

## Sampling Methods

### STA 2023 & 2122

There are many ways to select a sample from a population; the most straightforward sampling methods are:

**Simple Random Sample (SRS)**

**Systematic Sample**

**Stratified Sample**

**Cluster Sample**

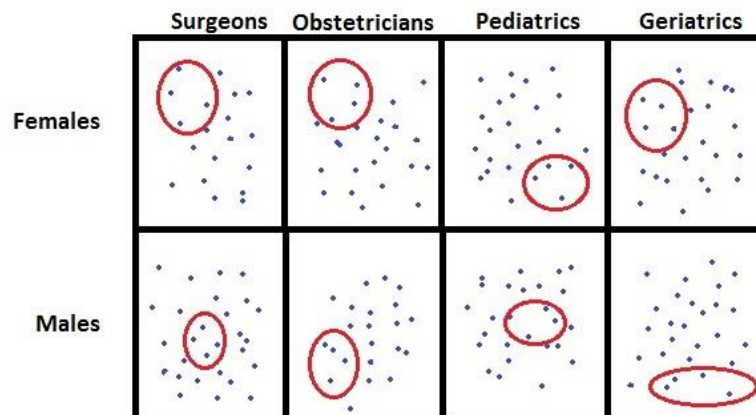
**Simple Random Sample (SRS)** is a sample chosen in which all individuals within a given population have the same probability of being selected.

**Example 1:** The professor of a Drawing and Art class wants to select five students out of a class of 42. She writes all 42 names on individual pieces of paper and then puts them in a hat. Randomly and without looking, she selects five pieces of paper, and reads their names.

**Example 2:** The director of the statistics department of a certain university wants to estimate the age of all the 9000 students in his university. He goes to a computer and obtains 100 random four-digit numbers (between 0001-9000) without repetition. Once the 100 numbers are selected, he goes to the database and pulls out the list of the students and matches those 100 numbers with the students' four-digit ID numbers.

**Stratified Sample:** is a method that divides the population into **different groups**, and then it performs a **simple random sample on each group**.

**Example 1:** The Health Department wants examine the stress levels of medical doctors. The Health department divides the doctor community into Surgeons, Obstetricians, Pediatrics and Geriatrics and also by gender. Then, the Health Department selects simple random samples from each one of these groups



**Example 2:** Hernán goes to Sam's Club and enjoy eating from the sample stands. Let's consider each stand is a different group, and Hernán goes to each one of the stands selecting two samples. This will be a stratified sample because there are groups (sample stands) and there are samples from each group.

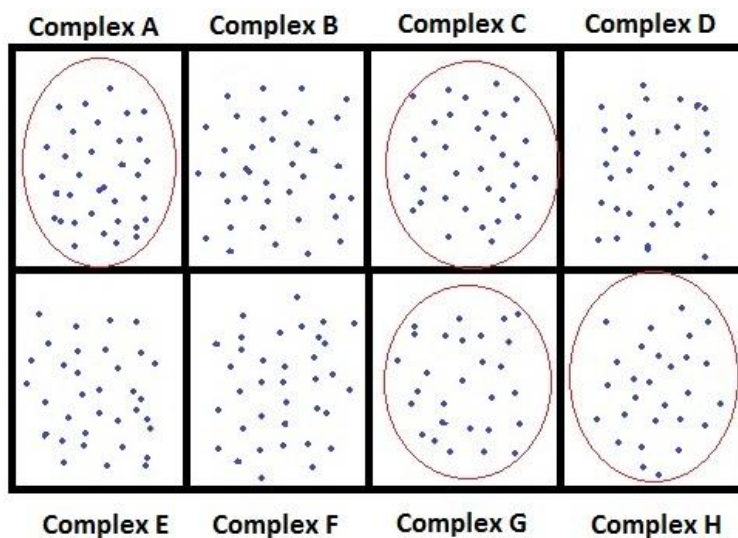
**Systematic:** is a sample in which one can select every  $k$ th person from a list of the population. This is also called 1 in  $k$  systematic sample

**Example 1:** The Human Resources department wants to estimate the number of student visit during office hours. HR pulls the faculty directory and selects every eighth person to be sample in its survey. This will be called a 1 in 8 Systematic Sample.

**Example 2:** An instructor for a large class of 136 students wants to know the hours the students spend studying for his class. He uses the roster to select every third person from the list to ask how much time they spend studying for his class. This will be a 1 in 3 Systematic Sample.

**Cluster:** this is a method that divides the population into **different groups**. Then, **some of the groups are selected** and **every person in the group** is selected.

**Example 1:** The sociologist department of a university wants to examine the amenities in apartment complexes. There are 8 apartment complexes (A, B, C, D, E, F, G, and H) in the city. They select 4 apartment complexes, and they survey every person in those complexes.



**Example 2:** Hernán's friend is not allowed at Sam's Club because he went to his favorite five sample spots and ate every single one of the samples.