

Probability Distributions so far (a family comparison)

Bernoulli (p)

A child is born in a family.

Is it a girl or a boy?

• p = Probability (girl)

Binomial (n, p)

A family has a bunch of children.

How many of them are girls?

• n = # kids

• p = Probability (girl)

Hyper Geometric (M, N, k)

Take a few kids from family to candy store.

How many of the kids with me are girls?

• x = # (girls going to store)

• M = # (girls in family)

• k = # (kids going to store)

• N = # (boys in family)



Note: Textbook writes

HyperGeometric ($k, M, \underline{M+N}$)

↳ total # kids

Geometric (p)

A family keeps having kids until a girl is born.

How many kids are there?

• p = Probability (girl is born)

Negative Binomial (r, p)

A family keeps having kids until enough girls born.

How many boys are there?

• r = Required # girls

• p = Probability (girl is born)

In R these are:

BINOMIAL: $\text{dbinom}(x, \text{size}, \text{prob})$

HYPERGEOM: $\text{dhyper}(x, \underbrace{m, n}_\text{Total pop.}, k)$

Total pop.
 m = # succ.
 n = # fail Sample pop.
 k = # sample

GEOMETRIC: $\text{dgeom}(x, \text{prob})$

NEG. BINOM.: $\text{dnbinom}(x, \text{size}, \text{prob})$

success required