

The prosecutor's fallacy: a match probability is not a guilt probability.

The chance of seeing this evidence if the person is innocent is not the chance they are innocent given the evidence.

$P(\text{evidence} \mid \text{innocent}) \neq P(\text{innocent} \mid \text{evidence})$

Match odds 1 in a million

Depends on the pool

Not the odds of guilt

Large database searched

Allow for search size

Chance matches rise

Two rare findings

Independence must hold

Do not simply multiply

THE COMMON MISTAKE

× **One in a million match, so guilty**

✓ **Ask how many people could match**

Transposing the conditional is the prosecutor's fallacy, and it has contributed to documented miscarriages of justice.

Educational reference. Courts increasingly expect likelihood ratios with stated assumptions rather than bare probability claims.