

Hardy-Weinberg

Biology

The equilibrium equation, and the assumptions it requires.

Allele and genotype frequencies stay constant across generations under specific conditions.

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

$$q^2 = 0.04 \text{ (affected)}$$

$$q = 0.2, p = 0.8$$

Carrier frequency

32% are carriers.

$$2pq = 2(0.8)(0.2) = 0.32$$

Homozygous dominant

$$p^2 = 0.64$$

THE COMMON MISTAKE

✗ **Applying it without checking assumptions**

✓ **Checking all five**

It requires no mutation, no selection, no migration, random mating and a large population. Real populations violate several.

Deviation from equilibrium is the useful result: it indicates selection, drift, migration or non-random mating.