**Is Medworld Cheating? Part 1**[[1]](#footnote-1)

Medworld is a reputed a drug manufacturing company and one of its main products is Slezx, a life-saving drug. At the time of obtaining the license from Drug Regulatory Authority (DRA), this 500mg tablet was slated to contain 100 mg of the ‘medicine’ and 400 mg of ‘filler’; the variance of ‘medicine’ in the tablets was also slated to be 12.25 sq.mg. Recently a complaint has been registered at the DRA claiming that Medworld is giving more fillers than stipulated on average.

In order to validate the charge, DRA appoints a senior inspector, Rama. Rama has decided to check the content of 50 randomly sampled Slezx tablets from the market and measure the medicine content of these tablets. Rama as well as the people who brought the charge against Medworld believes that there is no problem with quality control at Medworld and hence there is no reason to question Medworld’s stated position on variability in the medicine/filler content or the total weight of the Slezx tablets. Before carrying out the test, Rama wants to announce her procedure to both the parties.

The following is a list of issues Rama prepared that she believes would help addressing the problem objectively.

1. What stand should Rama take prima-facie, before checking the tablet contents? Does it make any difference?

2. Should she address the problem from the requirement perspective of filler content? Or medicine content? Does it make any difference?

3. Can she afford to presume that Medworld is innocent till proven guilty?

4. On what minimum numerical evidence should she take action against Medworld?

5. What are the possible errors that she can possibly make while taking her decisions? What are the likelihoods of the same?

6. How much improvement can she expect in her decision making if she decides to double the sample size?

What should be her decision?

Her sample of 50 tablets produced the following amounts (mg) of medicine contents.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 99.85 | 96.33 | 107.2 | 96.81 | 100.32 | 99.45 | 95.81 | 97.2 | 96.82 | 101.57 |
| 98.53 | 97.19 | 96.53 | 103.2 | 95.68 | 97.78 | 106.87 | 104.58 | 101.95 | 103.81 |
| 98.43 | 93.06 | 103.69 | 94.98 | 103.26 | 97.63 | 97.09 | 96.85 | 93.36 | 100.08 |
| 98.73 | 102.26 | 103.28 | 97.47 | 99.25 | 99.63 | 98.26 | 102.25 | 100.86 | 98.92 |
| 95.5 | 100.15 | 99.77 | 101.13 | 97.83 | 98.24 | 98.23 | 98.27 | 100.76 | 100.01 |

**Is Medworld Cheating? Part 2**

How many tablets Rama ought to sample if she wants to estimate the actual filler content within 0.5 gm of the true value with 95% confidence?

**Is Medworld Cheating? Part 3**

Refer to Part 1 of the case. How many tablets Rama ought to sample if she wants to limit the following risks at the level stated below:

• If Medworld is cheating by 1 mg on average, then there ought to be at least 98% chance in the adopted procedure that Rama is able to catch Medworld’s wrong-doing;

• If Medworld not cheating then should be no more than 1% chance that it is penalized by mistake.

**Is Medworld Cheating? Part 4**

Rama decided that she would first check whether the average medicine content is as specified. But subsequently she also wants to verify if 50% or more tablets produced has medicine content less than 99% of the printed amount. Would her decision change?

1. Case prepared by: Shubhabrata Das, IIMB [↑](#footnote-ref-1)