Hardy Weinberg Equation

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- **Purpose:** Determine allele frequency in a population
  - Can determine frequency of homozygous and heterozygous genotypes
- **Uses:** Determine genetics health of a population
  - Calculate the risk of being a carrier for a genetic disorder

The Equation Set Up

- p = frequency of dominant alleles
- q = frequency of recessive alleles

Therefore p + q = 1

Genotypes

- Homozygous Dominant: pp
- Heterozygous: pq
- Homozygous Recessive: qq

But those weren't a part of the equation…yet…

Full Equation

$$(p + q)^2 = 1^2$$

$$p^2 + 2pq + q^2 = 1$$

How to use it

1. Determine q^2 from the population.
   (Those who show the recessive trait must be q^2)
2. Find q by taking the square root
3. Solve for p using $p + q = 1$
4. Plug in your values for whatever you are looking for.

Example

- There is a recessive genetic disorder that shows up in 1 out of every 64 babies born. Determine the frequency of each allele and the percentage of the population that is homozygous dominant, homozygous recessive and heterozygous.