Power Analysis

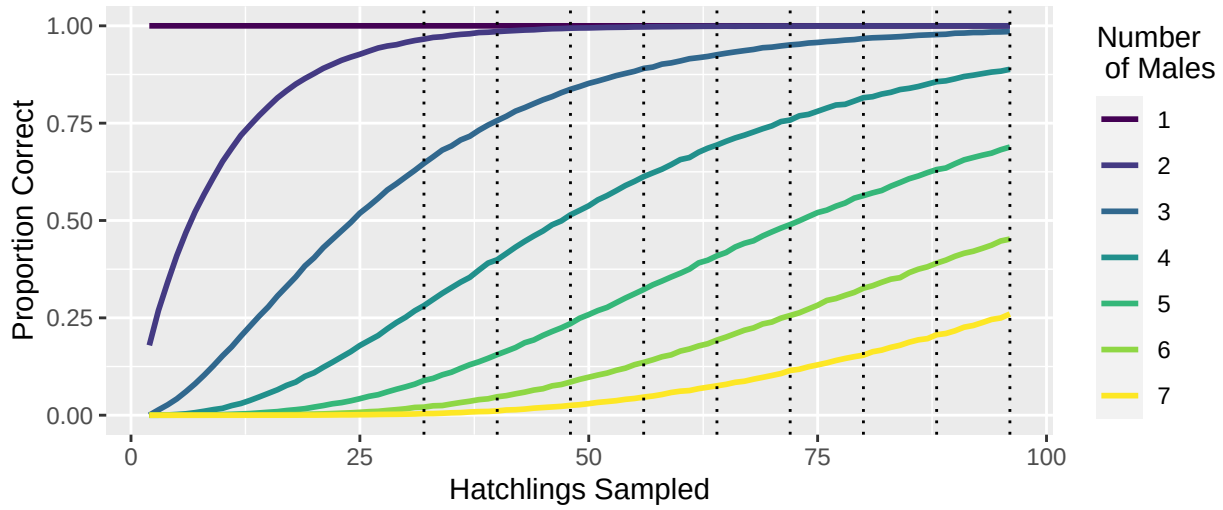
Question 1: How many hatchlings should be sampled from a nest to robustly estimate the number of males that contributed to it?

Assuming one dominant sire that fertilizes 90% of eggs

```
source('hatchlings_to_sample.R')

hatchlings_to_sample(n_hatchlings = 100,
                max_hatchlings = 96,
                max_males = 7,
                breeding = 'dominant',
                n_sims = n_sims,
                dom = 0.9,
                n_sizes = c(32, 40, 48, 56, 64, 72, 80, 88, 96))
```

```
## [[1]]
```



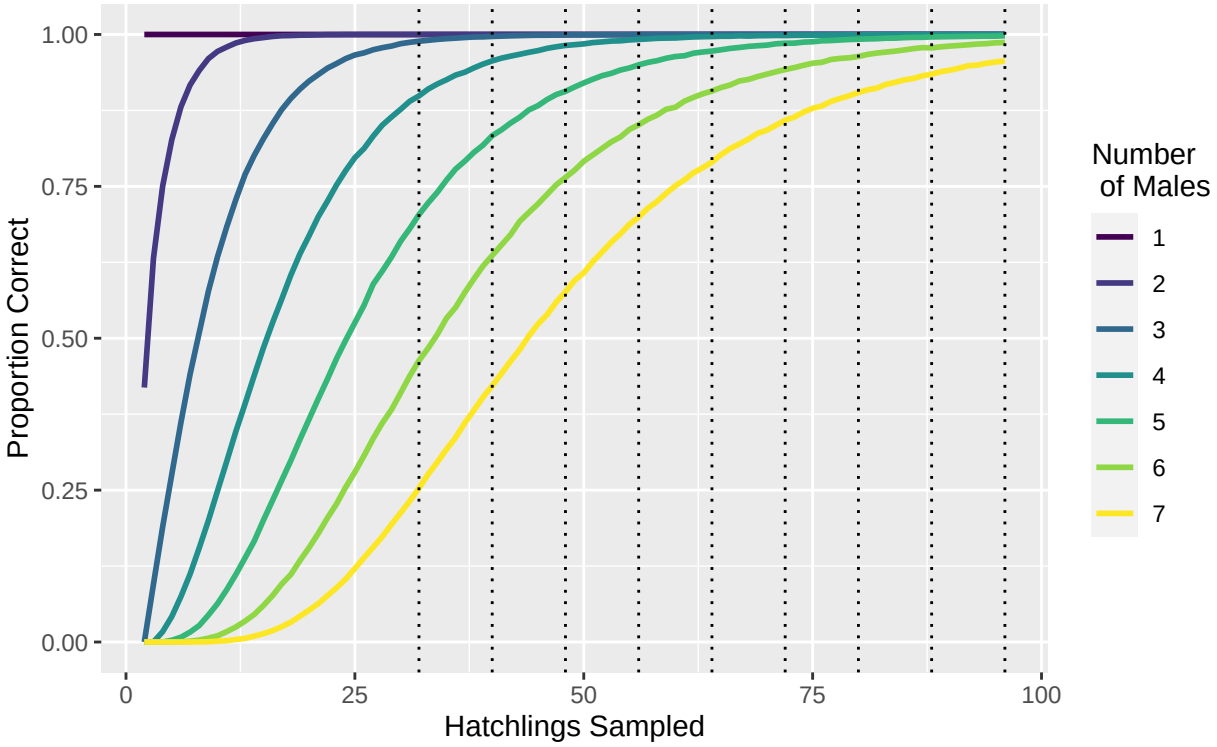

```
##
## [[2]]
##   Males      32      40      48      56      64      72      80      88      96
## 1     1 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000
## 2     2 0.96589 0.98519 0.99398 0.99717 0.99891 0.99951 0.99977 0.99988 0.99999
## 3     3 0.64689 0.75664 0.83692 0.89070 0.92573 0.95104 0.96769 0.97759 0.98529
## 4     4 0.28144 0.39921 0.51453 0.61268 0.69384 0.75795 0.81543 0.85653 0.88835
## 5     5 0.08918 0.15564 0.23521 0.32282 0.40934 0.48947 0.56385 0.63079 0.68862
## 6     6 0.02068 0.04732 0.08516 0.13555 0.19292 0.25597 0.32618 0.39050 0.45227
## 7     7 0.00412 0.01094 0.02521 0.04653 0.07537 0.11482 0.15412 0.20662 0.25980
```

Assuming one dominant sire that fertilizes 70% of eggs

```
source('hatchlings_to_sample.R')

hatchlings_to_sample(n_hatchlings = 100,
                max_hatchlings = 96,
                max_males = 7,
                breeding = 'dominant',
                n_sims = n_sims,
                dom = 0.7,
                n_sizes = c(32, 40, 48, 56, 64, 72, 80, 88, 96))
```

```
## [[1]]
```



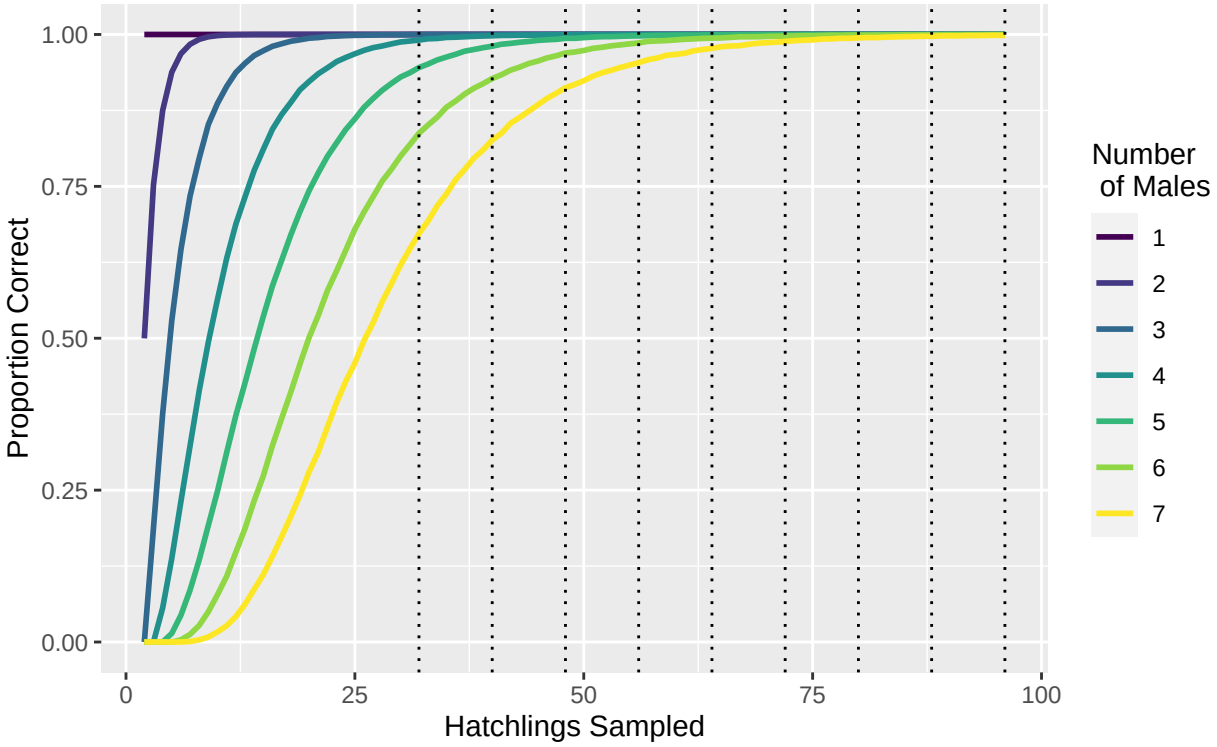

```
##
## [[2]]
##   Males      32      40      48      56      64      72      80      88      96
## 1     1 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000
## 2     2 0.99996 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000
## 3     3 0.98895 0.99680 0.99910 0.99979 0.99995 0.99998 0.99998 0.99999 1.00000
## 4     4 0.89881 0.95657 0.98197 0.99184 0.99661 0.99824 0.99933 0.99962 0.99984
## 5     5 0.70341 0.83342 0.90640 0.94998 0.97269 0.98555 0.99220 0.99595 0.99791
## 6     6 0.46308 0.63617 0.76457 0.85138 0.90689 0.94222 0.96380 0.97798 0.98680
## 7     7 0.25325 0.42173 0.57643 0.69932 0.78982 0.85888 0.90446 0.93467 0.95643
```

Assuming one dominant sire that fertilizes 50% of eggs

```
source('hatchlings_to_sample.R')

hatchlings_to_sample(n_hatchlings = 100,
                max_hatchlings = 96,
                max_males = 7,
                breeding = 'dominant',
                n_sims = n_sims,
                dom = 0.5,
                n_sizes = c(32, 40, 48, 56, 64, 72, 80, 88, 96))
```

```
## [[1]]
```




```
##
## [[2]]
##   Males      32      40      48      56      64      72      80      88      96
## 1     1 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000
## 2     2 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000
## 3     3 0.99982 0.99999 0.99999 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000
## 4     4 0.99080 0.99785 0.99954 0.99985 0.99996 1.00000 1.00000 1.00000 1.00000
## 5     5 0.94553 0.98070 0.99377 0.99764 0.99933 0.99975 0.99988 0.99994 0.99999
## 6     6 0.83742 0.92746 0.96952 0.98603 0.99395 0.99747 0.99907 0.99948 0.99983
## 7     7 0.67225 0.82614 0.91243 0.95360 0.97722 0.98841 0.99437 0.99706 0.99832
```