# Population Genomics, Ancestry & Risk Scores (PRS) — Hands-on

Gain a practical, high level understanding of population genomics, ancestry analysis and polygenic risk scores (PRS). This module connects cohorts, biobanks, ancestry structure and risk score concepts so that participants can read, interpret and design basic population genomics and PRS workflows for translational and clinical contexts. Content is for training and awareness, not clinical or regulatory advice.

## Population Genomics, Ancestry & Risk Scores (PRS)

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**Session Index**



**Session 1**

**Fee: Rs 8800** Apply Now

### Population Genomics & Cohort Foundations

What population genomics aims to answer

**allele frequencies and diversity** | **disease risk and modifiers overview** | **biobanks and large cohorts snapshot**

Cohort designs and basic data structures (high level)

case control and cohort ideas | longitudinal follow up mindset | phenotypes, genotypes and covariates

Quality control thinking for population data

sample and variant level filters idea | call rate, relatedness and heterozygosity snapshot | batch and platform awareness mindset

Session 2

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## Ancestry, Population Structure & Stratification

Concepts of ancestry and population structure

reference panels and background structure idea | principal component style views | admixture and substructure snapshot

Ancestry inference mindset for practical work

using PCs or clusters as covariates | avoidable pitfalls in mixed cohorts | visual summaries for QC

Population stratification and confounding (high level)

why stratification matters for association | basic adjustment strategies snapshot | limitations and residual confounding mindset

Session 3

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## Polygenic Risk Scores (PRS) & Risk Modeling

What PRS tries to capture in simple terms

many variants with small effects idea | relative risk and stratification snapshot | concept of score distributions

High level PRS construction concepts

**effect sizes and variant selection idea** **link to GWAS summary statistics mindset** **cohort specific calibration snapshot**

Evaluating scores and communicating limitations

**AUC and variance explained ideas** **ancestry transferability challenges** **clinical use cases and caveats overview**

**Session 4**

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## Mini Capstone: Ancestry Aware PRS Snapshot

Start from a toy cohort with genotypes and simple traits

**Theory + Practical**

Sketch an ancestry and PRS summary view

**simple ancestry plot or grouping idea** **score distribution by ancestry snapshot** **basic risk bins concept**

Prepare a short interpretation and caveats paragraph

**what the scores might indicate** **ancestry and data limitations** **future improvements and validation ideas**