

The vision of a clinical risk score

- ▶ Framingham risk score: all predictors are on an absolute scale
 - ▶ Age (Years)
 - ▶ Cholesterol (mg/dL)
 - ▶ If smoker (Yes/No)
 - ▶ HDL cholesterol (mg/dL)
 - ▶ Systolic blood pressure (mm Hg)



COX PH MODEL

$$\hat{y} = X\hat{\beta}$$

Why we do not have an omics-based clinical risk score?

- ▶ Gene expression platforms are measured on a **relative scale**
 - ▶ Sequencing depth in RNA-Seq:

$$\hat{y} = X\hat{\beta} \qquad \hat{y} = (X - \mathbf{1})\hat{\beta}$$

- ▶ Use of different reagents between experiments:

$$\hat{\beta} = (X^{\top}X)^{-1}Xy$$