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A link has been discovered between a certain virus (adeno-virus 36) and obesity. Casual mechanisms are being elucidated biochemically but I was wondering if there are any general statemenst we can make about the virus's contribution to the obesity epidemic.

Given:

- 1) The virus is a causal risk factor for obesity and that obesity is not a risk factor for catching the virus.
- 2) 20% of the general population tests positive for the virus.
- 3) 40% of obese people test positive for the virus.
- 4) 30% of the united states is obese.

Can we infer?

- 1) What percentage of obesity in the general population is attributable to the effect of the virus.
- 2) What is the likelihood that you will become obese if you contract the virus.

We are given

$P(\text{virus}) = .20$

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$$P(\text{virus}|\text{obesity}) = .40$$

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The conditional probability for the second question is, from Bayes formula,

$$P(\text{obesity}|\text{virus}) = P(\text{virus}|\text{obesity}) * P(\text{obesity}) / P(\text{virus}) = (.40) * (.30) / .20 = .12 / .20 = .60.$$

Jack

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