Key Terms:

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Key Questions:

- Why is natural selection easier to predict than genetic drift?
- Why is “survival of the fittest” not a great description of evolution?
- Why do harmful, disease-causing alleles still exist in the human population?

Lecture Outline:

So what happens when H-W conditions are NOT met? evolution!

Natural Selection - difference in reproduction, which typically implies survival
  leads to adaptive evolution – a species that fits better with it’s environment
  of course the environment changes too

Genetic Drift - differences in allele frequencies due to chance
  amplified in small populations; can have really be effects on allele frequencies
  Founder Effect
  Bottleneck Effect

Gene Flow - adding or removing alleles from the population

Relative Fitness describes how much an individual contributes to the gene pool in the next generation
  reflective of the match between an individual and it’s environment relative to the others

Natural selection can affect the population in three main ways:
  Directional selection - current conditions favor one extreme of a phenotype
  Disruptive selection - disfavors the moderate phenotype and favors either extreme
  Stabilizing selection - favors the moderate phenotype over either extreme

Adaptive Evolution improves the fit between organism and the current environment
  drift and gene flow will alter the allele frequencies but may or may not improve fitness

Sexual selection – focuses specifically on obtaining mates, not just survival
  often leads to sexual dimorphism
  intrasexual selection – one sex competes for a limited mate.
  intersexual selection – one sex chooses to mate with the most fit

Why is genetic diversity preserved?
  one reason is diploidy. allows recessive allele to “hide”

Balancing selection – natural selection maintains two or more alleles as advantageous
  Heterozygote advantage
  Frequency-Dependent Selection

Neutral Variation – many changes have essentially no contribution to fitness
  at least in the current environment