

Module 2D Questions:

Using the Bruce Effect example, answer the following questions (Q1, Q2, Q3 on page 2):

A female house mouse mates and enters very early pregnancy. In her territory, unfamiliar males sometimes intrude. Exposure to the scent of an unfamiliar male (urine/pheromones) can trigger the Bruce effect—pregnancy block via implantation failure. This functions as an adaptive strategy in environments where infanticide risk from non-sire males is high: rather than invest in a likely doomed litter, the female aborts early and re-mates.

- If no unfamiliar male is present, pregnancy usually proceeds.
- If an unfamiliar male is present, pregnancy block is much more likely.

Thus, the state of the environment the female encounters (unfamiliar male present vs not) and the outcome (pregnancy continues vs blocks) are dependent variables

State:

$U(\text{nfamiliar}) = 1 \text{ (present), } = 0 \text{ (absent)}$

Outcome:

$B(\text{lock}) = 1, = 0 \text{ (no block, pregnancy proceeds)}$

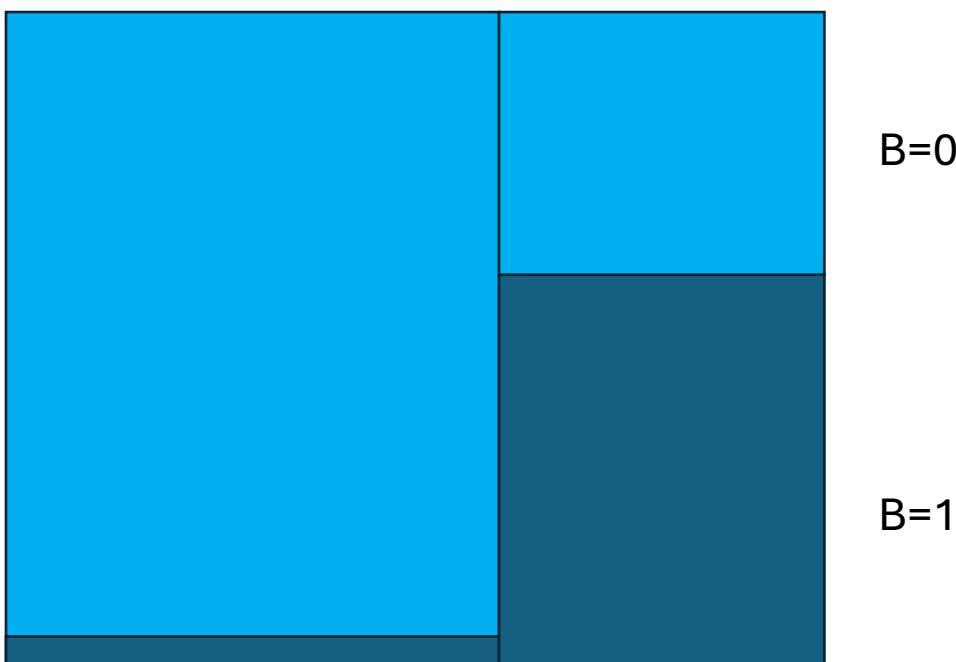
Prior:

$P(U=1) = 0.40; P(U=0)=0.60$

Conditional:

$P(B=1|U=1) = 0.6$

$P(B=1|U=0)=0.05$



- Q1. What proportion of pregnancies block overall?
- Q2. If you observe a pregnancy block, what's the posterior probability an unfamiliar male was present?
- Q3. If pregnancy continues, what's the probability an unfamiliar male was present?