MEMO

Date: March 31, 2010

Subject: Operating Room Charges

From: Casey Cumbow

To: Mr. Brown

As you already know, our insurance company pays hospital claims. In order to better predict whether or not specific charges are included in the hospital claims, I need you to perform a few calculations. This will help our company operate more efficiently. I will be forwarding the results and the significance of these calculations to colleagues in a different department who may not be as familiar with typical technical vocabulary, so please don’t include any calculations in your memo.

The majority of claims that come through regarding hospitals are emergency charges and operating charges, which occur independently. The number of claims that include emergency or operating charges is 85% or the total number of claims we receive. On the other hand, the number of claims that do not include emergency room charges is 25% of the total number of claims received. We are looking to determine the probability that a claim submitted includes operating room charges.
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Upon receiving your request, I have determined the probability that a submitted claim includes operating charges. Using the basic rules of probability, there is a 40% chance that a claim includes operating charges. This means that on average every 4 out of 10 claims will have operating charges. Therefore, it is necessary to evaluate claims individually when establishing whether or not it includes the various charges.

If the probability of acquiring a claim with operating charges was very small, it might not be necessary to check for the existence of the charges on every submitted claim. It may end up being a waste of money to pay employees to verify the charges if operating charges rarely exist.

Since the likelihood is 40%, it is definitely necessary and more cost efficient to employ someone to check the claims for the different potential charges.
SOLUTION

E = emergency room charges
O= operating room charges

(E U O) = .85
Not E = .25
E = 1 - .25 = .75

Since (E U O) = E + O - (E n O), and (E n O) = E x O,

We have (E U O) = E + O - (E)(O).

.85 = .75 + O - (.75)(O)

.1 = .25(O)

O = .4

There is a 40% chance that a claim submitted includes operating charges.