_female, x, 10, "Female log10",
        300)
})
```

[[1]]

Table 19: Top10 CpGs from 300 for birth_weight of Female log10 by p.value (Sample Size = 278)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
49	cg16725984	-0.0367	0.0081	-4.5194	0.0000	0.0000000
27	cg17519749	0.0420	0.0121	3.4601	0.0006	0.0900000
248	cg11196848	0.0444	0.0141	3.1445	0.0019	0.1900000
71	cg16672637	0.0990	0.0342	2.8983	0.0041	0.3075000
297	cg01607625	0.0606	0.0218	2.7815	0.0058	0.3480000
222	cg27258399	0.0274	0.0101	2.7108	0.0071	0.3550000
185	cg07716131	-0.0547	0.0216	-2.5380	0.0117	0.4745455
113	cg22685502	0.0504	0.0202	2.4903	0.0134	0.4745455
240	cg16375541	0.0659	0.0272	2.4200	0.0162	0.4745455
87	cg10397322	0.0529	0.0219	2.4146	0.0164	0.4745455

[[2]]

Table 20: Top10 CpGs from 300 for ipv3_pp_fm_pct of Female log10 by p.value (Sample Size = 271)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
189	cg13382072	-0.1423	0.0490	-2.9033	0.0040	0.9863415
203	cg15066197	-0.1936	0.0750	-2.5808	0.0104	0.9863415
33	cg05431942	0.0802	0.0334	2.4037	0.0169	0.9863415
28	cg12872489	0.1035	0.0441	2.3500	0.0195	0.9863415
20	cg00210042	-0.2069	0.0885	-2.3380	0.0202	0.9863415
51	cg15642854	-0.0514	0.0222	-2.3163	0.0213	0.9863415
5	cg12657739	-0.1407	0.0638	-2.2053	0.0283	0.9863415
54	cg19529074	0.1854	0.0866	2.1398	0.0333	0.9863415
151	cg10996327	-0.1580	0.0775	-2.0371	0.0427	0.9863415
292	cg04804814	0.1641	0.0819	2.0041	0.0461	0.9863415

[[3]]

Table 21: Top10 CpGs from 300 for Chol_IPV3 of Female log10 by p.value (Sample Size = 257)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
64	cg24469114	0.1554	0.0524	2.9647	0.0033	0.3375000

	names	Estimate	Std.Error	t.statistic	p.value	FDR
49	cg16725984	0.0576	0.0198	2.9107	0.0039	0.3375000
72	cg16659510	-0.1442	0.0501	-2.8788	0.0043	0.3375000
60	cg26381452	0.0502	0.0175	2.8655	0.0045	0.3375000
142	cg21501241	-0.1370	0.0495	-2.7677	0.0061	0.3514286
235	cg25017403	0.0629	0.0232	2.7141	0.0071	0.3514286
11	cg02233835	-0.1200	0.0450	-2.6644	0.0082	0.3514286
267	cg22138002	-0.0931	0.0368	-2.5340	0.0119	0.4100000
193	cg01541565	-0.0894	0.0354	-2.5225	0.0123	0.4100000
45	cg16422816	0.1515	0.0627	2.4169	0.0164	0.4450000

[[4]]

Table 22: Top10 CpGs from 300 for FFA_IPV3 of Female log10 by p.value (Sample Size = 237)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
167	cg16495448	-0.1639	0.0669	-2.4498	0.0151	0.9170642
14	cg09473264	-0.1372	0.0565	-2.4274	0.0160	0.9170642
171	cg09461851	0.1977	0.0860	2.2975	0.0225	0.9170642
290	cg00798281	-0.1250	0.0555	-2.2531	0.0252	0.9170642
281	cg22946159	0.2346	0.1050	2.2341	0.0265	0.9170642
20	cg00210042	0.2069	0.0948	2.1816	0.0302	0.9170642
268	cg05119480	0.1364	0.0628	2.1711	0.0310	0.9170642
272	cg17269633	-0.1239	0.0576	-2.1514	0.0325	0.9170642
230	cg22950210	-0.1085	0.0528	-2.0534	0.0412	0.9170642
215	cg11417025	-0.0954	0.0469	-2.0353	0.0430	0.9170642

[[5]]

Table 23: Top10 CpGs from 300 for Gluc_IPV3 of Female log10 by p.value (Sample Size = 263)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
168	cg12680424	-0.1812	0.0631	-2.8701	0.0045	0.74375
260	cg17284440	0.1544	0.0576	2.6823	0.0078	0.74375
262	cg05888037	-0.1581	0.0617	-2.5634	0.0110	0.74375
6	cg26724375	-0.0689	0.0300	-2.2927	0.0227	0.74375
288	cg10848522	0.0451	0.0198	2.2795	0.0235	0.74375
216	cg06230206	-0.0553	0.0245	-2.2586	0.0248	0.74375
285	cg27535677	0.0459	0.0204	2.2495	0.0254	0.74375
173	cg23506842	-0.0582	0.0259	-2.2458	0.0256	0.74375
167	cg16495448	-0.0593	0.0267	-2.2251	0.0270	0.74375
3	cg07551200	-0.1361	0.0619	-2.2002	0.0287	0.74375

[[6]]

Table 24: Top10 CpGs from 300 for HDL_IPV3 of Female log10 by p.value (Sample Size = 242)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
113	cg22685502	-0.1310	0.0476	-2.7522	0.0064	0.6054545
291	cg09630142	-0.0839	0.0316	-2.6515	0.0086	0.6054545
11	cg02233835	-0.1171	0.0448	-2.6148	0.0095	0.6054545
185	cg07716131	-0.1327	0.0507	-2.6149	0.0095	0.6054545
222	cg27258399	-0.0604	0.0237	-2.5461	0.0116	0.6054545
277	cg05227616	-0.0942	0.0374	-2.5210	0.0124	0.6054545
147	cg03604367	0.0913	0.0378	2.4148	0.0165	0.6054545
50	cg27124293	0.0560	0.0241	2.3272	0.0208	0.6054545
60	cg26381452	0.0400	0.0172	2.3239	0.0210	0.6054545
72	cg16659510	-0.1130	0.0488	-2.3147	0.0215	0.6054545

[[7]]

Table 25: Top10 CpGs from 300 for Insu_IPV3 of Female log10 by p.value (Sample Size = 255)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
139	cg08743751	0.2928	0.0706	4.1470	0.0000	0.0000000
254	cg22692511	0.1893	0.0389	4.8637	0.0000	0.0000000
88	cg19667731	-0.2844	0.0893	-3.1842	0.0016	0.1600000
237	cg21380181	-0.1887	0.0624	-3.0266	0.0027	0.2025000
236	cg04061372	-0.0684	0.0251	-2.7190	0.0070	0.4200000
295	cg09114153	0.1922	0.0744	2.5843	0.0103	0.5150000
299	cg17217478	-0.0537	0.0219	-2.4560	0.0148	0.5366667
77	cg23478547	-0.1117	0.0461	-2.4244	0.0161	0.5366667
239	cg01969701	0.1360	0.0561	2.4246	0.0161	0.5366667
28	cg12872489	0.1170	0.0495	2.3613	0.0190	0.5700000

[[8]]

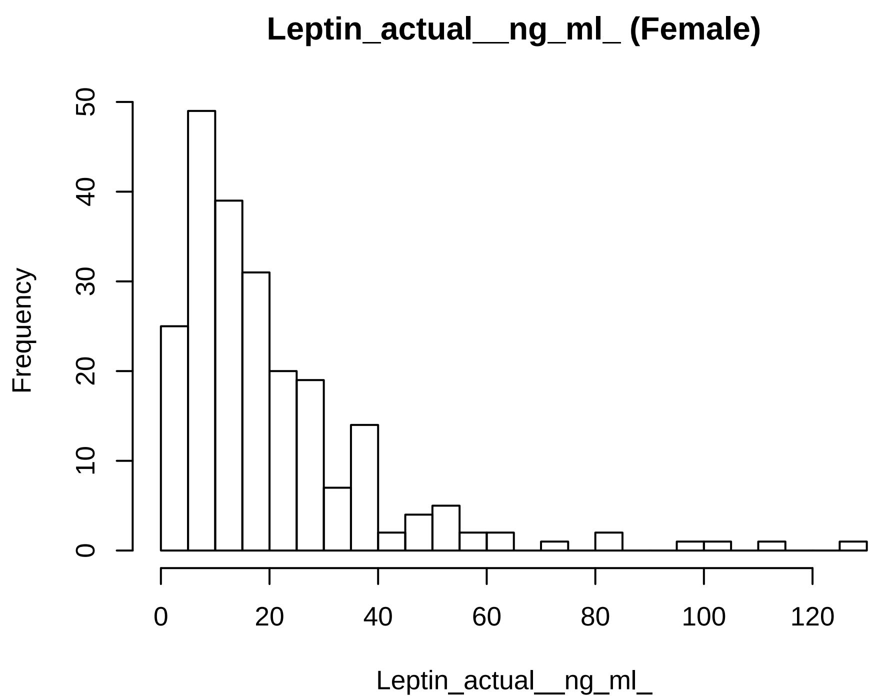
Table 26: Top10 CpGs from 300 for Trig_IPV3 of Female log10 by p.value (Sample Size = 252)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
109	cg22120094	-0.1019	0.0415	-2.4572	0.0147	0.876087
13	cg21451869	-0.1961	0.0802	-2.4448	0.0152	0.876087
297	cg01607625	-0.2053	0.0865	-2.3747	0.0184	0.876087
172	cg07812715	-0.2047	0.0881	-2.3233	0.0210	0.876087
58	cg09887862	0.0701	0.0305	2.2991	0.0224	0.876087
155	cg15727287	0.0822	0.0368	2.2318	0.0266	0.876087
38	cg10533331	0.2260	0.1013	2.2300	0.0267	0.876087
17	cg13699963	-0.2083	0.0939	-2.2175	0.0275	0.876087
298	cg14801692	0.0655	0.0308	2.1289	0.0343	0.876087
113	cg22685502	0.1607	0.0778	2.0645	0.0400	0.876087

[[9]]

Table 27: Top10 CpGs from 300 for Leptin_actual_*ng_ml* of Female log10 by p.value (Sample Size = 226)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
62	cg04523661	-0.4288	0.1297	-3.3065	0.0011	0.3300000
204	cg15045292	0.1756	0.0585	3.0045	0.0030	0.3800000
126	cg05390685	-0.2360	0.0805	-2.9301	0.0038	0.3800000
45	cg16422816	-0.4788	0.1695	-2.8248	0.0052	0.3900000
232	cg03991871	-0.2149	0.0803	-2.6745	0.0081	0.3900000
49	cg16725984	-0.1600	0.0607	-2.6351	0.0090	0.3900000
237	cg21380181	-0.2534	0.0963	-2.6321	0.0091	0.3900000
199	cg21261158	0.4504	0.1865	2.4144	0.0166	0.5716667
82	cg18373158	0.2249	0.0943	2.3833	0.0180	0.5716667
44	cg09420412	-0.2234	0.0998	-2.2390	0.0262	0.5716667




```
######################################## using pfas_male_FDRcpg pfas_female_FDRcpg
lapply(Outcomes[1:9], function(x) {
    cpg_reg(log10(pfas_male_FDRcpg[, x]), pfas_male_FDRcpg, x,
        10, "Male log10", 120)
})
```

[[1]]

Table 28: Top10 CpGs from 120 for birth_weight of Male log10 by p.value (Sample Size = 305)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
8	cg25195288	0.0795	0.0234	3.3957	0.0008	0.0960000
70	cg25137968	0.0424	0.0159	2.6660	0.0081	0.4860000
49	cg04029532	0.0524	0.0230	2.2728	0.0238	0.6257143
69	cg07105947	0.0165	0.0074	2.2346	0.0262	0.6257143

	names	Estimate	Std.Error	t.statistic	p.value	FDR
37	cg05524354	0.0273	0.0129	2.1183	0.0350	0.6257143
108	cg07011961	0.0290	0.0144	2.0125	0.0451	0.6257143
48	cg19708901	0.0366	0.0184	1.9864	0.0479	0.6257143
74	cg03015672	0.0277	0.0143	1.9432	0.0530	0.6257143
21	cg04591709	0.0466	0.0242	1.9280	0.0548	0.6257143
119	cg09114153	0.0280	0.0146	1.9194	0.0559	0.6257143

[[2]]

Table 29: Top10 CpGs from 120 for ipv3__pp__fm__pct of Male log10 by p.value (Sample Size = 292)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
68	cg15066197	-0.1946	0.0694	-2.8039	0.0054	0.6480000
109	cg04804814	0.1906	0.0861	2.2145	0.0276	0.7872000
4	cg21853587	0.2174	0.0995	2.1856	0.0297	0.7872000
70	cg25137968	0.1391	0.0645	2.1548	0.0320	0.7872000
35	cg08743751	0.1227	0.0572	2.1452	0.0328	0.7872000
86	cg01969701	0.0834	0.0428	1.9485	0.0524	0.9520588
80	cg16489689	0.1055	0.0576	1.8296	0.0684	0.9520588
65	cg09461851	0.1377	0.0798	1.7247	0.0857	0.9520588
37	cg05524354	0.0871	0.0524	1.6624	0.0975	0.9520588
88	cg20732198	0.0848	0.0515	1.6447	0.1011	0.9520588

[[3]]

Table 30: Top10 CpGs from 120 for Chol__IPV3 of Male log10 by p.value (Sample Size = 287)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
102	cg08162803	0.1011	0.0394	2.5642	0.0109	0.874
69	cg07105947	-0.0341	0.0162	-2.1106	0.0357	0.874
108	cg07011961	0.0586	0.0309	1.8965	0.0590	0.874
104	cg17132124	0.0510	0.0271	1.8835	0.0607	0.874
72	cg09825146	-0.0384	0.0214	-1.7976	0.0733	0.874
84	cg04061372	0.0198	0.0110	1.7973	0.0734	0.874
10	cg13699963	0.0851	0.0476	1.7869	0.0751	0.874
47	cg15486454	-0.0477	0.0271	-1.7597	0.0796	0.874
97	cg11618577	0.0434	0.0250	1.7396	0.0831	0.874
52	cg03225444	0.0864	0.0505	1.7101	0.0884	0.874

[[4]]

Table 31: Top10 CpGs from 120 for FFA__IPV3 of Male log10 by p.value (Sample Size = 265)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
46	cg21215576	0.1513	0.0501	3.0225	0.0028	0.336

	names	Estimate	Std.Error	t.statistic	p.value	FDR
4	cg21853587	-0.2415	0.1018	-2.3717	0.0185	0.846
89	cg16375541	0.2600	0.1176	2.2101	0.0280	0.846
88	cg20732198	-0.1148	0.0531	-2.1609	0.0316	0.846
22	cg19529074	-0.1452	0.0711	-2.0430	0.0421	0.846
43	cg13771313	0.0765	0.0379	2.0214	0.0443	0.846
64	cg15404665	0.0649	0.0356	1.8222	0.0696	0.846
120	cg14801692	0.0542	0.0310	1.7465	0.0819	0.846
94	cg05888037	-0.2177	0.1256	-1.7339	0.0842	0.846
107	cg15115757	-0.0412	0.0242	-1.7044	0.0895	0.846

[[5]]

Table 32: Top10 CpGs from 120 for Gluc_IPV3 of Male log10 by p.value (Sample Size = 295)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
17	cg01816336	-0.0981	0.0396	-2.4761	0.0139	0.9797
59	cg01060409	0.1314	0.0575	2.2864	0.0230	0.9797
30	cg23478547	0.0360	0.0177	2.0375	0.0425	0.9797
88	cg20732198	0.0478	0.0235	2.0291	0.0434	0.9797
32	cg23629795	0.0412	0.0208	1.9808	0.0486	0.9797
15	cg15355952	0.0573	0.0290	1.9767	0.0491	0.9797
92	cg26781129	0.0452	0.0244	1.8477	0.0657	0.9797
22	cg19529074	-0.0552	0.0309	-1.7885	0.0748	0.9797
49	cg04029532	0.0754	0.0426	1.7682	0.0781	0.9797
73	cg25138412	-0.0285	0.0168	-1.7010	0.0901	0.9797

[[6]]

Table 33: Top10 CpGs from 120 for HDL_IPV3 of Male log10 by p.value (Sample Size = 261)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
15	cg15355952	-0.1054	0.0333	-3.1646	0.0017	0.2040000
84	cg04061372	0.0308	0.0110	2.8043	0.0054	0.3020000
102	cg08162803	0.0993	0.0385	2.5761	0.0106	0.3020000
20	cg19549232	0.0924	0.0367	2.5191	0.0124	0.3020000
101	cg22946159	-0.1367	0.0548	-2.4925	0.0133	0.3020000
93	cg00798281	-0.0643	0.0263	-2.4463	0.0151	0.3020000
90	cg03989507	0.0708	0.0311	2.2785	0.0235	0.4028571
82	cg06230206	-0.0629	0.0292	-2.1575	0.0319	0.4785000
51	cg21209948	-0.0319	0.0154	-2.0630	0.0402	0.4920000
117	cg19059839	-0.0293	0.0143	-2.0539	0.0410	0.4920000

[[7]]

Table 34: Top10 CpGs from 120 for Insu_IPV3 of Male log10 by p.value (Sample Size = 282)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
73	cg25138412	-0.1090	0.0442	-2.4637	0.0144	0.9533793
111	cg09630142	0.1295	0.0569	2.2766	0.0236	0.9533793
24	cg21261158	-0.2247	0.1141	-1.9699	0.0499	0.9533793
91	cg20276750	-0.1754	0.0999	-1.7556	0.0803	0.9533793
82	cg06230206	0.1143	0.0660	1.7318	0.0845	0.9533793
48	cg19708901	-0.1525	0.0904	-1.6869	0.0928	0.9533793
18	cg01541565	0.1209	0.0720	1.6786	0.0944	0.9533793
65	cg09461851	0.1610	0.0988	1.6295	0.1044	0.9533793
57	cg17578309	-0.1901	0.1180	-1.6114	0.1083	0.9533793
107	cg15115757	0.0421	0.0277	1.5209	0.1295	0.9533793

[[8]]

Table 35: Top10 CpGs from 120 for Trig_IPV3 of Male log10 by p.value (Sample Size = 284)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
111	cg09630142	-0.1431	0.0443	-3.2318	0.0014	0.168
36	cg18373158	0.1295	0.0509	2.5434	0.0115	0.464
44	cg14349977	-0.0827	0.0326	-2.5413	0.0116	0.464
30	cg23478547	0.0836	0.0364	2.2993	0.0222	0.480
89	cg16375541	0.2456	0.1068	2.3001	0.0222	0.480
49	cg04029532	-0.2009	0.0885	-2.2703	0.0240	0.480
72	cg09825146	-0.0813	0.0382	-2.1276	0.0343	0.588
61	cg06243084	0.1372	0.0717	1.9148	0.0566	0.768
71	cg19711268	-0.0808	0.0426	-1.8948	0.0592	0.768
110	cg27535677	-0.0812	0.0446	-1.8212	0.0697	0.768

[[9]]

Table 36: Top10 CpGs from 120 for Leptin_actual_*ng_ml* of Male log10 by p.value (Sample Size = 252)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
78	cg24280832	0.4147	0.1136	3.6493	0.0003	0.0360000
37	cg05524354	0.2988	0.1007	2.9680	0.0033	0.1920000
15	cg15355952	0.3546	0.1246	2.8472	0.0048	0.1920000
55	cg20505445	-0.1772	0.0821	-2.1582	0.0319	0.7306667
47	cg15486454	0.2045	0.0958	2.1338	0.0339	0.7306667
38	cg07716131	0.3561	0.1715	2.0761	0.0390	0.7306667
97	cg11618577	-0.1649	0.0893	-1.8472	0.0660	0.7306667
118	cg01607625	0.2999	0.1625	1.8450	0.0663	0.7306667
45	cg07694864	0.1770	0.0960	1.8433	0.0665	0.7306667
50	cg24833819	0.1527	0.0866	1.7635	0.0791	0.7306667

```
lapply(Outcomes[1:9], function(x) {
    cpg_reg(log10(pfas_female_FDRcpg[, x]), pfas_female_FDRcpg,
        x, 10, "Female log10", 120)
})
```

[[1]]

Table 37: Top10 CpGs from 120 for birth_weight of Female log10 by p.value (Sample Size = 278)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
118	cg01607625	0.0606	0.0218	2.7815	0.0058	0.4176
16	cg27258399	0.0274	0.0101	2.7108	0.0071	0.4176
38	cg07716131	-0.0547	0.0216	-2.5380	0.0117	0.4176
89	cg16375541	0.0659	0.0272	2.4200	0.0162	0.4176
48	cg19708901	0.0517	0.0216	2.3927	0.0174	0.4176
91	cg20276750	-0.0462	0.0215	-2.1458	0.0328	0.5508
78	cg24280832	0.0276	0.0130	2.1152	0.0353	0.5508
21	cg04591709	0.0537	0.0263	2.0429	0.0421	0.5508
70	cg25137968	0.0338	0.0168	2.0157	0.0448	0.5508
50	cg24833819	0.0297	0.0148	2.0059	0.0459	0.5508

[[2]]

Table 38: Top10 CpGs from 120 for ipv3_pp_fm_pct of Female log10 by p.value (Sample Size = 271)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
68	cg15066197	-0.1936	0.0750	-2.5808	0.0104	0.9803077
19	cg15642854	-0.0514	0.0222	-2.3163	0.0213	0.9803077
22	cg19529074	0.1854	0.0866	2.1398	0.0333	0.9803077
109	cg04804814	0.1641	0.0819	2.0041	0.0461	0.9803077
1	cg09331106	-0.2992	0.1609	-1.8595	0.0641	0.9803077
110	cg27535677	0.0865	0.0480	1.8033	0.0725	0.9803077
85	cg02333352	0.2072	0.1156	1.7927	0.0742	0.9803077
16	cg27258399	0.0709	0.0403	1.7572	0.0801	0.9803077
13	cg03991871	-0.0790	0.0457	-1.7272	0.0853	0.9803077
44	cg14349977	0.0595	0.0351	1.6973	0.0909	0.9803077

[[3]]

Table 39: Top10 CpGs from 120 for Chol_IPV3 of Female log10 by p.value (Sample Size = 257)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
27	cg16659510	-0.1442	0.0501	-2.8788	0.0043	0.2700000
25	cg26381452	0.0502	0.0175	2.8655	0.0045	0.2700000
105	cg22138002	-0.0931	0.0368	-2.5340	0.0119	0.3560000
18	cg01541565	-0.0894	0.0354	-2.5225	0.0123	0.3560000
118	cg01607625	-0.1293	0.0540	-2.3941	0.0174	0.3560000
113	cg27166921	-0.1089	0.0457	-2.3855	0.0178	0.3560000

	names	Estimate	Std.Error	t.statistic	p.value	FDR
78	cg24280832	-0.0719	0.0310	-2.3204	0.0211	0.3617143
100	cg05227616	-0.0811	0.0383	-2.1149	0.0355	0.5325000
9	cg09473264	-0.0639	0.0319	-1.9996	0.0467	0.5378182
81	cg07226718	-0.1033	0.0519	-1.9920	0.0475	0.5378182

[[4]]

Table 40: Top10 CpGs from 120 for FFA_IPV3 of Female log10 by p.value (Sample Size = 237)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
9	cg09473264	-0.1372	0.0565	-2.4274	0.0160	0.7950000
65	cg09461851	0.1977	0.0860	2.2975	0.0225	0.7950000
93	cg00798281	-0.1250	0.0555	-2.2531	0.0252	0.7950000
101	cg22946159	0.2346	0.1050	2.2341	0.0265	0.7950000
114	cg17217478	0.0405	0.0207	1.9588	0.0514	0.8885333
107	cg15115757	0.0451	0.0238	1.8919	0.0598	0.8885333
79	cg06407657	0.1096	0.0607	1.8071	0.0721	0.8885333
120	cg14801692	-0.0624	0.0349	-1.7882	0.0751	0.8885333
17	cg01816336	0.1655	0.0938	1.7648	0.0790	0.8885333
61	cg06243084	0.1687	0.0975	1.7311	0.0848	0.8885333

[[5]]

Table 41: Top10 CpGs from 120 for Gluc_IPV3 of Female log10 by p.value (Sample Size = 263)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
94	cg05888037	-0.1581	0.0617	-2.5634	0.0110	0.7620000
5	cg26724375	-0.0689	0.0300	-2.2927	0.0227	0.7620000
82	cg06230206	-0.0553	0.0245	-2.2586	0.0248	0.7620000
110	cg27535677	0.0459	0.0204	2.2495	0.0254	0.7620000
10	cg13699963	-0.0851	0.0416	-2.0464	0.0418	0.7905000
51	cg21209948	0.0483	0.0244	1.9752	0.0493	0.7905000
75	cg13652281	0.0968	0.0493	1.9644	0.0506	0.7905000
48	cg19708901	0.0715	0.0367	1.9470	0.0527	0.7905000
13	cg03991871	-0.0372	0.0199	-1.8658	0.0632	0.8426667
78	cg24280832	0.0382	0.0222	1.7192	0.0868	0.9585882

[[6]]

Table 42: Top10 CpGs from 120 for HDL_IPV3 of Female log10 by p.value (Sample Size = 242)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
111	cg09630142	-0.0839	0.0316	-2.6515	0.0086	0.3685714
38	cg07716131	-0.1327	0.0507	-2.6149	0.0095	0.3685714
16	cg27258399	-0.0604	0.0237	-2.5461	0.0116	0.3685714

	names	Estimate	Std.Error	t.statistic	p.value	FDR
100	cg05227616	-0.0942	0.0374	-2.5210	0.0124	0.3685714
41	cg03604367	0.0913	0.0378	2.4148	0.0165	0.3685714
25	cg26381452	0.0400	0.0172	2.3239	0.0210	0.3685714
27	cg16659510	-0.1130	0.0488	-2.3147	0.0215	0.3685714
18	cg01541565	-0.0783	0.0347	-2.2555	0.0250	0.3750000
43	cg13771313	-0.0442	0.0203	-2.1842	0.0300	0.4000000
95	cg07638935	0.1370	0.0647	2.1186	0.0352	0.4224000

[[7]]

Table 43: Top10 CpGs from 120 for Insu_IPV3 of Female log10 by p.value (Sample Size = 255)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
35	cg08743751	0.2928	0.0706	4.1470	0.0000	0.0000
40	cg19667731	-0.2844	0.0893	-3.1842	0.0016	0.0960
84	cg04061372	-0.0684	0.0251	-2.7190	0.0070	0.2760
119	cg09114153	0.1922	0.0744	2.5843	0.0103	0.2760
114	cg17217478	-0.0537	0.0219	-2.4560	0.0148	0.2760
30	cg23478547	-0.1117	0.0461	-2.4244	0.0161	0.2760
86	cg01969701	0.1360	0.0561	2.4246	0.0161	0.2760
94	cg05888037	-0.3696	0.1662	-2.2240	0.0271	0.4065
36	cg18373158	0.1232	0.0618	1.9945	0.0472	0.5760
16	cg27258399	0.0921	0.0463	1.9876	0.0480	0.5760

[[8]]

Table 44: Top10 CpGs from 120 for Trig_IPV3 of Female log10 by p.value (Sample Size = 252)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
118	cg01607625	-0.2053	0.0865	-2.3747	0.0184	0.8023529
10	cg13699963	-0.2083	0.0939	-2.2175	0.0275	0.8023529
120	cg14801692	0.0655	0.0308	2.1289	0.0343	0.8023529
9	cg09473264	-0.1036	0.0511	-2.0277	0.0437	0.8023529
84	cg04061372	0.0423	0.0212	1.9952	0.0472	0.8023529
61	cg06243084	0.1681	0.0855	1.9667	0.0504	0.8023529
71	cg19711268	-0.0979	0.0512	-1.9135	0.0569	0.8023529
69	cg07105947	-0.0473	0.0258	-1.8342	0.0679	0.8023529
90	cg03989507	0.0976	0.0544	1.7944	0.0740	0.8023529
7	cg04523661	0.1275	0.0713	1.7871	0.0752	0.8023529

[[9]]

	names	Estimate	Std.Error	t.statistic	p.value	FDR

Table 45: Top10 CpGs from 120 for Leptin_actual_ng_ml of Female log10 by p.value (Sample Size = 226)

	names	Estimate	Std.Error	t.statistic	p.value	FDR
7	cg04523661	-0.4288	0.1297	-3.3065	0.0011	0.1320000
13	cg03991871	-0.2149	0.0803	-2.6745	0.0081	0.4860000
24	cg21261158	0.4504	0.1865	2.4144	0.0166	0.5400000
36	cg18373158	0.2249	0.0943	2.3833	0.0180	0.5400000
78	cg24280832	0.2090	0.0940	2.2224	0.0273	0.6411429
90	cg03989507	-0.2162	0.1015	-2.1299	0.0343	0.6411429
22	cg19529074	0.2851	0.1361	2.0946	0.0374	0.6411429
25	cg26381452	0.1038	0.0512	2.0275	0.0439	0.6585000
47	cg15486454	0.1817	0.0950	1.9135	0.0570	0.6924000
113	cg27166921	0.2592	0.1358	1.9082	0.0577	0.6924000