## Scientific Literacy \& Numeracy - Numeracy Problem Set I

1. For a 20 -sided dice, what is the probability of obtaining the following results:

| Number of Rolls | Outcome | Probability? |
| :--- | :--- | :--- |
| Once | Rolling a "2" | $1 / 20=0.05=5 \%$ |
| Once | Rolling a "2" or a "15" |  |
| Twice | Rolling a "2" both times |  |
| N Times | Rolling a "2" every time |  |
| Once | Not rolling a "2" |  |
| Twice | Not rolling a "2" either time |  |
| N Times | Not rolling a "2" any time |  |

2. There are approximately, 60,000 clinical articles published in medical journals each year. Assume another 40,000 studies are conducted but not published (i.e. because of negative findings, Easterbrook Lancet 1991). Therefore, assume that there are a total of 100,000 research studies each year. How many articles will have $P$ $<0.05$ just by chance when the findings are not actually true?
3. Wenzel. NEJM 2004; 350: 105-13. A man is intubated and CPR is begun for asystolic arrest. A consultant hands you this article and suggests that the patient be given vasopressin instead of epinephrine. Read the article carefully and decide whether or not you would follow the recommendation?
4. Kaiser. Arch Int Med 2003; 163: 1667-72. A previously healthy woman presents with fever and cough and is subsequently shown to have influenza. A consultant hands you this article and suggests that the patient be given oseltamivir. Read the article carefully and decide whether or not you would follow the recommendation?
5. A RCT compares dopamine vs. norepinephrine in patients with hypotensive shock. What conclusions would you draw from this article?

| Hazard Ratio (95\% CI) |  |
| :---: | :---: |
| Type of shock |  |
| Hypovolemic | - |
| Cardiogenic | $\square$ |
| Septic | - |
| All patients | - |
|  | $\begin{array}{lll}0.5 & 1.0 & 1.5\end{array}$ |
|  | Norepinephrine Better $\begin{gathered}\text { Dopamine } \\ \text { Better }\end{gathered}$ |
| Figure 3. Forest Plot for Predefined Subgroup Analysis According to Type of Shock. |  |
| A total of 1044 patients were in septic shock ( 542 in the dopamine group and 502 in the norepinephrine group), 280 were in cardiogenic shock ( 135 in the dopamine group and 145 in the norepinephrine group), and 263 were in hypovolemic shock ( 138 in the dopamine group and 125 in the norepinephrine group). The $P$ value for interaction was 0.87 . |  |

