



Law of total probability

$$\begin{aligned} P(\text{rich}) &= P(\text{rich} \cap \text{has wrkd}) + P(\text{rich} \cap \text{has not wrkd}) \\ &= P(\text{rich}|\text{has wrkd}) * P(\text{has wrkd}) + P(\text{rich}|\text{has not wrkd}) * P(\text{has not wrkd}) \end{aligned}$$