GER1000 2018 Sem 1
Quiz 5

1. The Montogomery-Åsberg Depression Rating Scale (MADRS) is used by clinicians to assess the severity of depression in patients. In 2016, there were 1,800 patients admitted to the Institute of Mental Health (IMH), and their average MADRS score was 22.4 points. From these patients, 193 were selected by simple random sampling. The sample average MADRS score was 23.4 points.

Let the population be all patients admitted to IMH in 2016. 22.4 is the ___.   23.4 is the ___.

   a) Estimate, Error term
   b) Estimate, Parameter
   c) Parameter, Error term
   d) Parameter, Estimate

Answer: d
From Chapter 4, our Parameter of interest is from a defined Population. We can use a Sample to give us an Estimate about that Parameter.

2. The Montogomery-Åsberg Depression Rating Scale (MADRS) is used by clinicians to assess the severity of depression in patients. In 2016, there were 1,800 patients admitted to the Institute of Mental Health (IMH), and their average MADRS score was 22.4 points. From these patients, 193 were selected by simple random sampling. The sample average MADRS score was 23.4 points.

Assuming that there is no problems in the response process, the bias = ___ point(s) and the random error = ___ point(s).

   a) 0, 1.0
   b) 0, -1.0
   c) 0.5, 0.5
   d) 1.0/193, 0
   e) More information is needed

Answer: a
For all probability sampling methods, there is no selection bias present. Assuming that there is a 100% response rate and no problems in the response process, the bias = 0 points. This means that the random error = (estimate – parameter) = 23.4-22.4 = 1.0 points.

3. The Montogomery-Åsberg Depression Rating Scale (MADRS) is used by clinicians to assess the severity of depression in patients. In 2016, there were 1,800 patients admitted to the Institute of Mental Health (IMH), and their average MADRS score was 22.4 points. From these patients, 193 were selected by means of a quota sample, and their sample average MADRS score was 25.4 points.

Assuming that there is no problems in the response process, the bias = ___ point(s) and the random error = ___ point(s).

    a) 0, 1.0
    b) 0, 3.0
    c) 0, -3.0
    d) 2.0, 1.0
    e) More information is needed

Answer: e
Quota sample is a non-probability sampling method, and selection bias would be present. However, we do not know how big the bias would be in the study, and hence more information is needed about the bias or random error.

4. A researcher wanted to find out how satisfied the students of NUS are with university life. He randomly chose 5 faculties out of a total of 17, and emailed his survey forms to all students of the 5 faculties. He received completed survey forms from less than 40% of said students. Which of the following is most likely the issue encountered here in sampling?

    a) Imperfect sampling frame
    b) Self-selected sample
    c) Low response rate
    d) Non-probability sampling plan

Answer: c.
More than 60% non-response rate is considered quite bad. The rest of the options did not occur in this scenario. In particular, a self-selected sample refers to a sample whereby inclusion of units from the population is entirely determined by self-selection, which is not the case here, because a probability sampling plan (cluster sampling) was used.

5. A researcher has a method of distinguishing a sampling unit within the population from one outside the population. However, the method requires him to process one unit at a time. He wants to draw a sample from the population for a study. If he uses a sampling frame that covers the population but is many times larger than the population, then

    a) time and effort is likely to be wasted on unwanted units.
    b) the unwanted units will tend to cause bias to the result.
    c) it will be difficult for him to carry out a probability sampling plan.

Answer: a.
In this case, the main drawback is inconvenience to data collection. To hit a desired sample size, he should apply probability sampling to select a much larger number of units, and then whittle them down using his method to include only those in the population.

6. Tien wants to conduct an experiment on a group of people to test the effects of a particular drug in creating a "third eye". He obtained a namelist of residents of his town, randomly selected a month in the year, and included all in the namelist whose birthday falls in that month. What sampling plan must this be?

    a) Simple random sampling
    b) Cluster sampling
    c) Multi-stage sampling
    d) Systematic sampling

Answer: b.
Each cluster is represented by a month, and comprises people in the namelist whose birthdays fall in said month.