

Polygenic Risk Scores - Africa

Day 4 - PRS Ethics considerations

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Lecture Outline

- | What does Ethics in PRS means to us?
- | Potential Benefits of PRS
- | Potential risk of PRS
- | Ethics considerations in Africa

What does ethics means to you with regard to PRS?

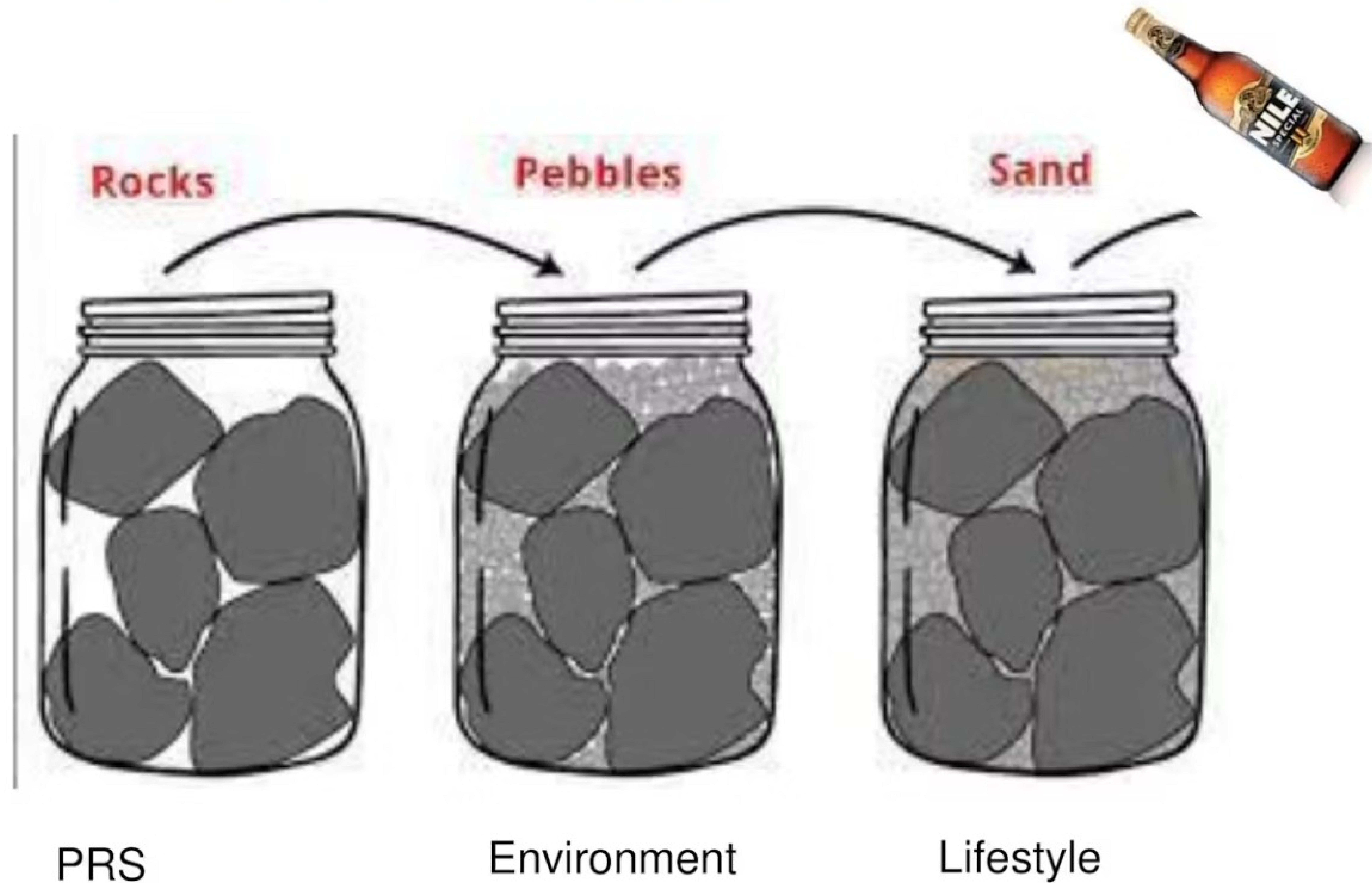


What does PRS means to us?

Polygenic risk scores (PRSs) aggregate the many small effects of alleles across the human genome to estimate the risk of a disease or disease-related trait for an individual.

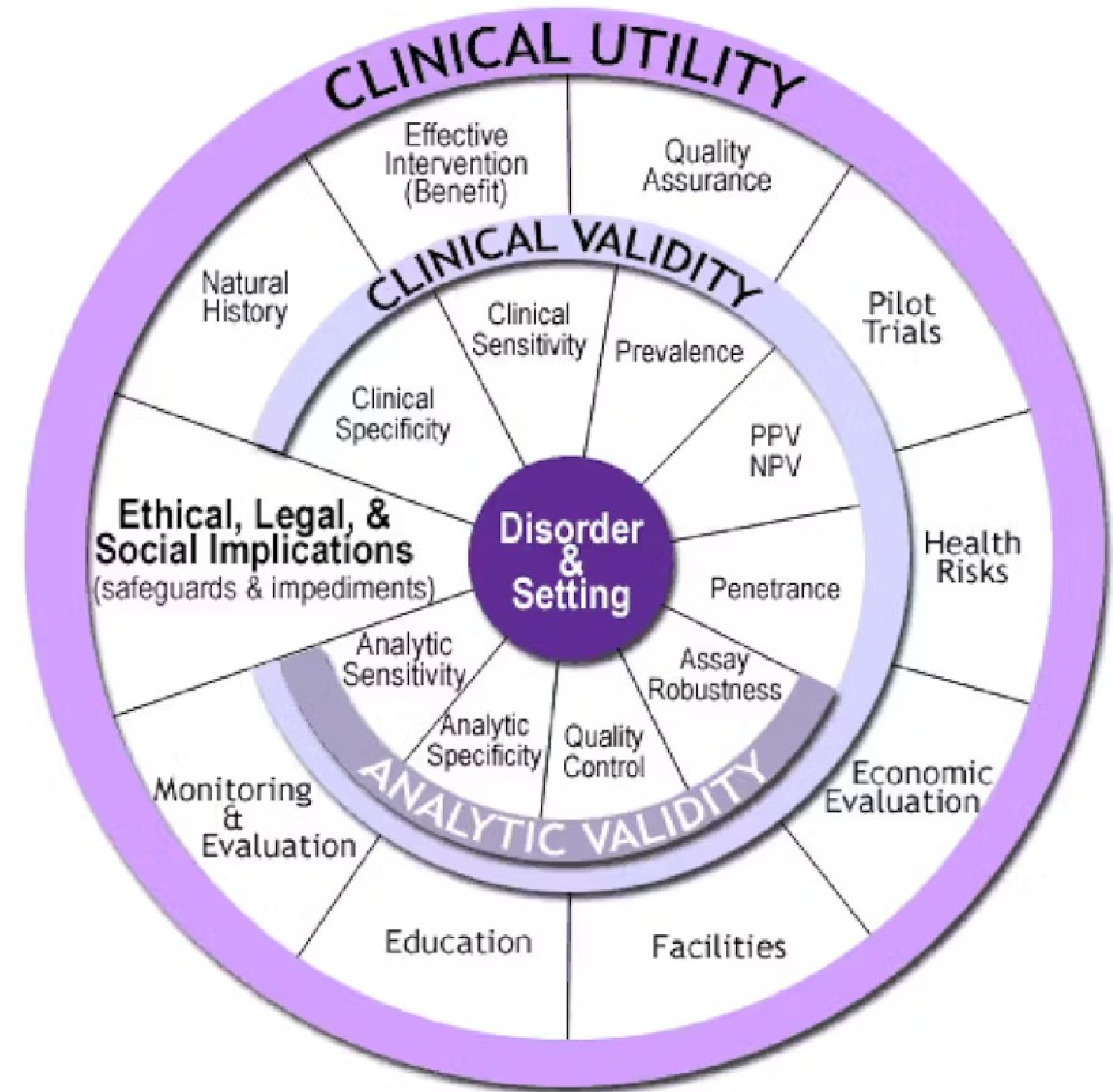


What does PRS means to us?



What does PRS means to us?

Translation of PRS in Health system



What does PRS means to us?

- An individual with the highest polygenic risk score (top 1%) had a lifetime cardiovascular risk >10% which was comparable to those with rare genetic variants. (Khera et al., 2018)
- Clinical practice can be influenced by knowing which individuals have this rare genetic cause of cardiovascular disease
- Accuracy improvement of clinical prediction: 14.2% correctly reclassified to the higher-risk category and 2.6% incorrectly reclassified to the lower-risk category. (King et al., 2022)

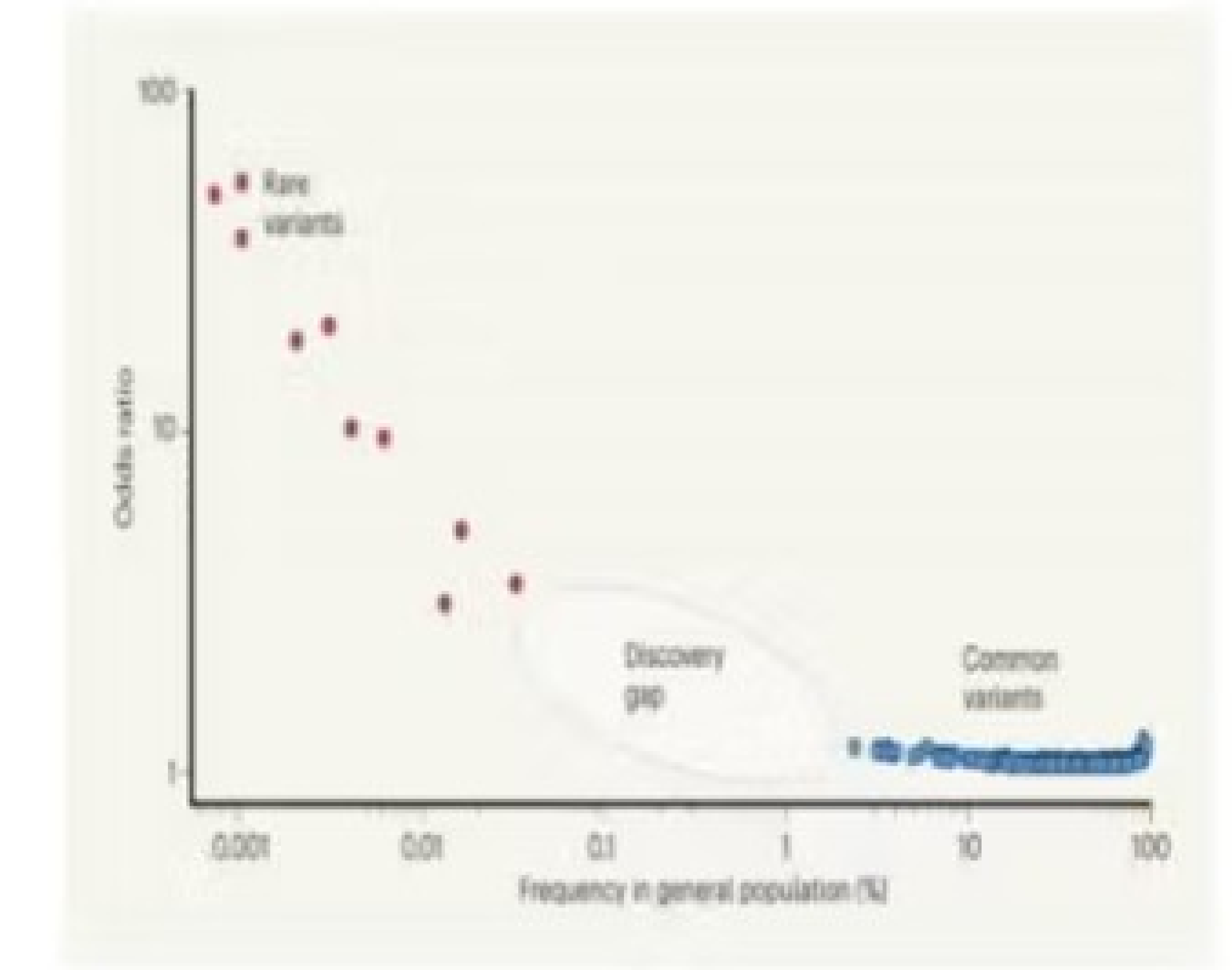
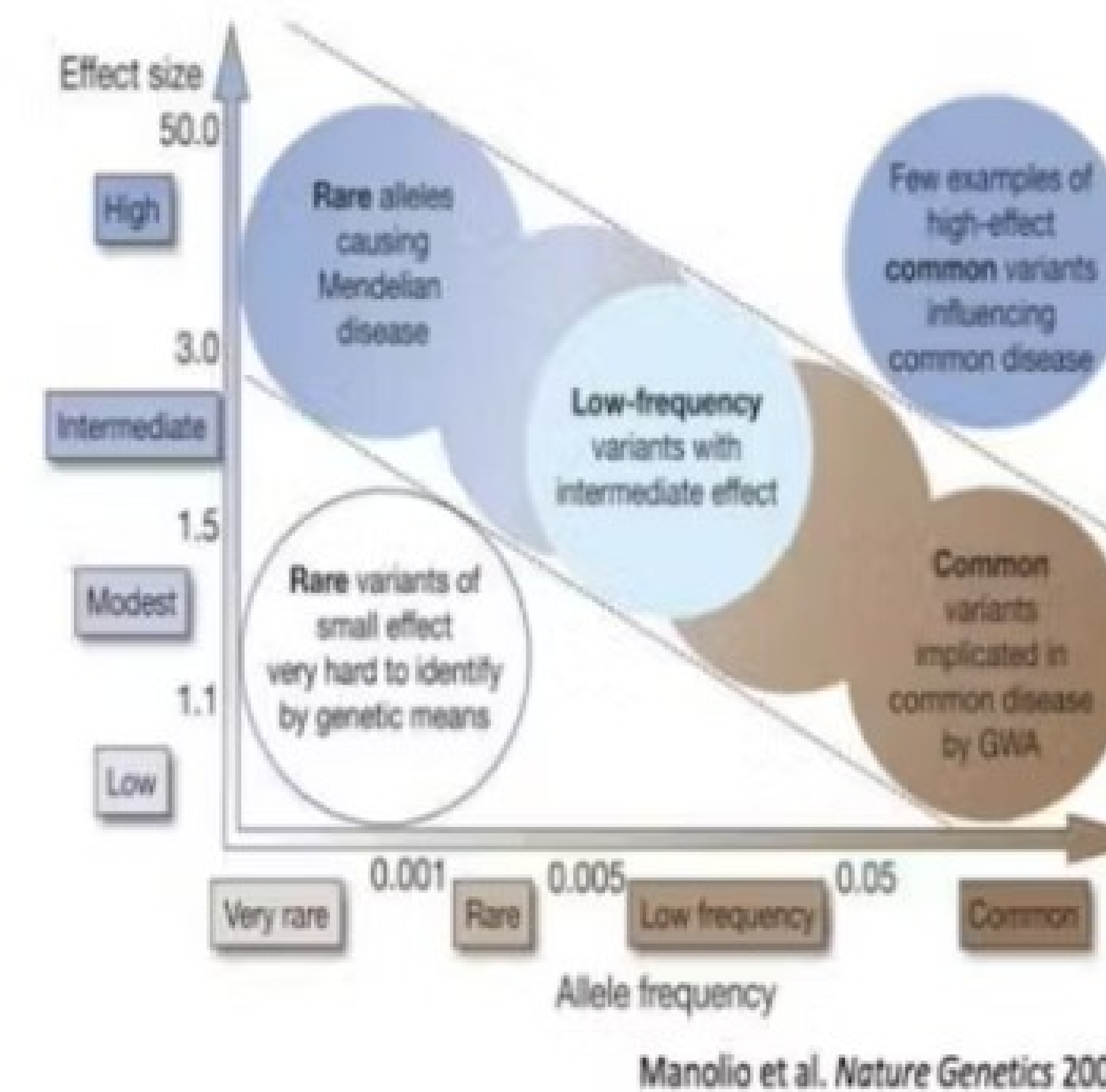
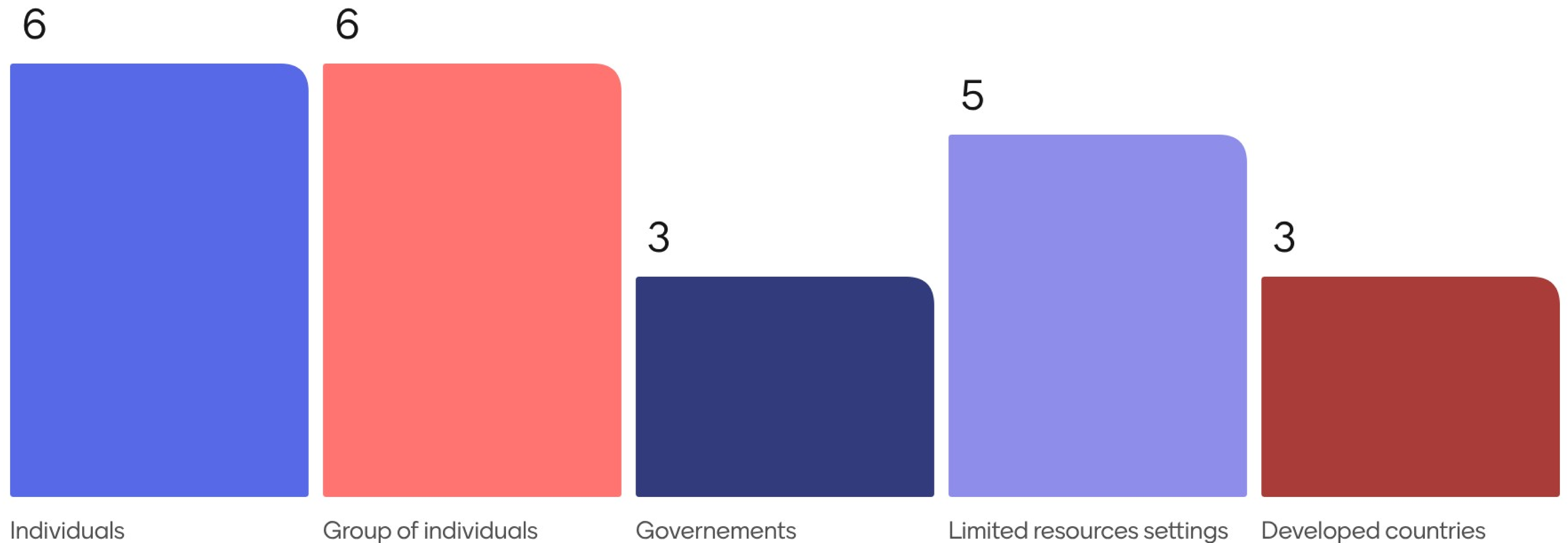


Figure 1: Genetic variants associated with schizophrenia. Trubetskoy et al.² used genome-wide association studies (GWASs) to identify 342 common genetic variants that are each associated with a slightly

Iyegbe & O'Reilly, *Nature*. 2022

Who do you think will benefit more from precision medicine



Improved precision medicine

- Individualized risk prediction
- Group specific risk prediction
- More efficient population-level screening
- Better treatment (response prediction)
- Cost-effective enhancement of primary disease prevention

What are the potential risk related to PRS use?



Potential risk of PRS

- ❖ Risks arising from 'correct' information. Do not confuse PRS and monogenic results (clinically validated)
- ❖ Improper risk communication may result in physical or financial harm from unnecessary lifestyle or clinical interventions, as well as unwarranted negative psychosocial effects such as anxiety or depression.
- ❖ Need for genetic counselor before and after the genetic test, followed by a physician visit.

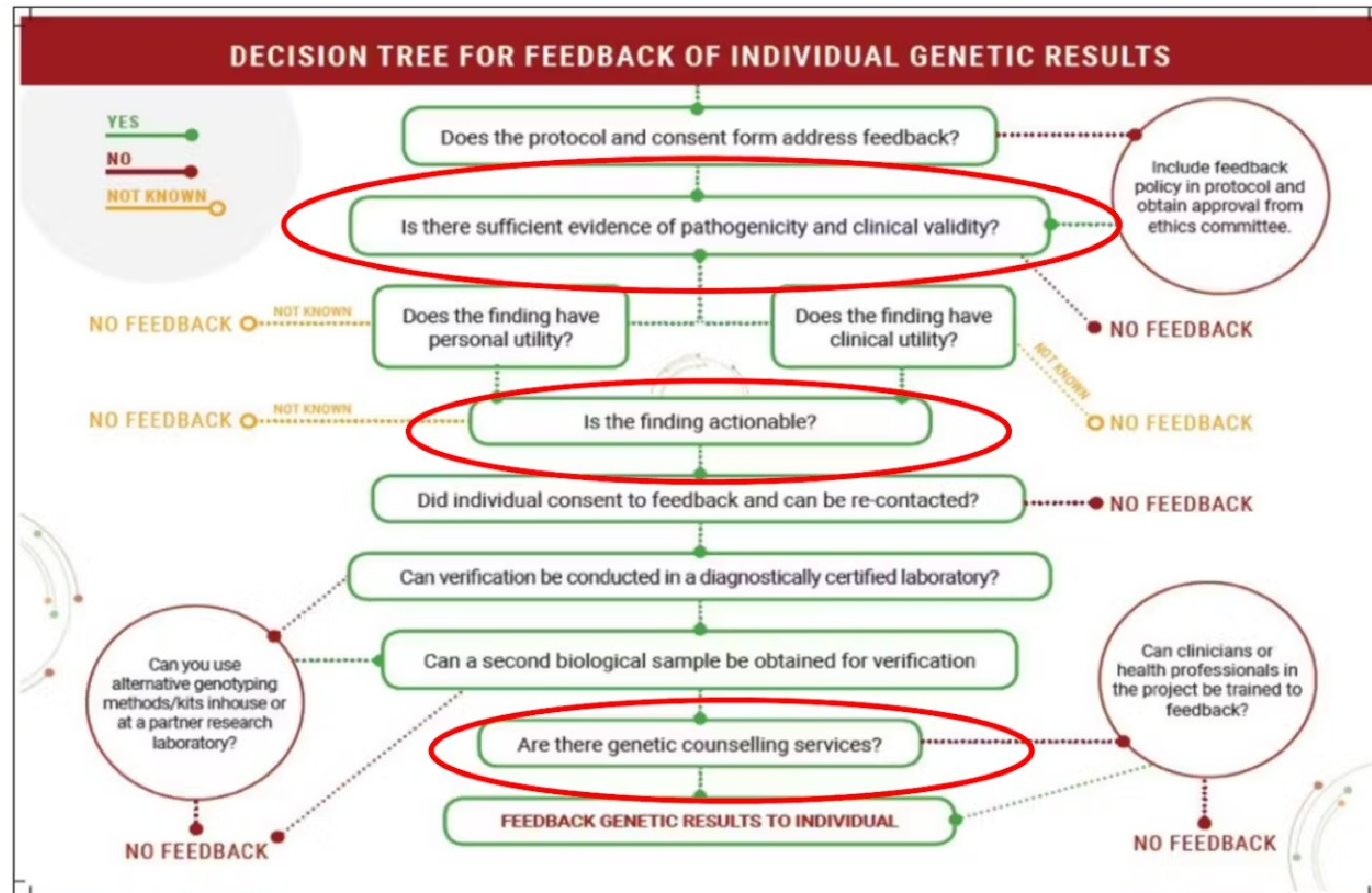
Potential risk of PRS

- ❖ For population-level screening, it is not feasible to scale this process for the return of PRS results to many individuals for many diseases, particularly because genetic counsellors are in short supply in many countries
- ❖ Reduced cross ancestry predictivity

Ethical, legal, and social implications (ELSI) of PRS

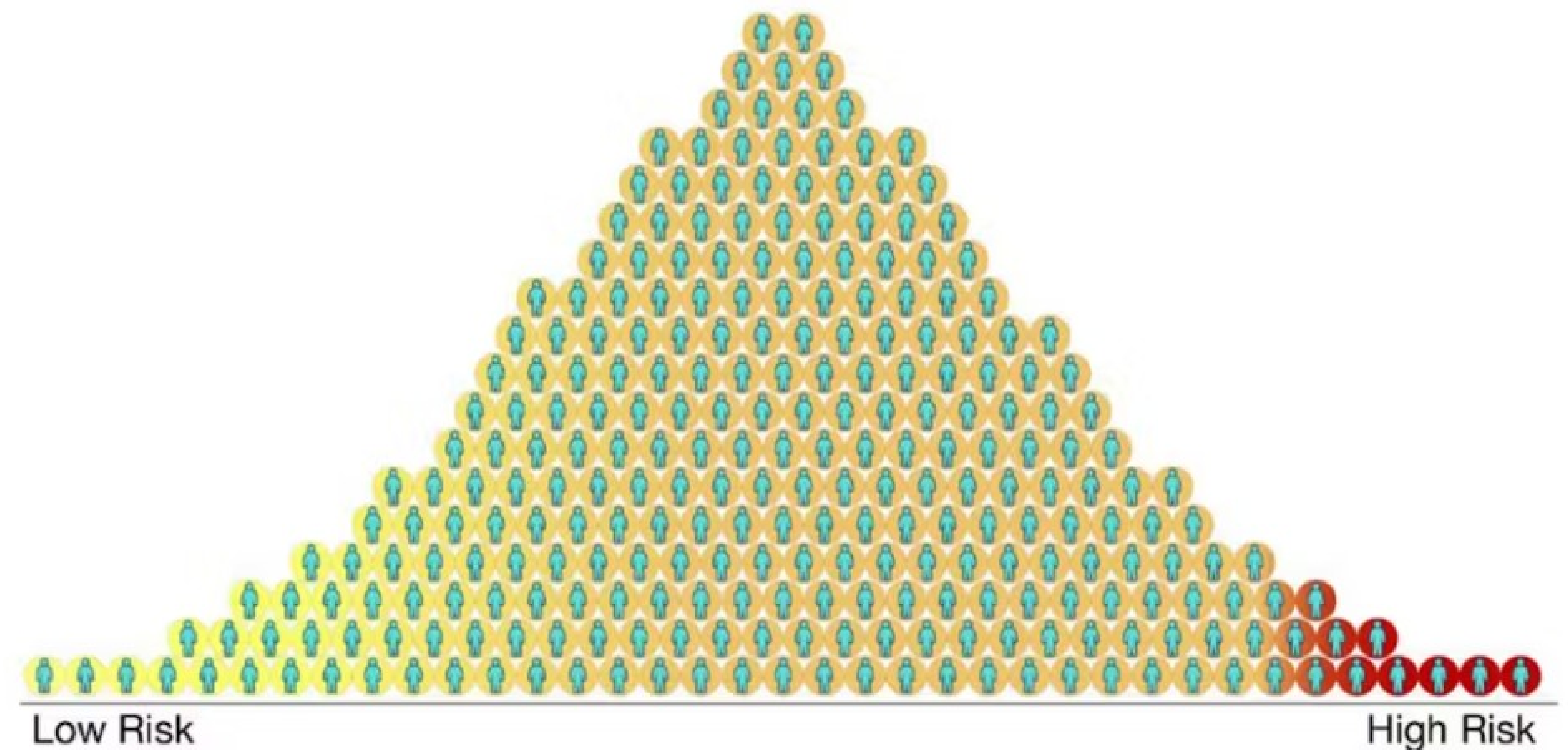
- Research settings
- Clinical practices
- Legal proceedings

Ethics considerations in Africa



Ethics considerations in Africa

Public health efforts
will be needed to
address issues :
access, insurance
coverage, and
**sharing of results
across health
systems.**



Ethics considerations in Africa

- First, polygenic risk scores do not determine whether a person will develop a condition. They measure just one of many possible risk factors.
- Second, polygenic risk scores are population-specific and subject to variation due to ancestry and environment.
- Third, it is important to accurately communicate the level of risk to prospective patient.

Thanks for listening!!!