

```

      "p.value"))))

# adjusted p-value
outcome_lm = outcome_lm %>% mutate(FDR = p.adjust(p.value,
  "BH", ncp = ncp), names = colnames(data)[21:(ncp + 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 ",
  ncp, " 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)
})
```