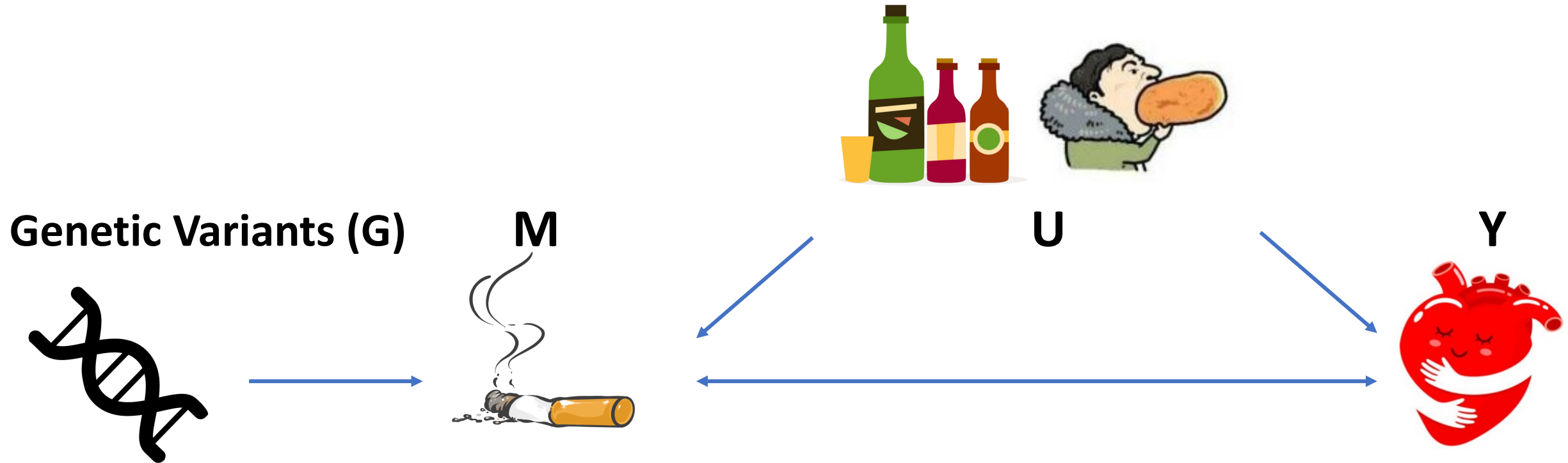


Using genetic variants as instrumental variables (IVs)



- **G** is associated with **M**
- **G** is independent with **U**
- All the effect from **G** to **Y** go through **M**

$$Y = M\beta + \epsilon_y$$

$$M = G\alpha + \epsilon_M$$

$$\hat{\beta}_{IV} = (G^T M)^{-1} G^T Y$$