EXERCISES
Session 4b: Quantitative genetics

Exercise 1 (multifactorial inheritance)

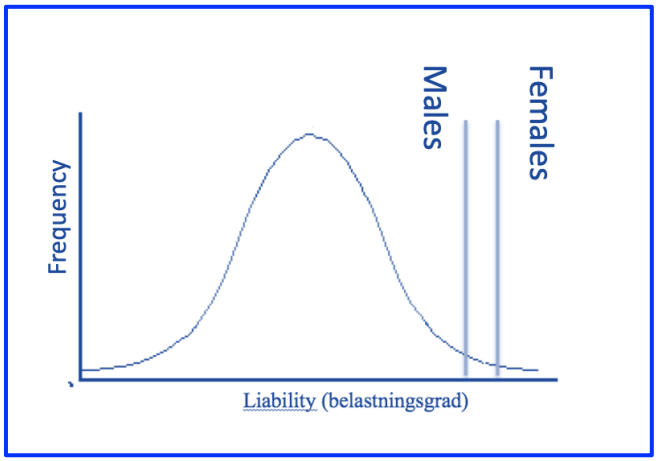
A. Discuss the similarities and differences between i) monogenic traits, ii) polygenic traits, and iii) multifactorial traits in terms of [but not exclusive to]:
   - *Genetic architecture plot.*
   - *Mendelian inheritance.*
   - *Number of risk variants.*
   - *Non-genetic influence.*
   - *Example traits.*
   - *Other.*

   …

Exercise 2 (liability and threshold model)

Consider a multifactorial disease that occurs twice as frequently in males as in females.

A. Draw a liability distribution curve for the population and indicate the respective thresholds for males and females.
   Because the trait is more common in males than in females, we infer that the genetic threshold for becoming affect by the disease is lower for males than for females.



B. Identify which parental combination carries the highest risk of having affected children and briefly explain why:
   i) Affected mother and healthy father.
   ii) Affected father and healthy mother.
   An affected mother is at greater risk for producing affected offspring than is an affected father, because she (on average) has a higher genetic burden for the trait.

C. Which offspring gender has the highest recurrence risk?
   Boy offspring as males need fewer risk alleles/genes to become affected.