

Review of: "Notes on the Implications of Ignoring Bayes' Rule in Search and Rescue Practice in the UK"

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Potential competing interests: No potential competing interests to declare.

This is a very interesting and potentially important topic. However, I found the paper difficult to follow and did not really see the connection to Bayes' theorem. I think the initial section should be a brief overview of Bayes' theorem, and then you should explain how your calculations stem from this. I did not follow where Equations A and B come from, and the Table needs a title that clarifies what the figures in the table are. I don't quite follow where the 8% comes from. The multiplication rule surely gives the PoS (not PoA) of $0.5 \times 0.7 = 0.35$ (not 0.15?), and I don't follow your version of Bayes' rule in Equations A and B.

I think your description of the probabilities is a little confused. You refer to "the likelihood of our picking the yellow one having previously picked the red one is 16.5%" when I think you mean the probability of picking the red then the yellow. And you say little about the probability of success, which is surely the whole point. Surely search parties aren't allocating according to the best new POAs but to the best PoSs?

Bayes' rule is for updating probabilities in the light of fresh evidence. The fresh evidence is presumably that the missing person has not been found in a particular area. (If they are found, presumably you stop calculating and go home!) This will presumably increase the probability of their being found in the other areas (all by the same factor?), and I would have thought the probability of finding them in the area searched would need rethinking depending on the experience of the search.

I'm not convinced that Bayes' rule is helpful here, but I may be wrong because I don't follow your argument in enough detail. I can't really see the problem with the multiplication rule. Presumably, the time taken to reach or search the different areas would be a critical consideration?