

0708-1

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## Single continuous outcome

### Structure & Relationship

Outcome : Y Exposure : A,B,C Covariates : D,F,G,H

relationship:

$$E(Y|A, B, C, D, F, G, H) \sim N(\mu, \sigma)$$

$$E(A|D, F, G, H) \sim N(\mu, \sigma)$$

$$E(B|D, F, G, H) \sim N(\mu, \sigma)$$

$$E(c|D, F, G, H) \sim N(\mu, \sigma)$$

$$E(D) \sim \text{bin}(0.7)$$

$$E(F) \sim N(30, 5)$$

$$E(G) \sim N(120, 5)$$

$$E(H) \sim \text{Poi}(20)$$

### 1.First: try with small sample

```
n = 1000

#covariates
d = rbinom(n,1,0.7)
e = rnorm(n,30,5)
f = rnorm(n,120,5)
h = rpois(n,20)

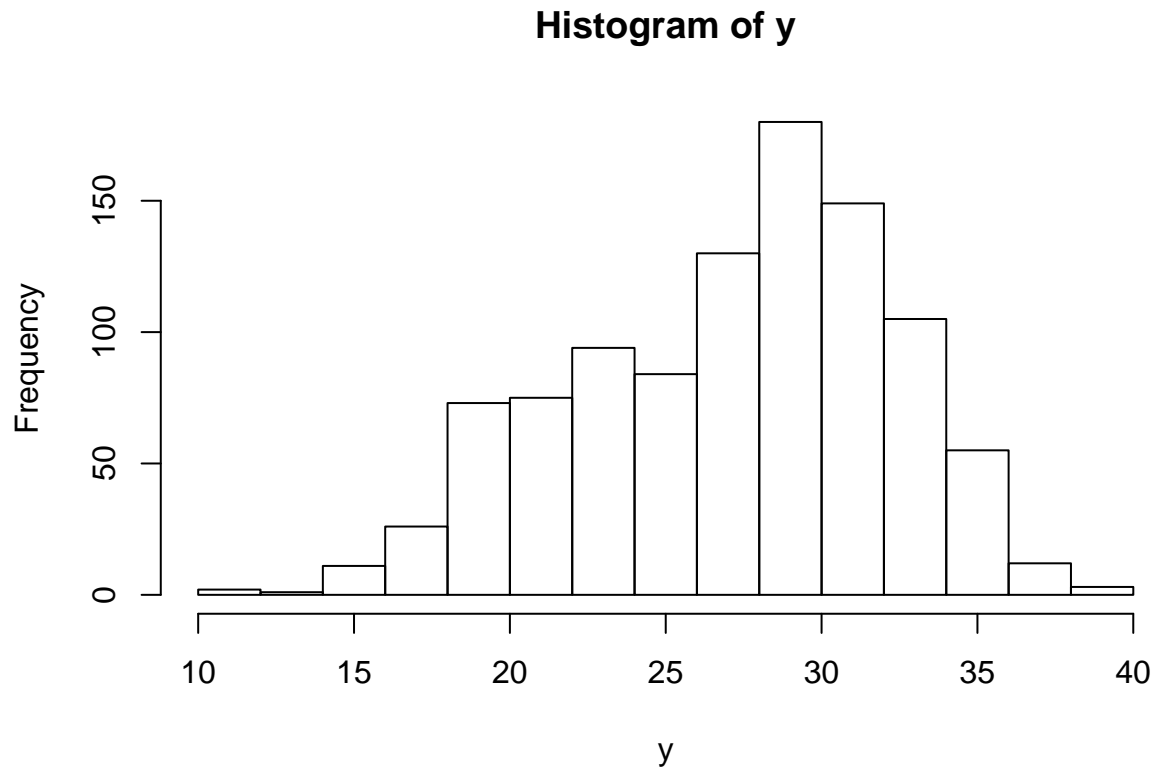
#exposures

b = 2.5*d+0.027*e+0.018*f+0.035*h +rnorm(n,0,0.5)
c = 1.5*d+0.013*e+0.008*f+0.35*h+rnorm(n,0,0.5)
d = 3.5*d+0.07*e+0.002*f+0.05*h+rnorm(n,0,0.5)

#response
```

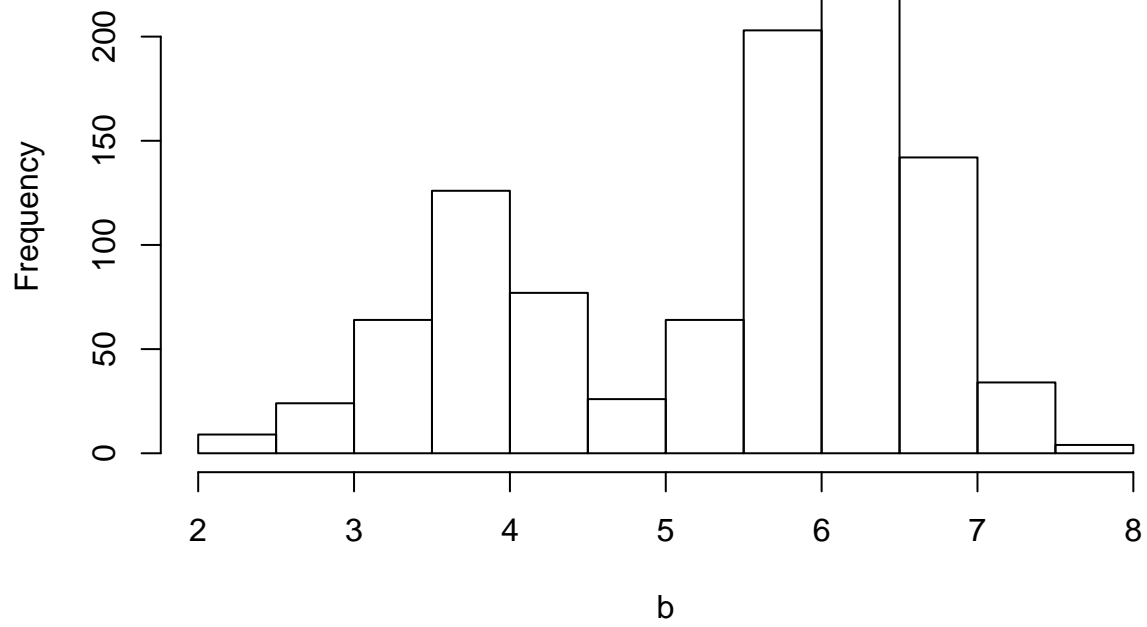
```
y = 0.26*b+0.35*c+0.87*d+1.3*d+0.072*e+0.008*f+0.35*h+rnorm(n,0,0.5)
```

```
hist(y)
```



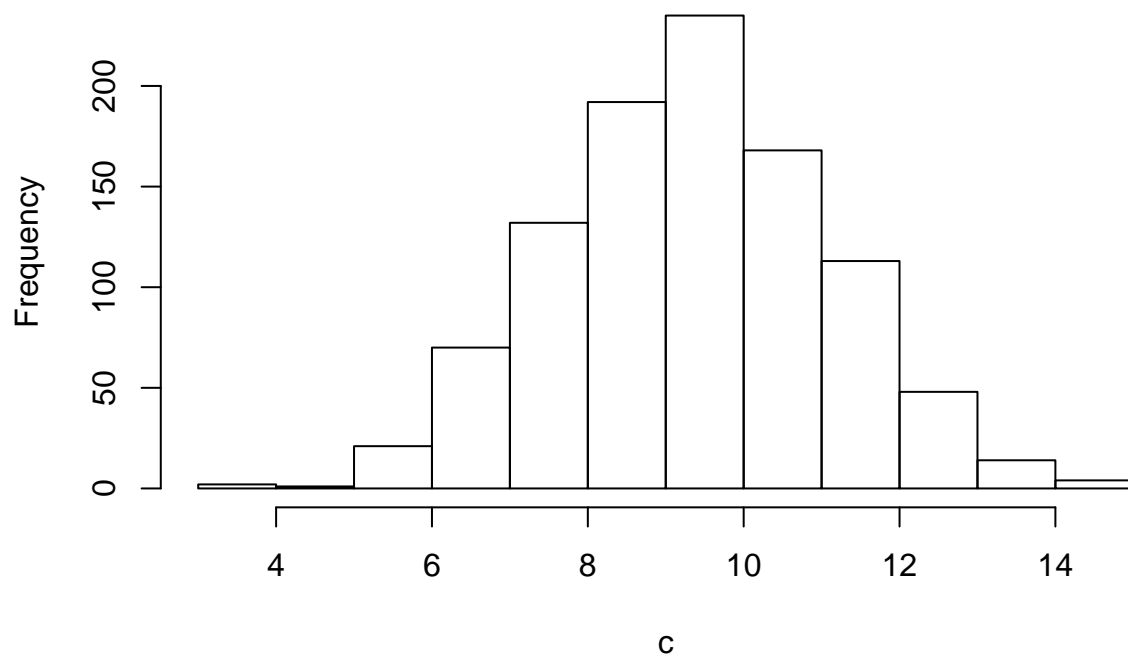
```
hist(b)
```

**Histogram of b**

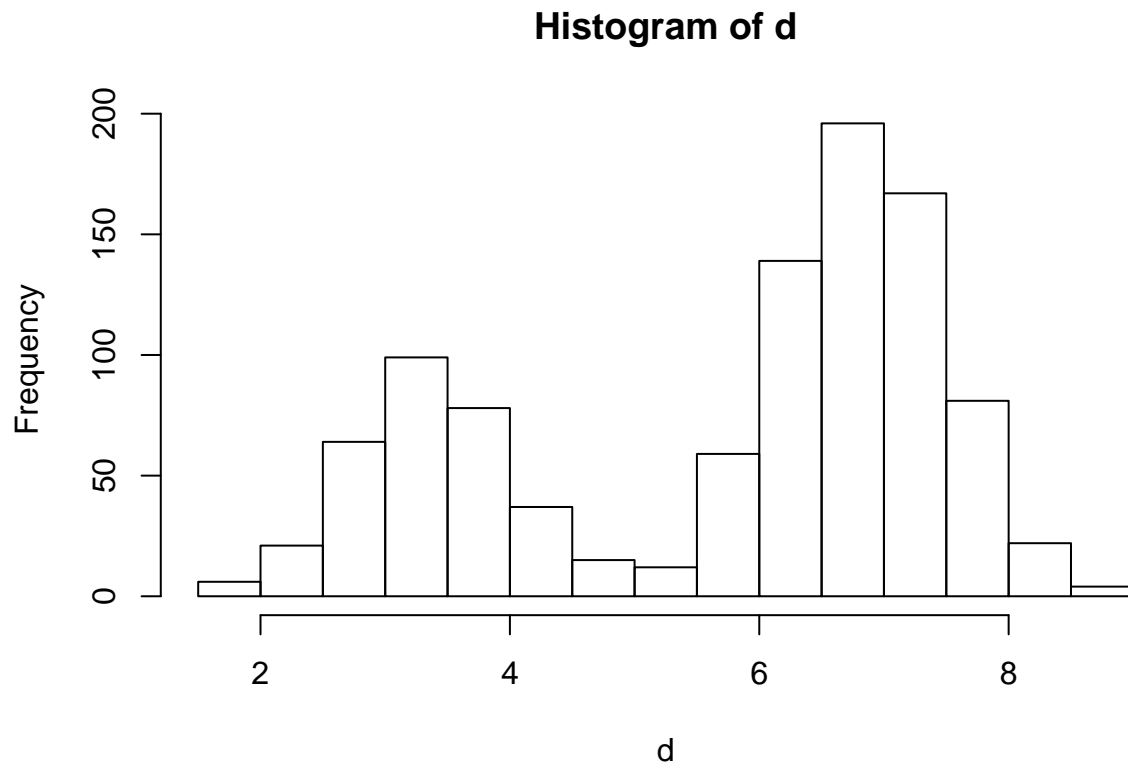


```
hist(c)
```

**Histogram of c**



```
hist(d)
```



g-formula

marginal structural model