

## Chapter 7

### Simple Random Samples

In this chapter we will discuss the following topic:

- How to select a Simple Random Sample (SRS) using the R-function `sample()`.

#### Simple Random Samples

A *simple random sample* (SRS) of size  $n$  consists of  $n$  individuals from the population chosen in such a way that every set of  $n$  individuals has an equal chance to be the sample actually selected. [1].

**Problem.** A small town has 1000 residential telephone numbers. An interviewer asks to speak with an adult member of the residential to ask a question for a statistical study. Use R to select a SRS of 70 residential phone numbers. Label all the residential phone numbers from 1 to 1000 and then randomly choose 70 of the numbers.

**Solution.** The R-code is as follows:

```
> population=c(1:1000)
> SRS=sample(population,70)
> SRS
 [1] 753 793 561 728 463 571 695 376 396 813 588 25 394 425 269
[16] 546 529 500 371 946 285 948 651 530 595 950 51 60 448 304
[31] 98 136 231 569 559 590 58 28 796 252 437 545 308 158 521
[46] 346 910 246 712 553 182 326 48 10 649 484 752 1000 457 931
[61] 143 841 826 535 117 809 894 783 214 247
```

**Explanation.** The code can be explained as follows:

- The command `sample(population,70)` randomly selects a sample of 70 *without replacement* from the members of `population`.

#### References

- [1] D. S. Moore, W. I. Notz, M. A. Fligner, R. Scoot Linder. *The Basic Practice of Statistics*. W. F. Freeman and Company, New York, 2013.