

F-Statistic:

$$F_{ST} = 1 - \frac{\pi_{within}}{\pi_{between}}$$

Hudson et al 1992

F<sub>ST</sub> = 1 = Highly structured

F<sub>ST</sub> = 0 = No structuration

Genetic differentiation index (GDI, based on heterozygosity):

| Fixed | Private A | Private B | Shared |
|-------|-----------|-----------|--------|
| AA/TT | AT/AA     | AA/AT     | AT/AT  |

$$\pi_{AB} = \text{fixed} + \text{private}_A + \text{private}_B + \text{shared}_{AB}$$

$$\pi_A = \text{private}_A + \text{shared}_{AB}$$

$$\pi_B = \text{private}_B + \text{shared}_{AB}$$

$$1 - \frac{(\pi_A + \pi_B) / 2}{\pi_{tot AB}}$$

Comparing intra vs extra population GDIs:

$$1 - \frac{(\pi_{A1} + \pi_{A2}) / 2}{\pi_{tot A}}$$

GDI within pop A  
(control)

vs

$$1 - \frac{(\pi_{A1} + \pi_{B1}) / 2}{\pi_{tot A1B1}}$$

global GDI

